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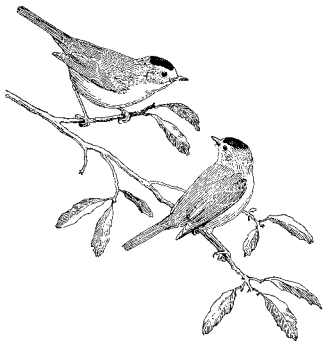

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AVIFAUNAL SURVEYS OF THE UPPER APURÍMAC RIVER VALLEY, AYACUCHO AND CUZCO DEPARTMENTS, PERU: NEW DISTRIBUTIONAL RECORDS AND BIOGEOGRAPHIC, TAXONOMIC, AND CONSERVATION IMPLICATIONS

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ABSTRACT.—The sliver of humid tropical and montane forest on the east slope of the Andes in Ayacucho Department ranks among the least surveyed sectors of the Peruvian Andes. This mountainous region, along with adjacent Apurímac Department and western Cuzco Department, comprise the Apurímac River Valley, a putative biogeographic barrier. Hence, understanding avian distributions in the vicinity of the Apurímac River Valley is fundamental to understanding faunal turnover across it. Here, we report results of recent avifaunal surveys (2008–2012) from five sites in the Apurímac Valley region. We report 35 bird species previously undocumented in Ayacucho, six of which represent range extensions, including records of the endemic Black-spectacled Brush-Finch (*Atlapetes melanopsis*), Marcapata Spinetail (*Cranioleuca marcapatae*), and Chestnut-breasted Mountain-Finch (*Poospiza caesar*); the remaining records filled perceived range gaps. Specimen evidence suggests little phenotypic introgression between differentiated forms across the region, except for apparent introgression zones in Superciliaried Hemispingus (*Hemispingus superciliaris*) and Mountain Cacique (*Cacicus chrysonotus*); these observations uphold the idea that the Apurímac River Valley functions to isolate bird populations. Specimens of two *Grallaria* sp. and one *Scytalopus* sp. may represent new taxa, two of which appear to be endemic to

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Ayacucho (the third extends into adjacent Junín Department). More generally, montane forest bird species richness and avian endemism in eastern Ayacucho are similar to those of Cuzco and Pasco departments; previous assessments that considered Ayacucho as an area of reduced diversity were misled by sparse sampling effort. *Received 4 December 2014. Accepted 23 July 2015.*

Key words: Andes, cryptic species, diversity, elevation gradient, endemism, range extension.

Humid Andean slopes harbor the most diverse montane avifaunas in the world (Churchill et al. 1995, Stotz et al. 1996, Kattan and Franco 2004, Herzog et al. 2005). In central and southern Peru, the Andes rise from Amazonian forest to elevations above 4,000 m, with several glacier-capped peaks reaching elevations above 5,000 m. With increasing elevation, forests become shorter in stature, wetter, and more laden with epiphytes. Tree line occurs at 3,000–4,500 m, depending on topography and anthropogenic disturbance. Bird communities change with elevation, often tracking narrow, elevation-specific bands of habitats, resulting in extraordinary species diversity across the elevational gradient (Terborgh 1971, 1977). For example, more than 1,000 bird species are known to occur along a well-surveyed elevational gradient (250–4,200 m) in Manu National Park (Walker et al. 2006).

Numerous deep, dry river valleys cut through the Andes in south-central Peru, producing dramatic breaks in montane forest continuity (Chapman 1921, Cracraft 1985, Stotz et al. 1996, Winger and Bates 2015). Major river valleys include (from north to south) those of the Río Perené, Río Mantaro, Río Pampas, Río Apurímac, and Río Urubamba, each a tributary of the Río Ucayali, itself a major tributary of the Amazon. Avian distributional limits here often coincide with these dry valleys, the most important of which is thought to be the Apurímac River Valley (Weske 1972, Cracraft 1985). Species turnover along environmental gradients and across biogeographic barriers is likely responsible for the tremendous diversity and endemism in central and southern Peru (Cracraft 1985, Fjeldså and Krabbe 1990, Churchill et al. 1995, Stotz et al. 1996, Schulenberg et al. 2010).

As a whole, central and southern Peru features great avian endemism, yet observers have noted that certain sectors harbor more range-restricted species and greater alpha diversity than others. Humid forests of Ayacucho and Junín departments are thought to hold fewer regional endemic species, and have lower alpha diversity than Pasco Department to the north and Cuzco Department to the south (Fjeldså et al. 1999; Schulenberg et al. 2006, 2010). Fjeldså et al. (1999) suggested that variation in long-term climatic stability associated with topography could explain this pattern. However, Ayacucho and Junín are relatively poorly known when compared to Pasco and Cuzco; perceived gaps in species' distributions could instead be artifacts of low survey effort, and restricted-range endemic species could occur but have yet been documented (e.g., Witt and Lane 2009, Hosner et al. 2013).

Weske and Terborgh's landmark studies of bird communities across elevational gradients (Weske 1972, Terborgh and Weske 1975) on both sides of the Río Apurímac in 1965–1970 made the upper Apurímac River Valley one of the best-studied tropical sites of that era. Those surveys produced the first detailed information on elevational distributions of Andean birds and uncovered several species new to science (Vaurie et al. 1972; Weske and Terborgh 1974, 1981; Parker and O'Neill 1985; Remsen 1993). Subsequent work in the remote northern end of the Vilcabamba Mountains clarified the status and distribution of the avifauna on the east side of the upper Apurímac River Valley (Alonso et al. 2001).

Here, we present results of recent avian inventories focused on the humid forests of the upper Apurímac River Valley. We first visited sites on the Ayacucho side of the river, where our field surveys were the first in 40 years, owing to decades of political strife (Palmer 1986, Burt 2007). Second, we visited the southern Vilcabamba Mountains on the Cuzco side. The southern sectors of the Vilcabamba Mountains are part of the main Andean Cordillera, are the most proximate humid montane forests to the dry Apurímac Valley gap, and had never been surveyed thoroughly by ornithologists.

METHODS

Fieldwork.—We documented occurrences of bird species with voucher specimens (skin, skeleton, and fluid preparations), audio recordings, mist net captures, and observations (visual and aural detections) at five major sites in the upper

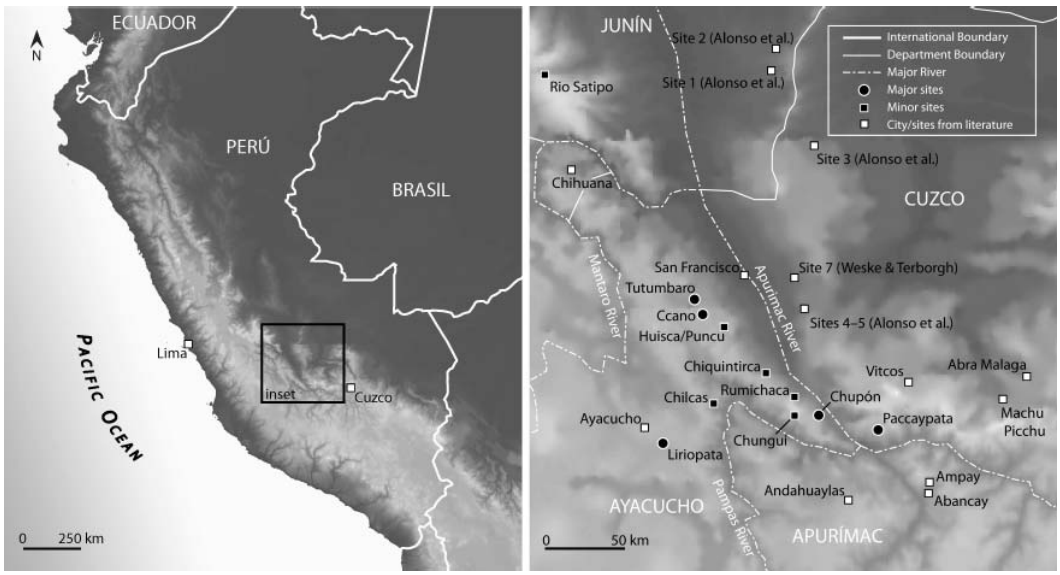

FIG. 1. Topographic map of Peru and the study region. Major sites are identified by black circles with white border; minor sites are identified by black squares with white borders. Relevant sites from other studies (Sites 1–5 [Alonso et al. 2001]; Site 7 [Weske 1972]) and cities are identified by white squares with black borders. The Apurímac River forms the border between Cuzco and Apurímac/Ayacucho, the Pampas River forms the border between Ayacucho and Apurímac, the Mantaro River largely forms the border between Ayacucho and Huancavelica/Junín (except in the vicinity of Chihuana, Huancavelica).

Apurímac River Valley: four in Ayacucho and one in Cuzco (Fig. 1). We surveyed trails and open areas on foot. Mist net effort (except when otherwise noted) included 15–20 12-m mist nets, opened from 0600 to 1600 hrs daily. Mist nets were set in a variety of forested habitats, and were moved every 3–4 days when capture rates slowed. For difficult-to-capture species (i.e., canopy, ground-dwelling, and open-country species), we supplemented net-based collecting efforts with shotguns.

