A new Peruvian locality for Scimitar-winged Piha *Lipaugus uropygialis*, with the first description of flight display and other natural history notes

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Summary.—While participating in a Rapid Biological Inventory (RBI) to the Santuario Nacional Megantoni, Cuzco department, Peru in May 2004, we encountered Scimitar-winged Pihas *Lipaugus uropygialis* in tall cloudforest at our high-elevation camp 'Tingkanari' (*c*.2,100–2,300 m; 12º16'S, 72º06'W). The species previously was known in Peru from only one site nearly on the Bolivian border *c*.400 km to the south-east: Abra de Maruncunca, in Puno department. Over two days, we observed the pihas several times and documented them with photographs and sound-recordings, including the first known observations of the species' display flight, in which it produces mechanical sound with its uniquely modified primaries. We also present information from the four Peruvian specimens of the species, and discuss various characters, including the voice, display, probable subadult plumage and modifications of the primaries, and their implications for taxonomic relationships between this species and other pihas. We suspect Scimitar-winged Piha is restricted to tall humid forest on ridgeline 'saddles' at 1,800–2,750 m. These sites probably represent desirable sites for human colonists to clear for pasture and agriculture, and thus are of conservation concern. However, with the potential size of the species' distribution nearly doubled by the discovery of a Cuzco locality, more of its habitat may be protected than previously thought.

Scimitar-winged Piha *Lipaugus uropygialis* has been shrouded in mystery since its description by Sclater & Salvin (1876); the species has remained seldom seen and its voice has only recently been described in detail (Bryce *et al*. 2005). What little is known of the species' natural history was summarised by Snow (2004), Bryce *et al*. (2005) and Kirwan & Green (2012). The bulk of its distribution has been thought to lie within Bolivia (Snow 1982, 2004, Fjeldså & Krabbe 1990, Ridgely & Tudor 1994, BirdLife International 2000, Bryce *et al*. 2005, Kirwan & Green 2012). However, two specimens taken in 1980 at Abra Maruncunca, Puno department, a site within 35 km of the Bolivian border, were the first documentation of the species in Peru (Remsen & Traylor 1989, Fjeldså & Krabbe 1990, Robbins *et al*. 2013). The species remained unknown further to the north and west in Peru despite fairly heavy ornithological coverage of the *yungas* (southern Andean humid montane forest) habitat along the Cuzco–Quincemil and Paucartambo–Pilcopata roads by field workers and birders (Walker *et al*. 2006). Thus it was with some surprise that we encountered this species while conducting avifaunal surveys in Santuario Nacional Megantoni (hereafter simply Megantoni), on the east side of the middle río Urubamba, Cuzco department (Lane & Pequeño 2004). This record extends the Scimitar-winged Piha's range more than 400 km to the north-west of Abra de Maruncunca (Fig. 1).

We located two different groups of *Lipaugus uropygialis* and documented them by sound-recordings and photographs. Another unknown sound led us to observe a lone bird performing its display flight, which includes mechanically produced sounds. To our

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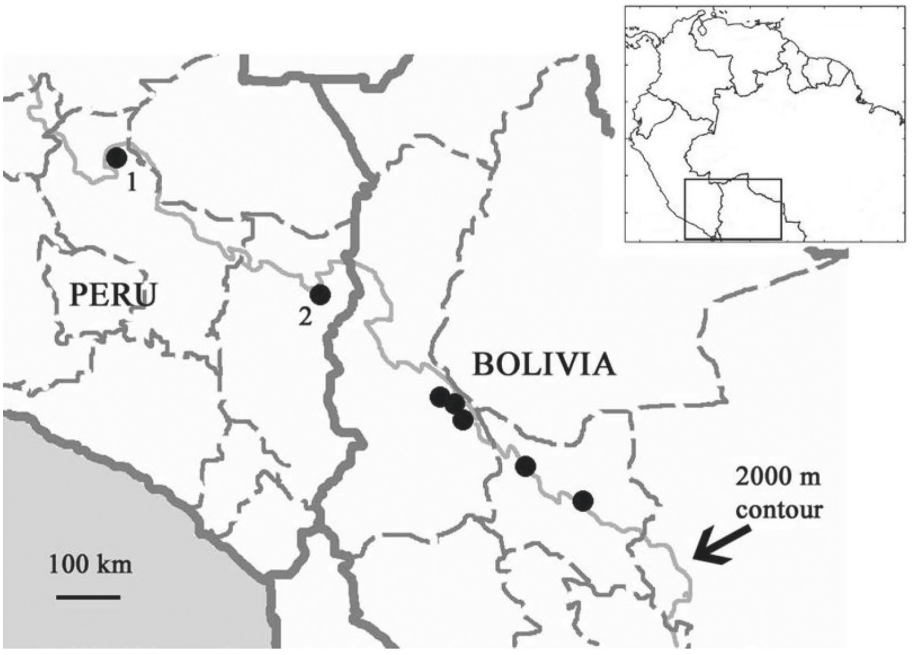

