



New information on plumage, nesting, behaviour and vocalisations of the Bolivian Swallow-tailed Cotinga *Phibalura flavirostris boliviana* from the Apolo area of Madidi National Park, Bolivia

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La casi amenazada *Phibalura flavirostris* (Palkachupa en Quechua) tiene dos subespecies, *P. f. flavirostris* de Brazil y la población aislada en los Andes de Bolivia, *P. f. boliviana*. Antes del año 2000, *boliviana* era solo conocida por dos especímenes colectados en 1902, y uno otra antes sin datos. Considerando que *boliviana* puede ser una especie distinta y muy amenazada, el programa de Áreas de Importancia para la Conservación de las Aves de Armonía (BirdLife en Bolivia) estableció la especie como una prioridad de investigación. Hemos entrado en el área del descubrimiento para observar 35 ejemplares, la mayoría en parejas. Hemos tomado fotos de hembras y machos, grabado sus llamadas, y anotado tres nidos.

La investigación mostró que el plumaje de la hembra de *boliviana* es diferente a lo de la hembra de *P. f. flavirostris*. Encontramos ejemplares en seis sitios en fragmentos de bosques semi-humedo y con nidos en arbustos en áreas abiertas. *P. f. boliviana* solo es común en el área de Pata sin datos de poblaciones saludables en otras áreas. La población esta ubicada en Parque Nacional Madidi pero en un área de manejo integrado que anualmente sufre de quemadas para ganadería. ABH esta preparando un manuscrito proponiendo *boliviana* como una especie que merece un más alto nivel de atención de conservación.

The Near Threatened¹, high research priority¹⁰ Swallow-tailed Cotinga *Phibalura flavirostris* is represented by two subspecies, *flavirostris* of eastern Brazil and, separated by c.2,500 km of lowland forest and pantanal, *P. f. boliviana* consisting of an isolated population of unknown size living in an Andean area of disturbed open forest surrounded by moist yungas and intermontane dry forest. Two specimens collected from a single locality in 1902^{2,3} and a mounted bird with no locality other than Bolivia⁸ were, for 98 years, the only evidence of *boliviana* until it was rediscovered in 2000⁴. In July 2002, Wildlife Conservation Society research in the Apolo area of Madidi National Park (Madidi) did not observe the species but found it was well known among local inhabitants near the villages of Pata and Virgen del Rosario, having the local Quechua name of Palkachupa (forked tail)^{5,6}.

Phibalura f. boliviana appears to occur at 1,400–2,000 m in semi-humid forest fragments surrounding the city of Apolo, whereas the Brazilian subspecies *flavirostris* occurs below 1,400 m¹³. They both prefer edge habitat^{4,14}. Considering that *boliviana* could be a distinct, highly threatened species, Armonía's (BirdLife Bolivia) Important Bird Area Programme considered it a high conservation priority. Our goal was to determine the population size of this subspecies and to obtain information on its natural history and ecology.

Methods

GB, WNR, VB and JR studied the Pata area (14°35'S 68°41'W) from 24 September to 4 October 2002, visiting altitudes of 1,800–2,300 m (Table 1); they camped at seven sites along the mule trail between Tentación (14°39'S 68°36'W) and Virgen del Rosario (14°34'S 68°42'W). Searches for *boliviana* were conducted using binoculars and a telescope. ABH collected local information from the villages of Pata and Virgen del Rosario in July 2002 and observed *boliviana* on 4 and 19 October 2002, at Estancia Altumcama (14°44'S 68°19'W; east of Apolo) while hiking to a study site in the lower Yungas of Madidi.

We compared our digital photos taken in the field of four individuals to the two adult specimens at the American Museum of Natural History and to digital photographs of the immature specimen at the Zoological Museum at the University of Copenhagen.

Results

We observed at least 35 individuals, mostly in pairs. These notes are the first detailed field observations of *boliviana*.

Plumage

Chapman³ in his description of *boliviana* was not convinced that the specimen collected and sexed by R. S. Williams was a female because it differed so strongly from females of nominate *flavirostris*. This led Snow⁸ to suggest that the female *boliviana* specimen 'was perhaps a young male'.



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Table 1. Sites visited and number of individuals of *Phibalura flavirostris boliviana* observed.