Specimens are deposited at University of Kansas Biodiversity Institute (KU; Lawrence, KS, USA) and Centro de Ornitología y Biodiversidad (CORBIDI; Lima, Peru); specimen data are served via VertNet (http://www.vertnet.org). Audio recordings are deposited at the Macaulay Library (Cornell Laboratory of Ornithology, Ithaca, NY, USA), and are available online at http://www.macaulaylibrary.org. Observational data (MJA, PAH, MBR) are archived on eBird, and are available online at http://www.ebird.org. Taxonomy and nomenclature follow Remsen et al. (2015). Relative abundance criteria are: common (C), observed numerous instances daily (usually >3 individuals); fairly common (FC), observed almost daily to daily; uncommon (U), observed regularly, but only once every 2–3 days; rare/scarce (R), observed only a few times during survey effort; and (X), single observation (Supplemental Material). Elevational data represent our best estimates for each site from calibrated, pressure-based altimeter readings. We recorded breeding evidence when noted: physiological evidence (PE) from gonad condition, recently fledged young still under parental care (FL), territorial males (T; persistent singing throughout morning [or early evening/predawn for nocturnal species] from the same territory throughout survey effort), and courtship/breeding display behavior (D).

Study Sites

Tutumbaro, Ayacucho.—Personnel: MJA, RLB, LAS-G, JN, ATP, AGN-S, AU-T, JT. We established a camp along the Río Piene, in a steep valley just above the town of Tutumbaro (12.733 °S, 73.956 °W, 1,800 m). Surveys were conducted 2–12 June 2008 on the heavily forested south-facing slope. The drier, north-facing slope was completely deforested from past burning, so we did not survey there. We accessed forested habitats from two

trails: one ascended the ridge above camp to 2,400 m (12.729 °S, 73.965 °W); a second began 1.3 km upstream from camp and followed a side valley to 2,350 m (12.719 °S, 73.972 °W). Generally, habitat around and above camp at 1,800–1,950 m was disturbed/secondary forest and forest edge, including roadside scrub, whereas areas above 1,950 m contained primary forest, albeit with some disturbance near trails. Survey effort was concentrated at 1,800–2,200 m. During 10–12 June, we operated smaller numbers of nets below Tutumbaro on a trail at 1,300–1,500 m (12.718 °S, 73.918 °W).

Ccano, Ayacucho.—Personnel: MJA, RLB, LAS-G, JN, ATP, AGN-S, AU-T, JT. Camp was established on a flat terrace in a north-south side valley above the small town of Ccano (12.785 °S, 73.995 °W, 2,750 m). Surveys took place 13–24 June 2008, mostly above camp on the densely forested west-facing slope. We accessed forest from two trails: one ascended the valley's steep, west-facing slope to a human-modified tree line at 3,300 m (12.784 °S, 73.984 °W); a second that led south along the valley floor to 3,000 m (12.802 °S, 73.985 °W). Additionally, we worked along an old, overgrown roadway that ran south from camp through disturbed forest; crossing the modern road, it continued upslope above tree line to disturbed grassland at 3,400 m (12.797 °S, 73.998 °W).

Lirriopata, Ayacucho.—Personnel: MJA, PAH, HLO, AU-T. Camp was established in a broad, semi-humid valley at tree line above Lirriopata (spelled Liriopata on some maps; 13.328 °S, 74.196 °W, 3,860 m) during 6–11 January 2009. Immediately downslope from camp, we worked through scrubby tree line vegetation down to 3,750 m (13.317 °S, 74.203 °W). Upslope of camp, we followed a stream into puna vegetation to 4,200 m (13.333 °S, 74.166 °W), where a liquefied natural gas pipeline right-of-way bisected the valley. During 6–7 January 2009, we surveyed nearby Laguna Condorccocha, a series of lakes and marshy wetlands at 3,600 m (13.455 °S, 74.189 °W). Three mist nets were used in scrubby vegetation near camp; otherwise, we relied on shotguns to collect birds in the open landscape. Heavy grazing pressure (goats and cattle) was evident throughout, especially above camp on the south-facing slope.

Chupón, Ayacucho.—Personnel: LC-A, PAH, MBR, KV-G. We established camp along a small stream in a tongue of forest below Chupón village (13.246 °S, 73.501 °W, 3,300 m) 15–25 September 2012. One existing trail continued down the valley to the village of Chapada (~2,000 m, not visited); we surveyed this trail daily down to 3,000 m (13.241 °S, 73.492 °W), with one foray down to 2,700 m (13.231 °S, 73.482 °W; MBR). This trail accessed primary and secondary forest with large patches of *Chusquea* bamboo that was contiguous from camp down to just below 3,000 m. The forest was largely undisturbed along the entire south-facing slope; however, owing to repeated burning, an artificial tree line approached 2,800 m in some areas on the north-facing slope. Slopes below 2,700 m were well forested but remained unsurveyed due to distance from camp. The second trail ascended from camp up the valley through montane scrub to overgrazed/degraded puna at 3,500 m (13.240 °S, 73.517 °W), where cattle, sheep, and horses were prevalent. We cut a third trail upslope from camp through undisturbed forest and elfin forest to less-disturbed bunchgrass puna at 3,800 m (12.238 °S, 73.505 °W). The only puna grassland at this site not affected by severe grazing pressure was on near-vertical slopes inaccessible to livestock.

Paccaypata, Cuzco.—Personnel: LC-A, MC, PAH, MBR, KV-G. Camp was established above Paccaypata (spelled Pacaypata on some maps) at 3,000 m, at a site known locally as Kukur (13.376 °S, 73.137 °W) 30 September–11 October 2012. From camp, we worked two trails that led up to puna and eventually to the village of Occuro. The 'old' trail led through montane and elfin forest up to tree line at 3,800 m (13.356 °S, 73.125 °W), where we continued off-trail through bunchgrass puna to the edge of relatively intact *Polylepis* forest at 4,200–4,500 m (13.351 °S, 73.120 °W). Dense *Polylepis* was present on steep slopes/cliffs; we surveyed this habitat primarily along the sharply demarcated puna/woodland edge. In this area, puna bunchgrass was tall (up to 1 m), and domestic animals were not present during our visit; however, we noted evidence of old cattle trails and burning, including small, charred patches of dead *Polylepis*. The 'new' trail was forested up to about 3,700 m (13.349 °S, 73.132 °W) and offered a more direct route to Occuro. In this area, fire disturbance and grazing had degraded the puna/forest ecotone severely; vegetation was semi-humid scrub rather than humid elfin forest. Below camp, we worked along the mostly forested main trail down to 2,300 m, where forest became drier and affected by subsistence agriculture. During 11–16 October 2013, we moved to the town of Paccaypata

(2,000 m) to work lower elevations. Here, we worked along the main trail in plantations, semi-humid woodland (2,000–2,300 m), and secondary humid forest (2,300–2,500 m). Also, we briefly surveyed dry forest, scrub, and abandoned plantations along the road below the village to 1,400 m (13.528 °S, 73.172 °W).

In addition to the five main sites described above, we made additional observations during brief scouting visits to other sites. The following sites are referenced in the species accounts: Anco (13.099 °S, 73.693 °W; 3,800 m, shrubby puna; 1–2 January 2009), below Chiquintirca on the road to San Antonio (12.979 °S, 73.654 °W; 2,400–2,700 m, montane forest; 3 January 2009), Chungui (13.219 °S, 73.619 °W; 3,600 m, semi-humid scrub; 10–11 September 2012), above Chungui (13.187 °S, 73.651 °W; 4,200 m, shrubby puna; 10 September 2012), Huisca (12.832 °S, 73.923 °W; 3,600 m, montane forest edge/shrubby puna; this site was likely one valley north of the site called Puncu by Weske [1972]; 8 September 2012), and Rumichaca (13.162 °S, 73.588 °W; 2,700 m, montane forest; 1–2 January 2009).

RESULTS AND DISCUSSION

New Distributional Records

Our avifaunal surveys produced records of 35 species previously undocumented in Ayacucho. Three of these records were southward range extensions from Junín: Bay Antpitta (*Grallaria capitalis*), White-browed Spinetail (*Hellmayrea gularis*), and Black-spectacled Brush-Finch (*Atlapetes melanopsis*). Three first Ayacucho records were northward range extensions: Marcapata Spinetail (*Cranioleuca marcapatae*, also recently recorded in Junín; see species account), formerly considered endemic to Cuzco; Hellmayr's Pipit (*Anthus hellmayri*), formerly documented in Peru only in Puno Department; and Chestnut-breasted Warbling-Finch (*Poospiza caesar*), formerly documented from Cuzco and Apurímac. Additionally, we recorded seven species known from nearby areas of Peru for which no previous Apurímac River Valley records existed. These species included birds of humid forested habitats: Gray-headed Kite (*Leptodon cayanensis*), Golden-collared Tanager (*Iridisornis jelskii*), Pale-legged Warbler (*Myiothlypis signata*), and Silvery Tanager (*Tangara viridicollis*), as well as several found in drier habitats: Pearly-vented Tody-Tyrant (*Hemitriccus margaritaceiventer*), Golden-rumped Euphonia (*Euphonia cyanocephala*; a first documented record for Cuzco Department), and Grassland Yellow-Finch (*Sicalis luteola;* a first documented record for Apurímac Department). The remaining first Ayacucho records filled perceived distributional gaps between Pasco/Junín and the northern Vilcabamba Mountains of Cuzco (Weske 1972; Fjeldså and Krabbe 1990; Schulenberg et al. 2006, 2010).