Figure 1. Map of localities where Scimitar-winged Piha *Lipaugus uropygialis* has been reported, largely based on Bryce *et al*. (2005), with the new locality at Megantoni, Cuzco, Peru, represented by point 1, and Abra Maruncunca, Puno, Peru, by point 2. The grey line represents the approximate 2,000 m contour line of the main Andes.

knowledge, this is the first time this display has been witnessed. Below, we augment the natural history information published by Bryce *et al*. (2005), describe the flight display in detail and compare it to that of the other two montane *Lipaugus*. We also provide information concerning the four Peruvian specimens of *L. uropygialis* and discuss the distribution and conservation status of the species in light of the Megantoni record.

Locality and Methods

On 9–14 May 2004, we, as part of a Rapid Biological Inventory (RBI) team, established a campsite in Megantoni named 'Tinkanari'. The Tinkanari camp is in Cuzco department, Peru, on the east bank of the middle río Urubamba area, at 12º16'S, 72º06'W, *c*.2,100–2,300 m elevation (Fig. 1). A detailed description of the vegetation and fauna of Tinkanari is available in Vriesendorp *et al*. (2004). Our censusing methods and results were outlined in Lane & Pequeño (2004). We made recordings using a Sony TCM-5000 cassette recorder with a Sennheiser ME-66 microphone, and these recordings are deposited at the Macaulay Library (Cornell Lab of Ornithology, Ithaca, NY) and Xeno-canto (www.xeno-canto.org) sound collections.

Observations

Encounters.—At *c*.11.10 h on 10 May 2004, we were alerted to the presence of two *Lipaugus uropygialis* by their loud vocalisations. These birds were near a group of Dusky-green Oropendolas *Psarocolius atrovirens* and Blue-banded Toucanets *Aulacorhynchus coeruleicinctis*, but the pihas appeared to be moving independently of the other species. They did not respond to playback of their vocalisations. We found another group of pihas

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(not accompanying other bird species) more than 1 km to the east around dawn (*c*.05.45 h) on 11 May, relocating these again at approximately 08.30 h, *c*.0.5 km to the south-east, on a fairly level ridgetop at the ecotone of tall and stunted subtropical forest. This group of three individuals moved more slowly, foraging in the mid- and subcanopy (*c*.7–15 m above the forest floor; canopy 12–15 m). They permitted rather close approach, and we tape-recorded and photographed these individuals extensively. More than 3 km to the north-west, at *c*.16.00 h on 11 May, we found another lone individual performing a song-flight display. Again, we made tape-recordings and took notes as we observed the display. We did not encounter the species again during the following three days that we spent at Tingkanari, although we spent most of that period on different trails.

Behavior and habitat.—We observed Scimitar-winged Pihas moving through the forest in small groups that were very vociferous, producing loud bursts of noise that carried quite a distance; our observations agree closely with Bryce *et al*. (2005). The second group of pihas responded strongly to playback of these calls, readily approaching to inspect the source; playback would induce them to vocalise immediately, overlapping their vocalisations with those being played back much as they did with one another's vocalisations. The birds remained in the midstorey and subcanopy (5–15 m) of moderate stature forest (canopy *c*.15 m) and switched perches frequently and noisily, their wings producing an audible 'swishing' sound, which we even captured on tape.

The pihas' normal perched attitude when active was hunched, with the tail held *c*.20º below horizontal and head jutting forward. When not foraging, they would perch more upright (Figs. 2–4). As they foraged, groups of pihas covered ground rapidly in the manner described by Bryce *et al*. (2005). We observed a single foraging attempt, when an individual was seen sallying *c*.2 m, out and slightly above horizontal, for a fruit or insect (the item was not clearly seen) from a cluster of leaves as it changed perches. On landing, the bird tossed the item in the air and swallowed it with no noticeable handling motion (e.g., bashing the item on its perch). Stomach contents and foraging observations (Remsen *et al*. 1982, Snow 1982, Bryce *et al*. 2005) indicate that the species is largely frugivorous but consumes some insects, and even the occasional vertebrate. The stomach contents of four Peruvian specimens (see below) contained insects, a large pit (undoubtedly of an already digested fruit) and even a small lizard, suggesting that the species is rather omnivorous and opportunistic.

