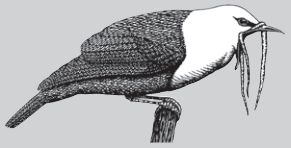
COTINGA

Journal of the Neotropical Bird Club

Number 40 **Spring 2018**



The Neotropical Bird Club aims to:

- foster an interest in the birds of the Neotropics amongst birdwatchers throughout the world
- increase awareness of the importance of support for conservation in the region
- mobilise the increasing number of enthusiastic birdwatchers active in the region to contribute to the conservation of Neotropical birds
- provide a forum for the publication of articles and notes about Neotropical birds, their identification and conservation and thus enhance information exchange in this subject area
- channel efforts towards priority species and sites, drawing attention to conservation needs
- publicise the activities of local groups and individuals, and improve liaison and collaboration between these same people and other birdwatchers

NBC publishes one issue of *Cotinga* and two issues of *Neotropical Birding* each year.

ISSN 1353-985X

Website:
http://www.neotropicalbirdclub.org

Cotinga
Journal of the Neotropical Bird Club

Membership
Membership of the Club is open to all and costs per annum (depending whether journals are received in printed or digital only form): Ordinary Member £26/$48/€39 (print) / £24/$34/€30 (digital); Family Membership £32/$60/€49 (print) / £30/$42/€36 (digital); Sponsoring Member £45/$80/€65 (print) / £43/$60/€52 (digital); Resident Neotropical Nationals $25 (digital only); Five-year Ordinary Membership £130/$240/€195 (print only); Life Membership £750/$1400/€1140 (print only); Libraries & Academic Institutions £55/$100/€81 (print only). Those wishing to receive our publications in digital form as well as in printed form should add £5 (UK), €6 (Europe) or $7 (Rest of the world) to the applicable printed membership rate. Members are urged to consider becoming Sponsoring Members; please note that you do not need to nominate a recipient. Members joining in countries with national representatives are advised to contact these individuals (please see inside back cover for a full list). Payment by cheque in either US Dollars or Sterling please to Neotropical Bird Club. Credit card payments must include the full number, type of card, expiry date and address that appears on the payee's statement. All payments outside Europe will be charged at US$ rates (to cover extra postage). To join or for further details, please contact the Membership Secretary, NBC, c/o The Lodge, Sandy, Bedfordshire, SG19 2DL, UK. E-mail enquiries can be made to: secretary@neotropicalbirdclub.org

Front cover: Cloud-forest Pygmy Owl *Glaucidium nubicola*, vocalising at dusk in a cloud forest, in Pichincha province, Ecuador (Gonzalo Iván Nazati Vela)

Back cover: Chestnut-eared Aracari *Pteroglossus castanotis*, LLanos, departamento Casanare, Colombia (Murray Cooper Photography)

Please direct correspondence to: Neotropical Bird Club, c/o The Lodge, Sandy, Beds. SG19 2DL, UK

NBC Reg. Charity No. 1040130

Contents

Main Papers

Short Communications

A breeding record of Spot-crowned Barbet *Capito maculicoronatus* in Panama

William John Adsett and Mariló C. Castro

Received 18 November 2016; final revision accepted 8 April 2018
Cotinga 40 (2018): 2–11
published online 16 June 2018

Se documenta un registro de anidación exitosa del Barbudo Copetimanchado *Capito maculicoronatus* en Panamá. Se trata de un nido observado desde el 17 de enero hasta el 9 de junio de 2015. El hueco fue excavado por una pareja de adultos en el tronco muerto de un árbol balsa *Ochroma pyramidale* ubicado en la comunidad de Achiote, cerca de la costa Atlántica en Panamá central y del área protegida de San Lorenzo. La pareja comenzó a dormir junta en el hueco el 24 de enero, pero entre el 18 de febrero y el 11 de abril dejaron de dormir allí y lo visitaron muy poco durante el día. El 9 de abril la pareja comenzó nuevamente a mostrar interés y el 12 de abril volvieron a pasar la noche juntos en el hueco. La hembra puso huevos el 21 de abril y los pichones nacieron el 3 de mayo. La comida que los adultos suplían a los pichones consistía en bayas y frutas pequeñas (c.90%) e insectos, partes de flores (c.10%) y dos lagartijas. Los dos pichones—una hembra y un macho—mostraban el mismo dimorfismo que los adultos, con unas pequeñas diferencias en las partes desnudas. El nido fue destruido el 9 de junio pero la familia sobrevivió. Una vez fuera del nido, las aves se separaron, el macho adulto dando alimento exclusivamente a la joven hembra y la hembra adulta al joven macho. Siguiendo los ejemplos de otros avistamientos, es probable que la familia se reunió nuevamente y se mantuvo unida durante varios meses más. Se han visto otros grupos familiares de tres o cuatro individuos volando y comiendo juntos hasta el mes de diciembre. La época de reproducción, según nuestras observaciones, comienza a finales de diciembre y termina en junio o julio.

Spot-crowned Barbet *Capito maculicoronatus* is distributed from Veraguas province in central-west Panama south and east to dptos. Antioquia and Valle in north-west Colombia. Two subspecies are recognised: the nominate occurs mostly on the Caribbean (or Atlantic) slope from Veraguas to San Blas in central-east Panama; and *rubrilateralis* on both the Pacific and Caribbean slopes further east in Panama and throughout the species' Colombian range. It is found from sea level up to 900 m, occasionally to 1,200 m. The genus *Capito* occurs primarily in South America; Spot-crowned Barbet is the only member that ranges into Middle America[1–4,6,8,10].

Details of the species' breeding biology are largely unknown. The only previously published data involved birds collected in breeding condition in December–April, and birds at holes in dead trees during December–June, in both Panama and Colombia[3,4,8,10]. Newly fledged young have been observed in Panama in June[3,4] and July (pers. obs.). Here we present a new breeding record of Spot-crowned Barbet, describing nest construction, incubation, feeding and care of the young, morphology, fledging and the first days post-fledging.

Study area

On 17 January 2015, MC found a pair of Spot-crowned Barbets excavating a hole in a dead tree stump near the El Tucán Community Centre in Achiote village, central Panama (09º13.132'N 80º00.215'W; 30 m). The village is on the Achiote road, a well-known birdwatching site near the Caribbean coast, c.1 km from the west edge of San Lorenzo Protected Forest. The latter comprises what were jungle training areas of former US military installations in the Panama Canal Zone, but which reverted to the Republic of Panama under the Panama Canal Treaties. The El Tucán Community Centre is operated by the Panamanian social development NGO Asociación Centro de Estudios y Acción Social Panameño (ACEASPA), with the aim of enabling local people to become involved in and benefit from protecting the forest and environment in general.

To the rear of the centre is an extensive tract of mostly second-growth forest; either side of it are rural dwellings and smallholdings with gardens and large trees; on the opposite side of the Achiote road are boggy fields and remnant patches of primary forest. Spot-crowned Barbet is regularly observed at fruiting trees and occasionally visits banana feeders. In the expectation that the hole would be used as a nest by the barbets, we commenced regular daytime observations on 17 January 2015, which continued until 9 June.

Methods

A video camera mounted on a tripod sited under the roof of the visitor centre was trained on the hole, usually from just after dawn (05h45–06h00)

until dusk (18h30–18h45). The camera was c.22 m distant from and c.10 m below the level of the entrance to the hole. A clear line of sight was obtained, but the location had some limitations. For example, our view of food items brought to the nest after the nestlings had hatched was often blocked by the adults' bodies or the wall of the entrance tunnel, and continuous, often loud ambient noise drowned out any soft calls the adults or their offspring might have made. Recordings also suffered from occasional hardware and software failure, and absence of personnel to restart the camera every hour. Nevertheless, all or nearly all events of importance at the nest were captured. Some of our videos can be accessed at the Internet Bird Collection (IBC; https://www.hbw.com/ibc/species/spot-crowned-barbet-capito-maculicoronatus). When time permitted, the hole was kept under direct watch from the same position as the camera, especially in early morning and late afternoon, and photographs were also taken. On a few occasions, a Sony PCM-50D audio recorder with Sennheiser MKE-600 shotgun microphone was used to try to capture (unsuccessfully) any faint calls the camera was failing to pick up. Due to the position and fragility of the stump in which the hole was sited, we elected not to examine its interior.

Results

Nest site and construction.—The horizontal entrance tunnel was c.7 m above ground in the decaying stump of a small dead balsa tree (*Ochroma pyramidale*) that emerged from shrubby growth at a forest edge on a steep bank. We estimated that the entrance tunnel was c.4.5 cm in diameter, while the diameter of the stump at the same level was c.12 cm. A disused and much deteriorated hole excavated by an unknown species was in the same stump, c.35 cm above it. The barbet hole was c.3 m below the top of the stump.

When initially detected on 17 January, the hole was already well advanced and large enough for one bird to fit entirely inside. Excavation was always performed in tandem; while one was inside working, the other waited on a nearby branch. Sometimes an adult alighted at the entrance and inspected the outer rim, but it did not enter and carry off material unless the other was present. During excavation, either one bird would do 2–3 turns in succession before the other took over, or they would take strictly alternate turns inside. Each bird removed a bill-full of fresh pale-coloured wood flakes, carrying and dropping them out of sight (Fig. 1). The pair was silent throughout nestbuilding and there was no apparent ceremony associated with the activity.

As shown in Table 1, time devoted to nestbuilding was highly erratic. An excavating bird spent between c.10 seconds and nine minutes in the cavity, indicating that it sometimes excavated more than could be removed in a single trip. On 17–18 January the birds reversed out of the hole to depart, but on 19 January the cavity was sufficiently large for them to turn round and emerge bill first. On most days construction was shared equally by the

Figure 1. Male Spot-crowned Barbet *Capito maculicoronatus* removing wood flakes excavated from hole, Achiote, central Panama, 18 January 2015 (W. J. Adsett)

Table 1. Details of hole excavation by a pair of Spot-crowned Barbets *Capito maculicoronatus* at Achiote, in central Panama.

Date Jan 2015	Total no. of excavation bouts	Male	Female	Total no. minutes	Time of day
17	No record kept				
18	2	1	1	17	12h00–12h17
19	48	24	24	76	11h30–11h50, 13h23–14h19
20	90	55	35	216	11h54–14h30
21	15	9	6	63	11h41–11h50, 12h34–13h40
22	No record kept				
23	2	1	1	10	10h40–10h50
24	5	2	3	11	14h22–14h28, 15h45–15h50
25–28	0	0	0	0	
29	13	6	7	59	15h14–15h46, 16h06–16h33
Totals	175	98	77	452	

sexes, but on 20 January the male performed 60% to the female's 40%.

Occupation.—Neither bird roosted in the hole until 24 January when the pair started using it as a dormitory; both entered at 18h00 and stayed until morning. They continued to do this nightly up to and including 17 February, usually arriving at 18h00–18h30 and leaving just after dawn at 06h00–06h30. For the entire period of our observations, on all nights that both adults roosted in the hole the male always entered and left first, the female following, usually—except when incubating—within seconds or minutes. During the period 24 January–17 February, the birds rarely visited the hole by day. Occasionally they removed a bill-full of fresh wood flakes, apparently as part of regular 'maintenance' rather than as a renewed campaign to enlarge the cavity.

Temporary abandonment.—On 18–20 February the birds appeared to abandon the hole, neither visiting it by day nor sleeping there at night. Then, at 08h49 on 21 February the pair returned and the male entered the hole. He perched facing out of the entrance. At 08h51 the female, which had been perched nearby, flew to join him. They touched bills at least once, and the female entered the nest, both birds staying inside until 08h54, when they left and were not seen again that day. Next day, at 08h52 the male arrived, waited for the female, and when she arrived both entered the nest and stayed for six minutes before departing. This behaviour, including bill-touching, was seen only during this two-day period and in mid April. However, on neither of the two days did the birds overnight in the hole; indeed they did not roost there again for another four weeks. The pair made brief daytime visits during the first part of this period, but these became steadily fewer until by 22 March neither bird visited the hole nor was observed foraging in the area. Not until 28 March did the male return to roost alone in the hole. He continued to do so for another seven nights, but after 5 April neither bird was seen until 9 April.

Return.—On 9 April, the pair reappeared during the day and renewed their interest in the hole, with both making a detailed inspection at 14h30. On 10 April the male arrived just before dusk and peered from the entrance, but the female did not visit and he left before nightfall. On 11 April the pair spent one minute inside during the morning and later the male was seen and heard calling from inside and at the entrance twice more, but again did not roost there. On 12 April, between 13h24 and 13h57 there was considerable interaction between the pair at the hole. The male arrived and started calling, whereupon the female joined him in the hole for two periods each of four minutes, during which she appeared at the entrance several times with her bill open. This behaviour was similar to that on 21–22 February.

That night both birds resumed roosting in the hole, for the first time since 17 February. They maintained this habit up to and including the night of 8 June. On 13–17 April the pair left early each morning and only the male made occasional daytime visits. Usually he entered the hole for no more than one minute, as if making a routine check, and rarely removed any wood flakes. On 18–20 April there was more activity; the male entered on average eight times per day, while the female did so on average four times. In most cases a visit lasted less than one minute and was by one bird alone, but four times both were in the nest simultaneously for periods of 2–5 minutes. During these three days the female often held her bill open as if panting. Also, the male, when at the hole alone, occasionally called from the entrance, sometimes attracting the female.

Egg laying and incubation.—On 21 April the pair changed their daytime routine significantly, with one bird at a time remaining inside the hole for relatively long periods. At 05h59 the male left but the female did not follow him immediately, as she had done previously, instead remaining until 07h49 when the male returned. The female flew off; the male entered, then left. At 09h13 the female returned and entered. At 09h22 the male arrived but stayed outside. The female then emerged, joined the male, peered into the hole for a few seconds, and then they both left. At 10h00 video recording was interrupted, but when resumed at 11h00 the female was already in the hole. Thereafter, at 11h05 the male arrived, the female left, the male entered and stayed there; at 12h13 the female returned, the male left and female entered; at 13h39 the female left; at 14h01 the male arrived and entered; at 16h47 the female arrived, the male left and female entered; and at 18h23 the male entered again. Both birds stayed in the hole overnight.

Thus, the hole was occupied by one bird for at least nine of 12.5 daylight hours, and events showed that eggs (or perhaps the final egg of several) had been laid that day and were being incubated. A summary of egg coverage on 21 April and subsequent days appears in Table 2.

During the following 11 days up to and including 2 May, the birds remained in the nest for all or most of the day, the incubating bird generally—but not always—waiting until it was relieved. There was no apparent ceremony associated with such encounters. The timetable of changeovers between male and female was highly erratic, with periods when neither bird was in the nest. Each day, the male regularly departed before 06h00, but his return to relieve the female was irregular, at any time between 06h30 and 10h00, which was the

Table 2. Egg coverage (minutes) during the incubation period at a nest of Spot-crowned Barbets *Capito maculicoronatus* at Achiote, in central Panama.

Date 2015	Recorded periods	Eggs covered by: Male		Female		Neither		Both		Periods not recorded
	Min.	Min.	%	Min.	%	Min.	%	Min.	%	Min.
21 April	690	230	33	310	45	140	20	10	2	60
22 April	750	280	37	340	46	130	17	0	0	0
23 April	580	220	38	270	47	90	15	0	0	170
24 April	560	340	61	220	39	0	0	0	0	190
25 April	750	300	40	240	32	200	27	10	1	0
26 April	750	270	36	390	52	80	11	10	1	0
27 April	750	380	51	370	49	0	0	0	0	0
28 April	750	410	55	340	45	0	0	0	0	0
29 April	750	240	32	460	61	50	7	0	0	0
30 April	750	280	38	460	61	10	1	0	0	0
1 May	750	270	36	430	57	40	6	10	1	0
2 May	210	100	48	90	43	20	9	0	0	540
Total 12 days	8,040	3,320	41	3,920	49	760	9	40	1	960

period when most gaps in incubation occurred. If the male was late, the female (who was sometimes in the nest almost continuously from 16h00 the previous day) left it unattended, presumably to feed. During daylight hours recorded on video over 12 days (134 hours—with gaps in coverage), we observed 103 incubation bouts (when one bird or the other, or both, covered the eggs). Changeovers occurred 5–9 times per day (mean seven) and the period that one individual spent in the nest before being relieved (or simply leaving) varied from five minutes to >3 hours (mean 1.5 hours). The female was more diligent than the male in incubating (c.65 hours vs. c.55 hours). The nest was left unattended for a mean of just c.1 hour per day. In late afternoon, the female always covered the eggs until the male arrived after 18h00, when she would leave briefly and then rejoin him to roost, sometimes after 18h30.

Hatching and parental care.—On 3 May there was no video recording until 09h30, when the male was in the nest. At 09h52 the female arrived and male departed. At 11h25 the male arrived again; apparently he was carrying food in his closed bill because some dark fragments were visible on it. The female left and the male entered the nest. There followed two more changeovers, but in neither case was it possible to see if the arriving bird brought food. However, at 16h02 the male arrived carrying dark food items. This was the first day on which food was regularly carried to the nest indicating that the adults were provisioning newly hatched nestlings. On 4 May behaviour was similar.

On 5 May the female removed two large pieces of eggshell, at 07h49 and 16h21, flying off and disposing them out of view. These fragments were white and, as calculated from the video, had a diameter of c.25 mm. At 08h17 the male arrived and stayed in the nest. At 08h53 the female arrived with food and the male departed. Just four minutes later the male returned with food, the female departed and the male stayed in the nest. There followed ten changeovers, in each case the arriving bird carrying food. Intervals between changeovers were 16–48 minutes, but from 14h00 intervals between provisioning increased to more than one hour. On 6 May the pattern was very similar except that no eggshell was removed.

On 7 May activity intensified, the adults arriving 23 times during the day, on all or most occasions with food. Provisioning was most intense between 06h26 and 08h08 (mean every 14.4 minutes) during which period there were seven changeovers. Incoming birds brought food and stayed in the nest until the other returned. After 08h00 the schedule relaxed, with a mean 50 minutes between feeds. From 10h00 until 11h36 activity increased, with a mean 20 minutes between feeds. During 11h37 to 15h09, food was brought only twice and there were periods when the nest was unattended. From then until dusk (18h30) food was brought four times (mean 28 minutes). At 17h06 and 18h04 the female removed wood flakes mixed with faeces in her bill, and flew off to dispose of them elsewhere. 8 May showed a similar pattern.

On 3–8 May, there was always an adult brooding the young. However, on 9 May the adults started leaving the nestlings unattended at regular intervals for up to 30 minutes (more usually 15–20). Otherwise, the rate of provisioning was similar to 7–8 May. On the following days the adults spent steadily less time in the nest by day, and by 17 May stayed only long enough to deliver food and, when necessary, to remove waste. The mean number of provisioning visits per day on 9–16 May was 26; from 17 May until the last day the young were in the nest (8 June), it increased to an average of 51. The busiest day was 29 May, when food was brought 94 times (male 57 visits, female 37). Provisioning was very intensive in the morning; for example, on 29 May between 06h10 and 07h10, the male delivered berries 16 times at intervals as short as 60 seconds. Although the adults usually entered the nest quickly, departure was slower. They paused with their heads well out of the hole, looking around for several seconds before departing. If they saw or heard an apparent threat, e.g. calls of Collared Aracari *Pteroglossus torquatus*[4,8], they retreated into the hole and waited for up to a few minutes before re-emerging.

Provisioning.—Overall, feeding the nestlings was shared almost equally by the sexes. When

Figure 2. Nestling male Spot-crowned Barbet *Capito maculicoronatus* (left, in nest entrance) and adult male on branch, Achiote, central Panama, 7 June 2015. Pale bare parts visible on the nestling (M. C. Castro)

Figure 3. Tree stump showing where it broke off above nest on 4 June, and (lower) nest wall destroyed, Achiote, central Panama, 9 June 2015 (W. J. Adsett)

Figure 4. Newly fledged female Spot-crowned Barbet *Capito maculicoronatus*, Achiote, central Panama, 9 June 2015; note pale bare parts and small size (W. J. Adsett)

bringing food, each adult arrived at speed and landed on the lower rim of the entrance, sometimes stopping with its head already in the hole. Thus, although it can reasonably be assumed that the birds always brought food, it was not always possible to see it. Nevertheless, on most occasions food was glimpsed, and as the nestlings grew and food items became larger, it was easier to identify them. After the first two days, during which time only unidentifiable items were brought, the adults started feeding the nestlings with whole items carried in their bills, often supplemented with other material in their throats. After delivering food an adult would occasionally perch at the nest entrance, sometimes spitting out seeds, presumably leftovers from crushed berries.

The crushed food offered during the first two days consisted, at least in part, of dark sticky material that clung to the outside of the adults' bills, and was probably crushed berries. We could not determine if insects also formed part of the diet at this stage. However, on the third day after hatching (5 May) the adults started bringing whole items including small beetles, flies and

Figure 5. Family group consisting of adult pair and one presumed male offspring of Spot-crowned Barbet *Capito maculicoronatus*, Achiote, central Panama, 10 November 2016 (M. C. Castro)

other insects, as well as tiny berries. By day 8 (10 May) larger insects, such as small brown crickets, and many more small berries were present in the diet, and on day 12 (14 May) the first of several large red items was brought to the nest (some were subsequently removed, while others were apparently consumed by the young). Some may have been larger fruits, but others were clearly flowers or parts thereof. By day 18 (20 May) large insects such as green crickets and katydids were occasionally presented whole, despite some being so large that the adults had difficulty transporting them. On day 33 (4 June) the adult female removed a small lizard that we suspect was brought to the nest the previous day during a gap in our observations. Two days later the female arrived with another small dead lizard (c.125 mm long), the battered remains of which were removed with other waste next day. However, except the first few days when insects appeared to form a higher percentage, by far the majority of the diet comprised small fruits in very large quantities and of many different species (green, yellow, red, purple and virtually black), which were served to the nestlings either whole, or crushed and regurgitated. Until 20 May (day 18), the adults invariably fed the young by going all the way into the nest. From 21 May some feeds were performed with half of the adult's body outside the hole.

Faecal removal.—On average every 4.6 provisioning visits the adults removed waste

Figure 6. Female Spot-crowned Barbet *Capito maculicoronatus* struggling to open new hole in a recently dead *Cecropia* sp. stump, Achiote road, central Panama, 2 February 2017 (M. C. Castro)

material from the nest after delivering food to the young. The waste consisted of fresh wood flakes mixed with excrement or faecal sacs, often with a pink or yellow tinge. The waste filled the adults' bills and was dumped far away from the nest. Both adults removed waste at any time of day (especially during the first two hours of daylight). Video of this behaviour can be accessed on IBC.

Nestlings.—We did not observe the nestlings until 2 June (day 31 after hatching) when a male appeared at the entrance. A second nestling, a female, was first seen on 4 June (day 33). At this stage the adults either fed the nestling at the nest entrance or pushed past it to feed the other nestling inside. The morphological features of the young already exhibited the same pattern of sexual dimorphism as the adults, but they were somewhat duller, had horn-coloured bills, and pale bare orbital skin, whereas adults have bluish bills and dark skin around the eyes (Figs. 2 and 4).

Final days in the nest.—By early June, with frequent, heavy rain, the decaying stump was much-weakened and on 4 June the top of it broke off just c.20 cm above the nest (Fig. 3), leaving very little solid mass above it, while the lip of the entrance tunnel also began to disintegrate. Clearly the nest was soon going to be uninhabitable.

By 6 June we were reasonably certain that there were just two nestlings, one of each sex. The young male was dominant, spending much of the day at the entrance, head partly protruding, peering around. Between visits by the adults, he pecked at ants on the surface of the tree, or pried wood from the entrance. He also started to behave very aggressively towards both adults, trying to and sometimes succeeding to take by force the food they brought. On several occasions he grabbed the adult female with his bill, pulling and shaking her, to force her to release food. By 8 June this behaviour was even more violent, and at times he blocked efforts by the adult male to feed the young female in the nest. The young male only vacated the entrance for brief periods, during which the young female would take his place.

Also on 8 June the adults were clearly attempting to entice the nestlings to fledge. At 11h39 the adult male perched on a bare branch c.40 cm from the nest where the young male was waiting. The adult adopted a stooping position, with its bill open and head lowered. It then wagged its tail up and down several times while facing the nestling. The latter vibrated its throat (though no call was heard) but did not move. The adult departed without delivering food. At 12h24 the female arrived with a berry, perched on the same branch, and looked up at the young male. When he failed to come down, she swallowed the berry and flew off. At 12h32 the adult male brought a large red berry to the young male, who grabbed it with its bill, but the adult refused to release the fruit. Instead he flew down to the branch still holding the berry and gazed up at the nestling. The latter appeared tempted to follow the adult, but stayed in the hole. Once again the adult left without feeding the young. This behaviour continued with minor variations throughout the afternoon but the nestlings did not leave the nest.

Destruction of the nest and fledging.—On 9 June, while making our first check of the nest at 06h00, we discovered that one side of it, from just above the entrance tunnel downwards, had either been torn open or simply fallen off. The opening was irregular, c.25 cm from top to bottom and c.2–5 cm wide (Fig. 3). No barbets were visible. However, shortly afterwards we heard repeated *kaak* calls in the midstorey of a fruiting Melastomataceae sp. c.25 m away. The pair and two young were together. The calls were uttered exclusively by the adults, who were intensively feeding the young whole berries. A recording is available on Xeno-Canto (www.xeno-canto.org) as XC253677. The young did not adopt begging postures, nor did we hear them call. The young male was the same size as the adults and was fed exclusively by the female. The young female was 20–25% smaller than the male (Fig. 4) and was fed by the adult male alone. Both young appeared strong, jumping from branch to branch and, shortly afterwards, flew quite skillfully between trees.

After a few minutes the adult female flew off with the young male, and neither was seen again. The adult male and young female remained in the garden for at least an hour visiting different fruiting trees, the male feeding her berries and calling frequently. They were then lost to view, but returned later the same day and several times on nine subsequent days. The young female appeared to be gaining weight. Thereafter they were not seen again. None of the family returned to the nest site and their roost was unknown. Five days after the birds had departed, the entire stump collapsed, breaking into many pieces, preventing reconstruction and measurements of the nest.

Vocalisations.—The only audible calls made by the adults were repeated *kaak* notes, which were given occasionally in the nesting period, during brief interactions between the pair. However, once the young had fledged the adults vocalised constantly, apparently to maintain contact with the fledglings. In contrast, we never heard or recorded any sound from the young. However, both adults and young (when visible) were observed to vibrate their throats in view of one another, and it is possible that they were giving low calls inaudible to our equipment, or which were drowned out by ambient noise.

Other observations.—On various occasions in July–December we observed tight-knit groups of 3–4 Spot-crowned Barbets travelling and feeding together. They appeared to be family groups; in flight a pair leads, often calling incessantly, while the remaining bird or birds, presumably the young, follow close behind. These groups usually travel independently of mixed-species flocks. In cases of two young, they are of the same sex or one of each. On 10 November 2016 two males and a female visited banana feeders at the El Tucán centre.

One male acted as if subservient to the other two birds. We believe they were an adult pair with a male offspring that had fledged much earlier in the year (Fig. 5). Such groups are sometimes observed outside the species' usual range, for example at Altos de Cerro Azul, Chagres National Park, central Panama, at 800 m.

Further observations of hole construction.—On 2 February 2016 a pair of barbets was encountered starting to excavate a fresh hole 2 m up in a dead stump (probably a large *Cecropia* sp.) at a forest edge c.3 km south-east of Centro El Tucán. The wood was firm compared to other recorded barbet nest sites, and strongly fibrous. The barbets first pecked at the wood, then pried out loosened material, which fell to the ground. Although their bills are sturdy, the pair found it almost impossible to break the strong fibres and the hole was very messy. Four days later the pair were again at the hole, but only the female worked while the male watched. At this stage she could enter the hole, accumulate excavated material, and carry it away in her bill. She appeared to attempt to get the male to assist by grabbing his feathers in her bill and shaking him. Video of this is archived at IBC. The birds then gave up and were subsequently observed excavating another dead stump 50 m away; this attempt was also abandoned. On the other hand, in a video made by C. Elton at Cana in far eastern Panama (at IBC), two barbets excavated a hole in a very decayed dead tree with much greater ease and neatness.

Discussion

Nest excavation and preparation.—We do not know if the birds we studied excavated an entirely new hole in the dead stump, or if they enlarged an existing one. In other instances of hole excavation we observed, the barbets started an entirely new hole. Excavation proceeded only when both birds were present, work was shared more or less equally between the pair, and the amount of effort varied greatly from day to day. We saw no evidence of lining being added—if any was used, it was probably wood flakes from within the cavity (as with Prong-billed Barbet *Semnornis frantzi*[9]). Both adults roosted in the nest when it was complete; prior to that, they spent the night elsewhere, presumably in a hole unknown to us. Most observations indicate that Spot-crowned Barbets prefer to excavate in trees with soft, well-decayed (structurally weaker) wood, rather than harder material with strong fibres.

For reasons already described we could not measure the nest. From a distance, we estimated the diameter of the entrance tunnel (4–5 cm) while cavity depth—partially visible after the side had been removed—was at least 25 cm. Given that the stump had a diameter of c.12 cm and the nest cavity was almost certainly wider than the entrance tunnel, its wall could have been as thin as 3 cm or less, making the entire structure weak. Evidence also suggests that the species maintains two or more holes simultaneously.

Temporary nest abandonment.—We can only speculate on what the pair was doing between 18 February and 12 April, a period of 53 days during which they did not roost in the hole (except sometimes the male alone) and rarely visited it by day. It is possible they attempted to breed elsewhere. On 21–22 February we witnessed some previously unrecorded social behaviour (calling, close-range interaction, bill-touching and 'panting') and the pair spent time in the hole together, which also preceded the successful nesting effort. If such behaviour signified mating, then the birds moved to another location to breed, but were not absent long enough to have successfully raised a brood. It should be noted that, although we assume that the birds that returned to the hole in April were the same that had constructed it, we cannot be sure of this.

Successful breeding.—Evidently the birds mated as soon as—or just before—they returned to roost in the nest on 12 April. They interacted unusually closely and spent time together in the hole. However, nothing we observed could be clearly identified as a mating ceremony. Other Neotropical barbets have displays that involve body posturing, singing or counter-singing[4,8], but there is no record of such behaviour for Spot-crowned Barbet. Behavioural evidence indicates that incubation commenced on 21 April, and at least one egg hatched on 3 May. We cannot state how many eggs were laid, but never saw evidence for more than two. In general, Neotropical barbets lay few eggs and fledge just 1–2 offspring[4,8,9]. Several of our observations support this.

Because of the difficulties of observing the food the adults brought during the first two days, we cannot know its composition, but by the third day both small insects and berries formed a large part—or all—of the very young nestlings' diet. As they grew they were fed large quantities of berries; we estimate that c.90% of the diet consisted of small fruit. The remainder consisted of small and large insects mostly brought in whole, a few flowers or parts thereof and two small lizards (also introduced whole). Flowers and vertebrates were previously unreported in the species' diet.

Faeces or faecal sacs were removed in the adults' bills, invariably mixed with fresh-looking wood flakes presumably excavated from the walls and base of the nest, probably as the need arose. Consequently, the nest cavity was being enlarged around the nestlings, which had the undesirable side-effect of weakening the stump that housed it.

The young fledged on 9 June, but given the destruction of the nest wall, fledging may have

occurred a day or two early. Nonetheless, the adults were already trying to entice the nestlings to leave, and the young were fully plumaged (with no downy feathers visible), well developed and capable of strong flight. Chronology was as follows: nest occupation prior to laying at least nine days; incubation period 12 days; nestling period 37 days (including a brooding period of six days). Available evidence indicates that the breeding season starts in late December and continues at least until June.

There was a notable size difference between the fledglings, the female being c.25% smaller than the male and adults. She was perhaps deprived of her share of food when the young male dominated the entrance hole, and perhaps before that too.

Juvenile plumage.—As stated, sexual dimorphism is evident before the young leave the nest, the offspring resembling the adults. Plumage is somewhat duller in young; they also have pale-coloured bills and a pale ring of bare orbital skin, whereas adults have bluish bills and dark skin around the eye.

Nest destruction and fledging.—The behaviour of the adults on 8 June in bringing food but not feeding the young, accompanied by posturing outside the nest to convince them to fly is common in barbets[4]. We do not know what event was responsible for destroying the nest, but possibilities include a predator's attack, spontaneous collapse of the relatively thin nest walls, or the adults deciding to force the young to fledge. For several days afterwards, the family separated, at least in daytime, the young female being fed by the adult male, while presumably—though not seen—the young male was fed by the adult female elsewhere. We do not know if this behaviour is usual in Spot-crowned Barbets immediately post-fledging. If so, it would be very difficult to verify unless close study of a family could be achieved. Typical barbet behaviour is for the family to roost in the nest[4], but as it was destroyed they could not do so. We do not know whether the adults and young reunited for roosting and if so where.