Several factors may explain why we recorded numerous species previously undocumented for the region and why these species, most of which were common in appropriate habitat, evaded detection until our visits. First, our surveys included areas and habitats outside the scope of previous survey work in the region (Weske 1972, Terborgh and Weske 1975). Most notable of such habitats were high puna, where we recorded Darwin's Nothura (*Nothura darwinii*), Short-billed (*Anthus furcatus*), and Hellmayr's pipits (*A. hellmayri*); and dry inter-montane valley scrub and woodland habitats where we recorded Pearly-vented Tody-Tyrant (*Hemitriccus margaritaceiventer*), Chestnut-breasted Warbling Finch (*Poospiza caesar*), Grassland Yellow-Finch (*Sicalis luteola*), and Golden-rumped Euphonia (*Euphonia cyanocephala*). Moreover, Weske (1972) and Terborgh (1975) focused on undisturbed habitats. In mature montane forest, natural successional habitats are largely limited to areas with regenerating vegetation, such as landslides and tree fall gaps (which are challenging to access), and they often account for a small percentage of the total forest area. In contrast, each site we surveyed was at least moderately affected by human populations, so successional and edge habitats were well represented. Many of our first-area records were detected only in successional or edge habitats (natural or human-affected), and not in contiguous primary forest. These species included Taczanowski's Tinamou (*Nothoprocta taczanowskii*), Imperial Snipe (*Gallinago imperialis*), Mountain Velvetbreast (*Lafresnaya lafresnayi*), Green-tailed Hummingbird (*Amazilia viridicauda*), Rufous-capped Thornbill (*Chalcostigma ruficeps*), Bay Antpitta (*Grallaria capitalis*), Marcapata Spinetail (*Cranioleuca marcapatae*), White-tailed Tyrannulet (*Mecocerculus leucophrys*), Golden-collared Tanager (*Iridisornis jelskii*), and Silvery Tanager (*Tangara viridicollis*).

Weske and Terborgh inventoried the Apurímac River Valley during mid-June through August (1965–1970) when many species were not

vocalizing (Weske 1972). Similarly, we observed minimal vocal activity during June surveys at Tutumbaro and Ccano, but our use of playback with pre-recorded vocalizations (a resource unavailable to Weske and Terborgh) allowed detection of some otherwise non-vocal species (e.g., *Scytalopus* sp., Barred Antthrush [*Chamaeza mollisima*]). An illustration of the importance of conducting surveys during the breeding period was our relatively high rate of detecting tinamous (Tinamidae), antpittas (*Grallaria*), and tapaculos (*Scytalopus*; see species accounts) on our breeding season trips. Weske (1972) recognized that such taxa were likely missed during their work owing to vocal inactivity. Indeed, recordings of vocalizations made during our breeding season inventories (i.e., Chupón) have revealed three candidate new taxa from two of these groups (see Bay Antpitta [*Grallaria capitalis*], Rufous/Chestnut Antpitta [*G. cf. rufula/blakei*], and "above tree line" tapaculo [*Scytalopus cf. altirostris/simonsi*] species accounts; these taxa will be described elsewhere), as well as the first Ayacucho records of Hooded Tinamou (*Nothocercus nigrocapillus*).

Based on vocal activity, gonad data, and observations, only 10 species (7% of those sampled) were documented breeding during early June 2008 at Tutumbaro and 22 species (18%) were documented breeding in late June at Ccano. Conversely, 43 species (28%) were documented breeding in late September at Chupón, and 68 species (33%) were documented breeding in October at Paccaypata. However, by January, only 16 species (24%) were documented breeding at Lirriopata. These observations suggest a protracted breeding season with an increase in activity in early August and a peak of activity coinciding with the onset of the rainy season (typically Nov), followed by a marked drop-off in breeding activity in January–June. These observations generally coincide with the primary breeding season determined at other sites in central and southern Peru (Robbins et al. 2011, 2013).

Ayacucho Endemism

Eastern Ayacucho has been considered lacking in range-restricted and endemic species compared to other east-slope Peruvian departments (Fjeldså and Krabbe 1990; Fjeldså et al. 1999; Schulenberg et al. 2006, 2010). Our surveys demonstrate that this perception is mostly, if not entirely, an artifact of low sampling effort. We found seven new records of range-restricted species, including Taczanowski's Tinamou (*Nothoprocta taczanowskii*), Black-winged Parrot (*Hapalopsittaca melanotis*), Green-and-white Hummingbird (*Amazilia viridicauda*), Bay Antpitta (*Grallaria capitalis*), Marcapata Spinetail (*Cranioleuca marcapatae*), Black-spectacled Brush-Finch (*Atlapetes melanopsis*), and Chestnut-breasted Mountain-Finch (*Poospiza caesar*). Furthermore, our results suggest that three taxa—"Ayacucho" (Vilcabamba) Thistletail (*Asthenes vilcabambae ayacuchensis*), a "Rufous/Chestnut" Antpitta (*Grallaria cf. rufula/blakei*), and an "above tree line" tapaculo (*Scytalopus cf. altirostris/simonsi*)—are distinct and could be considered species endemic to the narrow belt of humid montane forest-puna ecotone in eastern Ayacucho (see species accounts).

Species Turnover

Many bird species and subspecies are thought to be limited distributionally by the Apurímac River Valley (Cracraft 1985, Schulenberg et al. 2006). Results of our field surveys largely supported the view that this valley represents a barrier to dispersal for montane forest populations. Our sites in Chupón and Paccaypata were approximately 30 km apart, the most proximate temperate forest areas on either side of the valley, but we found no evidence of intermediate forms between taxa of the following allopatric populations that occur on either side: Collared Inca (*Coeligena torquata insectivora*/*C. t. eisenmanni*), Fiery-throated Metaltail (*Metallura eupogon*)/Scaled Metaltail (*M. aeneocauda*), Bay Antpitta (*Grallaria capitalis*)/Red-and-white Antpitta (*G. erythroleuca*), the rufous/chestnut antpitta complex (undescribed Ayacucho taxon/*G. rufula occabambae*), the above treeline tapaculo complex (*Scytalopus* spp.), Peruvian Wren (*Cinnycerthia peruana*)/Fulvous Wren (*C. fulva*), Rufous-crested Tanager (*Creurgops verticalis*)/Slaty Tanager (*C. dentatus*), and Black-spectacled Brush-Finch (*Atlapetes melanopsis*)/Cuzco Brush-Finch (*A. canigenis*).

We documented two instances of taxon replacement across the Apurímac gap that differed from our expectation based on prior information: the bright yellow and green, southern subspecies of Superciliared Hemispingus (*Hemispingus superciliaris urubambae*) occurs on the Ayacucho side of the valley at Chupón, and birds that appeared intermediate between *H. s. urubambae* and *H. s. insignis* (of central Peru) were at Ccano. Similarly, we

collected specimens of Mountain Cacique (*Cacicus chrysonotus*) from Ccano that had variable amounts of yellow in the wing coverts, suggesting intermediates between *C. c. chrysonotus* from Cuzco to the south and *C. c. peruvianus* of Junín to the north. Intergrades between these forms have previously been reported from Junín (Jaramillo and Burke 1999). In these cases, the Apurímac River Valley likely represents an area of intergradation or gene flow between northern and southern populations. Specimen evidence also suggests the Apurímac break is not the only important geographic factor in the region: several distinctive taxa appear to be divided by the Río Mantaro Valley, such as distinctive subspecies of Bar-bellied Woodpecker (*Veniliornis nigriceps*), and Eye-ringed/"Ayacucho" Thistletails (*Asthenes palpebralis/A. vilcabambae ayacuchensis*; see species accounts).

Species Not Documented

Despite our efforts, ca. 30 Andean bird species expected (i.e., species that occur both north and south of Ayacucho) remain undocumented in Ayacucho (Appendix 1; Schulenberg et al. 2006). Most of these species ($n = 16$) are confined to foothill elevations below our survey sites. Foothill forests (1,000–1,500 m) in the vicinity of San Francisco/San Antonio were highly degraded such that only small patches of young secondary growth remained. However, a new road leads north from San Francisco to Canayre (Boca Mantaro), an area that retains foothill forests. Unfortunately, this area has a reputation for narcotics production (Fjeldså et al. 2005) and we were unable to work there.

Other species remain absent from the Ayacucho list that typically occur in habitats we did survey. Many of these species are local or infrequently detected throughout their ranges (e.g., Golden-plumed Parakeet [*Leptosittaca branickii*], Line-fronted Canastero [*Asthenes urubambensis*], Chestnut-crested Cotinga [*Ampelion rufaxilla*], or are local in the southern Peruvian Andes (e.g., Fawn-breasted Brilliant [*Heliodoxa rubinoides*], Cliff Flycatcher [*Hirundinea ferruginea*]). A few species were undetected at our field sites despite presence of appropriate habitat (e.g., Inca Flycatcher [*Leptopogon taczanowskii*], Ochraceous-breasted Flycatcher [*Nephelomyias ochraceiventris*], and Olivaceus Siskin [*Sporagra olivacea*]). We expect that additional survey effort will eventually document the presence of these species in Ayacucho.

We failed to record a suite of species at our Cuzco site (Paccaypata, in the southern Vilcabambas) known from similar elevations in the Northern Vilcabambas and the Machu Picchu area (Weske 1972, Terborgh 1975, Schulenberg et al. 2006). Intriguingly, these taxa, or their replacement congeners, were missing from Paccaypata but were conspicuous at our Ayacucho sites (e.g., Ccano and Chupón). At Paccaypata, we failed to record such conspicuous species as Green Violetear (*Colibri thalassinus*), Collared Inca (*Coeligena torquata*), Sword-billed Hummingbird (*Ensifera ensifera*), Chestnut-breasted Coronet (*Boissonneaua matthewsii*), Montane Woodcreeper (*Lepidocolaptes lacrymiger*), Rufous Spinetail (*Synallaxis unirufa*), Band-tailed Fruiteater (*Pipreola intermedia*), Fulvous Wren (*Cinnycerthia fulva*), White-eared Solitaire (*Entomodestes leucotis*), Common Chlorospingus (*Chlorospingus flavopectus*), Gray-hooded Bush Tanager (*Cnemoscopus rubirostris*), Grass-green Tanager (*Chlorornis riefferii*), and Lacrimose Mountain-Tanager (*Ansiognathus lacrymosus*). Favorable montane forest habitat occurred only in a relatively narrow elevational band at Paccaypata, likely owing to overall drier conditions below 2,300 m; perhaps this narrow band of habitat was not extensive enough to maintain populations of these species. These species may be present in adjacent valleys to the north where more humid conditions exist and humid forest extends to lower elevations. Further survey work will be necessary to uncover such fine-scale distributional patterns in the Apurímac River Valley.