All encounters with pihas were on broad ridgetop 'saddles' (between higher ridges) with tall forest (canopy *c*.12–25 m) or on very shallow-sloping mountainsides. We did not find pihas on steeper slopes, and conclude that they may remain largely on these flatter saddles, foraging along their length. Our most prolonged observation (*c*.30 minutes) was of a trio near the ecotone of taller forest and poor-soil stunted forest, but we noted that the group did not enter the stunted forest. The forest was heavily festooned with moss, with a notable presence of *Chusquea* bamboo, and a dense understorey including many tree ferns. In June 2007, DFL, A. M. Cuervo and K. Faust briefly observed another *L. uropygialis* at Abra Maruncunca, Puno department, in habitat very similar to that at Megantoni, but here the forest was taller: nearly 25 m (Robbins *et al*. 2013; Fig. 5). DFL has also encountered the species on several occasions at elevations of 1,800–2,400 m along the 'Old Coroico Road' in the Nor Yungas of La Paz department, Bolivia, in September 2009, September 2010, September 2011 and September 2016, while guiding tours. At this last site during the first three observations, 1–2 birds (those seen well were in subadult plumage, see below) were present along the road at a site where the slope was shallower, with fruiting trees amid second growth. In the 2016 observation, DFL and tour participants walked off the road on a track that led to taller primary forest along a saddle, where three adults responded

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Figure 2. One of the Scimitar-winged Pihas *Lipaugus uropygialis* at Reserva Nacional Megantoni, Cuzco, Peru, 11 May 2004 (Daniel F. Lane)

Figure 3. A presumed subadult-plumaged Scimitar-winged Piha *Lipaugus uropygialis*, Alto Sacramento, Old Coroico Road, La Paz department, Bolivia, 25 September 2009 (Daniel F. Lane)

A different presumed subadult-plumaged Scimitar-winged Piha *Lipaugus uropygialis*, above Alto Sacramento, Old Coroico Road, La Paz department, Bolivia, 24 September 2011 (Daniel F. Lane)

almost immediately to playback once in appropriate habitat. These observations, and additional confirmation from S. K. Herzog (pers. comm.; Herzog *et al*. 2017) regarding recent Bolivian sightings, suggest that the species' preference for tall-forest saddles and shallow slopes is probably real.

Vocalisations.—Several authors have incorrectly attributed the song of Blue-winged Mountain Tanager *Anisognathus somptuosus flavinuchus* to *Lipaugus uropygialis* (Ridgely & Tudor 1994, 2009, Prum 2001, Snow 2004). The true voice of the piha was not published until Bryce *et al*. (2005).

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Figure 5. Habitat at Abra Maruncunca, Puno, Peru, where a Scimitar-winged Piha *Lipaugus uropygialis* was encountered, 15 June 2007 (Daniel F. Lane)

As noted by Bryce *et al*. (2005), foraging groups of pihas are most easily detected by their loud bursts of calls. These explosive calls of *L. uropygialis*, which we term 'foraging calls', usually involved overlapping of the voices of several individuals. Scimitar-winged Pihas did not make exaggerated head movements in the manner of singing Screaming Piha *L. vociferans* when giving foraging calls. These calls were rather variable in structure: notes given usually were short and simple in structure, but some were much longer and more complex, particularly when given in a 'group burst' (Fig. 6a–b; from XC40334, available at www.xeno-canto.org/40334). Similar vocalisations are noted for the other two Andean *Lipaugus* (Cuervo *et al*. 2001; T. Mark recording XC7055).

The song given during the display flight is very different from foraging calls: it is a piercing, modulated whistle that rises terminally (Fig. 6c; from XC40335). Over the course of this whistle, there are three dull *fft* sounds, presumably produced mechanically by the wings.

Display flight.—In the evening (16.10–16.50 hours) of 11 May 2004, we observed a single *L. uropygialis*, presumably a male, performing a display flight. This display occurred at intervals of *c*.95 seconds and was initiated by the bird as it perched on the outermost branches of a canopy tree (often on bare, exposed branches, *c*.15 m above ground; Fig. 7). We observed just one individual, and whereas it would use several perches for the display, it seemed to prefer certain ones, although this may have been partially