The separation of the family group may have lasted just a few days, as in other species of barbets the young learn quickly to feed themselves[4], and we have several observations of family groups containing one or more young capable of self-feeding. Therefore, it is probable that the family did reunite once the young could feed themselves, and the lack of further sightings perhaps indicates that they dispersed a short distance, as suggested by Horne & Short[4] and as we have observed with other family groups.

Helpers.—We have no evidence that pairs of breeding Spot-crowned Barbets receive any assistance from helpers, such as the previous year's young.

Threats to the nest, eggs and nestlings.—It has been calculated that up to two-thirds of tropical bird nests fail due to predation[7]. Cavity-nesting in dead trees may improve protection from predators, but brings a number of other threats, such as flooding and structural collapse[7]. In this case, there was just one serious threat from a potential predator, a snake *Spilotes pullatus* (a well-known predator of birds' nests)[5] that passed by on a branch no more than c.30 cm from the hole. By far the greater threat was the precarious condition of the nest site. The nestlings were fortunate in that the stump initially broke at a point just above the nest, rather than below it. They then survived destruction of the nest wall, and they fledged just five days before the entire stump collapsed.

Vocalisations.—Mostly, the birds were silent or made calls that were so soft that they could not be heard above the rather high level of ambient noise at the site. The species makes one soft call (see http://macaulaylibrary.org/audio/108867). Their loud *kaak* calls, often repeated several times, are apparently reserved for the very few instances of interaction between a pair and (copiously) for maintaining contact with the young post-fledging. In our experience, this call is repeated constantly by the adults but not by the young. The absence of any audible begging call, or any discernible begging behaviour, is notable.

Comparison with other barbets.—More than 80 species of barbets occur throughout the Asian, African and American tropics. We compared the breeding behaviour of the Neotropical species, belonging to the genera *Capito*, *Eubucco* and *Semnornis*. For most of the ten species of *Capito*, including Spot-crowned Barbet, very little is known, except that all nest in cavities in dead trees. However, Black-spotted Barbet *C. niger* excavates a cavity c.20–30 cm deep, lays 3–4 eggs, both adults incubate and fledging takes c.34 days[4,8]. This information pre-dates the split of Black-spotted *C. niger* and Gilded Barbets *C. auratus*, but most of these data apparently do pertain to *C. niger sensu stricto*.

For *Eubucco* (four species), we also lack detailed data, except for Red-headed Barbet *E. bourcierii*. It lays 2–5 plain white eggs, incubated c.15 days with a nestling period of 31–42 days[3,4,8].

For *Semnornis* (two species), there is probably the most complete account of breeding for any Neotropical barbet; Skutch's description of the life history of Prong-billed Barbet[9]. This species ranges from Costa Rica to western Panama, occupying higher elevations than Spot-crowned Barbet, mostly 1,200–2,200 m. Skutch made periodic observations inside nests—a privilege denied us—linking them to behaviour of the adults outside. Prong-billed is morphometrically very similar to Spot-crowned Barbet, and their breeding biology

is often identical. Construction methods, share of duties, maintenance, absence of introduced lining, and sanitation are the same, while brooding, feeding and nestling diet (including large amounts of fruit) are largely the same, except that the adults observed by Skutch, although they ate flowers themselves, did not feed these to the young, nor did they bring vertebrate prey. Morphological characters of the young are identical in both species, closely resembling the respective adult, except the pale bare orbital skin and pale rather than blue bill. Skutch found that although Prong-billed Barbet lays up to five eggs, only two young usually fledge. He gave the incubation period as 13 days, the nestling period as at least one month, and concluded that the species is single-brooded. Other sources give the incubation period as 14–15 days[4,8].

The other member of *Semnornis*, Toucan Barbet *S. ramphastinus* feeds not only fruit and insects to its young, but also fungus and, like Spot-crowned Barbet, flowers and vertebrates. It fledges just one or two young, and sometimes loses nests when dead stumps collapse before the young fledge[4,8].

Finally, the Spot-crowned Barbet family separated during daytime after the young fledged, with the adult male exclusively feeding the young female, and the adult female attending the young male. The only similar example we have found among barbets is for Black-throated Barbet *Tricholaema melanocephala* of East Africa. When two offspring fledge, one follows one of the adults, and the other its mate[4,8], but it is unclear if they follow the same arrangement by sex as the Spot-crowned Barbets we observed.

Acknowledgements

We thank the Board of Directors of the Asociación Centro de Estudios y Acción Social Panameño (ACEASPA) and the staff of the El Tucán Community Centre for facilitating our study over so many months; and the Panamanian biologists Nelva Luna, Lorena González and Diosveira González for their invaluable monitoring support. We also thank our referee, Kristina Cockle, for making many wise recommendations that helped us to improve the text.

References

1. Angehr, G. & Dean, R. (2010) *The birds of Panama; a field guide*. San José, Costa Rica: Zona Tropical & Ithaca, NY: Comstock Publishing.
2. BirdLife International (2018) Species factsheet: *Capito maculicoronatus* www.datazone.birdlife.org/species/factsheet/spot-crowned-barbet-capito-maculicoronatus (accessed February 2018)
3. Hilty, S. L. & Brown, W. L. (1986) *A guide to the birds of Colombia*. Princeton, NJ: Princeton University Press.
4. Horne, J. F. M. & Short, L. L. (2002) Family Capitonidae (barbets). In: del Hoyo, J., Elliott, A. & Sargatal, J. (eds.) *Handbook of the birds of the world*, 7. Barcelona: Lynx Edicions.
5. Marques, O. A. V. & Sazima, I. (2004) História natural dos répteis da estação ecológica Juréia-Itatins. In: Marques, O. A. V. & Duleba, W. (eds.) *Estação Ecológica Juréia-Itatins: ambiente físico, flora e fauna*. Ribeirão Preto: Ed. Holos.
6. Ridgely, R. S. & Gwynne, J. A. (1989) *A guide to the birds of Panama with Costa Rica, Nicaragua and Honduras*. Second edn. Princeton, NJ: Princeton University Press.
7. Robinson, W. D. & Robinson, T. R. (2001) Observations of predation events at birds' nests in central Panama. *J. Field Orn*. 72: 43–48.
8. Short, L. L. & Horne, J. F. M. (2001) *Toucans, barbets and honeyguides*. Oxford: Oxford University Press.
9. Skutch, A. F. (1933) The life-history of the Prong-billed Barbet. *Auk* 61: 61–88.
10. Wetmore, A. (1968) *The birds of the Republic of Panamá*, 2. Washington DC: Smithsonian Institution Press.

William John Adsett
Altos del Torreón 142, Residencial de Montaña los Altos de Cerro Azul, Panama (postal address: Apartado 0819-09546, Panama, Republic of Panama). E-mail: wjadsett@hotmail.com.

Mariló C. Castro
Centro El Tucán, Carretera de Achiote s/n, Achiote, Costa Abajo de Colón, Colón (postal address: Apartado 0819-10043, Panama, Republic of Panama). E-mail: mariloccastro@hotmail.com or centroeltucan@gmail.com.

A preliminary list of the birds of the foothills and south-eastern buffer zone of Colonso Chalupas Biological Reserve, Ecuador

Yntze van der Hoek, Rolf Jensen, Luis Alberto Salagaje and Leonardo Ordóñez-Delgado

Received 7 March 2017; final revision accepted 16 January 2018
Cotinga 40 (2018): 12–22
published online 16 June 2018

Presentamos una lista de aves registradas en las estribaciones y la zona de amortiguamiento de la Reserva Biológica Colonso Chalupas (RBCC), provincia de Napo, Ecuador. Entre 2010 y 2017, utilizamos una combinación de redes de niebla, transectos y muestras oportunistas para registrar aves en esta zona de transición entre las tierras bajas amazónicas y la cordillera andina oriental. Hemos registrado 279 especies, incluyendo especies clave o indicadoras, especies con rangos de distribución restringidos y siete especies vulnerables. La RBCC tiene potencial para la conservación de los hábitats de la ladera andina oriental y la vida silvestre, y para valiosas iniciativas de investigación biológica, como se planteó en la designación oficial del RBCC como área protegida.

In 2014, the Ecuadorian government created the Reserva Biológica Colonso Chalupas (hereafter RBCC), covering 93,246 ha on the east slope of the Andes, under the IUCN 'strict nature reserve' protocol[5]. Levels of biodiversity and endemism in the reserve are thought to be high, as it is in a biodiversity hotspot[11] and covers a dramatic elevational gradient (enhancing β-diversity and the number of endemic species[2]). Additionally, published data on the nearby Llanganates[4] and Sumaco Napo Galeras National Parks[3,6] support the hypothesis of high biodiversity in RBCC. However, research on the avifauna of RBCC has been very limited, predominantly due to difficult access (roads and trails only reach c.10% of the area).

Here, we present a list of birds from the lower elevations of RBCC, mostly the foothill zone, which encompasses evergreen foothill and lower montane forest, as well as adjacent edge habitats. This list should serve as a tool for the development of management plans for RBBC. These include proposed conservation actions based on the presence of particular species (e.g., large-seed dispersers).

The RBCC was initially established as a biological reserve with a special focus on research, and may be considered the future 'living laboratory' of the newly (in 2014) created Universidad Regional Amazónica Ikiam. This bird list provides a starting point for avian ecological research at the university, potentially on a wide range of topics including elevational gradients (the reserve has an altitudinal range of >3,500 m), future range shifts and issues surrounding habitat degradation or ecological disturbance.

Materials and Methods

Study site.—RBCC is predominantly forested and ranges from c.550 m to 4,400 m. It is located on the east slope of the Andes, in Napo province (Fig. 1). The reserve protects several watersheds and harbours a range of vegetation types from evergreen foothill forest to *páramo*. The eastern buffer zone and first few kilometres within the reserve consist of a mix of secondary forest and traditional small-scale agricultural land (the 'chakra' system[19]), but human presence is relatively low further inside the reserve.

We compiled information on the biotic and abiotic characteristics of the reserve based on unpublished reports and management plans[7–9,13,14], as no peer-reviewed literature currently exists for the area. Following personal observations and using unpublished data[7–9], we conclude that the foothill vegetation of the RBCC is dominated by the woody plant families Myristicaceae, Fabaceae, Meliaceae, Euphorbiaceae, Rubiaceae, Moraceae, Vochysiaceae and Melastomataceae. In addition, several palm species occur at relatively low densities, including *Oenocarpus bataua*, *Iriartea deltoidea* and *Mauritia flexuosa*. The understorey consists predominantly of Melastomataceae and Rubiaceae.

We conducted bird surveys and counts in the lower parts of the RBCC (Fig. 1) and adjacent areas, in a radius of c.15 km surrounding the coordinates 00°56'00"S 77°53'491"W, at elevations of 580–1,550 m, and within 3 km of 01°04'25"S 77°57'18"W, at 550–650 m. We also conducted mist-netting at 00°56'32"S 77°53'51"W (1,000 m); 00°50'48"S 77°52'19"W (1,535 m); 00°53'33"S 77°51'39"W (780 m); 00°54'07"S 77°51'48"W (775 m); and 00°55'50"S 77°55'11"W (1,550 m). The study area experiences high rainfall (>4,000 mm annually), humidity levels of c.90% on average, and mean temperatures of 15–24°C. This part of the RBCC is characterised by its steep slopes, undulating hills and many fast-flowing rivers.

Data collection.—Between 2010 and 2017, we conducted mist-netting with photographic

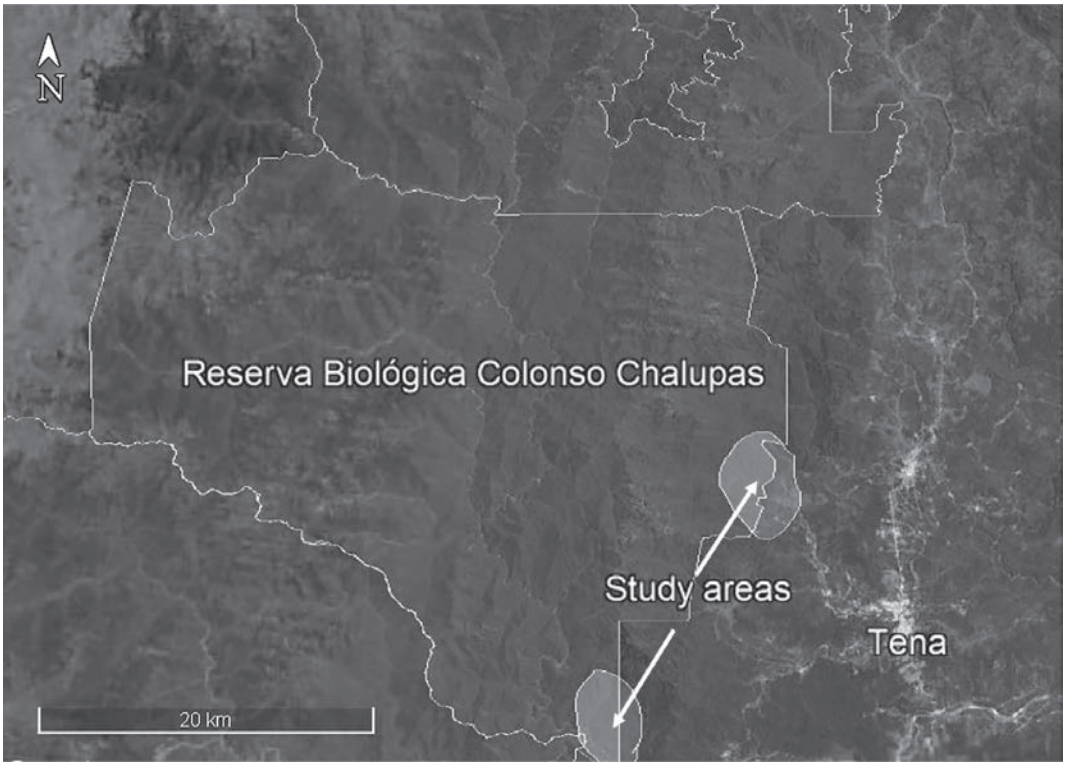


Figure 1. Location of Reserva Biológica Colonso Chalupas Colonso, Ecuador. Tena is the closest major settlement and the access point to the study areas (near 00°56'00"S 77°53'49"W, at elevations of 580–1,550 m, and near 01°04'25"S 77°57'18"W, at 550–650 m). (Map adapted from Google Earth; satellite image courtesy of Google Inc. All rights reserved © 2018.)

documentation, systematic surveys along transects (with and without playback) and opportunistic surveys using binoculars and sound-recorders. Total survey time amounted to >40 field days (c.175 hours), each between 2–8 hours long, usually starting at 06h00. Species identification followed standard field guides[10,16]. LO-D had earlier published an online field guide[12] based on records from the area previously recognised as Bosque Protector Colonso (Colonso Protection Forest), now part of RBCC. His checklist is incorporated herein.

Wherever possible, we deposited photographic evidence at https://flic.kr/s/aHskDjjmna or elsewhere online[12], and digital recordings of vocalisations at www.xeno-canto.org. Documented records can be accessed online using the index numbers listed in the Appendix. Taxonomy follows the latest version of the South American Classification Committee checklist[15].

Results

We recorded 279 species, belonging to 48 families and 19 orders (Appendix), and provide photographic or vocal evidence for nearly half of these (135 species). Seven species are considered threatened by IUCN[5], all listed as Vulnerable: Ruddy Pigeon *Patagioenas subvinacea*, Ecuadorian Piedtail *Phlogophilus hemileucurus*, Coppery-chested Jacamar *Galbula pastazae*, Channel-billed Toucan *Ramphastos vitellinus*, White-streaked Antvireo *Dysithamnus leucostictus*, Ash-browed Spinetail *Cranioleuca curtata* and Lemon-browed Flycatcher *Conopias cinchoneti*.

None of the species recorded is endemic to Ecuador, although several are near-endemics in that they occur only marginally in adjacent countries, e.g. Ecuadorian Piedtail *Phlogophilus hemileucurus*. In addition, many species were found near the edge or outside previously recognised ranges (both breeding and non-breeding ranges proposed by BirdLife International[1] or Ridgely & Greenfield[16]). For some of these, the range extension is rather marginal and in line with expectations based on previous observations. For example, over the course of two years, we recorded a breeding pair of Southern Lapwing *Vanellus chilensis* on and near the campus of Universidad Regional Amazónica Ikiam at 570 m, whereas the species is found mainly below 400 m in Ecuador. However, the distribution of this species has

expanded in Ecuador, with some recent records of breeding as high as 2,100 m[17]. In contrast to Southern Lapwing and several other species, we noted more substantial range extensions, especially elevational, for the following three species.

Nocturnal Curassow *Nothocrax urumutum*
On 9 March 2017, we encountered a group of four adults during daylight hours (10h40) in an open area adjacent to a recently (<1 year-old) fallen log in primary forest (00°56'08"S 77°53'40"W; 1,205 m). The species was recently reported at 1,100 m[17], making our observation the highest on record. We observed the birds for 10–20 seconds at 10 m range before they quietly but rapidly walked away through the understorey. They did not fly or make any noticeable vocalisations. The mature forest in this area has been hunted historically and subject to selective logging. It consists of relatively small-stature trees (canopy height 18–22 m) of a wide variety of species of Fabaceae, Lauraceae, Rubiaceae and Melastomataceae, and has very steep slopes (>40% over most of the area).

Crimson-crested Woodpecker
Campephilus melanoleucos
We recorded drumming on two separate occasions (8–13 December 2013 and 21 June 2017) at c.1,550 m and 1,450 m, respectively (both recordings made within 100 m of 00°55'50"S 77°55'11"W). On the second visit, we also observed an adult drumming on a dead tree trunk. Predominantly found below 900 m[16].

Musician Wren *Cyphorhinus arada*
On two separate occasions (8–13 December 2013 and 21 June 2017), we recorded the song of at least one male at 1,550 m and 1,450 m, respectively (both within 100 m of 00°55'50"S 77°55'11"W). This area consists of evergreen lower montane forest dominated by Lauraceae, Rubiaceae, Melastomataceae and Moraceae, but also relatively high densities of vines, climbers and epiphytes. Our records imply a substantial extension of the species' elevational range, as it is usually found below 1,000 m[16].

Discussion

We recorded 279 species in and around the lower parts of the RBCC. Because our list for the entire RBCC is incomplete at present, we expect it to grow substantially with continuing studies and improved accessibility in the future. We have not sampled extensively at higher elevations, performed very little sampling at night (fewer than ten surveys) and had no opportunity to use trail cameras. Thus, we could have missed a considerable number of nocturnal, shyer, less vocal, or rare species, as well as those commonly found at higher elevations.

Despite these limitations, we found that the steep elevational profile of the RBCC, and the varying levels of human disturbance at especially lower elevations, contribute to a diverse avifauna, including species of immediate conservation concern (e.g., listed as Vulnerable) or of ecological importance due to their key functions such as seed dispersal (e.g., Yellow-throated *Ramphastos ambiguus* and Channel-billed Toucans *R. vitellinus*) and cavity excavation (e.g., Lineated *Dryocopus lineatus*, Crimson-crested *Campephilus melanoleucos* and Crimson-bellied Woodpeckers *C. haematogaster*). At lower elevations, we found species that favour open habitats (e.g., Southern Lapwing and several *Sporophila* seedeaters), as well as forest specialists (e.g., the relatively scarce and local Rufous-breasted Wood Quail *Odontophorus speciosus*). At 1,200–1,500 m we found an interesting mix of lowland and montane species (some at or above their recognised elevational ranges). Elevational zonation, and other aspects of the ecology of RBCC's avifauna, should be addressed in future research efforts.

It is difficult to draw conclusions on the state of conservation of avifauna in our study area, as we did not collect data on abundance or population trends, and our sampling is still incomplete. For example, we recorded the presence of two species of tinamous and four cracids, which will have been subject to past and present human hunting pressure[18], but we know little of their abundances. For the same reason, we cannot confirm the absence of other keystone or indicator species, e.g. Chestnut-fronted Macaw *Ara severus*, which range close to RBCC. However, we are concerned that large-seed dispersers, large macaws and parrots, and apex predators, are relatively scarce within the reserve, and urge that both future research and conservation efforts focus on these and other ecologically important species.

Reserva Biológica Colonso Chalupas holds potential to conserve a diverse avifauna associated with a variety of habitat types and elevational strata, including several threatened, scarce or ecologically important species. Future research, an objective of the reserve's creation, is desirable and should address topics including species ranges and conservation issues.

Acknowledgements

We thank Félix Grefa, Sara Álvarez, María Cristina Peñuela, Jimmy Velastegui, Ángel Crespo Vásquez, Erica García, Alexander Gualli, Merizamar Tatiana Chongo, Wilmer Andrés Shiguango Yumbo, Mario Ricardo Nieto Pilataxi and several collaborators from Ecuador's Ministry of Environment. RJ, especially, expresses his gratitude to Gabriel D. Orozco, Manager of RBCC during his studies, for facilitating the early research and organising joint survey visits, particularly to the Laguna Azul area, and for valuable

background information and advice. LO-D gratefully acknowledges financial support from Fundación Bosques para la Conservación and the Departamento de Ciencias Biológicas, Universidad Técnica Particular de Loja. We also thank Proyecto Prometeo and Universidad Regional Amazónica IKIAM for financial and institutional support, and MAE Napo for their support in obtaining research permits. The Ministerio del Ambiente issued research permits 06-16-IC-FAU-DPAN/MA and 05-IC-FAU/FLO-DPPNO/MA. We thank Juan Freile, Guy Kirwan and two anonymous reviewers for their constructive comments on earlier drafts of this manuscript.

References

1. BirdLife International & NatureServe (2015) *Bird species distribution maps of the world*. Cambridge, UK: BirdLife International & Arlington, VA: NatureServe.
2. Fjeldså, J., Lambin, E. & Mertens, B. (1999) Correlation between endemism and local ecoclimatic stability documented by comparing Andean bird distributions and remotely sensed land surface data. *Ecography* 22: 63–78.
3. Hodge, A.-M. C. & Arbogast, B. S. (2015) Carnivore diversity at a montane rainforest site in Ecuador's Gran Sumaco Biosphere Reserve. *Oryx* 50: 1–6.
4. Hofstede, R. G., Dickinson, K. J., Mark, A. F. & Narváez, E. (2014) A broad transition from cloud forest to páramo characterizes an undisturbed treeline in Parque Nacional Llanganates, Ecuador. *Arctic, Antarctic & Alpine Res.* 46: 975–986.
5. IUCN (2017) The IUCN Red List of threatened species. Version 2017-1. www.iucnredlist.org (accessed 18 August 2017).
6. Lee, T. E., Burneo, S. F., Marchán, M. R., Roussos, S. A. & Vizcarra-Vásconez, R. (2008) The mammals of the temperate forests of Volcán Sumaco, Ecuador. *Mus. Texas Tech Univ. Occ. Pap*. 276.
7. Lozano, P. (2012) *Descubriendo la flora de la parte alta del Bosque Protector Colonso*. Quito: Fundación Bosques para la Conservación & Ministerio del Ambiente.
8. Lozano, P., Jara, L. F. & Sánchez, A. (2011) *Descubriendo la flora del Bosque Protector Colonso*. Quito: Fundación Bosques para la Conservación & Ministerio del Ambiente.
9. Ministerio del Ambiente (2016) Plan de manejo de la Reserva Biológica Colonso Chalupas. Unpubl. rep. Tena: Ministerio del Ambiente.
10. Moore, J. V., Krabbe, N. & Jahn, O. (2013) *Bird sounds of Ecuador*. CDs. San Jose, CA: J. V. Moore Nature Recordings & Jocotoco Foundation.
11. Myers, N., Mittermeier, R. A., Mittermeier, C. G., Da Fonseca, G. A. & Kent, J. (2000) Biodiversity hotspots for conservation priorities. *Nature* 403: 853–858.
12. Ordóñez-Delgado, L. (2015) Aves del Bosque Protector Colonso, Napo, Ecuador. Chicago: Field Museum. http://fieldguides.fieldmuseum.org/guides/guide/679 (accessed August 2016).
13. Ordóñez-Delgado, L., Tambo, D. V. & Yanez, D. V. (2011) *Descubriendo la fauna del Bosque Protector Colonso*. Quito: Fundación Bosques para la Conservación & Ministerio del Ambiente.
14. Ordóñez-Delgado, L., Tambo, D. V. & Yánez, D. V. (2012) *Fauna de la parte alta del Bosque Protector Colonso*. Quito: Fundación Bosques para la Conservación & Ministerio del Ambiente.
15. Remsen, J. V., Areta, J. I., Cadena, C. D., Claramunt, S., Jaramillo, A., Pacheco, J. F., Pérez-Emán, J., Robbins, M. B., Stiles, F. G., Stotz, D. F. & Zimmer, K. J. (2017) A classification of the bird species of South America. www.museum.lsu.edu/~Remsen/SACCBaseline.html (accessed August 2017)
16. Ridgely, R. S. & Greenfield, P. J. (2001) *The birds of Ecuador*. Ithaca, NY: Cornell University Press.
17. Solano-Ugalde, A. & Real-Jibaja, G. J. (2010) New distributional bird records from the eastern Andean slopes of Ecuador. *Check List* 6: 326–329.
18. Strahl, S. D. & Grajal, A. (1991) Conservation of large avian frugivores and the management of Neotropical protected areas. *Oryx* 25: 50–55.
19. Torres, B., Maza, O. J., Aguirre, P., Hinojosa, L. & Günter, S. (2015) The contribution of traditional agroforestry to climate change adaptation in the Ecuadorian Amazon: the Chakra System. In: Filho, W. L. (ed.) *Handbook of climate change adaptation*. Berlin & Heidelberg: Springer-Verlag.

Yntze van der Hoek
Universidad Regional Amazónica Ikiam, Km 7 Vía Muyuna-Atacapi, Tena, Ecuador. E-mail: yntzevanderhoek@gmail.com

Rolf Jensen
SENESCYT Prometeo at Ministerio Coordinador de Conocimiento y Talento Humano & Universidad Regional Amazónica Ikiam, Ecuador; and Adjunct Associate Professor, James Cook University, Townsville, Queensland, Australia.

Luis Alberto Salagaje
Universidad Estatal Amazónica, Campus central, paso lateral Km 2.5 vía a Napo, Troncal Amazónica E45, Puyo, Ecuador.

Leonardo Ordóñez-Delgado
Universidad Técnica Particular de Loja, Departamento de Ciencias Biológicas, Laboratorio de Ecología Tropical y Servicios Ecosistémicos - EcoSs Lab, Calle París S/N, CP EC11-01-608, Loja, Ecuador.

Appendix. List of birds recorded in the foothills of Colonso Chalupas Biological Reserve, Ecuador.

Evidence: V = sight-only; P = photographed, with numbers of digital photographs deposited at https://flic.kr/s/aHskDjjmna (Flickr) or published by Ordóñez-Delgado[12] in http://fieldguides.fieldmuseum.org/guides/guide/679 (OD); S = sound, with sound-recordings (XC) deposited at www.xeno-canto.org.

Species list follows the South American Classification Committee (SACC)[15].

Common name	Scientific name	2017 IUCN Red List category	Evidence
TINAMIDAE			
Great Tinamou	*Tinamus major*	NT	P (Flickr 1)
Little Tinamou	*Crypturellus soui*		S
CRACIDAE			
Nocturnal Curassow	*Nothocrax urumutum*		V
Sickle-winged Guan	*Chamaepetes goudotii*		S
Wattled Guan	*Aburria aburri*	NT	S (XC106630)
Speckled Chachalaca	*Ortalis guttata*		S
ODONTOPHORIDAE			
Rufous-breasted Wood Quail	*Odontophorus speciosus*	NT	V
COLUMBIDAE			
Scaled Pigeon	*Patagioenas speciosa*		S
Plumbeous Pigeon	*Patagioenas plumbea*		V; S (XC100430)
Ruddy Pigeon	*Patagioenas subvinacea*	VU	S (XC383836)
Ruddy Quail-Dove	*Geotrygon montana*		P (OD 7,8)
White-throated Quail-Dove	*Zentrygon frenata*		V
Ruddy Ground Dove	*Columbina talpacoti*		V
CUCULIDAE			
Smooth-billed Ani	*Crotophaga ani*		V; S (XC94278)
Dark-billed Cuckoo	*Coccyzus melacoryphus*		V
NYCTIBIIDAE			
Great Potoo	*Nyctibius grandis*		P (Flickr 5)
Common Potoo	*Nyctibius griseus*		S
CAPRIMULGIDAE			
Rufous-bellied Nighthawk	*Lurocalis rufiventris*		S
Common Pauraque	*Nyctidromus albicollis*		S
APODIDAE			
Chestnut-collared Swift	*Streptoprocne rutila*		V
White-collared Swift	*Streptoprocne zonaris*		V
Short-tailed Swift	*Chaetura brachyura*		V
TROCHILIDAE			
White-necked Jacobin	*Florisuga mellivora*		V
White-tipped Sicklebill	*Eutoxeres aquila*		P (OD 11,12)
Buff-tailed Sicklebill	*Eutoxeres condamini*		P (OD 13,14)
Grey-chinned Hermit	*Phaethornis griseogularis*		P (OD 15,16)
Green Hermit	*Phaethornis guy*		P (OD 17–19)
Tawny-bellied Hermit	*Phaethornis syrmatophorus*		V
Great-billed Hermit	*Phaethornis malaris*		P (Flickr 6)
Green-fronted Lancebill	*Doryfera ludovicae*		V
Blue-fronted Lancebill	*Doryfera johannae*		V
Brown Violetear	*Colibri delphinae*		V
Sparkling Violetear	*Colibri coruscans*		V
Black-eared Fairy	*Heliothryx auritus*		V
Black-throated Mango	*Anthracothorax nigricollis*		V
Wire-crested Thorntail	*Discosura popelairii*	NT	V
Ecuadorian Piedtail	*Phlogophilus hemileucurus*	VU	P (OD 23,24); S (XC174084)

Common name	Scientific name	2017 IUCN Red List category	Evidence
Speckled Hummingbird	*Adelomyia melanogenys*		V
White-tailed Hillstar	*Urochroa bougueri*		P (OD 25,26)
Rufous-vented Whitetip	*Urosticte ruficrissa*		P (OD 27–29)
Gould's Jewelfront	*Heliodoxa aurescens*		V
Violet-fronted Brilliant	*Heliodoxa leadbeateri*		P (OD 30–32)
White-bellied Woodstar	*Chaetocercus mulsant*		V
Napo Sabrewing	*Campylopterus villaviscensio*	NT	P (OD 33,34)
Fork-tailed Woodnymph	*Thalurania furcata*		P (OD 35–38)
Glittering-throated Emerald	*Amazilia fimbriata*		P (Flickr 7)
Golden-tailed Sapphire	*Chrysuronia oenone*		P (OD 39–41)
CHARADRIIDAE			
Southern Lapwing	*Vanellus chilensis*		P (Flickr 4)
SCOLOPACIDAE			
Spotted Sandpiper	*Actitis macularius*		V
EURYPYGIDAE			
Sunbittern	*Eurypyga helias*		P (OD 5,6); S (XC94288)
PHALACROCORACIDAE			
Neotropic Cormorant	*Phalacrocorax brasilianus*		V
ARDEIDAE			
Fasciated Tiger Heron	*Tigrisoma fasciatum*		V
Striated Heron	*Butorides striata*		V
Cattle Egret	*Bubulcus ibis*		V
Great Egret	*Ardea alba*		V
CATHARTIDAE			
Turkey Vulture	*Cathartes aura*		P (OD 1,2)
Greater Yellow-headed Vulture	*Cathartes melambrotus*		V
American Black Vulture	*Coragyps atratus*		P (OD 3)
ACCIPITRIDAE			
Swallow-tailed Kite	*Elanoides forficatus*		V
Double-toothed Kite	*Harpagus bidentatus*		P (Flickr 2)
Plumbeous Kite	*Ictinia plumbea*		V
Roadside Hawk	*Rupornis magnirostris*		P (Flickr 3); S (XC334535)
White Hawk	*Pseudastur albicollis*		V
Broad-winged Hawk	*Buteo platypterus*		P (OD 4)
STRIGIDAE			
Tropical Screech Owl	*Megascops choliba*		V
Band-bellied Owl	*Pulsatrix melanota*		P (OD 9,10)
Mottled Owl	*Ciccaba virgata*		S (XC99431)
Rufous-banded Owl	*Ciccaba albitarsis*		V; S
Subtropical Pygmy Owl	*Glaucidium parkeri*		S
TROGONIDAE			
Golden-headed Quetzal	*Pharomachrus auriceps*		V; S
Green-backed Trogon	*Trogon viridis*		P (Flickr 8)
Black-throated Trogon	*Trogon rufus*		V; S (XC334546)
Collared Trogon	*Trogon collaris*		P (Flickr 9,10); S (XC174083)
Masked Trogon	*Trogon personatus*		V
ALCEDINIDAE			
Ringed Kingfisher	*Megaceryle torquata*		V
Amazon Kingfisher	*Chloroceryle amazona*		V
Green Kingfisher	*Chloroceryle americana*		V
MOMOTIDAE			
Broad-billed Motmot	*Electron platyrhynchum*		V