Conservation

Puna grassland and *Polylepis* woodland are among the most human-affected and threatened biomes in the Andes (Fjeldså 1993, 2002; Stotz et al. 1996; Kessler and Herzog 1998), and both occur within the survey region. Puna was often severely degraded by grazing (except some areas above Paccaypata), and evidence of fire was clear at all sites above treeline. The treeline/puna border was sharply demarcated and shifted down-slope as a result of anthropogenic fire regimes, as is the case throughout much of the Andes. Indeed, these disturbance regimes have likely persisted for thousands of years in the region (Hansen and Rodbell 1995, Fjeldså 2002). Many scrub- and grassland-inhabiting species, such as high-elevation hummingbirds, canasteros (*Asthenes* spp.), and Sedge Wrens (*Cistothorus platensis*), were distributed

locally and present in small numbers. We attribute this pattern to extensive overgrazing and fire in highland areas.

Burning and gathering of firewood have reduced *Polylepis* woodland drastically throughout the Andes, almost to the point of extirpation in some areas (Fjeldså 2002). *Polylepis* was absent at our main Ayacucho sites, although very small patches persisted adjacent to homesteads on the road between Tambo and Huisca. However, *Polylepis* woodland was extensive and relatively intact on steep slopes above 4,000 m east of Paccaypata (ca. 13.352 °S, 73.170 °W), and *Polylepis* specialists such as Ash-breasted Tit-Tyrant (*Anairetes alpinus*), White-browed Spinetail (*Leptasthenura xenothorax*), Giant Conebill (*Oreomanes fraseri*), and Thick-billed Siskin (*Sporagra crassirostris*) were encountered there in small numbers. Unfortunately, pristine *Polylepis* was too distant from our Paccaypata camp for detailed survey; we suspect that additional *Polylepis* specialists will be found with a more directed effort. Given the size and remoteness of *Polylepis* patches at this site, coupled with relatively little human pressure, the area above and to the east of Paccaypata is an ideal candidate for legal protection of this highly threatened biome, as Paccaypata falls within one of three key areas that have been identified for conserving *Polylepis* avifaunas (Fjeldså 2002).

Our surveys have demonstrated high degrees of avian endemism in montane forests between the Mantaro and Apurímac valleys, yet no protected areas have been established to preserve habitats there. Our work supports that as many as three taxa are endemic to this region (*Asthenes vilcabambae ayacuchensis*, *Grallaria cf. rufula/G. blakei*, *Scytalopus cf. simonsi/altirostris*), each of which could be recognized as a species in light of new vocal information (see species accounts). Given the narrow potential distributions of these taxa, small numbers of known localities (3–5 sites/taxon), and continuing deforestation in the area, each taxon would qualify for endangered (EN) or vulnerable (VU) status under IUCN criteria if they were to be recognized as species. Other species of conservation interest in these forests and associated habitats include Black-spectacled Brush-Finch (*Atlapetes melanopsis*; EN, although the large range extension documented here may influence reassessment of its conservation status), Marcapata Spinetail (*Cranioleuca marcapatae*; vulnerable, VU—similarly, the range extension documented here may influence its conservation status), Taczanowski's Tinamou (*Nothoprocta taczanowskii*; VU), and Black-winged Parrot (*Hapalopsittaca melanotis*; VU).

Species Accounts

Museum and vocal archive acronyms are as follows: AMNH, American Museum of Natural History; CORBIDI, Centro de Ornitología y Biodiversidad; FMNH, Field Museum of Natural History; KU, University of Kansas Biodiversity Institute; LSUMZ, Louisiana State University Museum of Natural Science; ML, Macaulay Library; and XC, Xeno-Canto.

Hooded Tinamou (Nothocercus nigrocapillus).—A single individual was heard singing in montane forest at 2,500 m along the road below Chiquintirca (aural detection: MJA and PAH). No previous records exist for Ayacucho (Weske 1972, Schulenberg 2006). This species was common at Paccaypata with multiple individuals heard daily at 2,300–3,000 m. At 3,200 m above Paccaypata, we collected a juvenile *Nothocercus* tinamou (CORBIDI MCCF 477), but its identity remains uncertain because juvenile plumages of *Nothocercus* are not well described. This individual had a rufous face and crown, much more like *N. julius* than *N. nigrocapillus*. Furthermore, we only heard *N. nigrocapillus* below 3,100 m at this site. Terborgh collected a single specimen (AMNH 820390) ascribed to *N. julius* from the northern Vilcabambas; otherwise, there are no *N. julius* records south of Huánuco Department.

Taczanowski's Tinamou (Nothoprocta taczanowskii).—A single bird was observed walking on a trail at dawn at 3,700 m along the elfin forest/puna edge at Chupón (sight record: PAH). This species is uncommon and local throughout its limited range from central Peru to northern Bolivia. This report is the first from Ayacucho, and fills a gap in distribution between records from Apurímac and Junín (Schulenberg et al. 2006, 2010).

Darwin's Nothura (Nothura darwinii).—This species was heard almost daily in small numbers in dry bunchgrass puna above Lirriopata (3,700–4,000 m; ML 140721). These are the first documented records in Ayacucho, but it is also known from Apurímac and Huánuco (Schulenberg et al. 2006, 2010). *Nothura darwinii* is easily overlooked and likely under-recorded, so we suspect that additional survey effort with knowledge of

its voice will prove it widespread in high-elevation puna south of Huánuco.

Sickle-winged Guan (Chamaepetes goudotii).—This species was uncommon in humid montane forest at Tutumbaro at 1,800–2,200 m (CORBIDI LASGP-021, RLB 1180). These are the first documented records from Ayacucho, filling a gap between Junín and Cuzco (Schulenberg et al. 2006, 2010). Plumage was consistent with descriptions of the southern *rufiventris* subspecies.

Gray-headed Kite (Leptodon cayanensis).—An adult was observed on 30 September 2012 soaring over forest just above Paccaypata at 2,000 m (sight record: PAH and MBR). The bird was observed at length, and direct comparison with a soaring adult Black-and-chestnut Eagle *Spizaetus isidori*. This record is the first from the upper Apurímac River Valley and represents an unusually high elevational record for this species in Peru (Schulenberg et al. 2006, 2010).

White-rumped Hawk (Parabuteo leucorrhous).—This widespread but uncommon Andean hawk was collected at Ccano (KU 112914), a first documented record for Ayacucho. We also observed it (sight record: LCA and PAH) at Pacopampa (13.325 °S, 73.238 °W; 3,300 m), near Paccaypata.

White-throated Hawk (Buteo albigula).—We encountered this poorly known species on several occasions (all single individuals), soaring above montane forest edge, elfin forest, and inter-Andean semiarid scrub in June, September, and October; thus, all records were during the austral winter. All three specimens collected had small gonads indicative of non-breeding condition. Two June specimens from Ccano (KU 112815, CORBIDI RLB 1239) had light to moderate fat, whereas an adult male mist-netted in September at Chupón was extremely fat (CORBIDI MBR 8348). These specimens are the first documented Ayacucho records. No observations were made after 2 October (sight record: MBR, Paccaypata). The dates of these observations, coupled with the specimen data support the premise that this species is a non-breeding visitor to the area (Trejo et al. 2007). A pipit *Anthus* sp. was found in the stomach of an adult male taken on 22 June 2008 at Ccano (KU 112815): it was likely *Anthus hellmayri,* the only *Anthus* species recorded there.

Black-necked Stilt (Himantopus mexicanus).—A single bird collected on 6 January 2009 (CORBIDI PAH 671) at Laguna Condorccocha near Lirriopata is the first documented Ayacucho record (Schulenberg et al. 2006, 2010). This specimen belonged to the *H. m. mexicanus* subspecies, which appears to be a sparse winter resident in the high Andes of Peru.

Imperial Snipe (Gallinago imperialis).—A displaying individual of this local and often-overlooked snipe was heard and recorded below Chupón at 3,000 m, the first documented Ayacucho record (ML 173821). This species was also found displaying over stunted forest near treeline at 3,800 m above Paccaypata (ML 173979, 186955) alongside Andean Snipe *Gallinago jamesoni*. The Ayacucho record is the first between Cuzco and La Libertad.

Koepcke's Screech-Owl (Megascops koepckeae).—The newly described subspecies, *M. k. hockingi* (Fjeldså et al. 2012), was fairly common in heavily modified dry woodland, scrub, and old citrus plantations in and below Paccaypata at 1,400–2,000 m (KU 122712–3, CORBIDI PAH 1330); ML: 173916, 174070–1, 174073, 186982). Molt and gonad data suggest that these birds were in non-breeding condition. Stomach contents of all specimens included large orthopterans.