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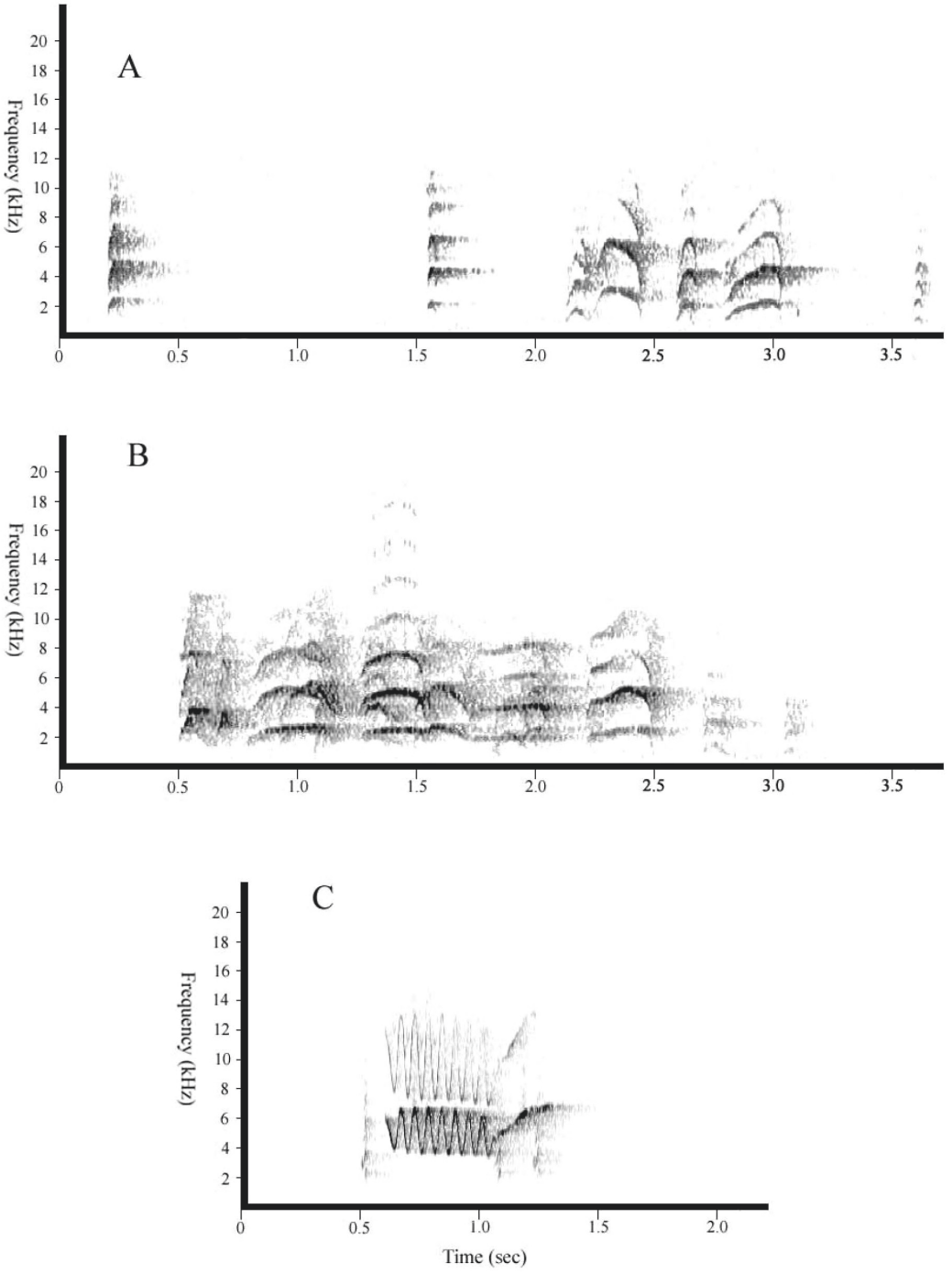

Figure 6. Sonograms of vocalizations of Scimitar-winged Piha *Lipaugus uropygialis*, all taken from recordings made by Daniel F. Lane at Megantoni, Cuzco, Peru, 11 May 2004. (A) Foraging calls from a single individual with shorter and longer calls (XC40334). (B) A burst of foraging calls with several birds' voices overlapping. (C) Sounds produced during flight display (XC40335). The long, modulated note with a rising tail is the piercing whistle given vocally, with three *fft* sounds (produced mechanically by the wings) at the start of the vocalisation, and twice more at the start and end of the rising tail of the whistle.