Common name	Scientific name	2017 IUCN Red List category	Evidence
Rufous Motmot	*Baryphthengus martii*		V
Amazonian Motmot	*Momotus momota*		V
GALBULIDAE			
Coppery-chested Jacamar	*Galbula pastazae*	VU	V
BUCCONIDAE			
Western Striolated Puffbird	*Nystalus obamai*		V
CAPITONIDAE			
Gilded Barbet	*Capito auratus*		V
Red-headed Barbet	*Eubucco bourcierii*		V
RAMPHASTIDAE			
Yellow-throated Toucan	*Ramphastos ambiguus*	NT	V; S (XC383837)
Channel-billed Toucan	*Ramphastos vitellinus*	VU	S (XC176973)
Chestnut-tipped Toucanet	*Aulacorhynchus derbianus*		S (XC99421)
Golden-collared Toucanet	*Selenidera reinwardtii*		S (XC334390)
Chestnut-eared Aracari	*Pteroglossus castanotis*		P (Flickr 11)
Ivory-billed Aracari	*Pteroglossus azara*		V
PICIDAE			
Lafresnaye's Piculet	*Picumnus lafresnayi*		P (Flickr 12)
Yellow-tufted Woodpecker	*Melanerpes cruentatus*		P (Flickr 13)
Smoky-brown Woodpecker	*Picoides fumigatus*		V; S
Little Woodpecker	*Veniliornis passerinus*		V;S
Yellow-vented Woodpecker	*Veniliornis dignus*		V
Golden-olive Woodpecker	*Colaptes rubiginosus*		V; S
Spot-breasted Woodpecker	*Colaptes punctigula*		V; S
Lineated Woodpecker	*Dryocopus lineatus*		P (Flickr 14)
Crimson-crested Woodpecker	*Campephilus melanoleucos*		P (Flickr 15)
Crimson-bellied Woodpecker	*Campephilus haematogaster*		S
FALCONIDAE			
Barred Forest Falcon	*Micrastur ruficollis*		V; S (XC284665)
Collared Forest Falcon	*Micrastur semitorquatus*		V
Black Caracara	*Daptrius ater*		V
Bat Falcon	*Falco rufigularis*		P (Flickr 16)
PSITTACIDAE			
Cobalt-winged Parakeet	*Brotogeris cyanoptera*		V
Red-billed Parrot	*Pionus sordidus*		V
Blue-headed Parrot	*Pionus menstruus*		V (XC383838)
Blue-winged Parrotlet	*Forpus xanthopterygius*		P (Flickr 18)
Maroon-tailed Parakeet	*Pyrrhura melanura*		V; S (XC308752)
White-eyed Parakeet	*Psittacara leucophthalmus*		S (XC334535)
THAMNOPHILIDAE			
Great Antshrike	*Taraba major*		S
Lined Antshrike	*Thamnophilus tenuepunctatus*		P (Flickr 19)
Plain-winged Antshrike	*Thamnophilus schistaceus*		S (XC334555)
Uniform Antshrike	*Thamnophilus unicolor*		V; S
Plain Antvireo	*Dysithamnus mentalis*		P (OD 42–45)
White-streaked Antvireo	*Dysithamnus leucostictus*	VU	V; S
Ornate Antwren	*Epinecrophylla ornata*		V; S
White-flanked Antwren	*Myrmotherula axillaris*		V; S
Peruvian Warbling Antbird	*Hypocnemis peruviana*		P (Flickr 20)
Blackish Antbird	*Cercomacroides nigrescens*		V; S
Black-faced Antbird	*Myrmoborus myotherinus*		P (OD 46,47)
Spot-winged Antbird	*Myrmelastes leucostigma*		P (Flickr 21); S (XC334538)

Common name	Scientific name	2017 IUCN Red List category	Evidence
White-plumed Antbird	*Pithys albifrons*		P (OD 48–50)
Hairy-crested Antbird	*Rhegmatorhina melanosticta*		P (OD 51,52)
Spot-backed Antbird	*Hylophylax naevius*		S (XC334553)
Common Scale-backed Antbird	*Willisornis poecilinotus*		P (OD 53–55)
GRALLARIIDAE			
Plain-backed Antpitta	*Grallaria haplonota*		S
Thrush-like Antpitta	*Myrmothera campanisona*		S (XC334546)
RHINOCRYPTIDAE			
White-crowned Tapaculo	*Scytalopus atratus*		S (XC116234)
FORMICARIIDAE			
Rufous-breasted Antthrush	*Formicarius rufipectus*		S (XC174088)
Short-tailed Antthrush	*Chamaeza campanisona*		S (XC99434)
FURNARIIDAE			
Tawny-throated Leaftosser	*Sclerurus mexicanus*		V
Black-billed Treehunter	*Thripadectes melanorhynchus*		S (XC383839)
Olivaceous Woodcreeper	*Sittasomus griseicapillus*		P (Flickr 22)
Long-tailed Woodcreeper	*Deconychura longicauda*	NT	V
Tyrannine Woodcreeper	*Dendrocincla tyrannina*		V
Plain-brown Woodcreeper	*Dendrocincla fuliginosa*		P (OD 56)
Wedge-billed Woodcreeper	*Glyphorynchus spirurus*		P (OD 57–59)
Black-banded Woodcreeper	*Dendrocolaptes picumnus*		V
Strong-billed Woodcreeper	*Xiphocolaptes promeropirhynchus*		V
Buff-throated Woodcreeper	*Xiphorhynchus guttatus*		P (OD 60,61)
Olive-backed Woodcreeper	*Xiphorhynchus triangularis*		V
Sharp-tailed Streamcreeper	*Lochmias nematura*		P (OD 62,63)
Montane Foliage-gleaner	*Anabacerthia striaticollis*		P (OD 64–67)
Ruddy Foliage-gleaner	*Clibanornis rubiginosus*		S (XC334563)
Orange-fronted Plushcrown	*Metopothrix aurantiaca*		V
Ash-browed Spinetail	*Cranioleuca curtata*	VU	V
Dark-breasted Spinetail	*Synallaxis albigularis*		S (XC94284)
TYRANNIDAE			
Yellow-crowned Tyrannulet	*Tyrannulus elatus*		P (OD 72)
Mottle-backed Elaenia	*Elaenia gigas*		P (OD 68,69)
White-lored Tyrannulet	*Ornithion inerme*		V
Torrent Tyrannulet	*Serpophaga cinerea*		P (OD 70,71)
Bronze-olive Pygmy Tyrant	*Pseudotriccus pelzelni*		V
Golden-faced Tyrannulet	*Zimmerius chrysops*		V; S (XC383840)
Ecuadorian Tyrannulet	*Phylloscartes gualaquizae*	NT	V
Olive-striped Flycatcher	*Mionectes olivaceus*		V
Ochre-bellied Flycatcher	*Mionectes oleagineus*		V
Slaty-capped Flycatcher	*Leptopogon superciliaris*		V
Ornate Flycatcher	*Myiotriccus ornatus*		P (OD 79); S (XC308741)
Buff-throated Tody-Tyrant	*Hemitriccus rufigularis*	NT	S (XC302348)
Scale-crested Pygmy Tyrant	*Lophotriccus pileatus*		V
Golden-winged Tody-Flycatcher	*Poecilotriccus calopterus*		P (OD 80,81)
Common Tody-Flycatcher	*Todirostrum cinereum*		P (Flickr 23)
White-throated Spadebill	*Platyrinchus mystaceus*		P (OD 83,84)
Tawny-breasted Flycatcher	*Myiobius villosus*		V
Black-tailed Flycatcher	*Myiobius atricaudus*		P (OD 85,86)
Cinnamon Flycatcher	*Pyrrhomyias cinnamomeus*		V
Olive-sided Flycatcher	*Contopus cooperi*	NT	V
Western Wood Pewee	*Contopus sordidulus*		V

Common name	Scientific name	2017 IUCN Red List category	Evidence
Black Phoebe	*Sayornis nigricans*		V
Drab Water Tyrant	*Ochthornis littoralis*		V
Long-tailed Tyrant	*Colonia colonus*		P (Flickr 24)
Piratic Flycatcher	*Legatus leucophaius*		V; S (XC94282)
Social Flycatcher	*Myiozetetes similis*		V
Great Kiskadee	*Pitangus sulphuratus*		V
Lemon-browed Flycatcher	*Conopias cinchoneti*	VU	V
Golden-crowned Flycatcher	*Myiodynastes chrysocephalus*		V
Tropical Kingbird	*Tyrannus melancholicus*		P (OD 89)
Pale-edged Flycatcher	*Myiarchus cephalotes*		V
Dusky-capped Flycatcher	*Myiarchus tuberculifer*		S (XC383841)
Bright-rumped Attila	*Attila spadiceus*		V
COTINGIDAE			
Scarlet-breasted Fruiteater	*Pipreola frontalis*		V
Andean Cock-of-the-rock	*Rupicola peruvianus*		P (Flickr 26,27)
PIPRIDAE			
Golden-winged Manakin	*Masius chrysopterus*		V
Green Manakin	*Cryptopipo holochlora*		P (OD 90)
Blue-crowned Manakin	*Lepidothrix coronata*		P (Flickr 28)
Blue-rumped Manakin	*Lepidothrix isidorei*	NT	P (OD 91–94); S (XC132022)
White-bearded Manakin	*Manacus manacus*		P (OD 95); S (XC334569)
Western Striped Manakin	*Machaeropterus regulus*		P (OD 96,97)
White-crowned Manakin	*Dixiphia pipra*		P (OD 99)
Golden-headed Manakin	*Ceratopipra erythrocephala*		V
TITYRIDAE			
Black-crowned Tityra	*Tityra inquisitor*		V
Black-tailed Tityra	*Tityra cayana*		V
Masked Tityra	*Tityra semifasciata*		P (Flickr 29)
Barred Becard	*Pachyramphus versicolor*		V
White-winged Becard	*Pachyramphus polychopterus*		V
VIREONIDAE			
Olivaceous Greenlet	*Hylophilus olivaceus*	NT	P (Flickr 30)
Slaty-capped Shrike-Vireo	*Vireolanius leucotis*		S (XC383843)
Red-eyed Vireo	*Vireo olivaceus*		V
CORVIDAE			
Violaceous Jay	*Cyanocorax violaceus*		P (Flickr (31); S (XC157152)
Green Jay	*Cyanocorax yncas*		V
HIRUNDINIDAE			
Blue-and-white Swallow	*Pygochelidon cyanoleuca*		V
White-banded Swallow	*Atticora fasciata*		V
White-thighed Swallow	*Atticora tibialis*		V
Southern Rough-winged Swallow	*Stelgidopteryx ruficollis*		P (OD 101)
TROGLODYTIDAE			
Wing-banded Wren	*Microcerculus bambla*		V; S (XC334559)
Scaly-breasted Wren	*Microcerculus marginatus*		P (OD 102,103); S (XC334548)
House Wren	*Troglodytes aedon*		V
Coraya Wren	*Pheugopedius coraya*		V; S (XC334540)
White-breasted Wood Wren	*Henicorhina leucosticta*		S (XC195396)
Musician Wren	*Cyphorhinus arada*		S (XC308739)
CINCLIDAE			
White-capped Dipper	*Cinclus leucocephalus*		V

Common name	Scientific name	2017 IUCN Red List category	Evidence
TURDIDAE			
Spotted Nightingale-Thrush	*Catharus dryas*		S (XC106633)
Swainson's Thrush	*Catharus ustulatus*		P (OD 104,105)
Black-billed Thrush	*Turdus ignobilis*		V
THRAUPIDAE			
Magpie Tanager	*Cissopis leverianus*		P (Flickr 32)
Oleaginous Hemispingus	*Sphenopsis frontalis*		V
Flame-crested Tanager	*Tachyphonus cristatus*		V
White-shouldered Tanager	*Tachyphonus luctuosus*		V
White-lined Tanager	*Tachyphonus rufus*		V
Fulvous Shrike-Tanager	*Lanio fulvus*		V
Silver-beaked Tanager	*Ramphocelus carbo*		P (Flickr 33,34); S (XC94285)
Blue-grey Tanager	*Thraupis episcopus*		P (Flickr 35)
Palm Tanager	*Thraupis palmarum*		P (Flickr 36); S (XC94286)
Masked Tanager	*Tangara nigrocincta*		P (Flickr 37)
Blue-necked Tanager	*Tangara cyanicollis*		P (Flickr 38)
Beryl-spangled Tanager	*Tangara nigroviridis*		V
Blue-browed Tanager	*Tangara cyanotis*		V
Turquoise Tanager	*Tangara mexicana*		P (Flickr 39)
Paradise Tanager	*Tangara chilensis*		P (Flickr 40)
Opal-crowned Tanager	*Tangara callophrys*		V
Bay-headed Tanager	*Tangara gyrola*		V
Golden-eared Tanager	*Tangara chrysotis*		V
Green-and-gold Tanager	*Tangara schrankii*		V
Golden Tanager	*Tangara arthus*		V
Yellow-bellied Tanager	*Ixothraupis xanthogastra*		V
Spotted Tanager	*Ixothraupis punctata*		V
Swallow Tanager	*Tersina viridis*		P (OD 107,108)
Black-faced Dacnis	*Dacnis lineata*		P (OD 109,110)
Yellow-bellied Dacnis	*Dacnis flaviventer*		V
Blue Dacnis	*Dacnis cayana*		V
Purple Honeycreeper	*Cyanerpes caeruleus*		V
Green Honeycreeper	*Chlorophanes spiza*		V
Guira Tanager	*Hemithraupis guira*		V
Yellow-backed Tanager	*Hemithraupis flavicollis*		V
Deep-blue Flowerpiercer	*Diglossa glauca*		S (XC308737)
Slate-coloured Grosbeak	*Saltator grossus*		V
Greyish Saltator	*Saltator coerulescens*		P (Flickr 41); S (XC156270)
Blue-black Grassquit	*Volatinia jacarina*		P (Flickr 42)
Chestnut-bellied Seedeater	*Sporophila castaneiventris*		V
Chestnut-bellied Seed Finch	*Sporophila angolensis*		V
Caquetá Seedeater	*Sporophila murallae*		P (Flickr 43)
Black-and-white Seedeater	*Sporophila luctuosa*		V
Bananaquit	*Coereba flaveola*		P (OD 111,112)
EMBERIZIDAE			
Yellow-throated Chlorospingus	*Chlorospingus flavigularis*		V
Common Chlorospingus	*Chlorospingus flavopectus*		V
Yellow-browed Sparrow	*Ammodramus aurifrons*		V
Orange-billed Sparrow	*Arremon aurantiirostris*		P (OD 113,114); S (XC334432)
Olive Finch	*Arremon castaneiceps*	NT	V
Chestnut-capped Brush Finch	*Arremon brunneinucha*		V
Rufous-collared Sparrow	*Zonotrichia capensis*		V

Common name	Scientific name	2017 IUCN Red List category	Evidence
CARDINALIDAE			
Summer Tanager	*Piranga rubra*		V
Scarlet Tanager	*Piranga olivacea*		V
Blue-black Grosbeak	*Cyanoloxia cyanoides*		V
PARULIDAE			
Tropical Parula	*Setophaga pitiayumi*		V
Blackburnian Warbler	*Setophaga fusca*		V
Yellow Warbler	*Setophaga petechia*		V
Blackpoll Warbler	*Setophaga striata*		V
Three-striped Warbler	*Basileuterus tristriatus*		V
Canada Warbler	*Cardellina canadensis*		V
Slate-throated Redstart	*Myioborus miniatus*		V
ICTERIDAE			
Russet-backed Oropendola	*Psarocolius angustifrons*		V; S (XC174090)
Crested Oropendola	*Psarocolius decumanus*		P (OD 123)
Yellow-rumped Cacique	*Cacicus cela*		V
Subtropical Cacique	*Cacicus uropygialis*		S (XC383842)
Giant Cowbird	*Molothrus oryzivorus*		V
FRINGILLIDAE			
Bronze-green Euphonia	*Euphonia mesochrysa*		V; S (XC132020)
Orange-bellied Euphonia	*Euphonia xanthogaster*		P (OD 124–128)
Blue-naped Chlorophonia	*Chlorophonia cyanea*		V

Diversidade de aves de rapina em uma paisagem fragmentada no sudoeste da Amazônia, Cacoal, Rondônia, Brasil

Thatiane Martins da Costa, Francisca Helena Aguiar-Silva, Odair Diogo da Silva e Emerson Moreira

Received 11 March 2017; final revision accepted 8 December 2017
Cotinga 40 (2018): 23–30
published online 16 June 2018

Birds of prey are important avifaunal components in ecosystems. The present study aimed to quantify the richness and analyse the occurrence of birds of prey in a forest fragment in southern Rondônia. The study was undertaken between January and September 2016, sampling diurnal and nocturnal birds of prey via a series of linear transects. Two hundred and seventeen individuals belonging to 35 species of six families were identified. The most frequent species, Roadside Hawk *Rupornis magnirostris*, was recorded on most transects, whereas 15 species were recorded just once. The raptor assemblage in the forest fragment studied includes generalists, species with strong dispersal capabilities and those tolerant of a non-forested matrix. The data demonstrate that even fragmented forests are important for the conservation of birds of prey, including rare, large and Near Threatened species such as Harpy Eagle *Harpia harpyja*. Connectivity among fragments, and availability of food resources and shelter will influence the permanence of these individuals.

A fragmentação florestal tem interferido na dinâmica das populações e na estrutura das comunidades de aves, embora aquelas resistentes aos impactos da perda de hábitat persistam em hábitats alterados[20,21]. A história de vida das espécies tem sido registrada como um dos fatores que predispõem à extinção das aves sob influência da fragmentação florestal[21]. No caso das aves de rapina, ocupando o nível trófico como predadores de topo, ocorrendo em baixas densidades populacionais e com baixa taxa reprodutiva, algumas espécies são mais sensíveis à perturbação do hábitat, enquanto outras são tolerantes a fragmentação florestal[23].

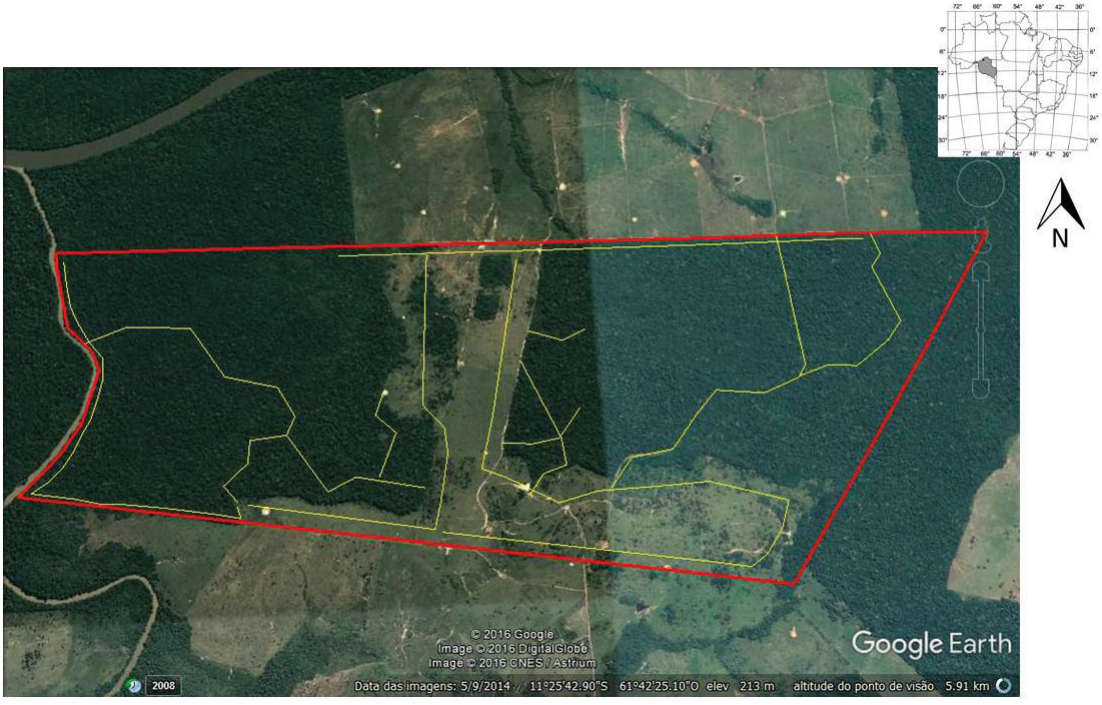


Figura 1. Transectos (linhas em amarelo) percorridos entre janeiro e setembro de 2016, durante a amostragem das aves de rapina. Polígono da área de estudo (linha vermelha), Fazenda Água Doce, Cacoal, Rondônia. © Google Earth 2014.

A maioria das aves de rapina apresenta adaptações para caça ativa, e desempenham papel fundamental no equilíbrio ecológico dos hábitats, como reguladores de populações das presas que consomem[10,32]. No entanto, não estão distribuídas uniformemente nos diferentes tipos de hábitats[18], e aspectos ecológicos, comportamentais, fisiológicos são alguns dos fatores que influenciam na seleção de hábitat [3,7,15].

O Brasil elaborou em 2008 o Plano de ação nacional para a conservação das aves de rapina[43], que defende o planejamento estratégico para conservação de populações de aves de rapina brasileiras e o direcionamento de projetos de pesquisa geradores de informações sobre as espécies. No caso do cenário de intensa fragmentação florestal na região sudoeste da Amazônia brasileira, onde está localizado o Estado de Rondônia, torna-se imprescindível o desenvolvimento de estudos que viabilizem o entendimento dos processos ecológicos em hábitats alterados[12]. E embora existam relevantes estudos com aves em algumas regiões de Rondônia[5,33,38,44], muitos dos métodos empregados nestes estudos, por não serem estudos direcionados à amostragem do grupo de rapinantes, podem por vezes não ser eficientes na detecção de determinadas espécies deste grupo[18].

No presente trabalho, objetivou-se quantificar a riqueza, a abundância e analisar a ocorrência de aves de rapina em diferentes hábitats de uma paisagem fragmentada, localizada em Cacoal, Rondônia. Com este estudo pretende-se contribuir com conhecimento da diversidade de aves de rapina da região, que possa favorecer ações para a conservação deste grupo de aves na Amazônia.

Materiais e Métodos

Área de estudo.—O estudo foi desenvolvido na Reserva Água Doce (11°26'11.00"S, 61°42'29.00"O), localizada no município de Cacoal, em Rondônia, sudoeste da Amazônia brasileira, na bacia do rio Ji-Paraná (Fig. 1). A área de propriedade de Jorge Antônio Cavallet, possui cerca de 1.100 ha divididos em hábitat florestal (700 ha) e aberto com pastagem (400 ha). Os principais remanescentes florestais são formados por reserva legal (RL) e áreas de preservação permanentes (APP) às margens do rio Machado / Ji-Paraná conectados entre si (Fig. 1).

A região localizada no trecho oeste do 'arco do desmatamento' é caracterizada por ser uma região de grande pressão antrópica[13]. Cacoal foi um dos projetos de assentamento pioneiros na década de 70 em Rondônia, com um fluxo de migração intenso e rápido crescimento populacional na região antes desabitada, que ao longo da rodovia BR-364 (Cuiabá–Porto Velho), a cobertura florestal foi substituída pelo desflorestamento para instalação da agropecuária[11,13]. Entre 1986 e 2005, a vegetação natural que ocupava 42,65% da área total do município de Cacoal, caiu para apenas 15,95%, um decréscimo de 37,37%[6]. Atualmente, no entorno da área de estudo predominam fragmentos florestais isolados inseridos em uma matriz com usos antrópicos, principalmente em pastagem[6].

A fitofisionomia da área é do tipo Floresta Ombrófila Aberta de terra firme[36]. Os ambientes aquáticos da área de estudo são formados pelo rio São Pedro, afluente da margem esquerda do rio Machado / Ji-Paraná e por pequenos igarapés que passam por dentro da área de floresta, algumas poças temporárias e açudes na área de pastagem. O clima é classificado segundo Köppen como Aw (Clima Tropical Chuvoso)[2], temperatura média anual entre 23ºC e 26ºC[16], precipitação média anual entre 1.400 e 2.300 mm, com estação de estiagem entre os meses de junho a outubro e a chuvosa entre novembro e abril.

Coleta de dados.—Por meio do método da transecção linear foi realizado o levantamento qualitativo e quantitativo das espécies de aves de rapina diurnas e noturnas. O percurso dos transectos ocorreu em trilhas pré-existentes no interior do fragmento, na borda de contato entre floresta e rio, floresta e pastagem, e na pastagem.

As amostragens ocorreram entre janeiro e setembro de 2016, distribuídas em 21 dias de campo, totalizando 108 horas de amostragem (81 horas diurnas e 27 horas noturnas). A amostragem das aves diurnas foi realizada a partir das 06h00 até as 12h00. Para amostrar as aves noturnas, as saídas a campo se iniciavam as 18h00 e finalizavam as 21h00. Dois observadores percorriam os transectos a 1 km / hora. Em todos os transectos o esforço foi o mesmo (isso considerando que são de tamanhos diferentes). Cada dia de amostragem um transecto foi amostrado, procurando amostrar em horários equivalentes. As amostragens noturnas foram limitadas devido à segurança, pois há evidências de caçadores utilizando a propriedade, e as saídas apenas aconteceram quando haviam mais pessoas para acompanhar.

Considerando os hábitats, a área de borda com pastagem foi mais privilegiada na amostragem, pois servia de trajeto para acessar a área do centro do fragmento florestal.

As espécies foram identificadas com o apoio de guias de aves[14,42], e seguiu a taxonomia do Comitê Brasileiro de Registros Ornitológicos[34]. O *website* Wikiaves (WA; www.wikiaves.com.br) foi utilizado como ferramenta complementar na identificação das espécies registradas. Ornitólogos também foram consultados para identificação / confirmação dos registros fotográficos. As espécies também foram identificadas a partir da vocalização após prévio aprendizado utilizando o banco de vocalizações disponível no *website* Xeno-canto (www.xeno-canto.org). Para espécies que não

vocalizam espontaneamente e para registro das espécies noturnas, *playback* foi utilizado na tentativa de aproximação da ave. A sequência da reprodução das vocalizações seguiu uma ordem em relação ao tamanho das espécies que ocorrem na região, sendo a de menor porte a primeira a ser reproduzida e por último a de maior porte[18]. O playback era acionado em diferentes pontos no percorrer do transecto.

A atividade das espécies registradas (voando, pousada, se alimentando, dormindo, vocalizando) e o tipo de hábitat onde houve o registro foram anotados. Os tipos de hábitat foram classificados em cinco categorias: floresta (f), borda rio (br), pastagem (p), borda pastagem (bp), agricultura (a). Agricultura se refere a plantação de frutíferas como laranja, ingás, açaí, jaca, poncã, cupuaçu, pupunha, maracujá, graviola, acerola, limão, pitaya, dendê, pitanga, café e também de mandioca, pimenta e hortaliças.

Análises estatísticas.—A composição de espécies de aves de rapina entre os hábitats foi analisada utilizando o índice de similaridade de *Jaccard* (*Sj*)[24]. Curvas de acumulação de espécies (com o estimador não paramétrico de Mao Tau), de rarefação e dois diferentes estimadores da riqueza de espécies (Chao 1 e ACE) foram utilizados para avaliar se o esforço amostral foi eficiente[17,35] para representar a comunidade de aves de rapina na área de estudo e para determinar o número esperado de espécies[8]. Chao 1 e ACE são estimadores de riqueza baseados nas abundâncias[17].

Resultados e Discussão

Duzentos e dezessete indivíduos de 35 espécies de aves de rapina foram registrados na Reserva Água Doce em Cacoal, Rondônia (Tabela 1). A espécie mais frequente, *Rupornis magnirostris*, foi registrada na maioria das amostragens, enquanto outras 15 foram registradas apenas uma vez (Tabela 1). *R. magnirostris* é uma espécie abundante e ocupa ampla variedade de ambientes[14,41]. O total de espécies registradas neste estudo representa 35% das 97 espécies de aves de rapina conhecidas no Brasil, sendo que na região do presente estudo em levantamentos prévios foram registradas até 37 espécies[33,38].

A maioria das espécies noturnas foram registradas com *playback*, mas os registros podem ter sido prejudicados pelo baixo esforço amostral (27 horas) no período de estudo. Amostragens no período das chuvas, que ocorrem na região entre novembro e maio, também podem ter influenciado o esforço de coleta no horário noturno[4].

A curva de acumulação de espécies sugere que o número de espécies ainda não estabilizou com a quantidade de dias amostrados (Fig. 2). Os estimadores de riqueza de espécies produziram estimativas maiores do que a riqueza de 35 espécies registrada em nove meses. As estimativas produzidas pelo método baseado em espécies variaram entre 48 ± 9,7 com Chao 1 e 52 ± 3,8 com ACE. No médio rio Ji-Paraná, leste de Rondônia, entre 1986 e 1988 um levantamento de aves, em duas áreas que seriam inundadas para instalação de empreendimento hidroelétrico, registrou 36 espécies de aves de rapina[44].

Espécies mais raras ou de difícil detecção podem não ter sido registradas, tais como o gênero *Micrastur*, em função de difícil detecção. Nenhum representante do gênero foi registrado durante o período do estudo, mesmo com a utilização frequente

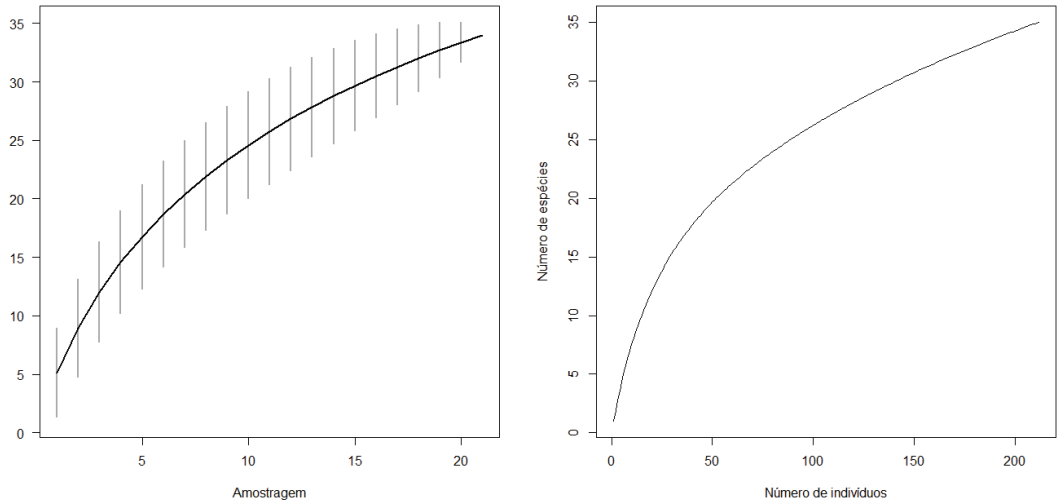


Figura 2. Curva de acumulação de espécies amostradas entre janeiro e setembro de 2016 na área de estudo.

de *playback*. Este gênero de falcão florestal foi registrado em florestas pouco perturbadas em Rondônia[33]. A ausência de registros na área deste estudo provavelmente é resultado da sensibilidade deste *Micrastur* a redução da cobertura florestal e perda de hábitat pela fragmentação florestal, compensando a baixa qualidade da paisagem com a ampliação da área de seu território e redução da defesa desta área[25]. Embora a área amostrada, não seja de grande extensão, faz parte de um corredor com outras áreas de preservação permanente e reservas legais. O registro de espécies com alta mobilidade pode ter sido influenciado por essa variável, somado a detectabilidade. Neste caso, a ausência do registro pode ter duas interpretações[9], um zero verdadeiro considerando a influência de um processo ecológico (ampliação do território) no período de amostragem, ou falso zero por ausência temporária. Provavelmente aumentando a área de amostragem e o período, *Micrastur* seria detectado, pois *M. ruficollis* ocorre na área, mas não foi detectado, pois há um registro de vocalização (G. C. Silva; WA2019154) anterior e outro de vocalização e avistamento posterior ao período deste estudo (TMC pers. obs.).

A metade dos registros ocorreu por meio de observação visual (51%), os demais foram por vocalização (19%), seguido por observação com vocalização (17%) e observação com registros fotográficos (8%) (Tabela 1).

Na floresta foram registradas 20 espécies, enquanto na pastagem 18 espécies, na borda da floresta com pastagem foram avistadas 13 espécies e na borda com o rio cinco espécies (Tabela 1). Dois ninhos de *Ictinia plumbea* foram mapeados, um localizado no centro da pastagem em um pinho cuiabano (*Schizolobium amazonicum*), e o outro localizado na borda do fragmento florestal com a pastagem em uma paineira (*Ceiba* sp.). Esta espécie utiliza hábitats alterados, florestas secundárias, bordas de florestas e campos abertos[14,38,40]. A estrutura da vegetação tem sido relatada como uma importante variável que influencia a composição de aves de rapina[26].