Peruvian Pygmy-Owl (Glaucidium peruanum).—The type locality of this owl is at nearby Niñabamba, Apurímac. We found it common in dry forest and scrub below Paccaypata (1,000–1,700 m; KU 122714, CORBIDI LCA 2012-38; ML 173915, 173926, 174072). The populations in the dry upper Apurímac/Urubamba/Mantaro River Valley systems may be isolated from populations on the Pacific slope from southern Ecuador to northern Chile and into the Marañon and Huallaga river valleys. Genetic and vocal studies are needed to assess differentiation across the species' distribution.

Bronze-tailed Comet (Polyonymus caroli).—An adult male was collected on 11 January 2009 in semi-humid montane scrub near Lirriopata (CORBIDI PAH 700), a minor range extension. Although this species is widespread on the Pacific slope in Ayacucho, it was previously unrecorded in the interior. It is known from the Mantaro drainage in nearby Huancavelica (Schulenberg et al. 2006, 2010), so its occurrence further south in the Mantaro drainage of Ayacucho was not unexpected.

Rufous-capped Thornbill (Chalcostigma ruficeps).—We netted this small and often local hummingbird at Ccano (KU 112828 and CORBIDI JNZ 692, LAGSP 78), a first documented record for Ayacucho (Schulenberg et al. 2006). It was known from nearby Cuzco and Junín.

Mountain Velvetbreast (Lafresnaya lafresnayi).—This hummingbird was fairly common in humid montane forest edge and treeline edge at 2,300–3,300 m at Ccano, Chupón, and above Paccaypata. These are the first documented records for Ayacucho (KU 112829–30, 122501–2; CORBIDI KVG 166, KVG 171, LASGP 86, LASGP 98), and fill a distributional gap between Junín and Apurímac (Schulenberg et al. 2006, 2010).

Green-tailed Hummingbird (Amazilia viridicauda) *and White-bellied Hummingbird* (A. chionogaster).—At Tutumbaro, *A. viridicauda* was uncommon in roadside edge and secondary growth at 1,800–2,200 m, whereas at Paccaypata, *A. chionogaster* was common in semi-humid secondary forest edge and heavily modified dry woodland/scrub at 2,000–2,300 m. Gonads from specimens (*A. viridicauda*: KU 112657–9 CORBIDI AGNS-PE-32; *A. chionogaster* KU 122720–2 and CORBIDI KVG 160, LCA 2012-84, MCCF 521) were not enlarged in either species, but males at Paccaypata were lekking, so breeding evidence was equivocal. The Tutumbaro specimens of *A. viridicauda* are the first documented records for Ayacucho, although the species was known to the north in northern Junín and east of the Apurímac in Cuzco (Schulenberg et al. 2006, 2010). These similar species overlap broadly in distribution in Peru, and appear to show seasonal movements (Robbins et al. 2013). Molecular data are needed to help clarify the status and taxonomy of these confusing taxa.

Military Macaw (Ara militaris).—A flock of 12–15 birds was heard calling and seen briefly as they passed overhead at 3,000 m on 21 September 2012 below Chupón (observation: MBR). Although this macaw has been recorded in this region (Weske 1972, Schulenberg et al. 2010), this observation was at an exceptionally high elevation for the species in Peru. We presume that they were individuals wandering upslope, because they were observed only once in 10 days of fieldwork in the area.

Scarlet-fronted Parakeet (Psittacara wagleri) *and Mitred Parakeet* (P. mitratus).—The distribution and ecology of these two similar parakeets where they overlap are poorly understood. *Psittacara wagleri* was present at 1,000 m near the Apurímac River Valley floor below Paccaypata (photo: PAH); it is known from the nearby Río Pampas Valley, and also upstream along the Río Apurímac at Río Blanco (FMNH 286658). Only *P. mitratus* was found in arid scrub and degraded forest at higher elevations (1,600–2,300 m) around Paccaypata (KU 122724, CORBIDI KVG 242; ML 173923, 173925, 174083). Based on these observations, it appears that *P. wagleri* is present at more arid, lower elevations, whereas *P. mitratus* occurs at higher elevation in semi-humid habitats.

Black-winged Parrot (Hapalopsittaca melanotis).—We observed this poorly known parrot twice in small flocks (2–6) in humid montane forest at Tutumbaro, where one individual was taken at 2,000 m (CORBIDI: MJA 282). Additionally, a lone bird was audio recorded at 3,000 m below Chupón (ML 173903). These are the first documented occurrences in Ayacucho, filling a gap between Junín and Cuzco (Schulenberg et al. 2006, 2010).

Bar-bellied Woodpecker (Veniliornis nigriceps).—Subspecies *V. n. pectoralis* and *V. n. nigriceps* differ in female crown color, but all specimens collected previously in the area were male birds (AMNH 820584–5, 820736). Newly collected females (KU 112776, 122661; CORBIDI LCA 2012-49) on both sides of the Apurímac Valley had black crowns and are referable to *V. n. nigriceps*; hence, the geographic barrier between forms is likely the Mantaro River Valley.

Creamy-bellied Antwren (Herpsilochmus motacilloides).—A silent adult male *Herpsilochmus* antwren was observed well in association with a mixed-species canopy flock above Paccaypata at 2,400 m (sight record: PAH). Presumably, this constitutes an unusually high elevational record of *H. motacilloides,* which is known from 1,420–1,670 further north in the Apurímac Valley (Weske 1972). Despite much work in this area, including use of playback, we did not detect additional individuals. This bird may have wandered upslope from more typical humid foothill habitats to the north.

Barred Antthrush (Chamaeza mollissima).—One individual was heard singing on 8 June 2008 at 1,950 m in forest above camp (aural detection: MJA and LAS-G). It responded well to playback of pre-recorded vocalizations, and approaching and singing six excited song bouts over 10 min; the longest of these songs lasted 20 sec. The pitch and tempo matched precisely the recording used for playback but the bird was not seen nor detected subsequently. This observation is the first for Ayacucho (Schulenberg et al. 2010), and helps fill a gap in its patchy known distribution along the east slope of the Andes.

Scaled Antpitta (Grallaria guatemalensis).—Several individuals were heard and recorded in

semi-humid secondary growth and forest edge at 2,000–2,400 m above Paccaypata (ML 174047, 174067, 186981). The slow pace of the introductory notes in the songs recorded supports these birds are *G. g. sororia* of southern Peru and Bolivia. This site was in unusual habitat and high in elevation (for Peru) for this humid-forest species that is typically found in foothill and lower montane forest. It was recorded only up to 1,700 m in the northern Vilcabambas (Weske 1972, Alonso et al. 2001).

Bay Antpitta (Grallaria capitalis).—This range-restricted endemic of central Peru, previously known from Pasco, Huánuco, and Ucayali, was found at four localities in Ayacucho. Birds were found in primary and secondary growth forest above Tutumbaro (2,300 m; specimens KU 112673, CORBIDI LASGP-20), below Chupón (2,700 m, MBR), below Rumichaca (2,700 m, PAH), and below Chiquintirca on the road to San Antonio (2,500 m; MJA, PAH, HLO). Specimens collected in Ayacucho (and also in the Río Satipo Valley in Junín: KU 113992–5; CORBIDI JRSL 204, MBR 7875, MFOR 322, PAH 658) differ from Pasco, Huánuco, and Ucayali specimens (LSUMZ series $n = 19$) in having the crown deep black rather than dusky brown, and having whitish lores rather than chestnut. Also, the primary vocalization given in Ayacucho (ML 171926, 173865, 173869, 173871, 173875, 173876) and Junín (ML, 147274, 147278, 147298, 147297, 147294, 147313, 147316, 171886, 171906, 171913) consisted of three notes, whereas Pasco and Huánuco birds typically give four to five noted songs (e.g., ML 17813, 40091). These differences in plumage and voice are comparable to differences between other species in the bay-backed antpitta complex, and suggest that this newly found population in Ayacucho and Junín represents an undescribed taxon. In June, birds were not vocalizing (Tutumbaro), but in September (below Chupón) and December–January (below Rumichaca and below Chiquintirca) they were highly vocal. In October, birds along the Río Satipo in Junín (11.508 °S, 74.859 °W; 2,300–2,550 m) were highly vocal and had enlarged gonads.

Rufous/Chestnut Antpitta (Grallaria cf. rufula/G. blakei).—We recorded vocalizations (ML 173822, 171928, 173831, 173836, 173860, 186907–8, 186919, 186926) and collected specimens (CORBIDI LASGP 020, LASGP 060, LCA 2012-18, PAH 1241; KU 112735–6, 112916, 122539–40) of a uniform rufous/chestnut-colored antpitta that may represent an undescribed taxon. We found this bird in montane forest at Ccano (2,800–3,000 m) and Chupón (3,000–3,800 m). Overall plumage coloration is similar to *G. rufula obscura* and *G. rufula occabambae*, except that it lacks a pale eyering and is slightly richer in overall coloration. Its voice is similar to the "southern form" of *G. blakei* from Pasco and Junín (CORBIDI MFOR 324, PAH 653; KU 113990–1; LSUMZ 106081, 170664). However, spectrograms of Junín/Pasco birds and Ayacucho birds show markedly different note shapes. Unlike further north in Peru (Amazonas to Junín), where *G. rufula* and *G. blakei* are elevational replacements, we found only a single form of the complex in Ayacucho. East of the Río Apurímac in Paccaypata, we also found only a single form, referable to *G. rufula occabambae*. Clarification of species limits among the many forms in this vocally diverse complex (Isler and Whitney 2002), including this new material, is in preparation (M. Isler and T. Chesser, pers. comm.).

Rufous-vented Tapaculo (Scytalopus femoralis).—Specimens (KU 112727) and recordings (ML 173880, 1738701, 73877) confirm that *S. femoralis* does occur in Ayacucho (Krabbe and Schulenberg 1997; Schulenberg et al. 2006, 2010). We found this species at Ccano, Chupón, and Rumichaca, all at 2,700 m.