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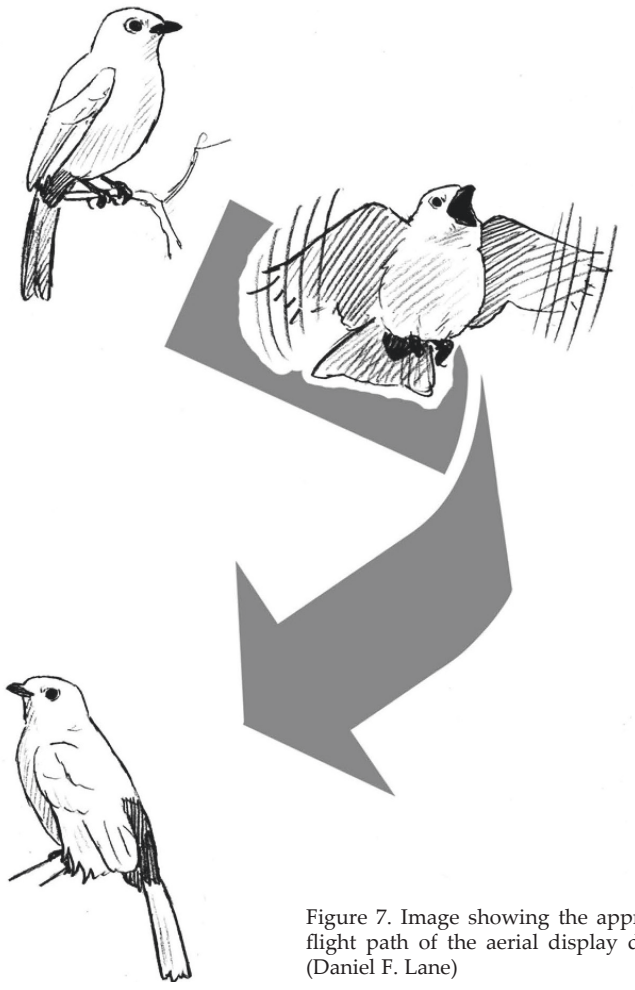

Figure 7. Image showing the approximate positions and flight path of the aerial display described in this paper (Daniel F. Lane)

determined by playback. After some time spent motionless, the bird launched from the branch and descended in a half-spiral (like a 'corkscrew') to a lower perch (*c*.7 m above ground; Fig. 7) while giving a high, piercing, whistled vocalisation in conjunction with three whirring sounds produced by the wings (Fig. 6c); only one such vocalisation was given per performance. As it descended, the bird appeared 'inflated', with body plumage exaggeratedly puffed out, and the bill open wide as it gave the vocal portion of its display. Our view of the display was partially obscured by tree-fern fronds, so we were unable to see details of the wing-flapping rate. However, we believe that the wings were sharply beaten at least three times during the vocalisation, resulting in airy *fft* sounds (Fig. 6c). During the long pauses between display flights, the bird never gave foraging calls; only in response to playback of the display vocalisation did it produce a foraging call. We did not see or hear another displaying individual at this site, indeed we did not detect any other individuals nearby at all, and so we have no evidence that the species has a lekking system of display.

Specimens, morphology and comparisons to other Andean *Lipaugus*

Peruvian specimens.—We are aware of four specimens of *L. uropygialis* from Peru. Two are at Louisiana State University Museum of Natural Science, Baton Rouge (LSUMZ), both

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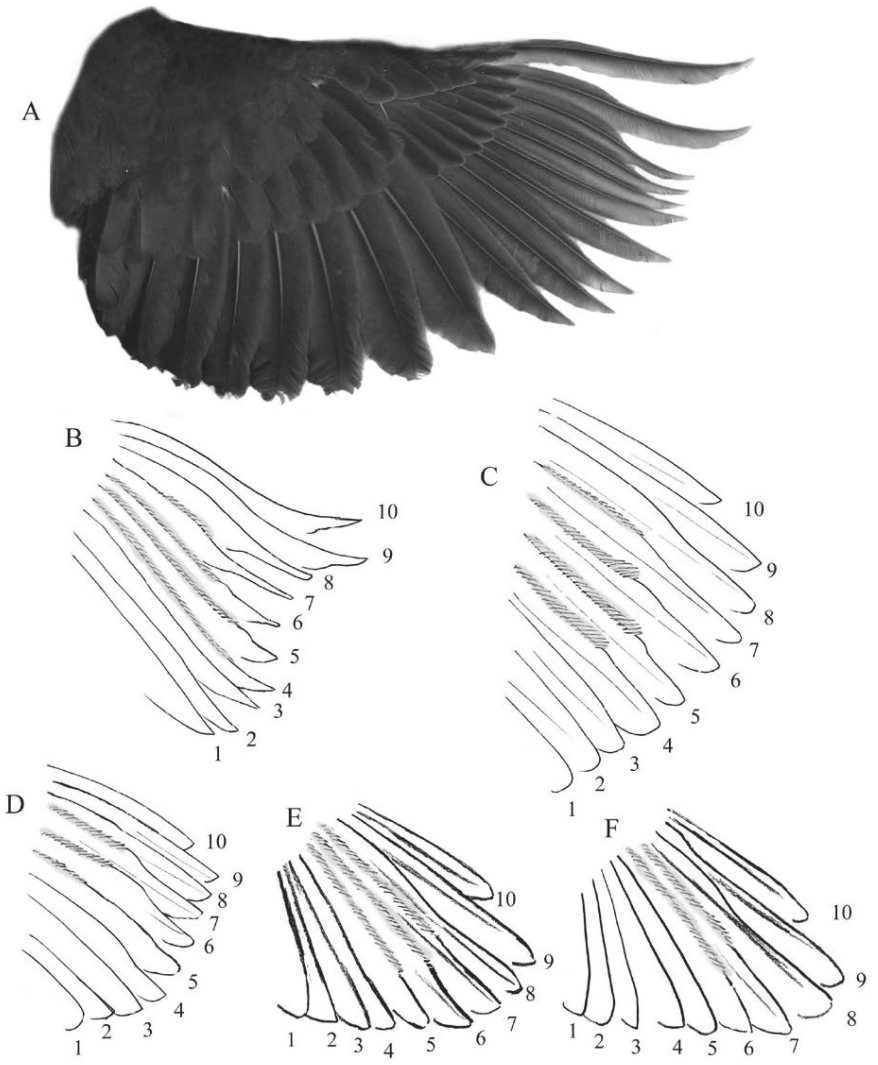