Com base na presença-ausência das 35 espécies de aves de rapina nos hábitats, a similaridade na riqueza de espécies entre a floresta e a borda de floresta em contato com pastagem atingiu 40%. A similaridade entre floresta e pastagem foi de 20%, sendo o mesmo valor observado entre a borda de pastagem e pastagem. E entre os hábitats com maior número de espécies registradas (floresta, borda da floresta com pastagem e pastagem) foi baixa (6%), compartilhando apenas três espécies: *Rupornis magnirostris*, *Buteo nitidus* e *Herpetotheres cachinnans*. O padrão de ocorrência das espécies nos diferentes hábitats pode estar relacionado com a filogenia, pois as duas primeiras espécies são generalistas na dieta e as três generalistas no uso de hábitat. As diferenças nas características das espécies, como conspicuidade, comportamento, história de vida e raridade, podem afetar a detecção, além de falhas no esforço, clima, método de amostragem, ou período da amostragem[9].

A proximidade da área de estudo com o rio Machado / Ji-Paraná e conexão entre os fragmentos pode ter favorecido a maior riqueza de aves de rapina nesta região, mesmo com entorno altamente fragmentado. Entre 2001 e 2003 em quatro diferentes áreas de Rondônia (Reserva Biológica do Traçadal, Terra Indígena Uru-Eu-Wau-Wau, Parque Nacional Serra da Cutia, Estação Ecológica Antônio Mujica Nava), Olmos *et al*.[33] registraram 37 espécies de aves de rapina, das quais 21 também foram registradas neste estudo (Tabela 1). Estas reservas compreendem desde 18.280 ha (Estação Ecológica Antônio Mujica Nava) a 1.87 milhões de ha (TI Uru-Eu-Wau-Wau), áreas 16,6 vezes maiores que o tamanho do fragmento florestal do presente estudo, no qual 14 foram exclusivas.

Durante a caracterização ornitológica realizada por Santos & Alves[38] na Reserva Biológica do Guaporé, também em Rondônia, foram registradas cinco espécies de aves de rapina—*Sarcoramphus papa*, *Herpetotheres cachinnans*, *Ibycter americanus*, *Pandion haliaetus* e *Harpia harpyja*. Na Floresta Nacional do Jamari, Rondônia, Santos *et al*.[39] registraram 16 espécies das aves de rapina: *Sarcoramphus papa*, *Harpia harpyja*, *Gampsonyx swainsonii*, *Ictinia plumbea*, *Elanoides forficatus*, *Buteo nitidus*, *Pseudastur albicollis*, *Caracara plancus*, *Herpetotheres cachinnans*, *Daptrius ater*, *Coragyps atratus*, *Cathartes burrovianus*, *C. melambrotus* e *Megascops choliba*. Os autores registraram ainda *Busarellus nigricollis* e *Falco rufigularis* que não foram observados durante as amostragens no presente estudo na Reserva Água Doce. Potencialmente mais amostragens poderiam favorecer o registro destas espécies considerando que a curva de acumulação de espécies ainda não chegou à estabilização (Fig. 2).

Isso sugere que a assembléia de aves de rapina no fragmento florestal estudado inclui principalmente espécies com hábitos generalistas, alta habilidade de dispersão e tolerantes à matrizes não-florestais.

Quanto à situação de conservação, das 35 espécies registradas, *Harpia harpyja* encontra-se listada como Quase Ameaçada de Extinção (NT) e as demais com situação de conservação Pouco Preocupante (LC)[22]. No entanto, na lista brasileira, a coruja-preta *Strix hulula* e o gavião-real estão classificados na categoria de Vulnerável[28], sendo que apenas o gavião-real é alvo em planos de ação nacional (PAN) recentes: PAN para a conservação das espécies endêmicas e ameaçadas de extinção da fauna da região do baixo e médio Xingu[27], PAN para

Tabela 1. Espécies de aves de rapina registradas na Fazenda Água Doce, Cacoal, Rondônia entre janeiro e setembro de 2016. *N* = Número de registros, FO = frequência de ocorrência (%).

Nome científico	Nome comum	*N*	FO	Ocorrência[a]	Tipo registro[b]	Hábitat[c]	Atividade[a]	Ameaça (IUCN)[e]
ACCIPITRIFORMES								
Pandionidae (1)								
Pandion haliaetus	águia-pescadora	*1*	0,5	comum/raro	ob, fo	p	D	LC
Accipitridae (15)								
Leptodon cayanensis	gavião-de-cabeça-cinza	*2*	0,9	comum	ob, fo	f, br	D	LC
Elanoides forficatus	gavião-tesoura	*8*	3,8	comum	ob, vo	bp, f	D	LC
Gampsonyx swainsonii	gaviãozinho	*1*	0,5	comum	ob	p	D	LC
Elanus leucurus	gavião-peneira	*1*	0,5	comum	ob	p	D/C	LC
Harpagus bidentatus	gavião-ripina	*1*	0,5	raro/comum	ob, fo	f	D	LC
Harpagus diodon	gavião-bombachinha	*2*	0,9	raro/comum	ob, fo	f, br, bp	D	LC
Ictinia plumbea	sovi	*8*	3,8	comum	ob, vo	bp, p	C	LC
Rostrhamus sociabilis	gavião-caramujeiro	*1*	0,5	comum	ob, fo	br	D	LC
Helicolestes hamatus	gavião-do-igapó	*3*	1,4	comum	ob, fo, vo	br	D	LC
Rupornis magnirostris	gavião-carijó	*43*	20,3	comum	ob, vo	f, br, bp, p	D	LC
Geranoaetus albicaudatus	gavião-de-rabo-branco	*2*	0,9	raro/comum	ob, fo	bp, p	D	LC
Pseudastur albicollis	gavião-branco	*1*	0,5	raro/comum	ob	bp	D	LC
Leucopternis kuhli	gavião-vaqueiro	*1*	0,5	raro	ob, fo	f	D	LC
Buteo nitidus	gavião-pedrês	*10*	4,7	raro/comum	ob, fo, vo	f, bp, p	D	LC
Harpia harpyja	gavião-real	*1*	0,5	raro	ob, fo	f	D	NT
FALCONIFORMES								
Falconidae (7)								
Daptrius ater	gavião-anta	*2*	0,9	comum	ob, vo	a	D	LC
Ibycter americanus	gralhão	*5*	2,4	comum	ob, vo	a, p	D	LC
Caracara plancus	caracará	*1*	0,5	comum	ob	p	D	LC
Milvago chimachima	carrapateiro	*1*	0,5	comum	ob	p	D	LC
Herpetotheres cachinnans	acauã	*16*	7,5	comum	ob, vo, fo	f, bp, p	D	LC
Falco sparverius	quiriquiri	*1*	0,5	comum	ob	br	D	LC
Falco femoralis	falcão-de-coleira	*1*	0,5	comum	ob	p	D	LC
CATHARTIFORMES								
Cathartidae (5)								
Cathartes aura	urubu-de-cabeça-vermelha	*9*	4,2	comum	ob	f, p	D	LC
Cathartes burrovianus	urubu-de-cabeça-amarela	*12*	5,7	comum	ob, fo	f, bp	D	LC
Cathartes melambrotus	urubu-da-mata	*10*	4,7	comum	ob	f, p	D	LC
Coragyps atratus	urubu-de-cabeça-preta	*18*	8,5	comum	ob	f, p	D	LC
Sarcoramphus papa	urubu-rei	*8*	3,8	raro	ob	f, p	D	LC
STRIGIFORMES								
Tytonidae (1)								
Tyto furcata	suindara	*2*	0,9	comum	ob	p	N	LC
Strigidae (6)								
Megascops choliba	corujinha-do-mato	*13*	6,1	-	vo	f, bp, a	-	LC
Megascops usta	corujinha-relógio	*15*	7,1	-	vo	f, bp	-	LC
Lophostrix cristata	coruja-de-crista	*3*	1,4	-	vo	f	-	LC
Strix huhula	coruja-preta	*1*	0,5	-	vo	f	-	LC
Glaucidium hardyi	caburé-da-amazônia	*3*	1,4	-	vo	f, bp	-	LC
Athene cunicularia	coruja-buraqueira	*5*	2,4	-	ob, vo	p	-	LC

[a]Ocorrência[20]: comum, raro.

[b]Tipo de registro: ob (observação), vo (vocalização), fo (fotografia).

[c]Hábitat do registro: borda rio (br), borda pastagem (bp), floresta (f), pastagem (p), agricultura (a).

[d]Atividade: diurna (D), crepuscular (C), noturna (N).

[e]Situação de ameaça (IUCN): LC (*Least Concern*) = Pouco preocupante, NT (*Near Threatened*) = Quase ameaçada.

a conservação das aves da Amazônia[29], PAN para conservação das aves do Cerrado e Pantanal[30] e PAN para conservação das aves da Mata Atlântica[31]. Na área de estudo em 2012 um ninho de gavião-real foi identificado e a reprodução acompanhada[1,18], até quando a árvore caiu naturalmente por influência do processo natural de inundação do rio São Pedro (J. A. Cavallet pers. com.).

Além do registro do gavião-real, mesmo não tendo sido registrado no período deste estudo, na área há registros de nidificação[19], fotográficos e auditivo da espécie *Spizaetus ornatus*, outro importante rapinante que também é alvo de perseguição e caça[20].

Conclusão

Os dados obtidos no presente estudo demonstram que mesmo áreas fragmentadas, são importantes na conservação de aves de rapina, entretanto fatores como conexão com outros fragmentos, disponibilidade de recurso alimentar, e abrigo influenciarão na permanência destes indivíduos no local.

O tamanho do fragmento florestal estudado, favorecido por sua conectividade com outros fragmentos pode apresentar uma riqueza de rapinantes ainda mais significativa. A área de estudo está inserida num mosaico de cobertura vegetal, por se conectar com áreas de preservação permanente dos rios São Pedro e Machado/ Ji- Paraná, e áreas de reserva legal de outras propriedades o que contribui para mobilidade destas aves.

O método de amostragem apresentou limitações quanto a detecção de espécies raras. Sugere-se o desenvolvimento de outros estudos nesta Reserva para contribuir com o conhecimento deste grupo visando à sua conservação nesta importante região da Amazônia brasileira.

Agradecimentos

Agradecemos à Jorge Antônio Cavallet, por autorizar a pesquisa na Reserva Água Doce e pelo auxilio no campo. Aos colegas Thiago Velten e Glauko Correa por suas colaborações em campo. Ao Sula, indispensável na travessia pela balsa do Rio Machado. Familiares, amigos e professores que de alguma forma contribuíram com desenvolvimento deste trabalho de conclusão do curso de ciências biológicas.

Referências

1. Aguiar-Silva, F. H., Souza, L. S., Morais, W. G., Gusmão, A. C., Hilario, L. A. J., Jaudoin, O., Sanaiotti, T. M., Cavallet, J. A. & Santos, L. (2013) Áreas de Preservação Permanente na manutenção da interação presa-predador: primatas na dieta de harpia (*Harpia harpyja*) em Cacoal, RO. Em: *An. II Congr. Latinoamericano e XV Congr. Bras. Primatologia*. Recife.
2. Alvares, C. A., Stape, J. L., Sentelhas, P. C., Gonçalves, J. L. M. & Sparovek, G. (2014) Köppen's climate classification map for Brazil. *Meteorologische Zeitschrift* 22: 711–728.
3. Azevedo, M. A. G., Machado, D. A. & Albuquerque, J. L. B. (2003) Aves de rapina na Ilha de Santa Catarina, SC: composição, freqüência de ocorrência, uso de hábitat e conservação. *Ararajuba* 11: 75–81.
4. Barros, F. M. (2011) Área de vida, uso e seleção de habitat pela corujinha-do-mato *Megascops choliba* (Strigiformes: Strigidae) em uma área de cerrado na região central do Estado de São Paulo. Tese de Doutorado. Universidade de São Paulo.
5. Bóçon, R. (1999) Avifauna do Parque Estadual de Corumbiara, Rondonia, Brasil. Em: Fang, T., Montenegro, J. & Bodmer, R. E. (eds.) *Manejo y conservación de fauna silvestre en América Latina*. La Paz: WCS-MHNKMUAGRM, University of Florida, Instituto de Ecologia & UMSA.
6. Casagrande, B. (2009) Caracterização do meio físico e avaliação do desmatamento no município de Cacoal RO de 1986 a 2007, utilizando técnicas de geoprocessamento. Dissertação (Mestrado em Ciências Humanas). Universidade Federal de Uberlândia.
7. Cody, M. L. (1985) *Habitat selection in birds*. San Diego: Academic Press.
8. Colwell, R. K. & Coddington, J. A. (1994) Estimating terrestrial biodiversity through extrapolation. *Phil. Trans. R. Soc. Lond. B Biol. Sci.* 345: 101–118.
9. Dénes, F. V., Silveira, L. F. & Beissinger, S. R. (2015) Estimating abundance of unmarked animal populations: accounting for imperfect detection and other sources of zero inflation. *Methods Ecol. Evol.* 6: 543–556.
10. Estes, J. A., Terborgh, J., Brashares, J. S., Power, M. E., Berger, J. & Bond, W. J. (2011) Trophic downgrading of planet Earth. *Science* 333: 301–306.
11. Fearnside, P. M. (1986) Spatial concentration of deforestation in the Brazilian Amazon. *AMBIO* 15: 72–79.
12. Fearnside, P. M. (1989) *A ocupação humana de Rondônia: impactos, limites e planejamento*. Brasília: Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Assessoria Editorial & Divulgação Científica.
13. Fearnside, P. M. (2005) Desmatamento da Amazônia brasileira: história, índices e consequências. *Megadiversidade* 1: 113–123.
14. Ferguson-Lees, J. & Christie, D. A. (2001) *Raptors of the world*. Princeton, NJ: Princeton University Press.
15. Galina, A. B. & Gimenes, M. R. (2006) Riqueza, composição e distribuição espacial da comunidade de aves em um fragmento florestal urbano em Maringá, norte do Estado do Paraná, Brasil. *Acta Sci. Biol. Sci.* 28: 379–388.

16. Gama, M. J. (2000) *Boletim climatológico de Rondônia*. Porto Velho: Sedam.
17. Gotelli, N. J., & Colwell, R. K. (2001) Estimating species richness. Em: Magurran, A. E. & McGill, B. J. (eds.) *Frontiers in measuring biodiversity*. New York: Oxford University Press.
18. Granzinolli, M. A. M. & Motta-Junior, J. C. (2008) Aves de rapina: levantamento, seleção de habitat e dieta. Em: Matter, S. V., Straube, F. C., Accordi, I., Piacentini, V. & Cândido, J. F. (orgs.) *Ornitologia e conservação: ciência aplicada, técnicas de pesquisa e levantamento*. Rio de Janeiro: Technical Books.
19. Gusmão, A. C., Banhos, A., Aguiar-Silva, F. H., Souza, L. S., Sanaiotti, T. M., Silva, A. M., Costa, T. M., Oliveira, L. E., Morais, W. G. & Ferrari, S. F. (2016) Records of the occurrence, nesting, and hunting of the Harpy Eagle (*Harpia harpyja*) (Aves: Accipitridae) in Rondônia, southwestern Brazilian Amazonia. *Atualidades Orn*. 190: 18–23.
20. Lees, A. C. & Peres, C. A. (2006) Rapid avifaunal collapse along the Amazonian deforestation frontier. *Biol. Conserv*. 133: 198–211.
21. Lees, A. C. & Peres, C. A. (2008) Avian life history determinants of local extinction risk in a fragmented Neotropical forest landscape. *Anim. Conserv*. 11: 128–137.
22. IUCN (2016) The IUCN Red List of threatened species. www.iucnredlist.org (acessado 20 August 2016)
23. Jullién, M. & Thiollay, J.-M. (1996). Effects of rain forest disturbance and fragmentation: comparative changes of the raptor community along natural and human-made gradients in French Guiana. *J. Biogeogr*. 23: 7–25.
24. Magurran, A. E. (1988) *Ecological diversity and its measurement*. Princeton, NJ: Princeton University Press.
25. Martínez-Ruiz, M., Escalante, P. & Renton, K. (2016) Forest cover influences territoriality of Collared Forest-Falcons in a modified landscape of tropical moist forest. *J. Raptor Res*. 50: 404–415.
26. Menq, W. & Anjos, L. (2015) Habitat selection by owls in a seasonal semi-deciduous forest in southern Brazil. *Braz. J. Biol*. 75: 143–149.
27. Ministério do Meio Ambiente (MMA) & Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) (2012) *Plano de ação nacional para a conservação das espécies endêmicas e ameaçadas de extinção da fauna da região do Baixo e Médio Xingu – PAN Baixo e Médio Xingu. Portaria Nº 16, 17 de fevereiro de 2012*. Brasília: MMA & ICMBio.
28. Ministério do Meio Ambiente (MMA) & Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) (2014) *Lista nacional das espécies da fauna brasileira ameaçadas de extinção. Portaria Nº 444, 17 de dezembro de 2014*. Brasília: MMA & ICMBio.
29. Ministério do Meio Ambiente (MMA) & Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) (2014) *Plano de ação nacional para conservação das aves da Amazônia ameaçadas de extinção, PAN Aves da Amazônia. Portaria Nº 35, 27 de março de 2014*. Brasília: MMA & ICMBio.
30. Ministério do Meio Ambiente (MMA) & Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) (2014) *Plano de ação nacional para conservação das aves do Cerrado e Pantanal, PAN Aves do Cerrado e Pantanal. Portaria Nº 34, 27 de março de 2014*. Brasília: MMA & ICMBio.
31. Ministério do Meio Ambiente (MMA) & Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) (2017) *Plano de ação nacional para conservação das aves da Mata Atlântica, PAN Aves da Mata Atlântica. Portaria Nº 34, 24 de janeiro de 2017*. Brasília: MMA & ICMBio.
32. Newton, I. (1979) *Population ecology of raptors*. Vermillion, SD: Buteo Books.
33. Olmos, F., Silveira, L. F. & Benedicto, G. A. (2011) A contribution to the ornithology of Rondônia, southwest of the Brazilian Amazon. *Rev. Bras. Orn*. 19: 200–229.
34. Piacentini, V. Q., Aleixo, A., Agne, C. E., Maurício, G. N., Pacheco, J. F., Bravo, G. A., Brito, G. R. R., Naka, L. N., Olmos, F., Posso, S., Silveira, L. F., Betini, G. S., Carrano, E., Franz, I., Lees, A. C., Lima, L. M., Pioli, D., Schunck, F., Amaral, F. R., Bencke, G. A., Cohn-Haft, M., Figueiredo, L. F. A., Straube, F. C. & Cesari, E. (2015) Annotated checklist of the birds of Brazil by the Brazilian Ornithological Records Committee / Lista comentada das aves do Brasil pelo Comitê Brasileiro de Registros Ornitológicos. *Rev. Bras. Orn*. 23: 91–298.
35. R Development Core Team R (2016) A language and environment for statistical computing. Vienna: R Foundation for Statistical Computing. www.R-project.org (acessado 20 December 2016).
36. Radambrasil (1974) *Geologia, geomorfologia, pedologia, vegetação e uso potencial da terra*, 1. Brasília: Departamento Nacional de Produção Mineral.
37. Sanders, H. (1968) Marine benthic diversity: a comparative study. *Amer. Natur*. 102: 243–282.
38. Santos, C. C. & Alves, S. L. (2014) Aves da Reserva Biológica do Guaporé, Rondônia, Brasil. Em: *An. VI Seminário de Pesquisa e VI Encontro de Iniciação Científica do Instituto Chico Mendes de Conservação da Biodiversidade, Brasília, DF*.
39. Santos, M. P. D, Silva, G. C. & Reis, A. L. (2011) Birds of the Igarapé Lourdes Indigenous Territory, Jí-Paraná, Rondônia, Brazil. *Rev. Bras. Orn*. 19: 134–153.
40. Seavy, N. E., Schulze, M. D., Whitacre, D. F. & Vasquez, M. A. (1998) Breeding biology and behavior of the Plumbeous Kite. *Wilson Bull*. 110: 77–85.
41. Sick, H. (1997) *Ornitologia brasileira*. Rio de Janeiro: Ed. Nova Fronteira,.
42. Sigrist, T. (2009) *Avifauna brasileira: guia de campo*. São Paulo: Avis Brasilis.

43. Soares, E. S., Amaral, F. S. R., Carvalho-Filho, E. P. M., Granzinolli, M. A., Albuquerque, J. L. B., Lisboa, J. S., Azevedo, M. A. G., Moraes, W., Sanaiotti, T. M. & Guimarães, I. G. (2008) *Plano de ação nacional para a conservação de aves de rapina*. Brasília: ICMBio.
44. Stotz, D. F., Lanyon, S. M., Schulenberg, T. S., Willard, D. E., Peterson, A. T. & Fitzpatrick, J. W. (1997) An avifaunal survey of two tropical forest localities on the middle rio Jiparaná, Rondônia, Brazil. Em: Remsen, J. V. (ed.) *Studies in Neotropical ornithology honoring Ted Parker*. *Orn. Monogr*. 48.

Thatiane Martins da Costa
Programa de Pós-Graduação em Ciências Ambientais, Universidade do Estado do Mato Grosso (UNEMAT), Av. Santos Dumont s/n, Cidade Universitária (Bloco II), Cáceres/MT, Brasil. E-mail: thaticpcl@gmail.com.

Francisca Helena Aguiar-Silva
Instituto Nacional de Pesquisas da Amazônia (MCTIC/CNPq/INPA/PCI), Manaus, Amazonas, Brasil. E-mail: aguiarsilva.fh@gmail.com.

Odair Diogo da Silva
Grupo de Trabalho e Conservação do Gavião-real no Estado de Rondônia & Laboratório de Mastozoologia da Universidade do Estado do Mato Grosso (UNEMAT), Av. Santos Dumont s/n, Cidade Universitária (Bloco II), Cáceres/MT, Brasil. E-mail: odair_diogo@hotmail.com.

Emerson Almeida Moreira
Faculdade de Ciências Biomédicas de Cacoal (FACIMED), Cacoal, Rondônia, Brasil.

Bird diversity in the seasonally dry forests of central Huallaga, Peru

Francisco A. Vásquez-Arévalo, Joaquín A. Grández-Casado, Giria E. Muñoz-Pizango, Roosevelt García-Villacorta and Giussepe Gagliardi-Urrutia

Received 15 March 2017; final revision accepted 23 April 2018
Cotinga 40 (2018): 31–43
published online 16 June 2018

Realizamos un inventario de aves en cuatro concesiones de conservación en las provincias de Bellavista y Picota, departamento San Martín, Perú, en agosto y septiembre 2015, mediante censos en transectos y capturas con redes de niebla. Registramos 246 especies correspondientes a 20 órdenes y 45 familias, incluyendo dos especies endémicas del Perú (*Zimmerius villarejoi* y *Ramphocelus melanogaster*). Resaltó la presencia de especies con distribución restringida a bosques secos en el Perú como *Phaethornis pretrei*, *Hylophilus pectoralis*, *Thamnophilus punctatus*, *Casiornis rufus*, entre otras. En conjunto con estudios previos en la zona, reportamos 311 especies de aves. La conservación de la ornitofauna de los bosques secos requiere de la conexión de estas áreas fragmentadas mediante corredores de conservación.

The seasonally dry forests of central Huallaga possess a floristic composition that differs from other dry forests in the Pacific and inter-montane valleys of Peru[8,10]. These forests have a wide extension from Tarapoto to Juanjuí in dpto. San Martín[7,25] and are highly threatened due to agricultural expansion and timber extraction[8,13]. Currently, Huallaga dry forests are considered a national priority for conservation in Peru[25].

These forests have a unique avifauna, with high potential for bird tourism as part of the Northern Peru Birding Route[15]. The avifauna includes endemics like Mishana Tyrannulet *Zimmerius villarejoi* and Black-bellied Tanager *Ramphocelus melanogaster*[2,3,24], and species with restricted ranges in Peru, e.g. Planalto Hermit *Phaethornis pretrei*, Northern Slaty Antshrike *Thamnophilus punctatus*, Chestnut-throated Spinetail *Synallaxis cherriei*, Pearly-vented Tody-Tyrant *Hemitriccus margaritaceiventer* and Ashy-headed Greenlet *Hylophilus pectoralis*, among others[3,28,29].

Despite the availability of existing information on the avifauna of Huallaga dry forests, there has been no attempt to describe their bird communities.

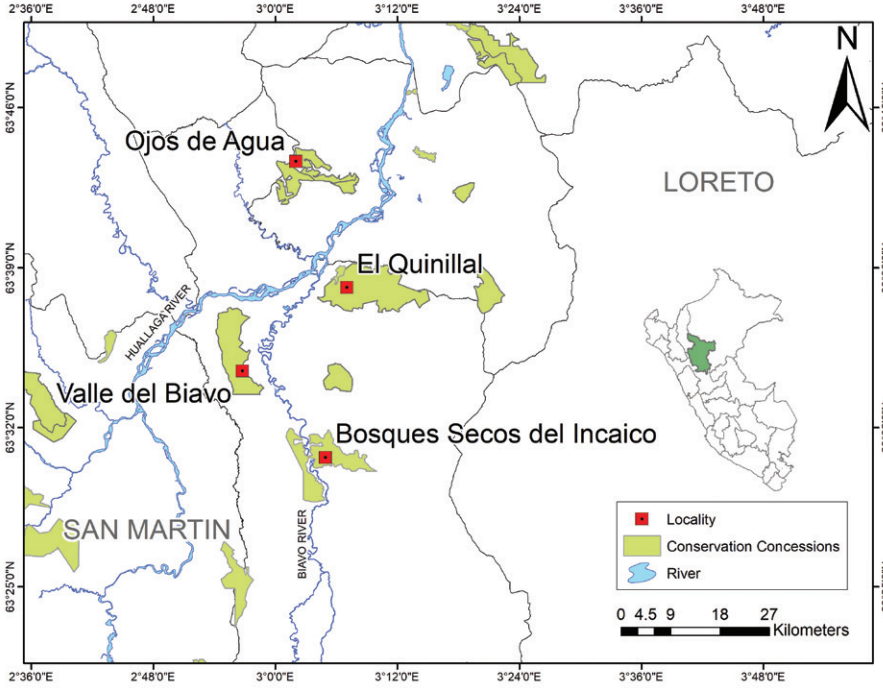


Figure 1. Map of study areas in San Martín, Peru.

Table 1. Specimens collected in the dry forest of Huallaga by locality and habitat. Localities = Valle del Biavo (BV), Bosques Secos del Incaico (BSI), El Quinillal (EQ) and Ojos de Agua (OA). Habitats include dry ridge forest (Bsc), dry plains forest (Bsp), quebrada forest (Bq), riparian forest of the Biavo River (Br) and secondary vegetation (Vs).

Scientific name	English name	Cat. no. (CRBIIAP-AVE)	Locality	Habitat
Nyctidromus albicollis	Common Pauraque	00034	EQ	Bsp
Anurolimnas viridis	Russet-crowned Crake	00015	BSI	Vs
Laterallus exilis	Grey-breasted Crake	00012	BSI	Vs
Momotus momota	Amazonian Motmot	00017, 00018	BSI	Bsc
Thamnophilus doliatus	Barred Antshrike	00032, 00046	EQ, OA	Bsc , Bq
Thamnophilus schistaceus	Plain-winged Antshrike	00002, 00008	VB	Bsp
Myrmoborus myotherinus	Black-faced Antbird	00003, 00028	VB, EQ	Bsp
Sciaphylax hemimelaena	Chestnut-tailed Antbird	00030	EQ	Bsp, Bsc
Dendrocincla fuliginosa	Plain-brown Woodcreeper	00011, 00035	VB, OA	Bsp
Dendrocincla merula	White-chinned Woodcreeper	00016, 00020	BSI	Bsp
Dendroplex picus	Straight-billed Woodcreeper	00052	OA	Vs
Xiphorhynchus elegans	Elegant Woodcreeper	00007,00031, 00033, 00039	VB, EQ, OA	Bsc, Bsp
Xiphorhynchus guttatus	Buff-throated Woodcreeper	00036	OA	Bsp
Mionectes oleagineus	Olive-striped Flycatcher	00038	OA	Bsp
Lophotriccus vitiosus	Double-banded Pygmy Tyrant	00021	BSI	Bsc
Todirostrum cinereum	Common Tody-Flycatcher	00042	OA	Bsc
Onychorhynchus coronatus	Royal Flycatcher	00009, 00010	VB	Bsp
Myiobius atricaudus	Black-tailed Flycatcher	00023	EQ	Bsp
Terenotriccus erythrurus	Ruddy-tailed Flycatcher	00024	EQ	Bsp
Empidonax alnorum	Alder Flycatcher	00050	OA	Bsc
Rhytipterna simplex	Greyish Mourner	00025	EQ	Bsp
Myiarchus tyrannulus	Brown-crested Flycatcher	00044	OA	Bsc
Attila spadiceus	Bright-rumped Attila	00022	BSI	Bsc
Neopelma sulphureiventer	Sulphur-bellied Tyrant-Manakin	00048, 00049	OA	Bsc
Ceratopipra fasciicauda	Band-tailed Manakin	00004, 00005, 00006, 00013, 00014, 00019, 00029, 00037	VB, BSI, EQ, OA	Bsc
Hylophilus pectoralis	Ashy-headed Greenlet	00043	OA	Bsc
Tachyphonus rufus	White-lined Tanager	00040, 00041, 00047, 00051	OA	Bsp
Sporophila castaneiventris	Chestnut-bellied Seedeater	00045	OA	Bsp
Habia rubica	Red-crowned Ant Tanager	00026, 00027	EQ	Bsp

Published data are scarce and limited to localities such as Pucacaca[3], Ampinakuna Sacha Ancestral Territory and Lagunas de San Pablo[28], Juan Guerra and Quebrada Upaquihua[29]. Consequently, we studied species diversity in the seasonally dry forests of central Huallaga at four localities in the provinces of Picota and Bellavista, covering the largest area possible on both banks of the Huallaga River. Our study provides new data on little-known and restricted-range species, with an emphasis on threatened species at national and global levels.

Methods

We conducted avian inventories at four conservation concessions in the provinces of Picota and Bellavista, dpto. San Martín, Peru: Valle del Biavo (07°10'49.62"S 76°34'31.40"W, 330 m elevation); Bosques Secos del Incaico (07°19'27.21"S 76°25'24.18"W, 470 m); El Quinillal (07°03'7.42"S 76°21'24.45"W, 300 m); and Ojos de Agua (06°50'20.60"S 76°27'36.55"W, 450 m) (Fig. 1). Climate is seasonally dry, with 850–900 mm of annual rainfall and temperatures of 18–30°C on average[17]. The topography is primarily composed of three geological formations: Chambira, Ipururo and Juanjui[5,18]. Forest stature is in the range 7–20 m, with 25 m emergents. Nearly 150 plant species are known in the seasonally dry forests of San Martín, with *Manilkara bidentata*, locally known as quinilla, being the most important tree species[8].

Surveys were conducted on 21 August–7 September 2015. Three transects per camp were surveyed in Valle del Biavo, Bosques Secos del Incaico and El Quinillal, and two transects in Ojos de Agua, with each transect covering 2–4 km. Surveys were conducted at 05h30–11h00 and 16h00–18h00. During each survey, we counted all bird species heard or seen. We also made occasional observations outside formal census periods,

including nocturnal surveys and photographic records throughout the day. We captured birds using ten mist-nets (12.0 × 2.5 m), which were opened at 06h00–12h00 and checked every 30 minutes. Mist-nets were used on all transects during the census period. Specimens have been deposited at the Museo de Colecciones Referenciales Biológicas del Instituto de Investigaciones de la Amazonía Peruana (CRBIIAP), Iquitos (Table 1). Censuses and mist-netting were undertaken in five habitat types: dry ridge forest, dry plains forest, quebrada forest, riparian forest of the Biavo River and secondary vegetation (Fig. 2).

Species identification was based on Schulenberg *et al*.[24], but taxonomy follows SACC[16]. Sound-recordings were compared with published sources[19–23] and have been archived at www.xeno-canto.org. Threat categories follow the list of endangered species of Peru[12] and IUCN Red List[26].

Results

Species composition

We recorded 1,384 individuals of 246 species (Appendix). As expected, Passeriformes was the richest avian order (138 species), with the most speciose families being Tyrannidae (38 species), Thraupidae (24 species) and Thamnophilidae (22 species). Passeriformes was also the order with most individuals recorded (887), with Tyrannidae (264) and Thamnophilidae (256) the most abundant families, followed by Columbidae (78 individuals). Valle del Biavo was the richest study site.

At Valle del Biavo we recorded 136 species, 18 of them Thamnophilidae, 16 Tyrannidae and eight Thraupidae. The commonest species were *Thamnophilus punctatus*, Black-faced Antbird *Myrmoborus myotherinus*, Bright-rumped Attila *Attila spadiceus* and Blue Ground Dove *Claravis pretiosa*. We also found *Phaethornis pretrei*, a hummingbird restricted in Peru to dry forests in San Martín.