Trilling Tapaculo (Scytalopus parvirostris).—We found this widespread and vocally distinctive tapaculo at Ccano, Rumichaca, Chupón, and Paccaypata, from ca. 2,700 m to treeline (3,300–3,800 m, depending on the site). Above tree line in Ayacucho, *S. parvirostris* was replaced by an undescribed taxon (see below). Below 2,700 m in Ayacucho, *S. parvirostris* was replaced abruptly by *S. femoralis*. At Paccaypata, *S. parvirostris* was replaced by *S. urubambae* above treeline. However, no *Scytalopus* species was detected at 2,300–2,700 m in seemingly appropriate montane forest habitat. Unlike further north and south in Peru, we found no evidence of an elfin forest specialist tapaculo (e.g., *S. acutirostris*, *S. schulenbergi*) at elevations between *S. parvirostris* and the "above tree line" tapaculo group. From recordings of known-sex specimens, we observed that only males gave the long trill song, and only females gave two other types of calls: a "sharp note" and a "staccato call" (e.g., ML 186923 includes examples of all three vocalizations). Vocalizations and repertoires appeared similar on either side of the Apurímac gap.

Vilcabamba Tapaculo (Scytalopus urubambae).—This restricted-range species, previously known only from two specimens (Zimmer 1939) and observations/recordings in the vicinity of Macchu Picchu, was common in treeline vegetation and *Polylepis* woodland from 3,800–4,500 m above Paccaypata. (KU 122622–4; CORBIDI LCA 2012-56, KVG 210, MCCF 498; ML 173949, 173950, 173951, 173987, 173991, 173992, 186956, 186970). A "rattle call" was most likely given by female birds. We expect this species is geographically and ecologically replaced by an undescribed *Scytalopus* species present on the west side of the Apurímac gap.

"Above treeline" Tapaculo (Scytalopus *cf.* simonsi/altirostris).—We discovered a population of *Scytalopus* at several sites (near Anco, Chungui, Chupón, and Huisca) that inhabits shrubby puna grasslands above tree line, often near ravines (3,500–4,200 m). No *Scytalopus* has been reported previously in Ayacucho from these elevations or habitats. These birds are similar in plumage (KU 122547–8 and CORBIDI PAH 1231, PAH 1233) and habitat to *S. simonsi, S. altirostris,* and undescribed *Scytalopus* populations in Pasco and Junín (Krabbe and Schulenberg 1997). However, Ayacucho birds differ in voice (ML 186900, 186901, 186928, 186931) from those populations/species. A revision of all "above tree line" *Scytalopus* in Peru, including putative new taxa from Pasco, Junín, and Apurímac, is needed to understand systematic relationships of the Ayacucho birds, which are also likely a new taxon.

White-browed Tit-Spinetail (Leptasthenura xenothorax).—We observed this range-restricted, threatened, and local species daily in *Polylepis* patches above Paccaypata, 4,200–4,500 (ML: 186960). Extensive *Polylepis* woodland extends east from above Paccaypata along the south-facing slope of the southern Vilcabambas that likely holds a sizable population of conservation interest.

White-browed Spinetail (Hellmayrea gularis).—A single individual was captured in a mist net in humid forest at 3,500 m at Chupón (KU 122541), a southern range extension and the first Ayacucho record (Schulenberg et al. 2006, 2010).

Streak-throated Canastero (Asthenes humilis).—This canastero was fairly common in overgrazed bogs above Chupón (KU 122577) and Rumichaca. These records fill a gap between populations in western Ayacucho and central Cuzco (Schulenberg et al. 2006, 2010).

Line-fronted Canastero (Asthenes urubambensis).—This species usually occurs in low densities, but was common (ssp. *urubambensis*) in tall bunchgrass puna and edges of *Polylepis* at 3,800–4,500 m above Paccaypata (KU 122578, CORBIDI KVG 218, PAH 1299). This species is generally considered an inhabitant of open *Polylepis/Gnoxys* woodland (Fjeldså and Krabbe 1990), rather than bunchgrass puna, which are usually inhabited by other *Asthenes* species (e.g., *A. humilis, A. virgata*, or *A. maculicauda*). However, above Paccaypata, those "grassland" canasteros were not found, and *A. urubambensis* may have been common in bunchgrass owing to ecological release. A similar phenomenon has been observed above Millpo in Pasco, where *A. urubambensis* was also the only canastero (LSUMZ 128459–62; T. Davis, pers. comm.) Alternatively, its high abundance could be related to extensive areas of tall puna grassland (>1 m in height). Although we did not encounter this species in Ayacucho, we did collect it in the Río Satipo Valley of Junín (ssp. *huallagae*; KU 113894, CORBIDI MBR 7843; 11.465 °S, 74.898°; 3,700 m); these new records help to close the apparent range gap between eastern Cuzco and Pasco.

Vilcabamba Thistletail (Asthenes vilcabambae).—We documented this range-restricted taxon (ssp. *vilcabambae*) in elfin forest patches and forest edge above Paccaypata at 3,500–3,900 m (KU 122579–80, CORBIDI MCCF 488, PAH 1289; recordings ML 173982, 186968–9). Previously, it was known only from the northern portion of the Vilcabambas (Weske 1972, Alfonso et al. 2001). Therefore, a contact zone between this species and Puna Thistletail *A. helleri* could exist between Paccaypata and Abra Malaga, Cuzco. Birds responding to *A. v. vilcabambae* song have been observed near Vitcos (13.111 °S, 72.938 °W; B. Walker, pers. comm.). We found ssp. *ayacuchensis* at Chupón, where it was uncommon at 3,300–3,700 m in forest edge and elfin forest patches, often with *Chusquea* bamboo (KU 122568–9, CORBIDI KVG 140, KVG 158). Our audio recordings (ML 186902, 186904, 186910, 186918, 186922) are the first certain to pertain to this taxon (a recording ascribed to *A. v. ayacuchensis;* ML 82815, may pertain to *A. ottonis*). The primary vocalization of *A. v. ayacuchensis* differs strikingly from nominate *vilcabambae*, and, surprisingly, is more similar to *A. palpebralis*. In light of its distinctive vocalizations, previously described plumage differences, and

molecular data (PAH, unpubl. data) support recognizing *A. ayacuchensis* as a distinct species endemic to Ayacucho (Hosner et al. 2015).

"White-crowned" Marcapata Spinetail (Cranioleuca marcapatae weskei).—We found this spinetail uncommon to fairly common at all forested sites at 2,800–3,600 m (KU 112900, 112843, 122581–2 and CORBIDI LCA 2012-24, MCCF 476, MBR 8315, MBR 8339; MJA 322, ML 173820, 173847, 174006–7, 174037, 186915, 186972). In June at Ccano, a few non-vocalizing individuals were encountered. However, in September and October at Chupón and above Paccaypata, presumed pairs and family groups (up to 4 individuals) were seen and heard daily as they foraged in *Chusquea* bamboo understory at 3,000–3,600 m. The Ccano and Chupón records are the first for Ayacucho. *Cranioleuca m. weskei* has also been documented recently in Junín (e.g., XC 74478, 155740). Specimens from Paccaypata differed from typical *C. m. weskei* in that the face and lores were plain gray, rather than buffy, and a few white crown feathers had faint rufous edging. These characters suggest that birds in Paccaypata may be intergrades between *C. m. weskei* and nominate *C. m. marcapatae* from further east in Cuzco. Apparent intergrades with a mix of rufous and white crown feathers have been observed around Vitcos (13.111 °S, 72.938 °W, 3,000 m; Jul 2014; B. Walker, pers. comm.).

Creamy-crested Spinetail (Cranioleuca albicapilla).—This Peruvian endemic spinetail was recorded above 3,000 m in scrubby habitat at all Ayacucho sites. However, at Paccaypata, it was limited to lower elevations (2,000–2,100 m), where we encountered at least four family groups in heavily modified forest; this record is the lowest elevation at which the species has been documented (Schulenberg et al. 2010).

Striped Treehunter (Thripadectes holostictus).—We netted this treehunter at 2,000 m above Tutumbaro (KU 112670, 112890; CORBIDI AGNS-PE-26), a first record for Ayacucho (Schulenberg et al. 2006). It was known from nearby Cuzco and Junín, so this record fills a distributional gap.

Azara's Spinetail (Synallaxis azarae).—At Paccaypata, we recorded this species at 3,000–3,500 m. All specimens (KU 122575–6; CORBIDI KVG 179, MCCF-472) had rufous tails with very limited dusky gray in the inner webs of the rectrices, so these birds appeared typical of *S. azarae* in phenotype (and identical to specimens from Tutumbaro: KU 112664–5, 112877; CORBIDI AGNS-PE-46, JTCH 26, RLB 177). Paccaypata is only ca. 35 km from the type locality of the Apurímac Spinetail, *S. courseni*, which differs from *S. azarae* in having the tail dusky gray (Blake 1971). Vocalizations of birds recorded at Paccaypata (ML 186941, 173954, 173954, 186964) are extremely similar to those of *S. courseni* and *S. azarae* from elsewhere in Peru. A detailed systematic assessment of the validity of *S. courseni* is needed.

Highland Elaenia (Elaenia obscura).—We found this species common in degraded forest at Tutumbaro at 1,800–2,000 m, below Chupón (2,700 m), and at Paccaypata (2,000–2,500 m; KU 112713–5, 122588–9, CORBIDI RLB 1156; ML 173863). Weske (1972) did not record this species from either side of the Apurímac River Valley, likely because appropriate habitat was not surveyed. Our Ayacucho records are the first documented for the department (KU 112713–4).