Figure 8. Images of the modified primaries of five species of piha (Daniel F. Lane). (A) The open wing of a male Scimitar-winged Piha *Lipaugus uropygialis* (CORBIDI-AV-011276), revealing the primary modifications. (B) Line diagram of primary modifications of *L. uropygialis* (based on AMNH 99212), with grey areas indicating the presence of stiffened outer webs lacking interlocking barbules. (C) Line diagram of primary modifications of Dusky Piha *L. fuscocinereus* (AMNH 183741). (D) Line diagram of primary modifications of Cinnamon-vented Piha *L. lanioides* (AMNH 494207). (E) Line diagram of primary modifications of Olivaceous Piha *Snowornis cryptolophus* (LSUMZ 171033). (F) Line diagram of primary modifications of Grey-tailed Piha *S. subalaris* (LSUMZ 88185).

females. Both specimens have pp10–4 (primaries numbered from innermost to outermost primaries) curved outward, lacking the degenerated outer webs and sharply attenuated tips of males. One (LSUMZ 98424) appears to have brown tips to the malar and breast feathers, as well as one brown lower scapular, suggesting that these may be retained from juvenile plumage, as such brownish feathering represents juvenile characters in the better-known *L. vociferans* (see description of first basic plumage below). However, of the two specimens, LSUMZ 98424 has a completely ossified skull and, additionally, lacks rufous tips to the rectrices.

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LSUMZ 98424: collected and prepared by L. C. Binford, 15 November 1980. Peru: dpto. Puno; Abra de Maruncunca, 10 km south-west of San Juan de Oro, 2,000 m. Female, 131 g. Little fat. Heavy body moult. Ovary 8 × 4 mm, ova minute. Skull ossified. Stomach: huge seed and one small lizard. Bill: black, mandibular rami and basal half of gonys dark bluish grey. Feet darker bluish grey (slate). Iris: dark reddish brown.

LSUMZ 98425: collected and prepared by L. C. Binford, 25 November 1980 (locality same as previous). Female, 135 g. Little fat. Ovary 10 × 7 mm, largest ovum 1 mm. Skull not completely ossified. Mandible dark grey. Feet dark grey.

In addition, the Museo de Historia Natural de la Universidad Mayor de San Marcos (MUSM) and Centro de Ornitologia y Biodiversidad (CORBIDI) collections in Lima, Peru, house an additional male specimen each. The wings of the MUSM individual, collected in January, are in heavy moult: the outermost primaries are largely sheathed, although their modified tips are already apparent. By comparison, the CORBIDI specimen, collected in June, shows very limited moult, this being restricted to the body.

MUSM 24135: collected and prepared by T. Valqui, 7 January 2001. Peru: dpto. Puno; between Sandia and San Juan de Oro, Abra Maruncunca, 2,170 m. Male, 128 g. Little fat. Heavy wing, tail and body moult. Left testis 5 × 3 mm. No bursa found. Stomach: insects. Skull 100% ossified. Iris: reddish brown. Legs: greyish black, soles yellowish. Bill: dark grey. Collected in humid montane forest about 8 m above the ground.

CORBIDI-AV-011276: collected and prepared by A. M. Cuervo [pers. catalogue no. 826], 15 June 2007. Peru: dpto. Puno; Abra de Maruncunca, 14º12'S, 69º13'W, *c*.2,150 m. Male, 131 g. Wingspan 462 mm. Heavy fat. Left testis 5 × 3 mm. Stomach: two seeds and violet fruit pulp. No bursa. Skull 100% ossified. No wing, tail moult; trace body moult. Irides dark reddish brown. Maxilla slate-black, mandible dark grey, horn towards base. Legs grey, orangey soles. Shot at 10 m height in the midstorey of tall montane wet forest in an area of large trees, open understorey, flat terrain.