At Bosques Secos del Incaico we recorded 123 species belonging to 32 families, with Tyrannidae (21 species) being the richest family, followed by Thraupidae (12 species) and Thamnophilidae (ten species). The commonest species were Chestnut-tailed Antbird *Sciaphylax hemimelaena*, Forest Elaenia *Myiopagis gaimardii*, Band-tailed Manakin *Ceratopipra fasciicauda* and Amazonian Motmot *Momotus momota*. One Peruvian endemic, *Ramphocelus melanogaster*, was recorded.

At El Quinillal we recorded 108 species of 33 families, with the richest families being Tyrannidae (19 species), Thamnophilidae (12 species) and Thraupidae (eight species). The commonest species were Rufous-winged Antwren *Herpsilochmus rufimarginatus*, *Sciaphylax hemimelaena*, Tataupa Tinamou *Crypturellus tataupa* and Blue-headed Parrot *Pionus menstruus*. We obtained the first record of Grey-lined Hawk *Buteo nitidus* for San Martín[27] and also recorded the endemic *Ramphocelus melanogaster*.

At Ojos de Agua we recorded 129 species; the richest families were Tyrannidae (26 species), Thamnophilidae (15 species) and Furnariidae (11 species). The commonest species were Pygmy Antwren *Myrmotherula brachyura*, *Herpsilochmus rufimarginatus*, Barred Antshrike *Thamnophilus doliatus*, Undulated Tinamou *Crypturellus undulatus* and White-lined Tanager *Tachyphonus rufus*. This locality was richest in species restricted to dry forests in Peru, including *Hylophilus pectoralis*, Rufous Casiornis *Casiornis rufus* and Brown-crested Flycatcher *Myiarchus tyrannulus*. We also recorded *Zimmerius villarejoi*, a Peruvian endemic otherwise confined to white-sand forests.

Endangered species

We recorded one Vulnerable species in Peru (*Zimmerius villarejoi*) and two Near Threatened species (Razor-billed Curassow *Mitu tuberosum* and Curl-crested Araçari *Pteroglossus beauharnaisii*). Likewise, we observed three globally Vulnerable species[26]: Grey Tinamou *Tinamus tao*, Ruddy Pigeon *Patagioenas subvinacea* and *Zimmerius villarejoi*, and two that are Near Threatened: Ornate Hawk-Eagle *Spizaetus ornatus* and Orange-cheeked Parrot *Pyrilia barrabandi*.

Selected species accounts

Rufous Nightjar *Antrostomus rufus*
Recorded every night at Valle del Biavo on 24–26 August 2015, in quebrada forest and secondary vegetation. In Peru, this species is patchily distributed in the inter-montane valleys[24]. It was not recorded at our other study camps.

Planalto Hermit *Phaethornis pretrei*
Observed at Valle del Biavo on 22 August 2015, in the dry channel of a 4 m-wide rocky quebrada. In Peru, this species is restricted to the lower río Mayo and to dry forest in central Huallaga[24].

Northern Slaty Antshrike *Thamnophilus punctatus*
Recorded at all four localities (Fig. 3). At Valle del Biavo and Ojos de Agua, it was found in dry ridge forest, dry plains forest and secondary vegetation. At El Quinillal it was recorded in dry ridge forest, quebrada forest and secondary vegetation. At Bosques Secos del Incaico, it was found only in riparian forest.

Mishana Tyrannulet *Zimmerius villarejoi*
Recorded on 10 September 2015 at Ojos de Agua in dry ridge forest characterised by scrub 7 m tall on average. A single bird was vocalising in the canopy. This endemic ranges up to 1,100 m in the río Mayo

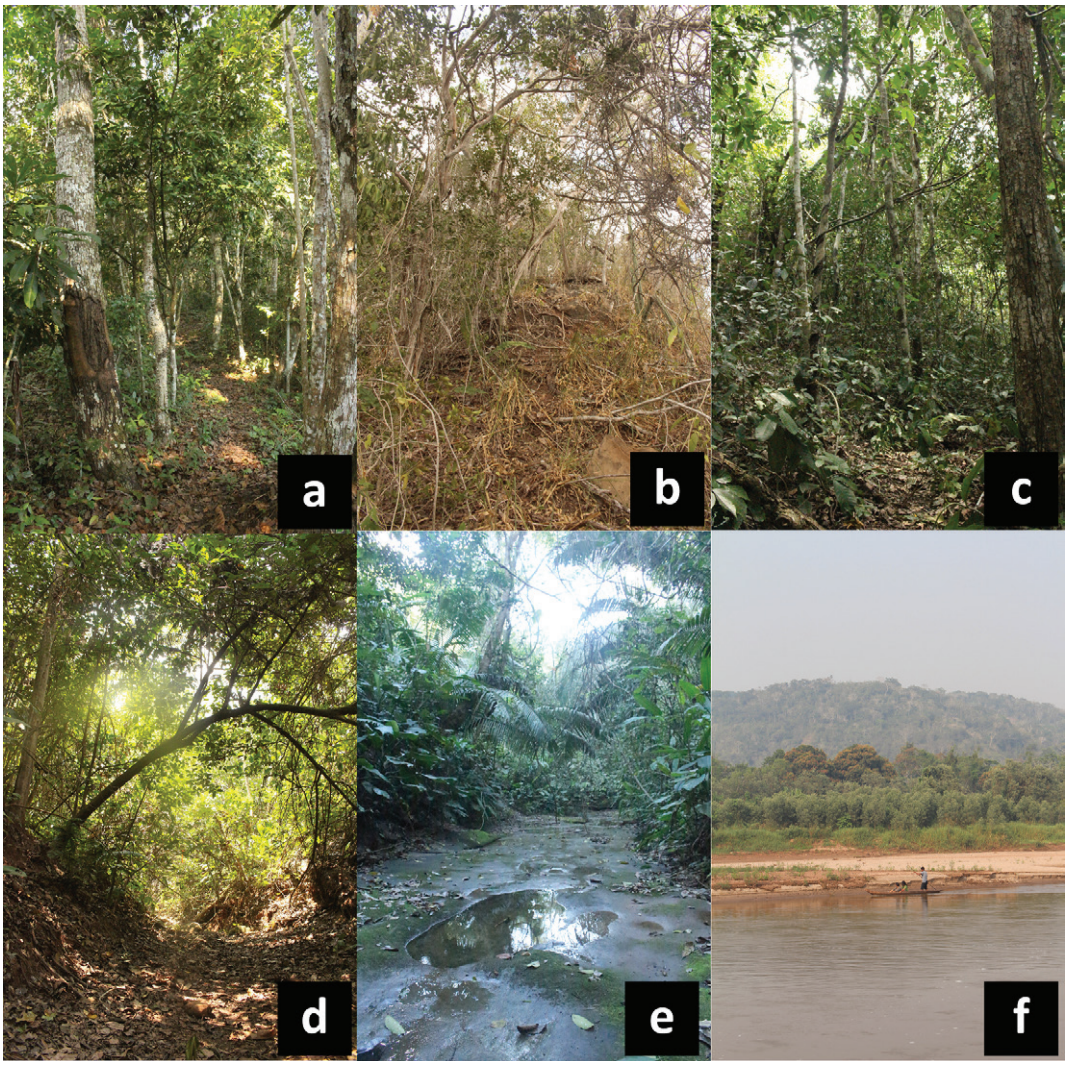


Figure 2. Habitats surveyed in the dry forest of Huallaga: (a, b) dry ridge forest, (c) dry plains forest, (d, e) quebrada forest and (f) riparian forest along the Biavo River (Giria E. Muñoz-Pizango)

Valley, San Martín, and in white-sand forests near Iquitos, Loreto[2,24].

Pearly-vented Tody-Tyrant *Hemitriccus margaritaceiventer*
Recorded on 9–10 September 2015 at Ojos de Agua in dry ridge forest and secondary vegetation characterised by dwarf brush, vocalising 1.5 m above ground.

Rufous Casiornis *Casiornis rufus*
One was recorded on 10 September 2015 at Ojos de Agua in low forest with abundant scrub. Mostly an austral migrant to Peru, but it has been suggested that resident populations occur in the middle río Huallaga[24]. Although our record was towards the end of the austral winter, there are records in San Martín year-round (www.eBird.org), supporting the hypothesis of a resident population.

Brown-crested Flycatcher *Myiarchus tyrannulus*
We trapped one at Ojos de Agua on 9 August 2015, in dry ridge forest with dwarf brush and dry scrub (Fig. 4). In Peru, found locally in dry forests of the Marañón Valley, the Urubamba Valley, and in the forests of Huallaga[24].

Ashy-headed Greenlet *Hylophilus pectoralis*
One trapped at Ojos de Agua in dry plains forest (Fig. 5). In this area, forest was low stature with abundant dry scrub. In Peru, the species is restricted to central Huallaga[24].

Figure 3. Northern Slaty Antshrike *Thamnophilus punctatus*, Valle del Biavo, San Martín, Peru, 22 August 2015 (Francisco A. Vásquez-Arévalo)

Figure 5. Ashy-headed Greenlet *Hylophilus pectoralis*, Ojos de Agua, San Martín, Peru, 9 September 2015 (Francisco A. Vásquez-Arévalo)

Figure 4. Brown-crested Flycatcher *Myiarchus tyrannulus*, Ojos de Agua, San Martín, Peru, 9 September 2015 (Joaquín A. Grández-Casado)

Black-bellied Tanager *Ramphocelus melanogaster*
Recorded at Bosques Secos del Incaico and El Quinillal, in riparian forest and secondary vegetation. Endemic to Peru, where confined to the basin of the ríos Mayo and Huallaga[24].

Discussion

Avian communities at our study sites included species with a broad Amazonian distribution, along with others restricted to dry forests in the inter-montane valleys of Peru, plus endemic and threatened species at global and national levels. Total species richness of the central Huallaga Valley currently numbers 311 species, including previous assessments and ours[3,28,29]. This total includes four species confined to dry forests in Peru, 12 that occur in dry forests and other habitats such as montane forest and bamboo, three additional montane species, and 292 species of the Amazonian lowlands.

Overall species richness in our study area is greater than at other dry forests in the Marañón Valley (c. 200 species; A. García-Bravo pers. comm.), El Angolo Reserve (196 species)[4] and Zapotillo, Ecuador (184 species)[14], the upper Magdalena Valley, Colombia (297 species)[11] and in Bolivia (245 species)[9]. However, dry-forest specialists are under-represented in the Huallaga Valley (four species), compared to 41 species at El Angolo[4], 43 at Zapotillo[14] and 57 species at Estancia Perforación, Bolivia[9]. Avian diversity in the Huallaga dry forests is influenced by their connectivity to Amazonian forests. Although it is not an isolated dry-forest region with numerous endemics like the Tumbesian region and Marañón Valley, it represents a unique and diverse avian community with an important concentration of restricted-range species in Peru.

Presence of more dry-forest specialists at Ojos de Agua than at other study sites reflects

its drier habitats, including low-stature forest, pasture microhabitats, exposed rocky outcrops and patches of cacti. In another survey, Álvarez *et al*.[3] reported other restricted-range species at this locality, including Chestnut-throated Spinetail *Synallaxis cherriei*, Cinereous-breasted Spinetail *S. hypospodia* and Rusty-backed Antwren *Formicivora rufa*. We believe that Ojos de Agua lies in a transitional area between dry and humid forests, given humidity increases between central Huallaga (850–900 mm annual rainfall) and north to the Tarapoto, Sauce and Sisa areas (1,213–2,365 mm annually)[17]. Local species composition is also influenced by two important habitats: riparian forest adjacent to the Biavo River (Valle del Biavo and Bosques Secos del Incaico) and disturbed habitats, mainly cacao and papaya crops, at El Quinillal and Bosques Secos del Incaico.

Various threats to birds were noted at our study sites, mostly agricultural expansion in the plains and, to a lesser extent, in hilly areas. Corn, rice, cacao and papaya crops are now the principal land use in the low valleys we sampled, where dry forests were formerly widespread. Hunting is also a threat to species like *Mitu tuberosum*, Spix's Guan *Penelope jacquacu*, tinamous and wood quails. Another threat is the indiscriminate logging of timber species such as quinilla *Manilkara bidentata*. Habitat fragmentation in the region is severe, with rural roads facilitating its expansion. Populations of flora and fauna in the conservation concessions could be severely affected in the near future. Therefore, connectivity between forest fragments on both sides of the Huallaga and Biavo Rivers is very important for conservation in the area.

There is significant potential to undertake further scientific research at our study sites, investigating birds adapted to seasonally dry habitats in the central Huallaga Valley. Additionally, birdwatching in the area has great potential, as the avifauna combines species restricted to the central Huallaga and many Amazonian species. Long-term conservation of these forests requires land protection via conservation concessions, mainly in areas heavily threatened by deforestation, which would simultaneously increase connectivity between forest fragments. A bi-national conservation corridor, the 'Abiseo-Condor-Kutukú' initiative, is currently underway, encompassing forests of San Martín, Amazonas and Cajamarca in Peru, and in Zamora-Chinchipe and Morona-Santiago in Ecuador[6]. Another proposed conservation corridor is the 'Corredor de Conservación de Aves Marañón-Alto Mayo'[1], which can be used as an example to propose a further corridor in the dry forests of Huallaga. Conservation of what remains of these dry forests is urgently required to preserve an important component of Peru's biodiversity.

Acknowledgements

We thank the Instituto de Investigaciones de la Amazonía Peruana (IIAP) for financing the inventory via budget programme MINAM 0035: 'Gestión Sostenible de Recursos Naturales y Diversidad Biológica'. We thank the Servicio Nacional Forestal y de Fauna Silvestre (SERFOR) for issuing research and collecting permits RDG No. 0068-2015-SERFOR-DGGSPFFS, and the Sistema Regional de Conservación de Autoridad Regional Ambiental del Gobierno Regional de San Martín. Thanks also to the Asociación de Conservación y Protección Ecológica "El Valle del Biavo", Asociación de Protección Ambiental del Bosque "El Quinillal", Asociación de Conservación y Protección Ecológica "El Bosque del Futuro Ojos de Agua" y "El Incaico". We further thank our field assistants Key Rengifo, Benedict Putpaña, Brolin Putpaña, Olinda Isuiza and Julimar Ushiñahua (Valle del Biavo); Cayo Reategui, Jhon Ushiñahua, Jorge Chávez, Teddy Sangama, Emilia Marilu Tuanama (El Incaico); Hugo Pérez, Nerio Grández, Oriel Sangama and son, María Chávez and Lloysi Sangama (El Quinillal); and Arnaldo Paredes, Luis Felipe López and Vasty Vásquez (Ojos de Agua). We thank the entire central Huallaga dry forest inventory field team: Marcos Ríos, Luis Torres, Hellen Andrare, Francisco Farroñay, Ehiko Ríos, Omar Rojas and Dennis Ruelas. Ricardo Pasapera helped coordinate with the various conservation associations and David Estrada Pacheco took charge of our transportation throughout the inventory. We thank Omar Rojas and Aldo Alva for the map, Natalia Piland for her manuscript revisions and translation, Tom Schulenberg and Juan Díaz for refereeing the manuscript, and Guy M. Kirwan and Juan Freile for their editorial work.

References

1. Angulo, F., Palomino, W., Arnal, H., Aucca, C. & Uchofen, O. (2007) *Corredor de Conservación de Aves Marañón–Alto Mayo*. Cusco: Asociación Ecosistemas Andinos & American Bird Conservancy.
2. Álvarez-Alonso, J. & Whitney, B. M. (2001) A new *Zimmerius* tyrannulet (Aves: Tyrannidae) from white sand forests of northern Amazonian Peru. *Wilson Bull.* 113: 1–9.
3. Álvarez-Alonso, J., Altamirano, J. O. & Shany, N. (2009) Evaluación de la avifauna en el bosque seco de Pucacaca, San Martín. Unpubl. rep. Iquitos: Instituto de Investigaciones de la Amazonía Peruana.
4. Barrio, J., García-Olaechea, D. & More, A. (2015) The avifauna of El Angolo Hunting Reserve, north-west Peru: natural history notes. *Bull. Brit. Orn. Club* 135: 6–20.
5. Castro, M. W. (2003) *Zonificación ecológica económica de la región San Martín: geología*. Moyobamba: Gobierno Regional de San Martín & Instituto de Investigaciones de la Amazonía Peruana.

6. Elliot, J. (2009) *Conservación y desarrollo sostenible en el corredor Abiseo-Cóndor-Kutukú, nororiente peruano y suroriente ecuatoriano*. Lima: Soluciones Prácticas.
7. Encarnación, C. F. (2004) *Zonificación ecológica económica de la región de San Martín: vegetación*. Moyobamba: Gobierno Regional de San Martín & Instituto de Investigaciones de la Amazonía Peruana.
8. García-Villacorta, R. (2009) Diversidad, composición y estructura de un hábitat altamente amenazado: los bosques estacionalmente secos de Tarapoto, Perú. *Rev. Peru. Biol*. 16: 81–92.
9. Herzog, S. K. & Kessler, M. (2002) Biogeography and composition of dry forest bird communities in Bolivia. *J. Orn*. 143: 171–204.
10. Linares-Palomino, R. (2006) Phytogeography and floristics of seasonally dry tropical forests in Peru. In: Pennington, R. T. & Ratter, J. A. (eds.) *Neotropical savannahs and seasonally dry forests: plant diversity, biogeography, and conservation*. Boca Raton, FL: CRC Press.
11. Lozada-Prado, S. & Molina-Martínez, Y. G. (2011) Avifauna del bosque seco tropical en el departamento del Tolima (Colombia): análisis de la comunidad. *Caldasia* 33: 271–294.
12. MINAGRI (2014) Decreto Supremo N° 004-2014-MINAGRI. www.serfor.gob.pe/wp-content/uploads/2016/09/DS-N%C2%B0004-Especies-amenazadas-de-fauna-silvestre.pdf.
13. MINAM (2015) Cuantificación y análisis de la deforestación en la Amazonía peruana en el periodo 2010-2011-2013-2014. http://geoservidor.minam.gob.pe/geoservidor/Archivos/Documentos/Memoria_Descriptiva_Cambios_Cobertura_Bosque_2014.pdf.
14. Ordóñez-Delgado, L., Tomás, G., Armijos-Ojeda, D., Jara-Guerrero, A., Cisneros, R. & Espinosa, C. I. (2016) Nuevos aportes al conocimiento de avifauna en la región tumbesina; implicaciones para la conservación de la Reserva de Biosfera del Bosque Seco, Zapotillo, Ecuador. *Rev. Ecosistemas* 25(2): 13–23.
15. Williams, R., Coppin, L. & Álvarez, A. J. (2005) *Perú: el verdadero paraíso de las aves*. Lima: PROMPERÚ.
16. Remsen, J. V., Areta, J. I., Cadena, C. D., Claramunt, S., Jaramillo, A., Pacheco, J. F., Pérez-Emán, J., Robbins, M. B., Stiles, F. G., Stotz, D. F. & Zimmer, K. J. (2017) A classification of the bird species of South America. http://www.museum.lsu.edu/~Remsen/SACCBaseline.html.
17. Rivera, V. J. (2005) *Zonificación ecológica económica de la región San Martín*. Moyobamba: Gobierno Regional de San Martín & Instituto de Investigaciones de la Amazonía Peruana.
18. Roddaz, M., Hermoza, W., Mora, A., Baby, P., Parra, M., Christophoul, F., Brusset, S. & Espurt, N. (2011) Cenozoic sedimentary evolution of the Amazonian foreland basin system. In: Hoorn, C. & Wesselingh, F. (eds.) *Amazonia, landscape and species evolution: a look into the past*. Chichester: John Wiley & Sons.
19. Schulenberg, T. S. (2000) *Voices of Andean birds*, 1. Ithaca, NY: Cornell Lab of Ornithology.
20. Schulenberg, T. S. (2000) *Voices of Andean birds*, 2. Ithaca, NY: Cornell Lab of Ornithology.
21. Schulenberg, T. S., Marantz, C. A. & English, P. H. (2000) *Voices of Amazonian birds. Birds of the rainforest of southern Peru and northern Bolivia*, 1. Ithaca, NY: Cornell Lab of Ornithology.
22. Schulenberg, T. S., Marantz, C. A. & English, P. H. (2000) *Voices of Amazonian birds. Birds of the rainforest of southern Peru and northern Bolivia*, 2. Ithaca, NY: Cornell Lab of Ornithology.
23. Schulenberg, T. S., Marantz, C. A. & English, P. H. (2000) *Voices of Amazonian birds. Birds of the rainforest of southern Peru and northern Bolivia*, 3. Ithaca, NY: Cornell Lab of Ornithology.
24. Schulenberg T. S., Stotz, D. F., Lane, D. F., O'Neill, J. P. & Parker, T. A. (2010) *Aves de Peru*. Lima: CORBIDI.
25. SERNANP (2009) *Plan director de las Áreas Naturales Protegidas (Estrategia Nacional)*. Lima: Servicio Nacional de Áreas Naturales Protegidas por el Estado.
26. IUCN (2017) IUCN Red List of threatened species. Version 2017-3. www.iucnredlist.org.
27. Vásquez-Arévalo, F. A., Grández-Casado, J. A., Muñoz-Pizango, G. E., García-Villacorta, R. & Gagliardi-Urrutia, G. (2016) Primer registro de Gavilán Gris Lineado *Buteo nitidus* en el departamento de San Martín. *Bol. UNOP* 11(2): 7–10.
28. Vecco, G. C. D. (2014) *Estudios biológicos participativos en el Territorio Integral Kichwa (TIK), sitio prioritario "Bosque Seco del Huallaga Central", provincias de Bellavista y Picota, San Martín*. Moyobamba: Servicio Nacional de Áreas Naturales Protegidas por el Estado & Gobierno Regional de San Martín.
29. Valqui, T. (2004) *Where to watch birds in Peru*. Lima: Gráfica Ñañez S.A.

Francisco A. Vásquez-Arévalo, Joaquín A. Grández-Casado and Giria E. Muñoz-Pizango
Programa de Investigación en Biodiversidad Amazónica, Instituto de Investigaciones de la Amazonia Peruana, Abelardo Quiñones Km 2,5, San Juan Bautista, Iquitos, Peru.

Roosevelt García-Villacorta
Centro Peruano para la Biodiversidad y Conservación, Nanay 373, Iquitos, Peru.

Giussepe Gagliardi-Urrutia
Programa de Investigación en Biodiversidad Amazónica, Instituto de Investigaciones de la Amazonia Peruana, Abelardo Quiñones Km 2.5, San Juan Bautista, Iquitos, Peru; Centro Peruano para la Biodiversidad y Conservación, Nanay 373, Iquitos, Peru; and Laboratorio de Sistemática de Vertebrados Pontifícia Universidade Católica do Rio Grande do Sul, Brazil.

Appendix. List of species and their relative abundances at each study site.

Habitat

Bsc = dry ridge forest; Bsp = dry plain forest; Bq = quebrada forest; Br = riparian forest along the Biavo River; Vs = secondary vegetation.

Relative abundance

C = common: observed and/or heard >10 times on average per day; F = fairly common: recorded <10 times per day; U = uncommon: recorded more than twice but not daily; R = rare: observed only once or twice.

Evidence

P = photographed; S = specimen deposited in the Museo de Colecciones Referenciales Biológicas del Instituto de Investigaciones de la Amazonía Peruana (CRBIIAP), Iquitos (see Table 1).

Scientific name	English name	Valle del Biavo	Bosques Secos Incaico	El Quinillal	Ojos de agua	Habitat	Evidence
Tinamidae (6)							
Tinamus tao	Grey Tinamou		R			Bsc	
Crypturellus cinereus	Cinereous Tinamou	R				Vs	
Crypturellus soui	Little Tinamou	R	R			Br, Vs	
Crypturellus undulatus	Undulated Tinamou	R		R	C	Bq Br, Vs	
Crypturellus variegatus	Variegated Tinamou		R		R	Bsc, Bsp	
Crypturellus tataupa	Tataupa Tinamou	U	U	F	U	Br, Bsc, Bq, Vs	
Cracidae (3)							
Penelope jacquacu	Spix's Guan	U	R		R	Bsc, Bsp, Vs	
Ortalis guttata	Speckled Chachalaca	R	R	U	F	Br, Bsc, Bsp, Bq, Vs	
Mitu tuberosum	Razor-billed Curassow		R			Bsc	
Odontophoridae (1)							
Odontophorus stellatus	Starred Wood Quail			R	R	Bsc, Vs	
Columbidae (9)							
Patagioenas speciosa	Scaled Pigeon	C	U	R		Br, Bsc, Bsp, Bq, Vs	
Patagioenas cayennensis	Pale-vented Pigeon	R	R	R	U	Br, Bsc	
Patagioenas plumbea	Plumbeous Pigeon		R		R	Br, Bsc	
Patagioenas subvinacea	Ruddy Pigeon	F	F	U	U	Br, Bsc, Bsp, Bq, Vs	
Leptotila verreauxi	White-tipped Dove	R	R	U		Bsc, Bq, Vs	
Leptotila rufaxilla	Grey-fronted Dove	R	R	R		Br, Bsc, Vs	
Columbina minuta	Plain-breasted Ground Dove				R	Vs	
Columbina talpacoti	Ruddy Ground Dove	R	R	R		Br, Vs	
Claravis pretiosa	Blue Ground Dove	C		U	U	Bsc, Bsp, Vs	
Cuculidae (4)							
Crotophaga ani	Smooth-billed Ani		R	R	R	Br, Bsc, Vs	
Tapera naevia	Striped Cuckoo	R			R	Br, Bsc	
Dromococcyx phasianellus	Pheasant Cuckoo		U	R	U	Bsc, Bsp, Vs	
Piaya cayana	Squirrel Cuckoo	U	U	R	R	Br, Bsc, Bsp, Bq	
Nyctibiidae (3)							
Nyctibius grandis	Great Potoo	R		R		Vs	P
Nyctibius aethereus	Long-tailed Potoo	R				Bsc, Bsp	
Nyctibius griseus	Common Potoo	U				Bsp	
Caprimulgidae (3)							
Nyctidromus albicollis	Common Pauraque	R		R	R	Bsc, Bsp, Vs	S
Nyctiphrynus ocellatus	Ocellated Poorwill	R			R	Bsc, Vs	
Antrostomus rufus	Rufous Nightjar	U				Bq, Vs	
Apodidae (3)							
Streptoprocne zonaris	White-collared Swift		U	R		Vs	
Chaetura cinereiventris	Grey-rumped Swift				R	Bsc	
Chaetura brachyura	Short-tailed Swift	U				Bsp	

Scientific name	English name	Valle del Biavo	Bosques Secos Incaico	El Quinillal	Ojos de agua	Habitat	Evidence
Trochilidae (6)							
Phaethornis atrimentalis	Black-throated Hermit	R				Bq	
Phaethornis pretrei	Planalto Hermit	R			R	Bsp, Bq	
Phaethornis malaris	Great-billed Hermit				U	Bsp, Vs	
Chlorostilbon mellisugus	Blue-tailed Emerald				R	Bsc	P
Thalurania furcata	Fork-tailed Woodnymph	R				Bq	
Amazilia lactea	Sapphire-spangled Emerald			R		Vs	
Opisthocomidae (1)							
Opisthocomus hoazin	Hoatzin	R				Br	
Rallidae (4)							
Aramides cajaneus	Grey-necked Wood Rail		R			Br	
Anurolimnas viridis	Russet-crowned Crake		R	R	R	Bsc, Vs	S
Laterallus melanophaius	Rufous-sided Crake	R				Br	
Laterallus exilis	Grey-breasted Crake		R			Vs	S
Recurvirostridae (1)							
Himantopus mexicanus	Black-necked Stilt	R				Vs	P
Ardeidae (3)							
Bubulcus ibis	Cattle Egret	R				Br	
Ardea alba	Great Egret	R				Br	
Egretta thula	Snowy Egret	R				Br	
Cathartidae (3)							
Cathartes aura	Turkey Vulture	R	R		U	Bsc, Bsp, Vs	
Coragyps atratus	Black Vulture	R		R	U	Br, Bsc, Vs	
Sarcoramphus papa	King Vulture		R			Bsc	
Accipitridae (12)							
Chondrohierax uncinatus	Hook-billed Kite	R		R	R	Br, Bsc, Vs	P
Elanoides forficatus	Swallow-tailed Kite		R		R	Bsc, Vs	P
Spizaetus tyrannus	Black Hawk-Eagle	R	R		R	Bsc, Vs	
Spizaetus ornatus	Ornate Hawk-Eagle	R				Br	
Harpagus bidentatus	Double-toothed Kite	R				Bsp	
Ictinia plumbea	Plumbeous Kite		R		R	Bsc, Vs	
Geranospiza caerulescens	Crane Hawk				R	Bsc	
Rupornis magnirostris	Roadside Hawk	U	R	U	F	Br, Bsc, Bsp, Vs	
Pseudastur albicollis	White Hawk	R				Bq	
Buteo albonotatus	Zone-tailed Hawk		R			Vs	
Buteo brachyurus	Short-tailed Hawk	R				Bq	
Buteo nitidus	Grey-lined Hawk			R		Vs	P
Strigidae (8)							
Megascops choliba	Tropical Screech Owl	R		R		Vs	
Megascops watsonii	Tawny-bellied Screech Owl	R			R	Bsc, Vs	
Lophostrix cristata	Crested Owl				R	Bsc	
Pulsatrix perspicillata	Spectacled Owl			R		Vs	P
Ciccaba virgata	Mottled Owl			R		Vs	
Ciccaba huhula	Black-banded Owl			R		Vs	P
Glaucidium hardyi	Amazonian Pygmy Owl			R		Bsc	
Glaucidium brasilianum	Ferruginous Pygmy Owl	R		R	R	Bsc, Vs	
Trogonidae (5)							
Trogon melanurus	Black-tailed Trogon	R	R			Br, Bsc	
Trogon viridis	Green-backed Trogon	F	U	U	F	Bsc, Bsp, Bq, Vs	
Trogon ramonianus	Amazonian Trogon	R	U	R	R	Bsc, Bq, Vs	

Scientific name	English name	Valle del Biavo	Bosques Secos Incaico	El Quinillal	Ojos de agua	Habitat	Evidence
Trogon curucui	Blue-crowned Trogon				R	Bsc	
Trogon rufus	Black-throated Trogon			R		Bq	
Momotidae (3)							
Electron platyrhynchum	Broad-billed Motmot		R			Vs	
Baryphthengus martii	Rufous Motmot	C	R		R	Bsc, Bq, Vs	
Momotus momota	Amazonian Motmot		F	R	U	Br, Bsc, Bsp, Vs	S
Galbulidae (1)							
Galbula cyanescens	Bluish-fronted Jacamar		R			Bq	
Bucconidae (4)							
Nystalus striolatus	Striolated Puffbird		R			Bsc	
Monasa flavirostris	Yellow-billed Nunbird		U			Vs	P
Monasa nigrifrons	Black-fronted Nunbird	R	R			Br	
Chelidoptera tenebrosa	Swallow-wing Puffbird		R			Vs	
Ramphastidae (6)							
Ramphastos tucanus	White-throated Toucan	U	U			Bsc, Vs	
Ramphastos vitellinus	Channel-billed Toucan	R	U	U	R	Bsc, Bsp, Vs	
Pteroglossus azara	Ivory-billed Araçari			R		Bq	
Pteroglossus beauharnaisii	Curl-crested Araçari			R		Bq	
Pteroglossus castanotis	Chestnut-eared Araçari	R		U	F	Br, Bsc, Bsp, Vs	
Selenidera reinwardtii	Golden-collared Toucanet	R	F			Bsc, Vs	
Picidae (8)							
Picumnus lafresnayi	Lafresnaye's Piculet				R	Bsc	
Melanerpes cruentatus	Yellow-tufted Woodpecker	U	R	R		Br, Bsc, Bq, Vs	
Veniliornis affinis	Red-stained Woodpecker			R		Bq	
Piculus chrysochloros	Golden-green Woodpecker	R	R		R	Bsc	
Celeus grammicus	Scale-breasted Woodpecker		R			Vs	
Campephilus rubricollis	Red-necked Woodpecker	R				Bsp	
Campephilus melanoleucos	Crimson-crested Woodpecker		R	R	R	Bsc, Bq, Vs	
Dryocopus lineatus	Lineated Woodpecker	R				Vs	
Falconidae (5)							
Herpetotheres cachinnans	Laughing Falcon	R				Br	
Micrastur mirandollei	Slaty-backed Forest Falcon	R			R	Bsc, Bsp	
Micrastur buckleyi	Buckley's Forest Falcon	U				Bsc, Vs	
Ibycter americanus	Red-throated Caracara				R	Bsc	
Daptrius ater	Black Caracara		R		R	Br, Bsc	
Psittacidae (6)							
Touit huetii	Scarlet-shouldered Parrotlet	R				Bsc	
Brotogeris versicolurus	Canary-winged Parakeet	C	F	R	F	Bsc, Bsp, Bq, Vs	
Pyrilia barrabandi	Orange-cheeked Parrot	R				Vs	
Pionus menstruus	Blue-headed Parrot	F	F	F	F	Br, Bsc, Bsp, Bq, Vs	P
Forpus xanthopterygius	Blue-winged Parrotlet	R	R	R		Br, Vs	
Orthopsittaca manilatus	Red-bellied Macaw	R	U	R	R	Br, Bsc, Vs	
Thamnophilidae (22)							
Cymbilaimus lineatus	Fasciated Antshrike	U				Bq, Vs	
Frederickena unduliger	Undulated Antshrike	R				Bq	
Taraba major	Great Antshrike	R		R		Br, Bsc, Vs	
Thamnophilus doliatus	Barred Antshrike	R	R	R	C	Br, Bsc, Vs, Bq	S
Thamnophilus schistaceus	Plain-winged Antshrike	C	R	R	U	Br, Bsc, Bsp, Bq, Vs	S
Thamnophilus murinus	Mouse-coloured Antshrike	C	U	R	U	Br, Bsc, Bsp, Bq, Vs	
Thamnophilus punctatus	Northern Slaty Antshrike	F	U	F	F	Br, Bsc, Bsp, Bq, Vs	P