Streak-necked Flycatcher (Mionectes striaticollis).—This species was a common or fairly common net capture at all humid forest sites. Although we were unable to obtain recordings (this common, yet unobtrusive species is frequently silent), we have noticed a striking difference in song (in tone and song phrase) between populations to the north (ssp. *poliocephalus*; Pasco, ML 35897; Ucayali, XC 152788) and south (ssp. *striaticollis*; Puno, ML 148296; Bolivia XC 150533) of the Apurímac region, but we have found no diagnostic plumage differences that coincide with these vocal differences (but see Zimmer 1941). Recordings from Ayacucho and Cuzco and phylogeographic analyses are needed to understand the distributional limits of these vocal groups, which may constitute separate species.

White-tailed Tyrannulet (Mecocerculus poecilocercus).—This species was fairly common in mixed-species canopy flocks in humid montane forest at 1,800–2,200 m at Tutumbaro (CORBIDI MJA 295), and at 2,200–2,500 m at Paccaypata (ML 174053). The Ayacucho records are the first for that department; these records fill a large distributional gap between Pasco and eastern Cuzco.

Ash-breasted Tit-Tyrant (Anairetes alpinus).—This local and threatened *Polylepis* specialist was observed twice in *Polylepis* woodland above Paccaypata at 4,200–4,500 m. The extensive *Polylepis* woodland extending east from above Paccaypata along the south-facing slope of the southern Vilcabambas likely holds good numbers of this species.

Unstreaked Tit-Tyrant (Anairetes agraphia).—We documented the first Ayacucho records (Schulenberg et al. 2006) of this local Peruvian endemic at Rumichaca (sight record: PAH and MJA) and Chupón (3,000–3,500 m, KU 122505–6, CORBIDI KVG 143, LCA 2012-25, LCA 2012-34; ML 173846), where it was common in edge habitats and *Chusquea* bamboo thickets. It was also present, but less common, at Paccaypata (3,000–3,500 m).

Pearly-vented Tody-Tyrant (Hemitriccus margaritaceiventer).—This species was very common in heavily modified, thorn-dominated scrub below Paccaypata (1,300–1,700 m), with as many as 15 heard in a single day (KU 122690 and CORBIDI MCCF-512; ML 173920, 173922, 174077, 174079, 174081, 186983, 186984). These records are the first of this tody-tyrant in the Apurímac River Valley. Given that it is known from similar habitats in the nearby Chanchamayo and Urubamba Valleys (Schulenberg et al. 2006, 2010), its occurrence here was not unexpected.

Bran-colored Flycatcher (Myiophobus fasciatus).—This species was encountered daily in small numbers in scrub at 1,700–2,300 m above and below Paccaypata (KU 122663–4 and CORBIDI LCA 2012-79, LCA 2012-83). Based on gonad condition and fat stores, we presume that both resident and migrant populations occur here. One male had enlarged testes and no fat, whereas an adult female had ovaries not enlarged and was extremely fat, suggesting it was a migrant. We did not observe birds singing or displaying regularly; the primary breeding period may not occur at this site until the rainy season (Nov through Mar). Breeding populations were documented recently in similar habitats in the nearby upper Urubamba River Valley (Robbins et al. 2011).

Smoky Bush-Tyrant (Myiotheretes fumigatus).—We found this species at Ccano (KU 112902, 122509), a first Ayacucho record. Previous nearby records were from Cuzco and Junín (Schulenberg et al. 2006). It was also present at Paccaypata (ML 186971), where it is syntopic with, but much less common than, the closely related *M. fuscorufous*.

Cerulean-capped Manakin (Lepidothrix coeruleocapilla).—A single adult male was observed in association with a mixed-species flock in secondary forest at 2,400 m above Paccaypata on 2 September 2014 (sight record: PAH). This record is unusually high elevationally for this Peruvian endemic species, previously reported up to 1,700 m in foothills and on outlying ridges (Schulenberg et al. 2010). Given that this species was observed only once and never captured in nets, it seems likely this individual was a wandering from humid, forested foothills north of Paccaypata.

Crested Becard (Pachyramphus validus).—An adult male was observed and recorded in relictual montane *Alnus* forest at Chilcas, Ayacucho (13.214 °S, 73.871 °S, 3,100 m) on 31 Dec 2008 (ML 140700, 140706, 140712). Given the date, it seems plausible that this bird represents part of a breeding population, rather than an austral migrant (Schulenberg et al. 2010). Weske (1972) reported *P. validus* (as *Platypsaris rufus*) from mid-elevations from both sides of the Apurimac Valley during the austral winter, but no specimens were obtained to determine subspecies. The status of presumed breeding *P. v. auda*x and the austral migrant *P. v. validus* still require clarification in Peru.

Red-eyed Vireo (Vireo olivaceus).—The isolated Apurímac/Urubamba/Mantaro Valley breeding population of *V. o. chivi* was fairly common in dry and semi-humid forest at 1,500–2,300 m around Paccaypata (KU 122614 and CORBIDI KVG 246, PAH 1315; ML 174016, 174068–9, 174091, 174093–4, 174089, 186986). Because only a few birds were singing persistently, we suspect the main breeding season initiates in late November when rains arrive.

White-collared Jay (Cyanolyca viridicyanus).—Specimens collected on both sides of the Río Apurímac in Ayacucho and Cusco (*C. v. cyanolaema*) were alike, with bright turquoise-blue underparts (KU 112621–2, 113409, 122609–10; CORBIDI KVG 186, KVG 215), with no evidence of gradation towards cobalt-blue *C. v. jolyae* (Amazonas to Junín). Recently, *C. v. jolyae* was collected in northeastern Huancavelica south of the Mantaro (Chihuana, 12.096°S, 74.559°W; 3,200 m; CORBIDI specimens; D. Lane, pers. comm.), demonstrating that the transition between described subspecies does not coincide with a dry river valley. These taxa are divergent in mitochondrial DNA (Bonaccorso 2009), and intergrades, if they occur, would likely be found in northeastern Ayacucho.

Pale-footed Swallow (Orochelidon flavipes).—This often scarce and local Andean swallow was common and observed daily around Chupón, at 3,000–3,800 m. These sightings are the first records for Ayacucho (sight records and aural detections: PAH and MBR). Previously, the nearest localities were Cuzco and Pasco (Schulenberg et al. 2006). This species was also common at Paccaypata at 2,500–3,800 m.

Short-billed Pipit (Anthus furcatus).—We collected the first Ayacucho records of this species (CORBIDI HLO 44, PAH 685, PAH 697) in dry bunchgrass puna above Lirriopata between 3,700–4,200 m, filling a distributional gap between Cuzco and Junín (Schulenberg et al. 2006, 2010).

Hellmayr's Pipit (Anthus hellmayri).—This species was uncommon at the human-altered treeline in dry grassland habitat between 3,100–3,200 m at Ccano (KU 112803, CORBIDI LASGP 95). Given that we made only limited forays into this habitat, we suspect that this pipit will be found to be more common with greater survey effort. These are the first Peruvian records outside Puno, a linear range extension of ~500 km (Schulenberg et al. 2006, 2010).

Pale-legged Warbler (Myiothlypis signata).—This species was common on both sides of the Apurímac River Valley in humid montane forest and secondary forest edge, at 1,800–2,200 m near Tutumbaro, and at 2,000–2,500 m above Paccaypata, where it also occurred in disturbed semi-humid edge and plantations (KU 112679, 122725, 122679, 123137; CORBIDI MBR 8419, PAH 1317, PAH 1322, RLB 1161, RLB 1174). This warbler was not documented on either side of the Río Apurímac by Weske and Terborgh (Weske 1972), which likely resulted in Schulenberg et al. (2010) stating that "it is scarce or absent from the Río Apurímac Valley." At the time of Terborgh and Weske's studies (Weske 1972), the vocal, elevational, and plumage differences between *M. signata* and *M. luteoviridis* were poorly understood, so *M. signata* may have been overlooked. These are the first documented records in Ayacucho.

Superciliaried Hemispingus (Hemispingus superciliaris).—This species, previously unrecorded in Ayacucho (Schulenberg et al 2006), was fairly common in mixed-species canopy flocks in humid montane forest at 2,800–3,100 m at Ccano and 3,000–3,300 m at Chupón. The two individuals (KU 112806, CORBIDI MJA 305) collected at Ccano appear intermediate between gray central Peruvian *insignis/leucogastrus* and yellow-green southern Peruvian *urubambae*, the first evidence of a possible contact zone between these taxa. Individuals collected in Chupón and above Paccaypata appear morphologically typical of *urubambae* (KU 122524–5, 122633; CORBIDI PAH 1292, MCCF 489).

Buff-breasted Mountain-Tanager (Dubusia taeniata).—We collected this species at Tutumbaro (2,000–2,200 m), Ccano (2,700–3,000 m), and Chupón (3,000–3,500 m), the first documented Ayacucho records (KU 112632–3, 112797, 122638; CORBIDI JTCH 61, MCCF 410, RLB 1223). This species was also common at Paccaypata (2,300–3,500 m). This tanager has marked plumage and vocal variation across its distribution, according to three described subspecies (*D. t. carrikeri*: Santa Marta Mountains of N. Colombia; *D. t. taeniata*: Andes from Venezuela south to the Marañon gap; *D. t. stictocephala*: Andes from the Marañon gap south to Cuzco). However, the primary vocalizations we recorded at Paccaypata—thin, high frequency, descending, tremulous notes (ML, 174002, 174031, 174034, 186952, 186965)—differ markedly from existing *D. t. stictocephala* recordings from north and west the Apurímac gap, which lack this tremulous quality (ML 171869, XC 29538, 29539, 61649, 61650, 61651, 148510, 152960). Vocal variation and repertoire of *D. t. stictocephala* are not well documented, but recordings available suggest that populations with distinctive vocalizations are isolated by the Apurímac River Valley

Golden-collared Tanager (Iridisornis jelskii).—We observed a single adult at 3,500 m below Chupón (sight record: PAH), the first record for the Apurímac River Valley and Ayacucho, filling a range gap between Junín and eastern Cuzco (Schulenberg et al. 2006, 2010).