Subadult plumage.—While leading tours in La Paz department, Bolivia, on 25 September 2009 and 24 September 2011, DFL photographed *L. uropygialis* (Figs. 3–4) that showed narrow, somewhat pointed rectrices with cinnamon tips and similar cinnamon tips to the secondaries. Specimens of *L. vociferans* at LSUMZ show these characters to be indicative of a subadult plumage in that species, so we infer that the same is true for *L. uropygialis*. We believe this to be the first evidence of a distinct age-related plumage class in *L. uropygialis* (Kirwan & Green 2012).

Wing structure.—As its English name implies, Scimitar-winged Piha has unusual wing feathers. Males (particularly) have unique modifications (Fig. 8) to the primaries, which led Sclater & Salvin (1876) to place the species in the subgenus *Chirocylla*, a name recognised at genus level occasionally since (e.g., Snow 1982). Following Remsen *et al*. (1982), more recent treatments (e.g., Fjeldså & Krabbe 1990, Ridgely & Tudor 1994, 2009, Prum 2001, Snow 2004, Bryce *et al*. 2005, Kirwan & Green 2012) have merged *Chirocylla* into *Lipaugus*, suggesting that *uropygialis* is sister to Dusky Piha *L. fuscocinereus*, which relationship was confirmed by Berv & Prum (2014). Two other montane *Lipaugus*, *L. fuscocinereus* and the recently described Chestnut-capped Piha *L. weberi*, share some of the primary feather modifications with *L. uropygialis*, and these species produce mechanical noise in flight displays (López-Lanús 2000, Cuervo *et al*. 2001, Snow 2004, Kirwan & Green 2012). We can find no evidence that lowland pihas possess any flight displays (Kirwan & Green 2012).

Fig. 8 shows the primary structure of a male *L. uropygialis*. Unique among all *Lipaugus* are the recurved (outward-bowed), finely pointed primaries. These can be seen in the field even on the closed wing. Additionally, as noted above, females also have recurved primaries. The stunted pp5–8 are also peculiar to *L. uropygialis*. Having surveyed male

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specimens from all genera (and nearly all species) of cotingas, only males of the two species of *Phoenicircus* red cotingas have recurved, narrow-tipped, similarly stunted primaries, which produce a bell-like tinkling in flight (pers. obs.). Among the pihas, *L. uropygialis* share stiffened outer webs, lacking interlocking barbules, of certain middle primaries with *L. weberi*, *L. fuscocinereus*, Cinnamon-vented Piha *L. lanioides*, and the two members of *Snowornis* (Cuervo *et al*. 2001). Which primaries possess these webs is species-dependent: in *L. uropygialis*, the stiffened vanes are present on pp4–7; *L. weberi* has them on pp6–7, *L. fuscocinereus* on pp4–7, *L. lanioides* on pp5–7, Olivaceous Piha *Snowornis cryptolophus* on pp5–7 and Grey-tailed Piha *S. subalaris* on pp6–7 (Fig. 8). We cannot find any other cotingids that share similar modifications to the outer vanes of the primaries in adult male plumages.

Similar, though not as extensive, structures appear on the middle primaries of the two species of the tyrant-flycatcher genus *Cnipodectes* (Lane *et al*. 2007). These feather modifications are thought to be used in the production of mechanical sounds in flight display as well. We expect that the mechanical sound produced in the display flight of Scimitar-winged Piha is made by a combination of the stiffened vanes and the finely pointed, recurved primaries; the precise mechanism requires more study. Of course, the acquisition of these characters by such unrelated clades as the two groups of pihas and the twistwings can be viewed only as convergence (Ohlson *et al*. 2007, Tello & Bates 2007, Berv & Prum 2014).

Compared to display noises recorded for the other two Andean *Lipaugus*, *L. uropygialis* includes fewer wing-produced 'swishing' sounds (just three vs. 12 by *L. fuscocinereus* and five in *L. weberi*), but sample sizes for each species are very small and there may be more variation within each species. In the published descriptions of flight displays of *L. fuscocinereus* and *L. weberi*, it appears that neither species has a vocal component to the flight display. López-Lanús (2000) suggested that the vocalisations on his sonogram may have emanated from a source or sources other than the displaying bird, and indeed, the overlap of two whistled phrases suggests that they stem from at least two sources, neither of which may have been the displaying bird. Although not explicitly stated in Cuervo *et al*. (2001), *L. weberi* also lacks a flight display vocalisation (A. M. Cuervo pers. comm.). The 'foraging call' vocalisations of *L. weberi* appear similar to those of *L. uropygialis* (Cuervo *et al*. 2001) and apparent 'foraging calls' of *L. fuscocinereus* suggest that it too has similar vocalisations (T. Mark recording XC7055).