Scientific name	English name	Valle del Biavo	Bosques Secos Incaico	El Quinillal	Ojos de agua	Habitat	Evidence
Thamnomanes caesius	Cinereous Antshrike	U		R		Bq	
Pygiptila stellaris	Spot-winged Antshrike	R				Vs	
Epinecrophylla erythrura	Rufous-tailed Antwren	R				Bsp	
Myrmotherula brachyura	Pygmy Antwren	F	R	R	C	Bsc, Bsp, Bq, Vs	
Myrmotherula ignota	Moustached Antwren				R	Bsp	
Myrmotherula axillaris	White-flanked Antwren	U	U	U	R	Bsc, Bsp, Bq, Vs	
Myrmotherula menetriesii	Grey Antwren	U	R			Bsc, Bsp	
Herpsilochmus rufimarginatus	Rufous-winged Antwren	R		C	C	Bsc, Bsp, Bq	
Cercomacra cinerascens	Grey Antbird	F	U	U	R	Br, Bsc, Bsp, Bq, Vs	
Myrmoborus leucophrys	White-browed Antbird				U	Bsc	
Myrmoborus myotherinus	Black-faced Antbird	C	R	U	U	Bsc, Bsp, Bq, Vs	S
Myrmelastes leucostigma	Spot-winged Antbird				R	Bsp	
Myrmophylax atrothorax	Black-throated Antbird				R	Bsp	
Sciaphylax hemimelaena	Chestnut-tailed Antbird	C	C	C	R	Br, Bsc, Bsp, Bq, Vs	S
Hafferia fortis	Sooty Antbird	R				Bsp	
Grallariidae (1)							
Myrmothera campanisona	Thrush-like Antpitta	R				Bsc, Vs	
Formicariidae (1)							
Formicarius analis	Black-faced Antthrush		R		U	Bsc, Vs	
Furnariidae (11)							
Dendrocincla merula	White-chinned Woodcreeper		U	R	R	Bsc, Bq	S
Dendrocincla fuliginosa	Plain-brown Woodcreeper	R			R	Bsc, Bsp	S
Dendroplex picus	Straight-billed Woodcreeper		R	R	R	Br, Bsc, Vs	S
Xiphorhynchus elegans	Elegant Woodcreeper	R	R	R	U	Bsc, Bsp, Vs	S
Xiphorhynchus guttatus	Buff-throated Woodcreeper	F	R	R	F	Br, Bsc, Bsp, Bq, Vs	S
Philydor pyrrhodes	Cinnamon-rumped Foliage-gleaner			R		Bsp	
Ancistrops strigilatus	Chestnut-winged Hookbill				R	Bsp	
Automolus ochrolaemus	Buff-throated Foliage-gleaner		R			Bsc	
Automolus rufipileatus	Chestnut-crowned Foliage-gleaner	C	U		F	Bsc, Bsp, Bq, Vs	
Synallaxis gujanensis	Plain-crowned Spinetail			R	U	Bsc, Vs	
Synallaxis albigularis	Dark-breasted Spinetail	R			R	Vs	
Tyrannidae (38)							
Tyrannulus elatus	Yellow-crowned Tyrannulet	U	U	U	F	Br, Bsc, Bsp, Bq, Vs	
Myiopagis gaimardii	Forest Elaenia	U	F	U	R	Br, Bsc, Bsp, Bq, Vs	
Myiopagis caniceps	Grey Elaenia			U		Bq	
Elaenia flavogaster	Yellow-bellied Elaenia		R			Vs	
Elaenia gigas	Mottle-backed Elaenia			R		Vs	
Phaeomyias murina	Mouse-coloured Tyrannulet	R	R		F	Br, Bsc, Vs	S
Capsiempis flaveola	Yellow Tyrannulet				R	Bsc	
Euscarthmus meloryphus	Tawny-crowned Pygmy Tyrant				F	Bsc	S
Zimmerius villarejoi	Mishana Tyrannulet				R	Bsc	
Mionectes oleagineus	Olive-striped Flycatcher				R	Bsp	S
Leptopogon amaurocephalus	Sepia-capped Flycatcher			R	R	Bsp, Bq	
Myiornis albiventris	White-bellied Pygmy Tyrant	F	U	R	R	Bsc, Bsp, Bq, Vs	
Myiornis ecaudatus	Short-tailed Pygmy Tyrant	U	R		R	Bsc, Bsp, Vs	
Lophotriccus vitiosus	Double-banded Pygmy Tyrant	C	U	U	F	Bsc, Bsp, Bq, Vs	S
Hemitriccus flammulatus	Flammulated Pygmy Tyrant	F	F		R	Br, Bsc, Bq, Vs	S
Hemitriccus margaritaceiventer	Pearly-vented Tody-Tyrant				F	Bsc	S
Poecilotriccus latirostris	Rusty-fronted Tody-Flycatcher	R		R		Br, Vs	
Todirostrum maculatum	Spotted Tody-Flycatcher		R			Vs	S

Scientific name	English name	Valle del Biavo	Bosques Secos Incaico	El Quinillal	Ojos de agua	Habitat	Evidence
Todirostrum cinereum	Common Tody-Flycatcher		U	R	R	Br, Bsc, Vs	S
Tolmomyias assimilis	Yellow-margined Flycatcher	R	R	R	R	Bsc, Bsp, Bq, Vs	
Tolmomyias poliocephalus	Grey-crowned Flycatcher		R			Bsc	
Tolmomyias flaviventris	Yellow-breasted Flycatcher		R	R	R	Br, Vs	
Onychorhynchus coronatus	Royal Flycatcher	R				Bsp	S
Myiobius atricaudus	Black-tailed Flycatcher			R	U	Bsp, Bq	S
Terenotriccus erythrurus	Ruddy-tailed Flycatcher		R	R	R	Bsc, Bsp, Bq	S
Empidonax alnorum	Alder Flycatcher				R	Bsc	S
Myiozetetes similis	Social Flycatcher		R		R	Br, Bsc, Vs	
Pitangus sulphuratus	Great Kiskadee		U			Br, Vs	
Myiodynastes maculatus	Streaked Flycatcher		F	R		Bq, Vs	
Megarynchus pitangua	Boat-billed Flycatcher	R	R	R	U	Br, Bsc, Vs	
Tyrannus melancholicus	Tropical Kingbird	R	R	R		Br, Vs	
Rhytipterna simplex	Greyish Mourner	F	F	R	U	Bsc, Bsp, Bq, Vs	S
Casiornis rufus	Rufous Casiornis				R	Bsc	
Myiarchus tuberculifer	Dusky-capped Flycatcher	R				Br	
Myiarchus ferox	Short-crested Flycatcher			R		Vs	
Myiarchus tyrannulus	Brown-crested Flycatcher				U	Bsc	S
Ramphotrigon ruficauda	Rufous-tailed Flatbill	U			R	Bsc, Bsp, Vs	
Attila spadiceus	Bright-rumped Attila	C	F	U	F	Bsc, Bsp, Bq, Vs	S
Cotingidae (2)							
Querula purpurata	Purple-throated Fruitcrow	F	R			Bsc, Bsp, Bq, Vs	
Lipaugus vociferans	Screaming Piha	F	U	U	U	Bsc, Bsp, Bq, Vs	
Pipridae (2)							
Neopelma sulphureiventer	Sulphur-bellied Tyrant-Manakin				U	Bsc	S
Ceratopipra fasciicauda	Band-tailed Manakin	F	C	F	U	Bsc, Bq, Vs	S
Tityridae (4)							
Tityra semifasciata	Masked Tityra		R	R		Br, Bsc, Vs	
Iodopleura isabellae	White-browed Purpletuft		R			Vs	
Pachyramphus polychopterus	White-winged Becard	U	R	F	U	Br, Bsp, Bq, Vs	
Pachyramphus minor	Pink-throated Becard	R				Vs	
Incertae sedis (1)							
Piprites chloris	Wing-barred Piprites				R	Bsp	
Vireonidae (6)							
Cyclarhis gujanensis	Rufous-browed Peppershrike				R	Bsc	
Hylophilus pectoralis	Ashy-headed Greenlet				U	Bsc	P, S
Hylophilus thoracicus	Lemon-chested Greenlet				U	Bsp	
Tunchiornis ochraceiceps	Tawny-crowned Greenlet	R		R	R	Bsc, Bsp, Bq	
Pachysylvia hypoxantha	Dusky-capped Greenlet	U	R	U	F	Bsc, Bsp, Bq, Vs	
Vireo olivaceus	Red-eyed Vireo		R	R	R	Br, Bsc, Vs	
Corvidae (2)							
Cyanocorax violaceus	Violaceous Jay	R				Br	
Cyanocorax yncas	Green Jay				U	Bsc	P
Hirundinidae (4)							
Pygochelidon cyanoleuca	Blue-and-white Swallow		U			Vs	
Progne chalybea	Grey-breasted Martin				R	Bsc	
Stelgidopteryx ruficollis	Southern Rough-winged Swallow		R			Vs	
Tachycineta albiventer	White-winged Swallow	R				Br	
Troglodytidae (4)							
Microcerculus marginatus	Scaly-breasted Wren	R	R	R		Bsc, Bq, Vs	P

Scientific name	English name	Valle del Biavo	Bosques Secos Incaico	El Quinillal	Ojos de agua	Habitat	Evidence
Troglodytes aedon	House Wren		R	R		Br, Vs	
Pheugopedius coraya	Coraya Wren				R	Bsp	
Cantorchilus leucotis	Buff-breasted Wren	R	R	U	R	Br, Bsc, Vs	
Polioptilidae (1)							
Polioptila plumbea	Tropical Gnatcatcher			R	R	Bsc, Bsp, Bq	
Turdidae (2)							
Turdus hauxwelli	Hauxwell's Thrush	R			R	Bsc, Bsp, Bq	
Turdus ignobilis	Black-billed Thrush	R				Br	
Thraupidae (24)							
Hemithraupis guira	Guira Tanager				R	Bsp	
Volatinia jacarina	Blue-black Grassquit	R	R	R	R	Br, Bsc, Vs	
Tachyphonus luctuosus	White-shouldered Tanager			R	R	Bq, Vs	S
Tachyphonus rufus	White-lined Tanager				C	Bsc	P, S
Ramphocelus melanogaster	Black-bellied Tanager		R	R		Br, Vs	
Ramphocelus carbo	Silver-beaked Tanager			R		Vs	P
Cyanerpes caeruleus	Purple Honeycreeper		R			Vs	
Tersina viridis	Swallow Tanager		R			Vs	
Sporophila castaneiventris	Chestnut-bellied Seedeater	R	R			Br	S
Saltator maximus	Buff-throated Saltator	R	R			Br, Bsp	
Saltator coerulescens	Greyish Saltator	R		U		Br, Vs	
Saltator grossus	Slate-coloured Grosbeak	F	U	R	R	Bsc, Bsp, Bq, Vs	
Thlypopsis sordida	Orange-headed Tanager	R				Br	
Tiaris obscurus	Dull-coloured Grassquit	R	R		R	Br, Bsc, Vs	
Schistochlamys melanopis	Black-faced Tanager		R			Vs	
Cissopis leverianus	Magpie Tanager			R		Vs	
Tangara mexicana	Turquoise Tanager		R			Vs	
Tangara velia	Opal-rumped Tanager	R	R			Bsc, Bsp, Bq	
Tangara gyrola	Bay-headed Tanager	R		R		Bq	
Tangara schrankii	Green-and-gold Tanager	R				Bq	
Thraupis episcopus	Blue-grey Tanager		R	R	R	Bsc, Vs	
Thraupis palmarun	Palm Tanager		R	R		Br, Vs	
Ixothraupis xanthogastra	Yellow-bellied Tanager		R			Br	
Lamprospiza melanoleuca	Red-billed Pied Tanager		R			Bsc	
Emberizidae (2)							
Ammodramus aurifrons	Yellow-browed Sparrow		R	R		Br, Vs	
Zonotrichia capensis	Rufous-collared Sparrow	R	R			Vs	
Cardinalidae (2)							
Habia rubica	Red-crowned Ant Tanager	U	U	U		Br, Bsc, Bq, Vs	S
Cyanoloxia cyanoides	Blue-black Grosbeak				R	Vs	
Icteridae (6)							
Psarocolius angustifrons	Russet-backed Oropendola	R				Br	
Psarocolius decumanus	Crested Oropendola	R		U	R	Bsc, Bsp, Vs	P
Psarocolius bifasciatus	Olive Oropendola	U	U	R	R	Br, Bsc, Bsp, Bq, Vs	
Cacicus solitarius	Solitary Black Cacique	R	R			Br	
Cacicus cela	Yellow-rumped Cacique	F	F	R		Br, Bsc, Bq, Vs	
Icterus cayanensis	Epaulet Oriole			R		Bq	
Fringillidae (3)							
Euphonia chlorotica	Purple-throated Euphonia			R	U	Bsc, Vs	
Euphonia chrysopasta	Golden-bellied Euphonia				R	Bsp	
Euphonia rufiventris	Rufous-bellied Euphonia		R			Br	

South Polar Skua *Catharacta maccormicki* in Rio Grande do Sul, southern Brazil

Nicholas W. Daudt, Alice Pereira, Maurício Tavares and Caio J. Carlos

Received 4 April 2017; final revision accepted 2 November 2017
Cotinga 40 (2018): 44–49
published online 16 June 2018

Registros de mandrião-do-sul *Catharacta maccormicki* para o Rio Grande do Sul, sul do Brasil, são apresentados, circunstanciados e discutidos. Indivíduos dessa espécie foram fotografados ao largo da costa do estado em novembro de 2011 e maio de 2013. Ainda, em março de 2011, um indivíduo de plumagem atípica debilitado foi registrado na praia de Xangri-lá, na costa norte do estado; apesar de não podermos excluir a possibilidade de um híbrido entre *C. maccormicki* e *C. chilensis*, sugerimos ser um mandrião-do-sul. Um espécime na coleção científica do Museu de Ciências Naturais da Fundação Zoobotânica do Rio Grande do Sul, cuja identificação poderia incluir *C. maccormicki*, foi reexaminado; este pertence ao grupo *C. antarctica*, provavelmente da subespécie *lonnbergi*.

Skuas (Stercorariidae) comprise seven species of predatory/scavenging seabirds that breed in temperate and polar regions of both hemispheres, and are long-distance migrants[10,12,14,18]. Southern Hemisphere skuas have been considered to form a superspecies complex of three species, one of which, Brown Skua *Catharacta antarctica* (generic assignment follows Carlos[6]) comprises at least three subspecies[9,10,14,18]. South Polar Skua *C. maccormicki* and the three subspecies of Brown Skua—*C. a. antarctica*, *C. a. hamiltoni* and *C. a. lonnbergi*—are phenotypically similar, displaying generally brown to greyish plumage with golden hackles on the nape and ear-coverts. The most distinctive taxon is Chilean Skua *C. chilensis*, which has a dark cap and cinnamon underparts[10,14,18].

South Polar Skua is smaller than Brown and Chilean Skuas, and is polymorphic: a pale morph with overall creamy coloration but somewhat dark wings, and a dark morph that is brown with dark wings. The species breeds in the austral spring and summer (October–February) on the South Shetland Islands and coasts of Antarctica. Post-breeding, it performs a trans-equatorial migration, wintering as far north as Japan and Alaska in the Pacific, and Greenland in the Atlantic[10,14,18]. In Brazil, the species is most frequent off the north-east coast between the states of Ceará and Sergipe, 02–09°S[7,13,20], with a few records from south-east and southern coasts[15,17,19]. Here, we review previous information and present documented records of South Polar Skua in the state of Rio Grande do Sul.

Vooren *et al.*[23] reported a sight record of South Polar Skua on Cassino beach, municipality of Rio Grande, in the austral winter. However, Vooren & Brusque[22] discarded this record due to both difficulties of identifying southern skuas and the lack of documentation. A specimen collected 5 km south-west of Cassino (32°14'S 52°12'W) on 29 July 1974 was tentatively identified as a nominate race Brown Skua[2]. The skin (MCN 1756) is currently at the Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil. Bencke[3] examined this specimen but was unable to reach a definite conclusion as to its identification, either Brown or South Polar Skua, or even a hybrid between them. Because of doubts regarding the specific (or subspecific) identification of this specimen, South Polar Skua has been considered to be of either 'probable' or 'hypothetical' occurrence in Rio Grande do Sul[3,4].

Specimen MCN 1756 was measured by NWD using callipers (to the nearest 0.1 mm) and a ruler: exposed culmen (from the tip to the feathers) 53.04 mm; bill depth at gonys 19.10 mm; tarsus (from the middle of mid-tarsal joint to the distal end of the tarso-metatarsus) 76.48 mm; and flattened wing chord 410 mm. Tarsus length alone can be used as a diagnostic to separate South Polar Skua from *C. a. lonnbergi*[9]. In this respect, MCN 1756 falls within the range of both *C. a. lonnbergi* and *C. a. hamiltoni* (Tables 1–2). Similarly, the exposed culmen of the specimen falls within the range of *C. a. lonnbergi* and *C. a. hamiltoni*, although in this case it also is in the uppermost range of female South Polar Skua (Tables 1–2). According to Devillers[9], the ratios of wing to tarsus length (W/T) and exposed bill to tarsus length (B/T) can also be used to separate South Polar Skua from *C. a. antarctica*. The W/T ratio of MCN 1756 is 5.36, thus agreeing well with *C. antarctica* (*sensu lato*) but excluding South Polar Skua (Table 2)[21]. The B/T ratio of the specimen in question is 0.69, i.e. within the known ranges of all Southern Hemisphere skuas, but far from the mean for South Polar Skua (Table 2). MCN 1756 has generally brown plumage, slightly darker on the upperparts, and the mantle exhibits a few yellowish streaks (Fig. 1). Consequently, this specimen is neither a *C. chilensis*, which

Table 1. Measurements (mm) of Southern Hemisphere *Catharacta* taxa. Data = range and (sample size). Sources: (1) Murphy[12], (2) Spellerberg[21], (3) Olsen & Larsson[14], and (4) Votier *et al.*[24].

		C. antarctica antarctica		*C. antarctica lonnbergi*		*C. antarctica hamiltoni*		*C. chilensis*		*C. maccormicki*	
		Males	**Females**	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
Wing	(1[a])	366–387 (10)	378–398 (6)	401–416 (6)	397–416 (8)	–	–	390–398 (7)	387–411 (5)	–	–
	(3[b])	355–393 (44)	372–402 (38)	378–442 (54)	392–455 (40)	372–409 (33)	378–423 (28)	368–405 (35)	375–418 (29)	370–417 (102)	377–421 (100)
	(4[a])	355–393 (44)	372–402 (38)	396–429 (101)	408–442 (101)	388–413 (38)	398–427 (35)	–	–	–	–
Culmen	(1[a])	46.5–50.3 (10)	47.0–50.8 (6)	54.3–58.2 (6)	53.5–56.7 (8)	–	–	49.4–56.1 (7)	51–56 (5)	–	–
	(2[c])	–	–	–	–	–	–	–	–	48.1–51.3 (21)	47.0–53.6 (24)
	(3[c])	41.1–51.3 (33)	44.9–52.0 (38)	46.6–59.0 (55)	46.2–61.0 (48)	49.2–56.0 (30)	50.5–57.9 (30)	45.6–51.4 (30)	45.2–53.3 (26)	43.0–52.5 (101)	43.6–54.0 (100)
	(4[a])	41.1–51.3 (33)	44.9–52.0 (38)	47.5–56.4 (101)	47.8–59.0 (101)	49.3–56.5 (38)	50.1–57.0 (35)	–	–	–	–
Bill depth	(3[a])	16.4–20.2 (34)	16.4–21.0 (38)	16.5–21.6 (53)	16.7–22.3 (46)	15.5–18.5 (30)	17.7–19.4 (30)	15.6–18.7 (35)	15.8–18.8 (29)	15.2–19.0 (102)	15.5–20.3 (95)
	(4[a])	16.4–20.2 (34)	16.4–21.0 (38)	19.0–21.8 (101)	19.3–22.4 (101)	17.8–19.5 (38)	17.8–20.0 (35)	–	–	–	–
Tarsus	(1[a])	64.3–70.0 (10)	64.7–69.6 (6)	70.8–79.3 (6)	72.8–79.0 (8)	–	–	60.6–72.3 (7)	66–70 (5)	–	–
	(2[d])	–	–	–	–	–	–	–	–	58.6–68.0 (21)	58–76 (24)
	(3[e])	60.9–70.0 (34)	62.3–71.0 (38)	65.0–84.6 (52)	66.5–84.5 (46)	64.7–79.0 (30)	61.9–77.4 (30)	58.1–72.3 (35)	59.4–73.0 (29)	56.4–70.3 (102)	56.6–74.4 (98)
	(4[a])	60.9–70.0 (34)	62.3–71.0 (38)	72.5–82.9 (101)	73.3–85.0 (101)	71–76 (36)	72–79 (33)	–	–	–	–
Tail	(1[a])	139.6–154.5 (10)	140.0–156.7 (6)	153.5–162.4 (6)	143.4–157.0 (8)	–	–	140.0–158.4 (7)	135.6–143.0 (5)	–	–
	(4[a])	140–154 (10)	140–157 (6)	–	–	152–158 (9)	148–154 (9)	–	–	–	–

[a] Methods unknown. [b] Flattened wing chord. [c] From the tip to the feathers. [d] Distal end of the upper side of the web to articulation with the tibio-tarsus. [e] From the inter-tarsal joint to the distal end or the last undivided scale before the toes diverge.

Table 2. Biometrics (mm) and ratios of Southern Hemisphere *Catharacta* taxa (sexes combined). Data = range (sample size) and, where available, [mean] or [mean ± SD]. Sources: (1) Murphy[12], (2) Spellerberg[21] and (3) Devillers[9].

		C. antarctica antarctica	*C. antarctica lonnbergi*	*C. antarctica hamiltoni*	*C. chilensis*	*C. maccormicki*
		Both sexes	**Both sexes**	**Both sexes**	**Both sexes**	**Both sexes**
Wing	(1[a])	366–398 (17)	397–416 (17)	–	365–412 (31)	390–410 (11)
	(3[a])	355–397 (35–36)	389–442 (40–41)	376–398 (9–10)	372–415 (16–18)	373–412 (80)
Culmen	(1[a])	46.5–50.8 (17)	53.5–58.2 (17)	–	47.4–56.1 (31)	47.6–51.8 (11)
	(2[b])	–	–	–	–	[49.3 ± 2.3]
	(3[a])	41.2–49.5 (35–36)	47.5–56.0 (40–41)	49.6–54.5 (9–10)	43.6–49.0 (16–18)	42.6–49.6 (80)
Tarsus	(1[a])	61.2–70.0 (17)	69.6–79.3 (17)	–	58.2–71.5 (31)	62.4–66.4 (11)
	(2[c])	-	–	–	–	[63.1 ± 4.2]
	(3[a])	61.5–72.9 (35–36)	71.5–85.0 (40–41)	67.5–75.0 (9–10)	64–71 (16–18)	58.5–70.0 (80)
Tail	(1[a])	139.6–156.7 (17)	143.4–162.4 (17)	–	131.0–158.4 (31)	140–152 (11)
W/T[1]	(3[a])	5.24–5.97 (35–36) [5.52]	4.91–5.97 (40–41) [5.39]	5.11–5.70 (9–10) [5.38]	5.38–5.96 (16–18) [5.69]	5.61–6.69 (80) [6.17]
B/T[2]	(3[a])	0.62–0.73 (35–36) [0.66]	0.60–0.74 (40–41) [0.67]	0.66–0.80 (9–10) [0.70]	0.63–0.72 (16–18) [0.69]	0.66–0.80 (80) [0.73]

[1]Wing to tarsus ratio; [2]Bill to tarsus ratio. [a]Methods unknown. [b]From the tip to the feathers. [c]Distal end of the upper side of the web to articulation with the tibio-tarsus.

has an obvious capped appearance and cinnamon underparts, nor a pale-morph South Polar Skua, which shows well-marked contrast between the upperparts and underparts. On the contrary, its plumage agrees well with *C. a. lonnbergi*[9]. Therefore, morphology strongly suggests that MCN 1756 belongs to the *C. antarctica* group, probably to race *lonnbergi*.

On 27 March 2011, an injured skua was found on a beach in the municipality of Xangri-lá (c.29°48'S 50°02'W), northern Rio Grande do Sul, and was sent firstly to the wildlife rehabilitation centre at the Universidade Federal do Rio Grande do Sul (UFRGS) and thereafter to the same institution's veterinary hospital. It had a creamy head (except for brown around the eyes), hindneck, breast and belly, whereas the wings, back and tail were brownish with narrow yellowish streaks. The bill was blue-grey with a blackish tip (Fig. 2). The paler hindcollar, and the marked contrast between the upperparts and underparts match a pale-morph South Polar Skua[9,14,18]. However, further examination revealed a cinnamon cast to the bird's underwings-coverts—a feature recalling Chilean Skua[14,18]. Therefore, the possibility of this bird being a hybrid South Polar × Chilean Skua cannot be eliminated (see Reinhardt *et al.*[16]). Hybrids between these two species more often display plumage recalling that of Chilean Skua[16], although in this case the bird's plumage was much like that of a pale-morph South Polar Skua, except for the cinnamon cast to the underwings.

The bird died on 25 November 2011, but the carcass was inadvertently discarded before it could be measured. Consequently, no documentation other than the photograph reproduced here (Fig. 2) is available. Although we highlight the possibility of it being a hybrid (see 'bird 3', Fig. 1 in Reinhardt *et al.*[16]), based on plumage alone we consider that it is more likely to have been a South Polar Skua, albeit an atypical variant.

On 7 November 2011, NWD photographed a South Polar Skua from the *R/V Atlântico Sul*, off Rio Grande do Sul at 29°24'S 47°33'W (Fig. 3). There was good light, sea state was Beaufort scale 5, and the north-east wind measured 20 knots. The bird followed the vessel closely for c.15 minutes before flying off. It showed visible contrast between the blackish-brown back plus both wing surfaces, and pale brown head, neck, breast and belly, which pattern matches that of South Polar Skua. Furthermore, the bird had a dark brown area around the eyes and an obvious paler hindcollar, both of which are also features of South Polar Skua[9,14].

Two additional records of South Polar Skua in Rio Grande do Sul have been claimed (www.wikiaves.com.br). The first (WA978971; Fig. 4) was a bird photographed by P. Fenalti on 31 May 2013

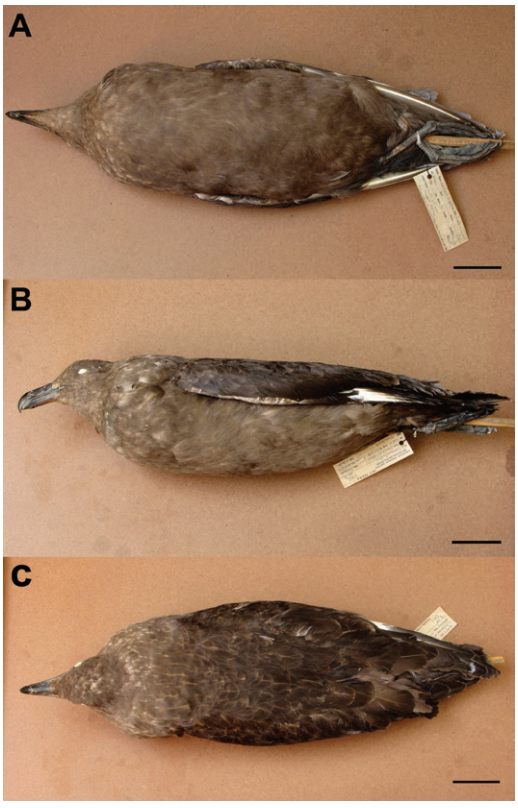


Figure 1. Specimen (MCN 1756) of Brown Skua *Catharacta antarctica*, housed at Fundação Zoobotânica do Rio Grande do Sul, collected at Cassino, Rio Grande do Sul, southern Brazil, 1974, in (a) ventral view, (b) lateral view, and (c) dorsal view; scale bar = 5 cm (G. A. Bencke)

at sea (c.30°00'S 50°05'W) near Tramandaí. It was a typical pale-morph South Polar Skua, with creamy underparts contrasting with a dark brown back and upper- and underwing-coverts. Furthermore, it was replacing some primaries and secondaries, in accordance with the moult schedule outlined by Olsen & Larsson[14]. However, the other (WA342354, WA337805, WA978971), photographed on 19 April 2011 on the beach at Tavares, has barred undertail-coverts, which suggests it was probably a Pomarine Skua *C. pomarina*[14].

Like other migratory seabirds, South Polar Skuas make use of winds blowing over the ocean's surface to facilitate their migration, resulting in a 'figure-of-eight' pattern[1,9]. This hypothesis was recently corroborated by Kopp *et al.*[11], who used light-level geolocators to track seasonal movements from the South Shetlands. They also noted that South Polar Skuas follow a broad corridor parallel to the east coast of South America, including Brazil, during both north- and southbound migrations. In a review of ringing recoveries for non-breeding

Figure 2. Atypically plumaged South Polar Skua *Catharacta maccormicki*, or a possible hybrid between South Polar Skua and Chilean Skua *C. chilensis*, found at Xangri-lá, Rio Grande do Sul, south Brazil, March 2011, in (a) general view, (b) ventral view, and (c) head detail, showing lack of dark crown (CECLIMAR/IB/UFRGS)

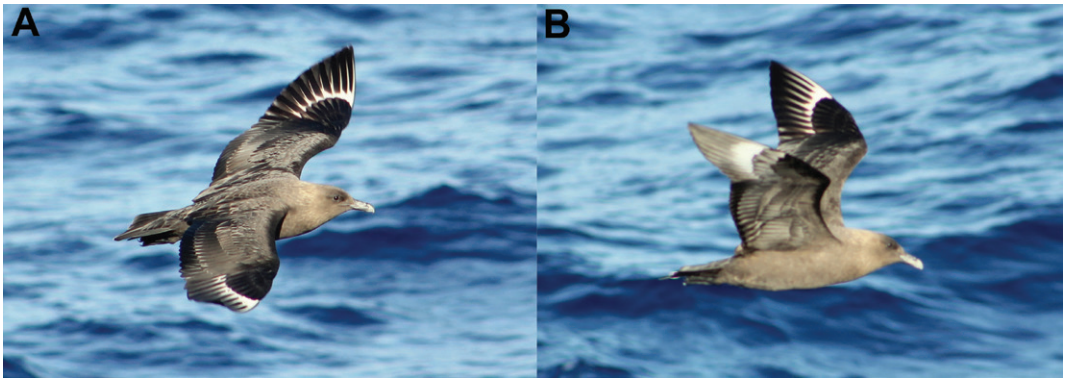


Figure 3. South Polar Skua *Catharacta maccormicki*, off Rio Grande do Sul, south Brazil, November 2011 (N. W. Daudt)

Figure 4. Pale-morph South Polar Skua *Catharacta maccormicki*, municipality of Tramandaí, Rio Grande do Sul, south Brazil, May 2013 (P. Fenalti)

seabirds in Brazil, Olmos[13] suggested that the concentration of recoveries of South Polar Skuas in the north-east of the country is due to the species' migratory habits, following the southern branch of the Equatorial Current, and to the relatively narrow continental shelf. In Rio Grande do Sul, the continental shelf is wide, extending up to 180 km offshore[5]; therefore, it is expected that migrating South Polar Skuas keep well out to sea, coming inshore only rarely. This, coupled with the few at-sea studies of seabirds in the region and the problems of skua identification, may explain the

lack of previous records of South Polar Skua in the state.