Silvery Tanager (Tangara viridicollis).—This species was uncommon, often seen in pairs in degraded forest at 1,800–2,200 m at Tutumbaro, and at 2,000–2,300 m above Paccaypata. The Tutumbaro records represent the first for Ayacucho (KU 112638, 122641, CORBIDI JN 653); these records fill a gap between Junín and eastern Cuzco.

Short-billed Bush-Tanager (Chlorospingus parvirostris).—This species was commonly observed and netted at Tutumbaro (KU 112689–90, 114017; CORBIDI JN 644, JN 655), the first Ayacucho records. Other records exist from nearby Cuzco and Junín (Schulenberg et al. 2006).

Chestnut-breasted Mountain-Finch (Poospiza caesar).—We observed pairs on two occasions in scrub around Chungui (sight records: PAH, MBR, LC-A). This southern Peru inter-montane valley endemic is known from the Río Pampas drainage in Apurímac (Fjeldså and Krabbe 1990, Schulenberg et al. 2006), but we find no documented records from the Ayacucho side of the Río Pampas Valley.

Grassland Yellow-Finch (Sicalis luteola).—A flock of 20–30 individuals was observed (sight record: PAH) along the Apurímac Valley floor at

1,000 m below Paccaypata. This record is the first of this species for Apurímac Department and the Apurímac River Valley. It is known from other inter-montane valleys in Peru (Schulenberg et al. 2006, 2010).

Cuzco Brush-Finch (Atlapetes canigenis).—This range-restricted endemic was common and breeding (recently fledged young) at 2,300–3,600 m above Paccaypata. Our specimens (KU: 122643–8; CORBIDI KVG 189, KVG 230, KVG 235-6 LCA 2012-32, MCCF 462) show considerable variation (regardless of sex or age) in intensity of gray in the underparts, ranging from individuals that are almost uniformly dark gray below to individuals that are pale gray with grayish-white abdomens. Although ventral color variation could represent hybridization with geographically proximate *A. melanopsis* or *A. forbesi*, it is also apparent in specimens from other localities, suggesting it is typical for *A. canigenis* (M. Brady, pers. comm., LSUMZ specimens); further study is required.

Black-spectacled Brush-Finch (Atlapetes melanopsis).—This range-restricted and poorly known species was uncommon in dense scrub and forest edge near the human-altered treeline at Ccano (2,850–3,100 m) and in montane forest edge at Chupón (3,000–3,300 m; ML 186903, 186921; PAH photographs). These birds were diagnosed from closely related Apurimac Brush-Finch *A. forbesi* by their pale cinnamon (rather than chestnut) hood and extensive black lores. A pair was also observed below Rumichaca at 2,700 m. These records are the first for Ayacucho of this recently described species (Valqui and Fjeldså 1999), and increase its known linear distribution roughly fourfold. As no high-elevation *Atlapetes* was documented from eastern Ayacucho, these records fill a distributional gap between *A. melanopsis* populations in the upper Río Mantaro drainage and populations of Apurimac Brush-Finch *A. forbesi* south of the Río Pampas in Apurímac. The Chupón locality is less than 35 km, but across the Río Pampas, from the type locality of *A. forbesi* (Pomayaco, Apurímac; Morrison 1947). Given the similarity in plumage, potential interactions between *A. forbesi* and *A. melanopsis* warrant further study.

White-winged Tanager (Piranga leucoptera).—This *Piranga* was fairly common in semi-humid woodland (CORBIDI PAH 1326) at 2,000–2,300 m above Paccaypata. This locality represents a high elevational record in Peru, where this species is local and most common on outlying ridges (Schulenberg et al. 2010).

Páramo Seedeater (Catamenia homochroa).—This nomadic species was observed frequently and in small groups feeding in seeding bamboo at forest edge in Chupón (3,000–3,500 m; specimens KU 122533, CORBIDI KVG 147). These records are the first documented records for Ayacucho.

Mountain Cacique (Cacicus chrysonotus).—Specimens collected at Ccano (KU 112784–5; CORBIDI AUT 6, JTCH 54, JN 690) vary in the amount of yellow in the wing coverts. Some specimens have reduced yellow when compared to *C. c. peruvianus* of Junín; others lack yellow entirely like *C. c. chrysonotus* of Cuzco. This species was recorded, but not collected, by Weske and Terborgh in Ayacucho, so we offer the first specimen evidence of possible hybridization between these taxa in Ayacucho (which have been considered separate species in the past; Jaramillo and Burke 1999). Previous specimen evidence for intergradation between these taxa includes *C. c. peruvianus* from Pasco/Junín with black fringes to otherwise yellow wing coverts (Bond 1953) and *C. c. chrysonotus* from Bolivia with yellow edging to otherwise black wing coverts (Hellmayr 1937). Below Paccaypata, we recorded this cacique in dry, heavily modified forest between 1,500–2,300 m and humid forest from 2,300–3,300 m. On 29 September 2014 at 1,700 m, MBR and LC-A observed two individuals out of a flock of 20+ birds with reddish-orange rump feathers, rather than the typical yellow. This cacique was very common at Paccaypata, and all other individuals observed had typical yellow rumps. It is unclear whether the red-orange color was a plumage pigment aberration related to diet or mutation, or was related to hybridization with *C. uropygialis* (which has a scarlet-red rump). *Cacicus uropygialis* was not recorded at Paccaypata, but is known from further north in the valley (Weske 1972).

Yellow-billed Cacique (Amblycercus holosericeus).—This species was common in dense *Chusquea* bamboo thickets and forest edge at Ccano (2,700–3,000 m) and Chupón (3,000–3,500 m). These are the first documented records for Ayacucho (KU 112786–7, 122554; CORBIDI AGNS-PE-71, ATP 2008-64, JTCH 53, LCA-2012-01; Schulenberg et al. 2006).

Scrub Blackbird (Dives warszewiczi).—We observed this species, which is widespread on the arid Peruvian coast, but local in the Río Mantaro and Río Pampas drainages (Schulenberg et al. 2006), on several occasions at 1,000–1,500 m below Paccaypata (sight records: PAH and

MBR). These records are the first for Cuzco, but occurrences are not surprising given the similar habitat in the nearby Pampas River Valley.

Golden-rumped Euphonia (Euphonia cyanocephala).—This euphonia was common and vocalizing persistently in heavily modified woodland with clumps of mistletoe at 2,000–2,300 m above Paccaypata. These records are the first in the Apurímac River Valley and Cuzco (KU 122691, CORBIDI MCCF 507; Weske 1972, Schulenberg et al. 2010). This species is known from other inter-Andean valleys in northern and southern Peru (Schulenberg et al. 2006, 2010); the geographically closest known populations are Junín and Puno.

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APPENDIX 1. Andean bird species that occur both north and south of Ayacucho, yet remain undocumented in Ayacucho itself (per Schulenberg et al. 2006).

Golden-plumed Parakeet (*Leptosittaca branickii*)
*Many-spotted Hummingbird (*Taphrospilus hypostictus*)
Fawn-breasted Brilliant (*Heliodoxa rubinoides*)
Line-fronted Canastero (*Asthenes urubambensis*)
*Chestnut-backed Antshrike (*Thamnophilus palliatus*)
*Foothill Antwren (*Epinecrophilla spodionota*)
*Stripe-chested Antwren (*Myrmotherula longicauda*)
*Yellow-breasted Antwren (*Herpsilochmus axillaris*)
*Scaled Antpitta (*Grallaria guatemalensis*)
Rusty-breated Antpitta (*Grallaricula ferrugineipectus*)
*Foothill Elaenia (*Myiopagis olallai*)
*Ashy-headed Tyrannulet (*Phyllomyias cinereiceps*)
*Marble-faced Bristle-Tyrant (*Phylloscartes ophthalmicus*)
*Plumbeous-crowned Tyrannulet (*Phylloscartes plumbeiceps*)
*Spectacled Bristle-Tyrant (*Phylloscartes orbitalis*)
Inca Flycatcher (*Leptopogon taczanowskii*)
*Yellow-throated Spadebill (*Platyrinchus flavigularis*)
*Yellow-olive Flycatcher (*Tolmomyias sulphurescens*)
Ochraceous-breasted Flycatcher (*Nephelomyias ochraceiventris*)
*Handsome Flycatcher (*Nephelomyias pulcher*)
Andean or Plumbeous Tyrants (*Knipolegus signatus/cabanisi*)
*Cliff Flycatcher (*Hirundinea ferruginea*)
*Scaled Fruiteater (*Ampeloides tschudii*)
Chestnut-crested Cotinga (*Ampelion rufaxilla*)
Correndera Pipit (*Anthus correndera*)
*Golden-eared Tanager (*Tangara chrysotis*)
*Carmiol's Tanager (*Chlorothraupis carmioli*)
*Hepatic Tanager (*Piranga flava*)
Olivaceus Siskin (*Sporagra olivacea*)

*denotes species found in foothill forests.