Site	Number of birds	Date	Locality	Altitude(m)
1	3	27–28 September 2002	Pata	1,675
2	5	28 September 2002	Pata area west	1,750
3	5	28 September 2002	Pata area east	1,650–1,750
4	8	30 September 2002	Trail to Santa Rosa	1,600
5	5	2 October 2002	Between Pata and Virgen del Rosario	–
6	5	3 October 2002	Forest patch below Santa Rosa trail	–
7	4	4 October 2002	Tentación	–

Our field observations confirm that Williams' specimen was indeed a female and that the plumage differs strongly from *flavirostris* females (Fig. 1). The most prominent difference is the lack of streaking on the female *boliviana*'s throat and belly, compared to the heavy spotting on the throat and belly of *flavirostris*.

We observed very little individual plumage variation, the only exception being a female, seen at site 4 on 30 September 2002 asymmetrically streaked on the lower breast, the right side having an open area of yellow only slightly streaked near the line of the wing.

Sexual plumage dimorphism in *boliviana* is less dramatic than in *flavirostris*. We found *boliviana* males and females to vary little and to be very similar to the specimens, except the immature (Fig. 2). Field observations of males demonstrated their considerably longer tail and that they appeared bulkier with more pronounced colouring, though approximate measurements of the two adult specimens and field observations do not indicate

significant sexual size variation (Fig. 3). The yellow lower breast is similar in both sexes, but females possess more black smudgy striations on the lower breast. Both sexes have yellow undertail-coverts, pinkish-ivory bills and pinkish-orange legs. The forked tail appears medium grey when viewed from the front. The red crown patch is occasionally visible, but can be wholly concealed.

The black upper breast scalloping in both sexes affords the impression of a necklace, but the male's is larger with bold black markings, whilst that of the female is broader and less intense black. The female is more widely marked with black striations extending along the breast-sides to the flanks, with the central breast unmarked, like males. The vent of the male is bright yellow, whereas in the female it is slightly streaked on a yellow background.

Though female *boliviana* are more similar to males than is the case in *flavirostris*, the male's characteristics are still obvious, including the longer tail. In immatures it appears that the only clear sexual characteristic is the colour of the wing-coverts, black in males and olive in females. The immature specimen was originally sexed as a male, but ABH considers it to be a female, with many ambiguous sexual characteristics, based on the olive wing-coverts.

Range

The three main populations, from the original collection site³, the Pata area⁴ and Altumcama, suggest the species historically occurred within the Apolo semi-humid forest area. From these records, it appears that *boliviana* occurs within a narrow ring of open forest and humid forest fragments around Apolo, which are possibly less than 50,000 ha in area. All our records and all the local observations are of birds on the edge of fragmented open semi-humid forest. It is interesting that local people stated that it is observed around Pata only in September–January. Given the botanical heterogeneity of the area, its range appears restricted by changes in habitat. Semi-humid forest is surrounded by dry forest, moist yungas and cleared agricultural areas. This area has been subject to intense forest destruction for the last 100 years. For example,

Captions to plate on opposite page

Figure 1. Female Bolivian Swallow-tailed Cotinga *Phibalura flavirostris boliviana*, Pata, La Paz, Bolivia, 27 September 2002 (William N. Ritchie)

Figure 2. Male Bolivian Swallow-tailed Cotinga *Phibalura flavirostris boliviana*, Pata, La Paz, Bolivia, 27 September 2002 (Jolyon Ritchie)

Figure 3. Male and female Bolivian Swallow-tailed Cotingas *Phibalura flavirostris boliviana*, Pata, La Paz, Bolivia, 27 September 2002 (Jolyon Ritchie)

Figure 4. Habitat of Bolivian Swallow-tailed Cotinga *Phibalura flavirostris boliviana*, Pata area west, looking west, La Paz, Bolivia, 28 September 2002 (William N. Ritchie)

Figure 5. JR pointing to Bolivian Swallow-tailed Cotinga *Phibalura flavirostris boliviana* nest, Pata, La Paz, Bolivia, 1 October 2002 (William N. Ritchie)

Figure 6. Nest and eggs of Bolivian Swallow-tailed Cotinga *Phibalura flavirostris boliviana*, Pata area west, La Paz, Bolivia, 28th September (William N. Ritchie)



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firewood was available from local forest within walking distance of Apolo 15 years ago (R. Cuevas pers. comm.), but is now non-existent.