Our reconsideration of alleged records of South Polar Skua in Rio Grande do Sul revealed that three of them cannot be accepted, namely the sight record from Cassino[22,23] due to lack evidence to verify the identification; the specimen at MCN-FZBRS (which is a Brown Skua, a species with several previous records in the state[3,4]); and the bird photographed at Tavares. Photographs of the injured bird at Xangri-lá (Fig. 2) suggest it was a South Polar Skua, but we cannot eliminate the possibility that it was a hybrid South Polar × Chilean Skua. The birds photographed at sea (Figs. 3–4) represent the only confirmed records of South Polar Skua for the state of Rio Grande do Sul[4,8].

Acknowledgements

We are grateful to Glayson A. Bencke (FZBRS) for permitting NWD to examine the specimen in his care and for providing the photographs used here; and Paulo Fenalti for kindly allowing us to use his photograph. We also thank personnel at at CECLIMAR / UFRGS, FAVET / UFRGS and PRESERVAS for their assistance. NWD thanks Eduardo R. Secchi for inviting him to take part in 'Projeto Cetáceos do Talude Sudeste-Sul – FURG/Chevron', sponsored by Chevron Brasil Petróleo, and Juliana C. Di Tullio, the survey's leader. Our referees, Daniel López-Velasco, Dick Newell and Fabio Olmos, commented constructively on the submitted manuscript. NWD & AP are supported by scholarships from the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) and CJC is supported by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Brazil.

References

1. Alerstam, T. (1990) *Bird migration*. Cambridge, UK: Cambridge University Press.
2. Belton, W. (1994) *Aves do Rio Grande do Sul, distribuição e biologia*. São Leopoldo: Unisinos.
3. Bencke, G. A. (2001) *Lista de referência das aves do Rio Grande do Sul*. Porto Alegre: Fundação Zoobotânica do Rio Grande do Sul.
4. Bencke, G. A., Dias, R. A., Bugoni, L., Agne, C. E., Fontana, C. S., Maurício, G. N. & Machado, D. B. (2010) Revisão e atualização da lista das aves do Rio Grande do Sul, Brasil. *Iheringia, Ser. Zool.* 100: 519–556.
5. Calliari, L. J. (1998) Características geomorfológicas. In: Seeliger, U., Odebrecht, C. & Castello, J. P. (eds.) *Os ecossistemas costeiro e marinho do extremo sul do Brasil*. Rio Grande: Ecoscientia.
6. Carlos, C. J. (2016) How many genera of Stercorariidae are there? *Rev. Bras. Orn.* 24: 191–195.
7. Carlos, C. J., Fedrizzi, C. E. & Azevedo-Júnior, S. M. (2005) Notes on some seabirds of Pernambuco state, north-east Brazil. *Bull. Brit. Orn. Club* 125: 140–147.
8. Carlos, C. J., Straube, F. C. & Pacheco, J. F. (2010) Conceitos e definições sobre documentação de registros ornitológicos e critérios para a elaboração de listas de aves para os estados brasileiros. *Rev. Bras. Orn.* 18: 355–361.
9. Devillers, P. (1977) The skuas of the North American Pacific coast. *Auk* 94: 417–429.
10. Furness, R. W. (1996) Family Stercorariidae (skuas). In: del Hoyo, J., Elliott, A. & Sargatal, J. (eds.) *Handbook of the birds of the world*, 3. Barcelona: Lynx Edicions.
11. Kopp, M., Peter, H. U., Mustafa, O., Lisovski, S., Ritz, M. S., Phillips, R. A. & Hahn, S. (2011) South polar skuas from a single breeding population overwinter in different oceans though show similar migration patterns. *Mar. Ecol. Prog. Ser.* 435: 263–267.
12. Murphy, R. C. (1936) *Oceanic birds of South America*. New York: American Museum of Natural History.
13. Olmos, F. (2002) Non-breeding seabirds in Brazil: a review of band recoveries. *Ararajuba* 10: 31–42.
14. Olsen, K. M. & Larsson, H. (1997) *Skuas and jaegers. A guide to the skuas and jaegers of the world*. New Haven, CT: Yale University Press.
15. Piacentini, V. Q., Wedekin, L. L. & Daura-Jorge, F. G. (2005) Petrels, skuas and other migrant seabirds in a coastal bay in Santa Catarina state, southern Brazil. *Cotinga* 24: 55–59.
16. Reinhardt, K., Blechschmidt, K., Peter, H. U. & Montalti, D. (1997) A hitherto unknown hybridization between Chilean and South Polar Skua. *Polar Biol.* 17: 114–118.
17. Scherer-Neto, P., Straube, F. C., Carrano, E. & Urben-Filho, A. (2011) *Lista das aves do Paraná*. Curitiba: Hori Consultoria Ambiental.
18. Shirihai, H. (2008) *The complete guide to Antarctic wildlife*. Second edn. Princeton, NJ: Princeton University Press.
19. Silveira, L. F. & Uezu, A. (2010) Checklist das aves do Estado de São Paulo, Brasil. *Biota Neotrop.* 11(1a): Supl. 1. www.biotaneotropica.org.br/v11n1a/en/abstract?inventory+bn0061101a2011.
20. Sousa, M. C., Fraga, R. T. & Carlos, C. J. (2005) Seabird records from Alagoas and Sergipe states, north-east Brazil. *Cotinga* 24: 112–114.
21. Spellerberg, I. F. (1970) Body measurements and colour phases of the McCormick Skua *Catharacta maccormicki*. *Notornis* 17: 280–285.
22. Vooren, C. M. & Brusque, L. F. (1999) *As aves do ambiente costeiro do Brasil: biodiversidade e conservação*. Rio Grande: FURG.
23. Vooren, C. M., Brandão, G. A. L., Filippini, A., Ferreira, W. S. & Pedras, G. J. (1982) Shore and seabirds of south Brazil. *Atlântica* 5: 127.

Nicholas W. Daudt
Programa de Pós-Graduação em Oceanografia Biológica, Instituto de Oceanografia & Laboratório de Aves Aquáticas e Tartarugas Marinhas, Instituto de Ciências Biológicas, Universidade Federal do Rio Grande – FURG, Rio Grande, CEP 96203-900, RS, Brazil; and Museu de Ciências Naturais (MUCIN) &

Centro de Estudos Costeiros, Limnológicos e Marinhos (CECLIMAR), Universidade Federal do Rio Grande do Sul (UFRGS), Imbé, CEP 95625-000, RS, Brazil. E-mail: nicholaswdaudt@gmail.com.

Alice Pereira
Museu de Ciências Naturais (MUCIN) & Centro de Estudos Costeiros, Limnológicos e Marinhos (CECLIMAR), Universidade Federal do Rio Grande do Sul (UFRGS), Imbé, CEP 95625-000, RS, Brazil; and Programa de Pós-Graduação em Biologia Animal & Laboratório de Sistemática e Ecologia de Aves e Mamíferos Marinhos, Departamento de Zoologia, Instituto de Biociências, Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, CEP 91501-970, RS, Brazil.

Maurício Tavares
Museu de Ciências Naturais (MUCIN) & Centro de Estudos Costeiros, Limnológicos e Marinhos (CECLIMAR), Universidade Federal do Rio Grande do Sul (UFRGS), Imbé, CEP 95625-000, RS, Brazil; and Programa de Pós-Graduação em Biologia Animal & Laboratório de Herpetologia, Departamento de Zoologia, Instituto de Biociências, Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, CEP 91501-970, RS, Brazil.

Caio J. Carlos
Programa de Pós-Graduação em Biologia Animal & Laboratório de Sistemática e Ecologia de Aves e Mamíferos Marinhos, Departamento de Zoologia, Instituto de Biociências, Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, CEP 91501-970, RS, Brazil.

Observações sobre o comportamento alimentar e dieta do crejoá *Cotinga maculata* no sul da Bahia, Brasil

Fernando Igor de Godoy

Received 13 April 2017; final revision accepted 13 November 2017
Cotinga 40 (2018): 50–53
published online 16 June 2018

Banded Cotinga *Cotinga maculata* is the only species of its genus restricted to the Atlantic Forest, where it is confined to a small area of eastern Brazil. It is a globally threatened bird and very little is known of the species' life history. Incidental observations were made on diet and foraging behaviour in May over three years (2013–15). The species was recorded feeding on eight species of plants, with *Byrsonima sericea* (Malpighiaceae) predominating. The most frequently observed foraging behaviours were picking and reaching.

A família Cotingidae, exclusiva da região neotropical, é representada por aves frugívoras florestais de médio a grande porte, muitas das quais com cores exuberantes[22]. São consideradas excelentes dispersoras de sementes[12,21], principalmente de frutos do dossel florestal[15,17], sendo fundamentais para a regeneração dos ambientes florestados[24]. O gênero *Cotinga* abriga sete espécies[24], quatro presentes no Brasil[14], na sua grande maioria amazônicas ou de florestas da América Central, e somente uma restrita à Mata Atlântica, o crejoá *C. maculata*[17,18].

Essa ave, cujo macho se sobressai pela vivaz coloração azul e roxa, apresenta distribuição original as matas úmidas litorâneas, atingindo até 200 m de altitude, entre o sul do Estado da Bahia ao Rio de Janeiro[4,9,18]. Todavia, sua área de ocorrência se tornou bastante restrita devido à supressão de ambientes florestais, possivelmente sendo extinta em diversos locais, como o Estado do Rio de Janeiro[1], possuindo registros atuais apenas em poucas localidades no Espírito Santo, sul da Bahia e Minas Gerais[19]. Desse modo, essa espécie de alta exigência ecológica é classificada como 'criticamente ameaçada' de extinção em nível nacional[7] e 'em perigo' globalmente[8].

Devido à escassez de informações e raridade da espécie, pouco se sabe a respeito de sua biologia[23], que teve ninho descrito apenas recentemente[6]. Seus hábitos alimentares também são pouco conhecidos, com evidências de se alimentar principalmente de frutos (e.g. *Ficus*, *Ocotea* e *Rapanea*[9]), do mesmo modo de seus congêneres, capturando também insetos para complementar a dieta[9,17,19]. A carência de informações pode dever-se à dificuldade em sua detecção e acompanhamento, já que a espécie habita o dossel e permanece pousada e imóvel por muito tempo, podendo passar despercebida por muitos pesquisadores[19], além de se tratar de ave pouco ativa vocalmente, sendo suas manifestações sonoras apenas conhecidas por sons instrumentais produzidos pelas asas[17].

Desta forma, o presente estudo tem como objetivo fornecer informações a respeito da dieta e comportamento alimentar do crejoá *C. maculata* em uma área de Mata Atlântica no sul da Bahia.

Métodos

O estudo foi realizado na RPPN Estação Veracel (16°23'17"S 39°10'11"W), de propriedade da Veracel Celulose S.A., cujos limites abrangem os municípios de Porto Seguro e Santa Cruz Cabrália, extremo sul da Bahia. Constitui um importante remanescente de Mata Atlântica, possuindo 6.069 ha de área e a cobertura florestal predominante é composta de floresta ombrófila densa, com alguns enclaves de muçununga[25]. Apresenta temperatura média anual de 22,6ºC e precipitação média 1.635 mm anuais, com clima Af[10], chuvoso, quente e úmido, sem estação seca[25].

Foram realizadas observações aleatórias utilizando-se binóculos. Sempre que a espécie era detectada se alimentando em uma árvore com frutos, seus comportamentos eram anotados até deixá-la. Tais observações ocorreram no mês de maio dos anos de 2013 a 2015, totalizando 36 horas de observação, distribuídas em 13 dias. As espécies vegetais foram identificadas de acordo com os especialistas de vegetação da Casa da Floresta Ambiental S.S. (CASA) e coletadas quando necessário e depositadas no herbário CASA, de propriedade da mesma empresa.

Apesar do predomínio do ambiente florestado, as observações se realizaram, preferencialmente, em bordas, muçununga ou árvores plantadas nas adjacências, já que a visualização da espécie no interior de florestas é difícil.

Resultados e Discussão

Durante os avistamentos, foram identificadas oito espécies de plantas utilizadas pela espécie com fins de alimentação (Tabela 1). Na maioria dos registros a ave foi observada consumindo frutos de murici *Byrsonima sericea* e de fícus *Ficus* sp., nos

Tabela 1. Espécies vegetais cujo consumo dos frutos por crejoá *Cotinga maculata* foi visualizado.

Nome popular	Nome científico	Família	No. visitas
embaúba	*Cecropia pachystachya*	Urticaceae	2
guamirim	*Myrcia splendens*	Myrtaceae	3
fícus	*Ficus* sp.	Moraceae	9
aroeira	*Schinus terebinthifolius*	Anacardiaceae	2
murici	*Byrsonima sericea*	Malpighiaceae	27
carvalho-vermelho	*Miconia cinnamomifolia*	Melastomataceae	2
açaí	*Euterpe oleracea*	Arecaceae	2
erva-de-passarinho	*Struthanthus* sp.	Loranthaceae	1

quais foi observada se alimentando na maioria dos avistamentos.

Ações comportamentais mais observadas foram: *picking* (colher) e *reaching* (alcançar)[11], nos quais as aves alimentavam-se sempre pousadas (Fig. 1). O consumo era feito engolindo os frutos por inteiro, com exceção de *Cecropia*, o qual consumia aos poucos. De acordo com Purificação *et al.*[16], o congênere amazônico *C. cayana* é um dos mais eficientes dispersores de *Schefflera morototoni* (Araliaceae), planta a qual possui frutos de pequeno porte (comprimento médio de 6–10 mm), cuja ingestão dos mesmos deve ser realizada por inteira, já que seu tamanho se assemelha os frutos de *Ficus* e *Byrsonima sericea*.

A visita às árvores era realizada solitária, sendo que somente em poucas ocasiões (n = 5) mais indivíduos foram observados na mesma planta, porém chegavam independentemente dos demais. Todavia, a planta era compartilhada com outras espécies, tais como *Pyrrhura cruentata*, *Trogon viridis*, *Megarynchus pitangua*, *Tolmomyias*

Figura 1. Crejoá *Cotinga maculata* alimentando-se de diversas espécies de plantas: (a) aroeira *Schinus terebintifolius*; (b) embaúba *Cecropia pachystachya*; (c) carvalho-vermelho *Miconia cinnamomifolia*; (d) murici *Byrsonima sericea*, RPPN Estação Veracel, Bahia, Brasil, maio (Fernando Igor de Godoy, Casa da Floresta)

flaviventris, *Xipholena atropurpurea*, *Procnias nudicollis*, *Lipaugus vociferans*, *Dixiphia pipra*, *Ceratopipra rubrocapilla*, *Chiroxiphia pareola*, *Turdus rufiventris*, *T. leucomelas*, *T. fumigatus, Tangara sayaca*, *T. palmarum*, *T. cyanomelas*, *T. brasiliensis* e *Euphonia violacea*, as quais foram observadas se alimentando no mesmo momento.

Ao se alimentar, o crejoá coletou diversos frutos (não sendo possível estabelecer uma média, chegando-se a contar 16 frutos de murici em uma única investida), evidenciando-se bastante ativo. Posteriormente, a ave permanecia imóvel em um poleiro próximo, com tempo aferido entre 22 a 40 minutos, quando regurgitava as sementes. Observou-se a ave regurgitar até três sementes em sequência. Esse longo período de repouso pode estar associado ao processo de digestão. Em geral o repouso era realizado abaixo da copa das árvores, em região sombreada, facilitando a camuflagem do animal. Tal hábito certamente é um dos fatores que dificulta a amostragem e detecção da espécie[19]. Chaves[3] relata o acúmulo de sementes embaixo de um poleiro de *Cotinga cayana*, acreditando que a espécie utilize poleiros 'preferenciais'. Esse fato difere do aqui relatado, já que observações realizadas em dias seguidos evidenciaram que a ave não repetia os poleiros para regurgitar as sementes.

Alimentava-se preferencialmente no dossel, porém, em suas investidas, chegava até capturar frutos em alturas mais baixas (cerca de 1 m do solo). Tal fato também foi visualizado na área pelo autor para outro cotingídeo, típico de dossel, *Xipholena atropurpurea* e do mesmo modo é relatado para *Cotinga ridgwayi*, na América Central[20]. Há também menção de que essa espécie se alimenta de frutos de *Euterpe* sp., como aqui registrado[20].

Interações agonísticas.—Em árvores situadas próximas às edificações antrópicas, possuindo maior isolamento da mata, foi observado que a espécie muitas vezes era repelida em voo ao tentar acessar as mesmas. Essa interação foi observada somente com o macho, provavelmente por ser bastante visível. A espécie que mais realizou interações agonísticas foi *Turdus rufiventris* (n = 4), chegando a impedir *C. maculata* de chegar aos frutos. Em alguns casos, *T. rufiventris* agredia *C. maculata* enquanto este último se alimentava, necessitando deixar a árvore. Esse comportamento já é bastante conhecido, já que *T. rufiventris* figura em diversos trabalhos exibindo reações agonísticas[2,5,13].

Em áreas florestais ou com transição para muçunungas, onde *T. rufiventris* é menos abundante, as demais espécies do gênero, *T. leucomelas* e *T. fumigatus*, foram observadas alimentando-se junto a *C. maculata*, porém nenhum comportamento agressivo foi detectado.

Ocorreu expulsão também entre machos, onde um indivíduo era repelido pelo outro em voo, produzindo um forte ruído com as asas. Essas agressões intraespecíficas também são relatadas para seu congênere amazônico, *C. cayana*[4]. A intensidade de tal ruído pode ser controlada pelo próprio indivíduo e praticamente substitui qualquer manifestação vocal da espécie[17]. De fato, além dos sons instrumentais, as vocalizações das demais espécies do gênero são conhecidas apenas por chamados breves e baixos[20,22].

Considerações finais

Estas observações são fundamentais para melhor compreensão dos hábitos dessa espécie ameaçada de extinção, que possui muitos aspectos de sua biologia desconhecidos[17,19,22] por ser rara e de comportamento discreto, o que pode auxiliar no aprimoramento das diretrizes para sua conservação. O fato de consumir frutos em bordas de matas e até mesmo em árvores fora do ambiente florestal indica que a espécie consegue se deslocar por ambientes arborizados próximos aos grandes remanescentes, sendo que a criação de corredores para conectividade entre fragmentos pode se mostrar uma estratégia eficaz na manutenção de suas populações.

Agradecimentos

Sou grato à Casa da Floresta Ambiental S.S. e à Veracel Celulose S.A., as quais permitiram a realização desta nota. Ao amigo Julio H. R. Magalhães pela eficiente identificação das plantas. Aos amigos, Jailson Santos, Diogo Casanova e Daniel H. Homem pela companhia em campo e ao Vagner de A. Gabriel pela colaboração na escrita deste manuscrito.

Referências

1. Alves, M. A. S., Pacheco, J. F., Gonzaga, L. A. P., Cavalcanti, R. B., Raposo, M. A., Yamashita, C., Maciel, N. C. & Castanheira, M. (2000) Aves. In: Bergallo, H. G., Rocha, C. F. D., Alves, M. A. S. & Van Sluys, M. (orgs.) *A fauna ameaçada de extinção do Estado do Rio de Janeiro*. Rio de Janeiro, Ed. UERJ.
2. Cazetta, E., Rubim, P., Lunardi, V. O., Francisco, M. E. & Galetti, M. (2002) Frugivoria e dispersão de sementes de *Talauma ovata* (Magnoliaceae) no sudeste brasileiro. *Ararajuba* 10: 199–206.
3. Chaves, L. (2001) Observations on diet, foraging behaviour, vocalisations and displays of Spangled Cotinga *Cotinga cayana*. *Cotinga* 16: 103–104.
4. Collar, N. J., Gonzaga, L. A. P., Krabbe, N., Madroño Nieto, A., Naranjo, L. G., Parker, T. A. & Wege, D. C. (1992) *Threatened birds of the Americas: the ICBP/IUCN Red Data Book*. Cambridge, UK: International Council for Bird Preservation
5. Francisco, M. R. & Galetti, M. (2002) Aves como potenciais dispersoras de sementes de *Ocotea pulchella* Mart. (Lauraceae) numa área de vegetação de cerrado do sudeste brasileiro. *Rev. Bras. Bot*. 25: 11–17.

6. Gonzaga, L. P. & Collar, N. J. (2010). A nest of Banded Cotinga *Cotinga maculata*. *Cotinga* 32: 125–126.
7. ICMBio (2014) Listas das espécies da fauna brasileira ameaçadas de extinção. Portaria MMA nº 444, de 17 de dezembro de 2014. www.icmbio.gov.br (acessido 01 de dezembro de 2016).
8. IUCN (2016). The IUCN Red List of threatened species. Version 2016.2. www.iucnredlist.org (acessido 12 de novembro de 2016).
9. Kirwan, G. M. & Green, G. (2011) *Cotingas and manakins*. London, UK: Christopher Helm.
10. Koeppen, W. (1948) *Climatologia. Con un estudio de los climas de la tierra. Versión directa de Pedro R. Hendrichs Pérez*. Ciudad de México: Fondo de Cultura Económica.
11. Moermond, T. C. & Denslow, J. S. (1985) Neotropical avian frugivores: patterns of behavior, morphology, and nutrition, with consequences for fruit selection. In: Buckley, P. A., Foster, M. S., Morton, E. S., Ridgely, R. S. & Buckley, F. G. (eds.) *Neotropical ornithology*. *Orn. Monogr.* 36.
12. Parrado-Rosselli, A. & Amaya-Espinel, J. D. (2006). Feeding behavior of Purple-throated Fruitcrow (*Querula purpurata*: Cotingidae) in the Colombian Amazon and its implications for seed dispersal. *Biotropica* 38: 561–565.
13. Pascotto, M. C. (2007) *Rapanea ferruginea* (Ruiz & Pav.) Mez. (Myrsinaceae) como uma importante fonte alimentar para as aves em uma mata de galeria no interior do Estado de São Paulo. *Rev. Bras. Zool*. 24: 735–741.
14. Piacentini, V. Q., Aleixo, A., Agne, C. E., Maurício, G. N., Pacheco, J. F., Bravo, G. A., Brito, G. R. R., Naka, L. N., Olmos, F., Posso, S., Silveira, L. F., Betini, G. S., Carrano, E., Franz, I., Lees, A. C., Lima, L. M., Pioli, D., Schunck, F., Amaral, F. R., Bencke, G. A., Cohn-Haft, M., Figueiredo, L. F. A., Straube, F. C. & Cesari, E. (2015) Annotated checklist of the birds of Brazil by the Brazilian Ornithological Records Committee / Lista comentada das aves do Brasil pelo Comitê Brasileiro de Registros Ornitológicos. *Rev. Bras. Orn*. 23: 91–298.
15. Pizo, M. A., Silva, W. R., Galetti, M. E & Laps, R. (2002) Frugivory in cotingas of the Atlantic Forest of southeast of Brazil. *Ararajuba* 10: 177–185.
16. Purificação, K. N., Pascotto, M. C., Mohr, A. & Lenza, E. (2015) Frugivory by birds on *Scheffleria morototoni* (Araliaceae) in a Cerrado-Amazon Forest transition area, eastern Mato Grosso, Brazil. *Acta Amazônica* 45: 57–64.
17. Sick, H. (1997) *Ornitologia brasileira*. Rio de Janeiro: Ed. Nova Fronteira.
18. Sigrist, T. (2009) *Avifauna brasileira: guia de campo*. São Paulo: Avis Brasilis.
19. Silveira, L. F. & Straube, F. C. (2008) Aves ameaçadas de extinção no Brasil. In: Machado, A. B. M., Drummond, G. M. & Paglia, A. P. (eds.) *Livro vermelho da fauna brasileira ameaçada de extinção*. Belo Horizonte: Ministério do Meio Ambiente & Fundação Biodiversitas.
20. Skutch, A. F. (1969) *Life histories of Central American birds*, 3. Pacific Coast Avifauna 35. Berkeley, CA: Cooper Ornithological Society.
21. Snow, D. W. (1981) Tropical frugivorous birds and their food plants: a world survey. *Biotropica* 13: 1–14.
22. Snow, D. W. (1982) *The cotingas*. Ithaca, NY: Cornell University Press.
23. Snow, D. W. (2004) Banded Cotinga (*Cotinga maculata*). In: del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, 9. Barcelona: Lynx Edicions.
24. Tabarelli, M. & Peres, C. A. (2002) Abiotic and vertebrate seed dispersal in the Brazilian Atlantic forest: implications for forest regeneration. *Biol. Conserv*. 106: 165–176.
25. Veracel (2007) *Plano de Manejo: Reserva Particular de Patrimônio Natural Estação Veracel*. Brasília: Veracel e Conservação Internacional Brasil.

Fernando Igor de Godoy
Casa da Floresta Ambiental S.S., Piracicaba, São Paulo, Brasil. E-mail: fernando@casadafloresta.com.br.

Primer registro del Negrón Costeño *Melanitta perspicillata* para El Salvador y Centro América

Guillermo Funes, Melvin Francisco Bonilla Navidad, Edwin Calderón, Scott Housten y Alejandro Calderón

Received 23 April 2017; final revision accepted 16 October 2017
Cotinga 40 (2018): 54–56
published online 16 June 2018

We document the observation of a first-year male Surf Scoter *Melanitta perspicillata* at Nahualapa Lagoon, La Paz, El Salvador, on 13–16 January 2017. Surf Scoter breeds in North America, and winters in the coastal USA and Mexico, and occasionally at inland lakes. This sighting is the first record for El Salvador and Central America, and the southernmost ever for the species.

El Negrón Costeño *Melanitta perspicillata* es un pato de hábitos marinos, que se reproduce en Alaska y al norte de Canadá e inverna principalmente en las costas del Pacífico y el Atlántico de Norteamérica. Sin embargo, algunos invernan en grandes cuerpos de aguas interiores como en los Grandes Lagos localizados entre Estados Unidos y Canadá[15,17]. Es un visitante común en el noroeste de México (Baja California y el golfo de California) durante el invierno[7]. Se alimenta de moluscos, principalmente de Mejillones *Mytilus edulis*, aunque también aprovecha el desove del Arenque *Clupea pallasii* para alimentarse[12,17].

El 13 de enero de 2017 un individuo de *M. perspicillata* fue avistado en la laguna de Nahualapa, El Salvador. La laguna de Nahualapa, 13°28'05.0"N 89°00'05.7"O (Fig. 4), se ubica en el municipio de El Rosario, La Paz, y se encuentra rodeado de un bosque seco tropical y una mezcla de sistemas productivos, donde se observan potreros, casas y distintas especies de árboles. Es un cuerpo de agua continental permanente, con vegetación acuática presente como Lirio de Agua *Eichornia crassipes*[10].

El ave fue avistada inicialmente por SH, quien sugirió que podría tratarse de un *M. perspicillata*. Posteriormente, el pato fue observado por todos los autores durante 45 minutos, permitiendo tomar nota de las principales características morfológicas y fotografiarlo (Figs. 1–3). El individuo se juntaba con otros Patos de Collar *Aythya collaris*, lo que permitió una comparación entre sus tamaños, siendo *M. perspicillata* ligeramente más grande. Ocasionalmente el pato se sumergía para alimentarse. Con buena luz, fue evidente el parche blanco en la nuca, y el pico amarillo. Además, fue posible observar el vientre del ave, color blanco. Los machos con su plumaje de primer año, que persiste desde mediados de enero hasta marzo, presentan picos multicolores, anaranjados o blancos, parches blancos de la nuca parcialmente desarrollados, pecho y vientres claros, y ausencia de los parches blancos de la frente y mejillas[9]. Estas características concuerdan con el individuo observado en laguna de Nahualapa. La identificación fue corroborada por un especialista a través de un video, confirmando además que se trataba de un macho en su primer año (S. Iverson com. pers.).

Otros observadores visitaron la laguna de Nahualapa el 15 y 16 de enero, y el pato todavía se encontraba ahí[3]. Un observador de aves, visitó nuevamente la laguna el 8 de febrero y el pato ya no fue observado (N. Herrera com. pers.). El 2 de abril, los autores y otro grupo de observadores de aves visitaron la laguna con el objetivo de buscar el pato, pero sin resultados positivos.

Esta especie de pato no figura en la última lista de aves de El Salvador[8], u otras publicaciones posteriores, por lo que esta observación constituye el primer registro para El Salvador. En cuanto a Centroamérica, esta especie tampoco figura en las listas de aves (u otra literatura) de Belice, Guatemala y Honduras[4], Nicaragua[13], Costa Rica[5,6] y Panamá[1,2]. En la base de datos en línea eBird tampoco existen registros para Centroamérica, el registro más próximo a la laguna de Nahualapa, es un individuo fotografiado en Carretera Puerto Arista-Boca del Cielo, Chiapas, México en marzo de 2015[3].

El hallazgo de *M. perspicillata* en la laguna de Nahualapa se convierte, a la vez, en el registro más al sur de su distribución. El que esta especie haya llegado hasta El Salvador, puede deberse a las condiciones climáticas en los días previos a la observación. Es conocido que los patos de esta especie realizan movimientos asociados a la disponibilidad de Mejillones, mientras invernan, sin embargo, estos movimientos son locales[11].

La semana del 9 al 13 de enero (cinco días antes de la observación) se percibieron en El Salvador fuertes ráfagas de viento (30–40 km/h), debido a una cuña anticiclónica que generaba alta presión; esta estaba ubicada en la costa este de Canadá y los Estados Unidos manteniéndose hasta Centroamérica[14]. Es posible que este individuo estaba invernando (o se dirigía a invernar) a las costas de México, y fue arrastrado por los fuertes vientos hasta El Salvador. En el pasado, la ocurrencia de ciertas especies raras en El Salvador

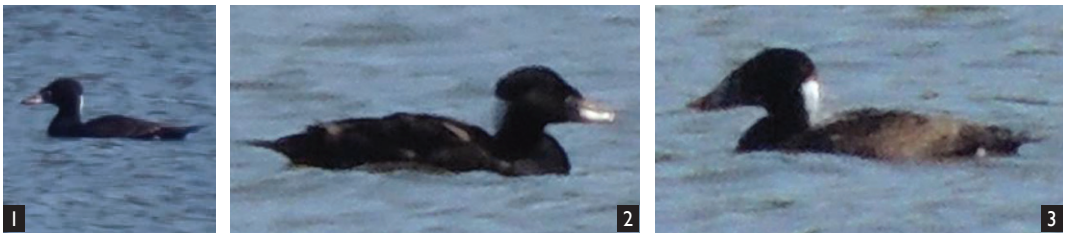


Figura 1. Individuo de Negrón Costeño *Melanitta perspicillata*, laguna de Nahualapa, La Paz, El Salvador, 13 de enero 2017 (Melvin Bonilla)
Figuras 2–3. Individuo de Negrón Costeño *Melanitta perspicillata*, laguna de Nahualapa, La Paz, El Salvador, 13 de enero 2017 (Scott Housten)

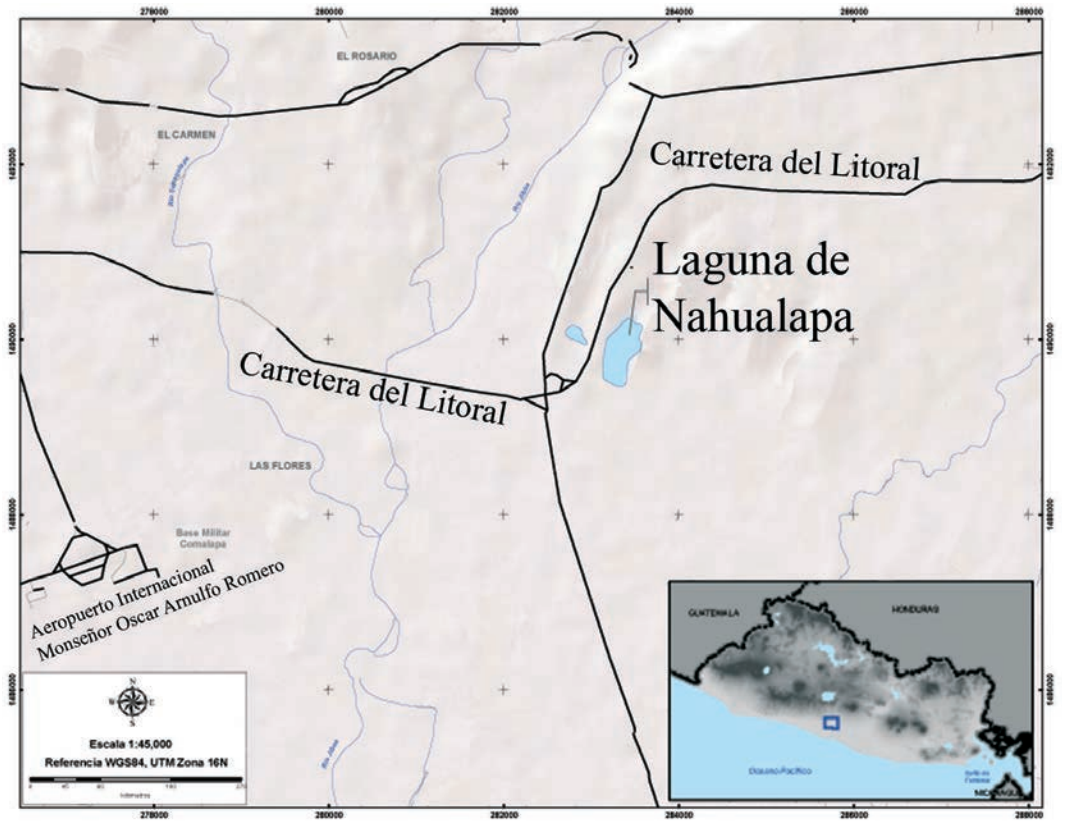


Figura 4. Ubicación de la Laguna de Nahualapa, La Paz, El Salvador. Mapa preparado por Ricardo Pérez.

se ha atribuido a fuertes vientos, como el caso del Saltador Garganta Canela *Saltator maximus*[16]. Aunque tampoco se puede descartar la posibilidad que el individuo simplemente siguió a otros patos que si suelen invernar en El Salvador (como *A. collaris* con los cuales se vio nadando). Se propone que esta especie sea catalogada como un vagabundo migratorio para El Salvador.