Discussion

Evolutionary relationships.—As discussed above, Cuervo *et al*. (2001) noted similarities in the structure of certain primary feather modifications among *L. uropygialis*, *L. fuscocinereus*, *L. lanioides*, *Snowornis cryptolophus* and *S. subalaris*. In particular, the barbule-less, stiffened outer webs of several middle primaries appear to be a shared character among all of these species. Conversely, the recurved primaries and (in the male) narrow-tipped outer primaries are autapomophic characters restricted to *L. uropygialis*. Additionally, the primaries of *L. uropygialis* do not extend beyond the longest secondaries on the folded wing (in either sex), a unique feature among *Lipaugus*; it appears this is due to the shorter, modified outermost primaries. Despite widely overlapping body masses, wing length of *L. uropygialis* is considerably shorter than in *L. fuscocinereus* (Snow 1982, 2004). The existence of similar flight displays among *L. uropygialis*, *L. fuscocinereus* and *L. weberi*, as well as their allopatric distributions at similar elevations, and their shared primary modifications, suggest that these species probably form a monophyletic clade, and at least a sister relationship between the former two was confirmed by Berv & Prum (2014). The same authors' phylogenetic tree suggested that *L. lanioides* is not part of this clade, but rather is sister to Black-and-

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gold Cotinga *Tijuca atra* (Berv & Prum 2014). We have not located any information on the presence or absence of flight displays in *L. lanioides*; by voice, it appears to be more similar to lowland Rufous Piha *L. unirufus* and *L. vociferans* than to any of the Andean species. With several phylogenetic datasets supporting the distant relationship of *Snowornis* to *Lipaugus*, we must conclude that the similar wing structures are the result of convergence (Prum *et al*. 2000, Prum 2001, Ohlson *et al*. 2007, Berv & Prum 2014). We note that no flight displays have been reported for the two *Snowornis*, although sounds recorded from *S. cryptolophus*, and reported as vocalisations (Kirwan & Green 2012), probably refer to mechanically-produced sounds (XC9860).

Conservation status.—Given that Scimitar-winged Piha appears to exist at low densities along tall-forest ridges between 1,800 and 2,750 m (Snow 2004, Kirwan & Green 2012), it does seem prudent to consider its threat status as Vulnerable (BirdLife International 2000). That said, we strongly disagree with Bryce *et al*. (2005), who used frequency of specimen collection as a means to assess population change over time. Their statement that they 'believe that the lack of 20th-century specimens may represent evidence for a population decline, a conclusion supported by the fewer field observations in recent years' (Bryce *et al*. 2005: 105) is unfounded; indeed, the table of observations they presented showed an increase in sight records as specimen evidence tailed off. Prior to the use of tools such as playback and mist-nets, collection was an opportunistic activity, and hardly a means to ascertain abundance.

We expect pristine Scimitar-winged Piha habitat to decline as habitat alteration by encroaching colonists continues in the humid *yungas* of south-east Peru and western Bolivia. This may be especially true if taller forest on level-ground 'saddles' is the preferred habitat of the species and, simultaneously, favoured agricultural terrain; indeed, when revisiting Abra Maruncunca in July 2017, the locality where the 2007 bird was found had been cleared for pasture (DFL pers. obs.)! However, with the discovery of the piha in Megantoni, the potential size of the species' range has effectively doubled, and it seems likely that other populations within the Peruvian portion of its range are safeguarded by the large blocks of *yungas* habitat encompassed by two large and pristine national reserves: Santuario Nacional Megantoni (Vriesendorp *et al*. 2004) and probably Parque Nacional Manu. Lack of records on the Kosñipata and Marcapata roads may be due to their lack of intersection with flatter saddles (certainly true on the Kosñipata road: DFL pers. obs.), or where they do, forest cover was cleared by colonists too early for ornithologists to detect the piha. In addition, Bolivian populations are known within Parque Nacional Cotapata and Parque Nacional Carrasco (Bryce *et al*. 2005), and probably occur in Parque Nacional Madidi, suggesting that extensive pristine habitat is available to the species in that country. Of great concern, however, is the current squatting and clearance of land within Bolivian national parks, apparently unimpeded (indeed, it is supported) by the Movimiento al Socialismo, the political party currently in control of the government. Efforts should be made to avoid extensive forest clearance, especially where tall 'saddle forest' exists at 1,900–2,750 m, to maintain viable populations of Scimitar-winged Piha in that country.

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