Habitat

Apolo lies within a large intermontane plateau believed to be originally covered mostly by semi-humid forest with some marshes in valley bottoms and perhaps more open, savanna-like mountain ridge vegetation (Figs. 4–5). This c.120,000-ha area is now dominated by highly degraded and eroded grazing land burned annually, with open woodland and scrub in the less affected areas and forest fragments in moist deep valleys. The area is bordered by Andean intermontane dry forest and moist Yungas forest^{4,7}.

Phibalura f. boliviana is frequently observed on the edge of moist forest fragments and has been seen flying across large open areas, travelling between forests. It has never been observed in dry forest^{11,12} (ABH pers. obs.) areas in the Machariapo and Tuichi valleys, and we believe the species inhabits only this fragmented habitat with scrub and grasslands. Brief surveys of the bird community around Apolo suggest that the savanna is natural given the presence of such campo grassland¹⁵ species as Red-winged Tinamou *Rhynchotus rufescens*, White-tailed Hawk *Buteo albicaudatus*, Greater Thornbird *Phacellodomus ruber*, Black-faced Tanager *Schistochlamys melanopis*, Burnished-buff Tanager *Tangara cayana* and Wedge-tailed Grass-finch *Emberizoides herbicola*. The last Stotz *et al.*¹⁵ list as an indicator species for campo grasslands of central South America.

Nests

Three nests were found. The first was 1.8 m above ground and c.100 m from a narrow strip of forest beside a stream, on 30 September 2002 (site 2, Fig. 5). The second was on the edge of a patch of cloud forest, on 4 October 2002 (site 7). The third nest was 1.4 m above ground, c.500 m from a large patch of forest and was found on 4 October 2002 (site 1). The nests were loosely constructed from lichen, basally supported in branch forks. They were c.10 cm across and c.2 cm deep, and in the shape of a shallow cup. Each contained two eggs that were pale pastel green marked with dark brownish-red spots and scribbling (Fig. 6). In one clutch the amount of marking differed, with one egg more intensively and uniformly marked, and the other less marked and more heavily so at the blunt end. One egg measured 2.5 cm. x 1.9 cm.

Vocalisations

GB tape-recorded the call notes of *boliviana* at 17h35 on 4 October 2003. This 14-second recording has 18 call notes repeated every 9–19 msec. The

sonogram shows a deep inverse dish c.0.2 msec in duration, rising and falling between 0.7 to 3 kHz. This possible contact note is harsh and weak and was heard several times within different groups. No other vocalisation type was heard and the local communities do not know of any other type of louder call or song.

Feeding

The species is locally known to eat small fruits of early successional trees like *Didymopanax morototoni* (Aubl.) Decne. & Planch. (Araliaceae). We observed individuals perching atop c.25 m-tall trees. They would almost vertically fly up c.10 m and then return to the same or a different perch. We were unable to verify if they were catching insects, but they shared some of these perches with Tropical Kingbird *Tyrannus melancholicus* that has similar flycatching behaviour. We twice observed *boliviana* actively chasing *T. melancholicus*.

Flight

Individuals in long-distance flight between forest fragments (c.200 m) were observed to fly with a non-rhythmic closed-wing undulation. They flew at canopy height (20–30 m) in a direct manner. The flight pattern was more similar to a lighter bodied flycatcher, with the male's closed long tail seen waving.

Conclusions

Presently *boliviana* only appears common in the Pata area (c.25,000 ha) with little indication, through local knowledge and brief field surveys, of healthy populations in other areas. We know that *flavivirostris* performs seasonal altitudinal movements¹⁴; therefore, it is possible that *boliviana* also moves away from the breeding areas, perhaps explaining the lack of records from some study sites. The original specimen site of Aten has not been surveyed.

The situation may be complex, with *boliviana* requiring a specific niche within breeding and non-breeding habitat, which has reduced the area of suitable habitat. We do not know if the area where we found *boliviana* is its preferred habitat or the last remnant of marginal habitat. What is certain is that the entire forested area around Apolo has been drastically reduced over the course of the last 100 years, and such destruction has continued until the present day. The population of *boliviana* receives partial protection by virtue of its presence in Madidi, but the area is designated as a management area, which by definition permits human agricultural activities, including clearing by burning. But there are conservation possibilities within Madidi and the park authorities are receptive to ideas to protect the species. ABH is preparing a manuscript proposing



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species status for *boliviana* and that a higher level of conservation attention be focused upon the taxon. Additional field research into the population size and range, habitat requirements, conservation threats and natural history of this possibly very threatened species is urgently required.

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