Agradecimientos

A los revisores de *Cotinga*, por sus aportes para mejorar el manuscrito. A Samuel Iverson del Canadian Wildlife Service por confirmar la especie y edad del pato. A todas las personas que revisaron el manuscrito, e hicieron aportes para mejorarlo: Oliver Komar, Carlos Funes, Luis Pineda, John van Dort, David Pablo, Néstor Herrera y Ricardo Ibarra.

Referencias

1. Audubon Panamá (2016) Lista de las aves de Panamá. Ciudad de Panamá: Sociedad Audubon de Panamá. www.audubonpanama.org/w/wp-content/uploads/Panama-checklist-2016.pdf (accedido 1 de marzo de 2017).

2. Angehr, G. R. & Dean, R. (2010) *The birds of Panama*. Ithaca, NY: Zona Tropical.
3. eBird (2012) eBird: una base de datos en línea para la abundancia y distribución de las aves. www.ebird.org (accedido 2 febrero de 2017).
4. Fagan, J. & Komar, O. (2016) *Field guide to birds of northern Central America*. New York: Houghton Mifflin.
5. Garrigues, R, Araya-Salas, M., Camacho-Varela, P., Chaves-Campos, J., Martínez-Salinas, A., Montoya, M., Obando-Calderón, G. & Ramírez-Alán, O. (2015) Lista oficial de las aves de Costa Rica 2015–2016. https://listaoficialavesdecostarica.wordpress.com/lista-oficial/ (accedido 10 febrero de 2017).
6. Garrigues, R., Araya-Salas, M., Camacho-Varela, P., Chaves-Campos, J., Martínez-Salinas, A., Montoya, M., Obando-Calderón, G. & Ramírez-Alán, O. (2016) Lista oficial de las aves de Costa Rica actualización 2016. *Zeledonia* 20: 3–12.
7. Howell, S. N. G. & Webb, S. (1995) *A guide to the birds of Mexico and northern Central America*. Oxford: Oxford University Press.
8. Ibarra, R. (2013) Aves de El Salvador: estado actual del conocimiento e iniciativas de conservación. *Bioma* 9: 12–91.
9. Iverson, S., Esler, D. & Boyd, W S. (2003) Plumage characteristics as an indicator of age class in the Surf Scoter. *Waterbirds* 26: 56–61.
10. Jiménez I., L., Sánchez-Mármol, G. & Herrera, N. (2004) *Inventario nacional y diagnósticos de humedales de El Salvador*. San Salvador: MARN/AECI.
11. Kirk, M., Esler, D. & Iverson, S. A. (2008) Movements of wintering surf scoters: predator responses to different prey landscapes. *Oecologia* 155: 859–867.
12. Lok, E., Kirk, M., Esler, D. & Boyd, W. S. (2008) Movements of pre-migratory Surf and White-winged Scoters in response to Pacific herring spawn. *Waterbirds* 31: 385–393.
13. Martínez Sánchez, J. C., Chavarría-Duriaux, L. & Muñoz, F. J. (2014) *A guide to the birds of Nicaragua*. Hohenwarsleben: Westarp Verlagsservicegelleschaft mbh.
14. SNET (Servicio Nacional de Estudios Territoriales) (2017) www.snet.gob.sv/ver/meteorologia/informes+especiales/?evento=299 (accedido 9 de marzo de 2017).
15. Terres, J. K. (1995) *The Audubon Society encyclopedia of North American birds*. New York: Wings Books.
16. Thurber, W. A., Serrano, F. J., Sermeño, A. & Benítez, M. (1987) Status of uncommon and previously unreported birds of El Salvador. *Proc. West. Found. Vert. Zool*. 3: 109–293.
17. Vermeer, K. (1981) Food and populations of Surf Scoters in British Columbia. *Wildfowl* 32: 107–116.

Guillermo Funes
Col. España # 2, pje. nvo. Cádiz, #53 Mejicanos, San Salvador, El Salvador. E-mail: guilleyfunes@gmail.com.

Melvin Francisco Bonilla Navidad
Urb. Dolores 4ta etapa, Mejicanos, San Salvador, El Salvador. E-mail: melvin_bonilla@yahoo.com.

Edwin Calderón
Lotificación Minerva, Santa Ana, Santa Ana, El Salvador. E-mail: edcalder@gmail.com.

Scott Housten
PO Box 5004, Ocean City, MD, EEUU. E-mail: ssquashfly@yahoo.com.

Alejandro Calderón
Lotificación Minerva, Santa Ana, Santa Ana, El Salvador. E-mail: aljoscalde@gmail.com.

The birds of San José de Payamino, Orellana, Ecuador

Stewart A. White and Javier Patiño

Received 6 May 2014; final revision accepted 17 January 2018
Cotinga 40 (2018): 57–68
published online 16 June 2018

El territorio de Payamino está localizado en la Amazonía ecuatoriana, una zona rica en biodiversidad ubicada en los Andes tropicales, y le pertenece a la comunidad de San José de Payamino. La Estación Científica Timburi Cocha está localizada dentro del territorio de Payamino, en el banco del río Payamino, y provee facilidades para investigadores visitantes y residentes. Hay un alto nivel de biodiversidad de aves en la región, y el presente estudio documenta la avifauna en el interior del territorio de Payamino. Registramos 340 especies de aves, incluyendo 32 especies indicadoras cuya presencia establece que la región es un ejemplo excelente de un Bosque Tropical Perennifolio de Llanura Amazónica Norteña. Algunas especies de interés seleccionadas son discutidas en mayor detalle, como *Gallinula galeata*, *Coccyzus melacoryphus*, *Conopophaga peruviana* y *Catharus minimus*. El desarrollo de la Estación Científica Timburi Cocha, junto al monitoreo continuo de la flora y la fauna en el área, continuará respaldando a la comunidad de Payamino y a sus esfuerzos para preservar su medio ambiente prístino.

Biodiversity levels peak in the tropics in general, especially in tropical forests[7]. Of the three main tropical forest regions, Neotropical rainforests support the highest species diversity in most groups of organisms[3]. Among birds, 90 of the c.150 recognised families occur in the Neotropics and of these 28 are endemic[7]. In their review of global biodiversity hotspots, Myers *et al.*[3] pinpointed the tropical Andes as harbouring the highest total number of bird species and the largest number of endemic bird species. Fjeldså & Rahbek[1] identified the east slope of the Andes as supporting the greatest avian species richness in the world, with the absolute peak of beta diversity around Volcán Sumaco and its adjacent foothills.

Sumaco Biosphere Reserve was established in the year 2000 and is on the east slope of the Andes within the Tropical Andes biodiversity hotspot. Inside the biosphere reserve lies Sumaco Napo Galeras National Park, created in 1994, as well as territory owned by the community of San José de Payamino. Payamino territory comprises 16,800 ha of primary and secondary forest around two main rivers, the Payamino and Paushiyacu. The territory covers altitudes from c.250 m in the east, to 1,500 m towards the slopes of Volcán Sumaco.

Here we describe the first systematic study of the avifauna of San José de Payamino territory. Surveys were undertaken in 2000–15, during various research expeditions and field courses operated by the University of Glasgow, UK. Mist-netting, visual observations and sound-recordings were used to survey birds. Sampling was conducted in six widely separated areas of Payamino territory and in various habitats: primary and secondary forest, man-made clearings, agricultural land and along rivers and streams. This study forms one part of efforts to catalogue biodiversity in Payamino territory.

Methods

Study area.—Timburi Cocha Research Station is sited in Payamino territory on the banks of the río Payamino at c.00º28'S 77º17'W (Fig. 1). The research station was constructed in 2005 on land owned by the Kichwa community of San José de Payamino and provides basic facilities for resident and visiting researchers, mostly ecologists. Timburi Cocha is jointly managed by Universidad Estatal Amazónica, Ecuador, and the University of Manchester, UK. As well as the research station itself, several temporary satellite stations have been constructed in more remote parts of Payamino territory. Vegetation is both primary and secondary lowland forest. The secondary forest is of varying ages and at various stages of regeneration from previously cleared and farmed land. Areas of primary forest are mainly *terra firme* with some small patches of *várzea* in low-lying areas along main rivers and streams.

Methods.—Several study areas were accessed during our surveys. Most areas were visited repeatedly over several field seasons, permitting birds to be marked and subsequently retrapped as described below. Most sampling was conducted in *terra firme* forest around San José de Payamino, with significantly reduced effort in secondary and *várzea* forests, and at the various satellite research stations (Table 1). It was impossible to balance sampling across areas and forest types for logistical reasons. Sampling to date has been in the altitudinal range 250–400 m. Sampling commenced in September 2000 and continues to date, with July, June and September, in that

Table 1. Coordinates of the central point in each survey area at Payamino.

Site	Coordinates
San José de Payamino	0°28'55"S 77°17'06"W
Juri Juri	0°27'08"S 77°10'14"W
Paushiyacu	0°24'31"S 77°14'30"W
Vigay	0°25'33"S 77°19'58"W
Sacha Huasi	0°24'31"S 77°16'39"W
Pacha Huasi	0°26'12"S 77°16'35"W

order, receiving most sampling effort, slightly lower effort in August and, finally, short sampling periods in March 2008 and 2013. In total, there was 297 days of surveys between September 2000 and September 2015.

Visual observation using binoculars, ground-level mist-netting and sound-recording were used to compile the avifaunal inventory. The majority of visual observations were made in clearings, along principal trails and along rivers, but at some sites it was possible to make observations deeper in forest, up to 300 m from the forest edge.

Mist-netting sites were along established trails and in newly cleared transects in areas further from edges, as well as clearings and along watercourses. Mist-netting commenced shortly before dawn, at c.06h00, using six 18 m-long × 2.5m-high, 33 mm-mesh mist-nets. They were checked every 30 minutes to remove captured birds, a period ample to permit efficient captures without endangering birds' health. All identifications were made using major reference works on South American avifauna[4–6]. Mist-netting continued until midday, after which nets were taken down and moved to a new site, unless further sampling was required at the same site. In general, nets were moved after each day to gain a larger sample size, due to birds becoming habituated to the nets.

Sound-recordings were made using a Sennheiser ME-66 directional microphone with either a Sony Hi-MD MZ-RH1 minidisc recorder or Roland RO5 stereo recorder. Sound-recordings were made in the period shortly before and after dawn when birds are most vocal. Vocalisations were subsequently identified via comparison with reference recordings[3]. A small number of recordings were made at night. Recordings are currently being catalogued for future archiving at the University of Glasgow, UK, and Universidad Estatal Amazónica, Puyo.

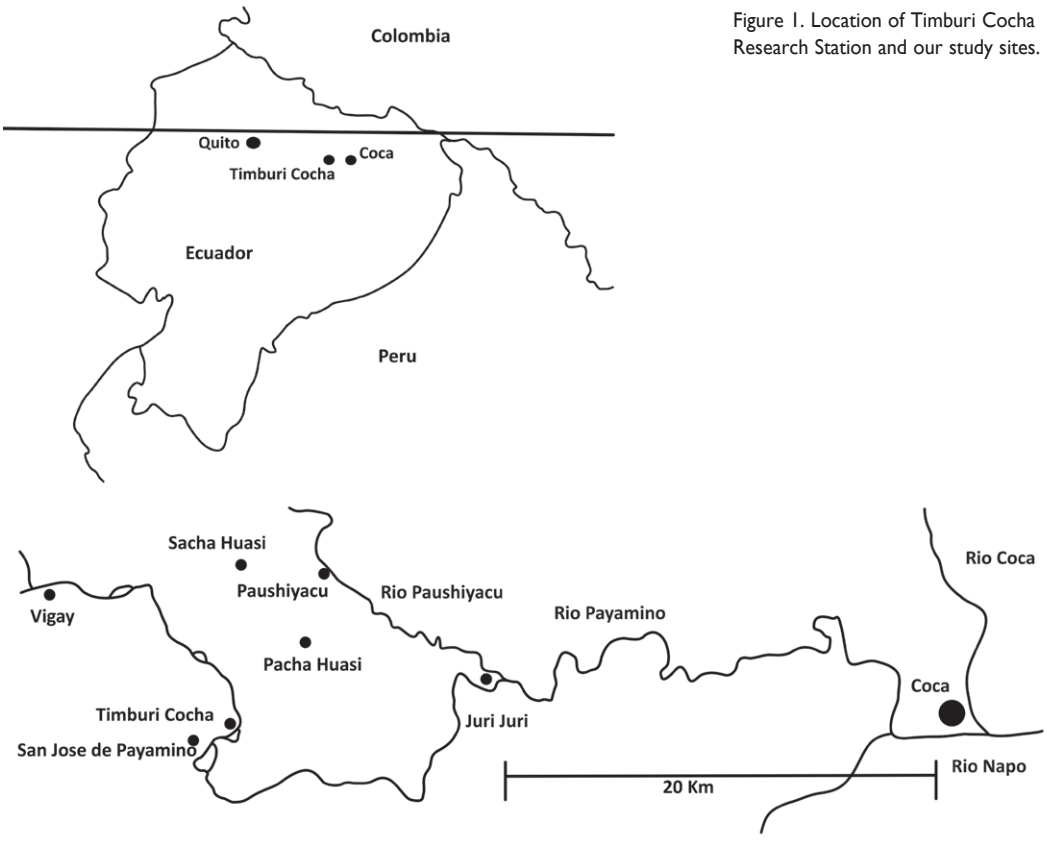


Figure 1. Location of Timburi Cocha Research Station and our study sites.

In addition to formal sampling techniques, a small number of species were recorded solely via images captured by trail cameras used to record mammalian fauna. The various sampling methods permitted as complete coverage as possible of the avifauna of Payamino territory given the limited periods when it was possible to visit the area. Potential gaps in the avifauna are discussed below.

Results

The Appendix presents the complete list of bird species recorded at Payamino up to September 2015, a total of 340 species. Also recorded are the method(s) of observation, relative abundance, foraging strata, habitat(s), sensitivity to disturbance, conservation and research priorities (*sensu* Stotz *et al.*[7]). All but one species on the list were recorded by ourselves or colleagues at Timburi Cocha Research Station. The exception is Oilbird *Steatornis caripensis*, whose inclusion is based on reliable descriptions provided by members of the Payamino community.

Stotz *et al.*[7] compiled lists of indicator species by zoogeographic region and by habitat within each region. Indicator species were chosen as their presence indicates that a site is a high-quality example of a given habitat. For Tropical Lowland Evergreen forest in northern Amazonia Stotz *et al.*[7] listed 52 indicator species: 32 occur at Payamino (Appendix 1).

Selected species accounts

Rufous-breasted Wood Quail *Odontophorus speciosus*
One record, a bird found alive in a ground trap set by one of the local community at Timburi Cocha in June 2012. It was captured at the edge of secondary forest at c.400 m, well below the usual altitudinal range of 800–1,800 m in Ecuador[4].

Common Gallinule *Gallinula galeata*
One observed in June 2007 at a pond in secondary forest, upstream of San José de Payamino. Regular in western lowlands of Ecuador, with populations at highland lakes in the north[4]. The only previous record in the eastern lowlands refers to a small resident population at Limoncocha on the río Napo north-east of Payamino[4].

Military Macaw *Ara militaris*
Several observed at a salt lick in secondary forest near the río Payamino at an elevation of c.350 m in March 2011.

Dark-billed Cuckoo *Coccyzus melacoryphus*
Austral migrant to the eastern lowlands, but resident in lowlands and foothills of south-west Ecuador[8]. Several observed separately in the canopy of scrubby secondary forest in June 2007 and July 2008.

Rufous Potoo *Nyctibius bracteatus*
Very rare and local but probably under-recorded in Ecuador[4]. Heard regularly at Timburi Cocha research station.

Fiery Topaz *Topaza pyra*
Scarce and local in eastern Ecuador[4]. One observed in July 2009 foraging along the río Payamino near its confluence with the río Vigay.

Brown Nunlet *Nonnula brunnea*
Thought to be rare and uncommon in eastern Ecuador[4], but it is the most commonly trapped puffbird at Payamino (Fig. 2). Regularly recorded at most study sites in primary and secondary forest.

Figure 2. Brown Nunlet *Nonnula brunnea*, Sacha Huasi, Payamino Ecuador, 25 July 2004 (Victoria Tough)

Figure 3. Grey-cheeked Thrush *Catharus minimus*, San José de Payamino, Ecuador, 22 April 2013 (Carly Aulicky)

Golden-olive Woodpecker *Piculus rubiginosus*
Less numerous on the east slope of the Andes in Ecuador than in the west. One trapped in *terra firme* forest at Sacha Huasi in July 2004 at c.320 m, well below its usual elevational range of 800–2,300 m[4].

Spot-throated Woodcreeper *Deconychura stictolaema*
Rare and local but probably overlooked in Ecuador[4]. One trapped in *terra firme* forest in September 2000 at the lowest altitude site sampled at Payamino (around 250 m).

Río Suno Antwren *Myrmotherula sunensis*
Rare and local in forest undergrowth in lowlands of eastern Ecuador[4]. One trapped in *terra firme* forest west of San José de Payamino in June 2005.

Ash-throated Gnateater *Conopophaga peruviana*
Only occurs south of the río Napo. A male and two females trapped during an eight-day period in June and July 2011.

Grey-cheeked Thrush *Catharus minimus*
A scarce boreal winter resident widely distributed in the foothills and lowlands of eastern Ecuador[4]. One caught in a mist-net during a short project targeting Pipridae in April 2013 (Fig. 3).

Discussion

Use of multiple sampling techniques permitted us to record a wide range of species. Given acknowledged biases in our methodology, there are gaps in the species list and some families are certainly under-recorded. Certain groups likely to be under-represented in our list include nightbirds, swifts (which are often seen but difficult to identify to species level) and canopy tyrant flycatchers. Future surveys will endeavour to address these shortcomings. More nocturnal sound-recording and canopy-level mist-netting will be conducted. Most sampling has been in June–September, but based on year-round observations by colleagues at Timburi Cocha, and limited mist-netting in March–April, the avifauna does vary considerably throughout the year. Future surveys will attempt to cover the October–May period and should add species to the list. As mentioned above, only a limited altitudinal range was sampled. Sampling at higher altitudes within Payamino territory and in areas less used for hunting and foraging by the local community will also be a focus of future studies.

The list of species recorded to date provides a strong indication of the avian species richness of Payamino, as would be expected from a site within the Tropical Andes biodiversity hotspot[3]. That 32 indicator species have been recorded is a measure of the health of the Payamino forest ecosystem as a whole. Like most areas in Amazonian Ecuador, increasing outside pressures are coming to bear on the forest and the community itself. All decisions are made by a group of elders following discussion with the rest of the community. The community seeks to maintain a traditional way of life and preserve the forest. Since 2000, support from the Payamino Project, Aalborg Zoo, Universidad Estatal Amazónica, the University of Manchester and University of Glasgow has permitted the community to resist overtures from oil companies to search for deposits in the area. Continuing development of Timburi Cocha Research Station and ongoing monitoring of the flora and fauna will continue to support the community. Visiting researchers pay a 'tourist tax' for each day they are in Payamino and are encouraged to purchase food supplies from community members if possible. None of these alternative sources of income can compete with the financial power of national and international oil companies, so the future health of this biologically valuable part of the world is not guaranteed.

Acknowledgements

Many University of Glasgow students who participated in expeditions and field courses between 2000 and 2015 helped with data collection. The study would have been impossible without the guides and various other members of the community of San José de Payamino, for permission to conduct research and for help in clearing trails and mist-net sites. Thanks to Nan Swannie for introducing SW to Payamino and to Jens Siggsgard, Richard Preziosi, Jennifer Rowntree, Ali May, Sumiko Gallagher, Rachael Donnachie, Anna Harrison, Martin Muir, Paul Bamford, Darwin García and all of the many other individuals involved with the Payamino Project during the study period. Funding for the various university expeditions came from University of Glasgow Court, the Carnegie Trust for the Universities of Scotland, Glasgow Natural History Society, Russel Trust, Dennis Curry Trust, Royal Scottish Geographical Society, Tunnocks Ltd, Frederick Soddy Trust, Lindeth Trust, HRH The Duke of Edinburgh, Albert Reckitt Charitable Trust, Gilchrist Educational Trust, Chester Zoo, Scottish Parrot and Foreign Bird Club, Rotary Club of Corstorphine, Cross Trust, Walter Guinness Trust, Chester Zoo and Thriplow Charitable Trust. Personal funding for SW was provided by the Carnegie Trust and British Ornithologists' Union.

References

1. Fjeldså, J. & Rahbek, C. (1999) Continent-wide conservation priorities and diversification processes. In: Mace, G. M., Balmford, A. & Ginsberg, J. R. (eds.) *Conservation in a changing world*. Cambridge, UK: Cambridge University Press.

2. Krabbe, N. & Nilsson, J. (2003) *Birds of Ecuador: sounds and photographs*. Westernieland: Bird Songs International BV.
3. Myers, N., Mittermeier, R. A., da Fonseca, G. A. B. & Kent, J. (2000) Biodiversity hotspots for conservation priorities. *Nature* 403: 853–858.
4. Ridgely, R. S. & Greenfield, P. J. (2001) *The birds of Ecuador*, Ithaca, NY: Cornell University Press.
5. Ridgely, R. S. & Tudor, G. (1989) *The birds of South America*, 1. Oxford: Oxford University Press.
6. Ridgely, R. S. & Tudor, G. (1994) *The birds of South America*, 2. Oxford: Oxford University Press.
7. Stotz, D. F., Fitzpatrick, J. W., Parker, T. A. & Moskovits, D. K. (1996) *Neotropical birds: ecology and conservation*. Chicago: University of Chicago Press.

Stewart A. White
School of Life Sciences, University of Glasgow, Glasgow G128QQ, Scotland. E-mail: stewart.white@glasgow.ac.uk

Javier Patiño
Universidad Estatal Amazónica, Puyo, Ecuador.

Appendix. List of species recorded at Payamino, prov. Orellana, eastern Ecuador, between September 2000 and September 2015.

Key:

Hab—Habitat: T = *terra firme*; v = *várzea*; S = secondary; M = marsh; R = river; SC = scrub/waste ground; AG = agricultural land.

Ev – Evidence: CAM = camera trap; M = mist-net; S = sight; TRAP = bird caught in trap; V = vocalisation; P = photographed; P(c) = photographed (camera trap).

Abund—Abundance: A = abundant (observed daily in large numbers); C = common (observed daily); F = fairly common (observed regularly but not always daily); U = uncommon (observed occasionally, present regularly); R = rare (very rarely observed).

Snst—Sensitivity, following Stotz *et al.*[7] database A: L = low; M = medium; H = high.

Strat—Foraging strata, following Stotz *et al.*[7] database A: T = terrestrial; U = understorey; M = midstorey; C = canopy; A = aerial; W = water.

Ind—Northern Amazonia Tropical Lowland Evergreen forest indicator species[7] whose range covers the Payamino area: I = indicator species.

Species	English name	Hab	Ev	Abund	Snst	Strat	Ind
TINAMIDAE							
Tinamus tao	Grey Tinamou	T	V	R	H	T	
Tinamus major	Great Tinamou	T	S	R	M	T	
Crypturellus cinereus	Cinereous Tinamou	S	V	U	L	T	
Crypturellus soui	Little Tinamou	S/T	V	F	L	T	
Crypturellus undulatus	Undulated Tinamou	S	V	U	L	T	
Crypturellus variegatus	Variegated Tinamou	T	V	U	H	T	I
Crypturellus bartletti	Bartlett's Tinamou	T	V	U	H	T	
CRACIDAE							
Penelope jacquacu	Spix's Guan	T	S	U	H	T/C	
Pipile cumanensis	Blue-throated Piping Guan	T	S	U	H	C	
Ortalis guttata	Speckled Chachalaca	T/R	V	C	L	U/C	
Nothocrax urumutum	Nocturnal Curassow	V/T	V	U	H	T	
Mitu salvini	Salvin's Curassow	T	S	R	H	T	I
ODONTOPHORIDAE							
Odontophorus gujanensis	Marbled Wood Quail	T	M	U	H	T	I
Odontophorus speciosus	Rufous-breasted Wood Quail	T	TRAP	R	H	T	
PODICIPEDIDAE							
Tachybaptus dominicus	Least Grebe	M	S	R	M	W	
COLUMBIDAE							
Patagioenas speciosa	Scaled Pigeon	T	S	U	M	C	
Patagioenas plumbea	Plumbeous Pigeon	T	S/V	C	H	C	
Patagioenas subvinacea	Ruddy Pigeon	T/V	V	F	H	C	
Geotrygon saphirina	Sapphire Quail-Dove	T	S	R	H	T	
Geotrygon montana	Ruddy Quail-Dove	T	S/V/M	C	M	T	
Leptotila rufaxilla	Grey-fronted Dove	T/S	S/M	C	M	T	
Columbina minuta	Plain-breasted Ground Dove	SC	S	U	L	T	
Claravis pretiosa	Blue Ground Dove	T	S	R	L	T/M	

Species	English name	Hab	Ev	Abund	Snst	Strat	Ind
CUCULIDAE							
Crotophaga major	Greater Ani	V/R	S	C	M	T/C	
Crotophaga ani	Smooth-billed Ani	SC/R	S	C	L	T/C	
Piaya cayana	Squirrel Cuckoo	T/S	S/V	F	L	C	
Piaya melanogaster	Black-bellied Cuckoo	T	S	F	H	C	
Coccyzus melacoryphus	Dark-billed Cuckoo	S	S	U	L	M/C	
STEATORNITHIDAE							
Steatornis caripensis	Oilbird	T		U	M	C/A	
NYCTIBIIDAE							
Nyctibius grandis	Great Potoo	T	V	U	M	C	
Nyctibius aethereus	Long-tailed Potoo	T	V	U	H	C	
Nyctibius griseus	Common Potoo	T/S/R	V	F	L	C	
Nyctibius bracteatus	Rufous Potoo	T	V	R	H	M?	
CAPRIMULGIDAE							
Nyctipolus nigrescens	Blackish Nightjar	T	V	U	M	T	
Nyctidromus albicollis	Common Pauraque	T/S	V	U	L	T	
Hydropsalis climacocerca	Ladder-tailed Nightjar	R	V	U	M	U	
APODIDAE							
Streptoprocne rutila	Chestnut-collared Swift	S	S	U	L	A	
Streptoprocne zonaris	White-collared Swift	T	S	C	L	A	
Chaetura brachyura	Short-tailed Swift	S	S	F	L	A	
Tachornis squamata	Fork-tailed Palm Swift	SC	S	F	L	A	
Panyptila cayennensis	Lesser Swallow-tailed Swift	S	S	U	M	A	
TROCHILIDAE							
Topaza pyra	Fiery Topaz	R	S	R	M	U/M	
Florisuga mellivora	White-necked Jacobin	S/AG	S	U	L	M/C	
Eutoxeres condamini	Buff-tailed Sicklebill	T/S	M (P)	F	M	U	
Glaucis hirsutus	Rufous-breasted Hermit	T/S	M (P)	F	L	U	
Threnetes leucurus	Pale-tailed Barbthroat	T	M (P)	F	?	U?	
Phaethornis atrimentalis	Black-throated Hermit	T/S	M (P)	F	M	U	
Phaethornis hispidus	White-bearded Hermit	V	M	U	M	U	
Phaethornis bourcieri	Straight-billed Hermit	T/S	M (P)	F	H	U/M	
Phaethornis malaris	Great-billed Hermit	T	S/M (P)	C	H	U	I
Doryfera johannae	Blue-fronted Lancebill	T	S/M (P)	U	M	U/M	
Anthracothorax nigricollis	Black-throated Mango	SC	S	U	L	M/C	
Heliodoxa aurescens	Gould's Jewelfront	V/T	M	U	M	U/C	
Campylopterus largipennis	Grey-breasted Sabrewing	T/S	S/M	F	M	U/M	
Thalurania furcata	Fork-tailed Woodnymph	T/S	S/M (P)	F	M	U/M	
Amazilia fimbriata	Glittering-throated Emerald	S/R	M	U	L	U/C	
Chrysuronia oenone	Golden-tailed Sapphire	S/T	M (P)	U	L	U/C	
OPISTHOCOMIDAE							
Opisthocomus hoazin	Hoatzin	M	S/V (P)	U	M	U/C	
PSOPHIIDAE							
Psophia crepitans	Grey-winged Trumpeter	T	S (Pc)	U	H	T	I
RALLIDAE							
Aramides cajaneus	Grey-necked Wood Rail	V	S	U	H	T	
Anurolimnas castaneiceps	Chestnut-headed Crake	S	CAM (Pc)	U	L	LT	
Anurolimnas fasciatus	Black-banded Crake	S/R	V	U	M	T	
Gallinula galeata	Common Gallinule	M	S	U	L	T/W	
Porphyrio martinica	Purple Gallinule	M	S	U	L	T	
HELIORNITHIDAE							
Heliornis fulica	Sungrebe	R	M	R	M	W	
CHARADRIIDAE							
Vanellus cayanus	Pied Lapwing	R	S	R	M	T	
SCOLOPACIDAE							
Actitis macularius	Spotted Sandpiper	R	S	R	L	W	

Species	English name	Hab	Ev	Abund	Snst	Strat	Ind
EURYPYGIDAE							
Eurypyga helias	Sunbittern	V	S	R	M	M	
PHALACROCORACIDAE							
Phalacrocorax brasilianus	Neotropic Cormorant	R	S	U	L	W	
ANHINGIDAE							
Anhinga anhinga	Anhinga	R	S	U	M	W	
ARDEIDAE							
Tigrisoma lineatum	Rufescent Tiger Heron	R	S	F	M	T/W	
Tigrisoma fasciatum	Fasciated Tiger Heron	R	S	U	M	T/W	
Butorides striata	Striated Heron	R	S	U	L	T/W	
Bubulcus ibis	Cattle Egret	R	S	F	L	T	
Ardea cocoi	Cocoi Heron	R	S	U	L	T/W	
Ardea alba	Great Egret	R	S	F	L	T/W	
Pilherodius pileatus	Capped Heron	R	S	U	M	T/W	
Egretta thula	Snowy Egret	R	S	F	L	T/W	
Egretta caerulea	Little Blue Heron	R	S (P)	U	M	T/W	
THRESKIORNITHIDAE							
Mesembrinibis cayennensis	Green Ibis	R	S	U	M	T	
Phimosus infuscatus	Bare-faced Ibis	M	S	R	M	T	
Platalea ajaja	Roseate Spoonbill	R	S	R	M	W	
CATHARTIDAE							
Cathartes aura	Turkey Vulture	AG	S	C	L	T/A	
Cathartes melambrotus	Greater Yellow-headed Vulture	T	S (P)	C	M	T/A	
Coragyps atratus	Black Vulture	SC	S	C	L	T/A	
Sarcoramphus papa	King Vulture	T	S	U	M	T/A	
PANDIONIDAE							
Pandion haliaetus	Osprey	R	S	U	M	W	
ACCIPITRIDAE							
Elanoides forficatus	Swallow-tailed Kite	T	S (P)	F	M	C/A	
Harpagus bidentatus	Double-toothed Kite	T	S	U	M	C	
Ictinia plumbea	Plumbeous Kite	T	S	F	M	C/A	
Accipiter superciliosus	Tiny Hawk	R	S	R	H	C	
Buteogallus schistaceus	Slate-coloured Hawk	V	M (P)	R	H	U/M	
Buteogallus urubitinga	Great Black Hawk	T/R	S	R	L	T/C	
Rupornis magnirostris	Roadside Hawk	S/T	S/V	F	L	C	
Leucopternis albicollis	White Hawk	T	S (Pc)	R	H	C	
STRIGIDAE							
Megascops choliba	Tropical Screech Owl	S	V	U	L	C	
Lophostrix cristata	Crested Owl	T	V	U	H	C	
Pulsatrix perspicillata	Spectacled Owl	T	S/V	U	M	C	
Glaucidium brasilianum	Ferruginous Pygmy Owl	S/T	S/M	U	L	C	
TROGONIDAE							
Pharomachrus pavoninus	Pavonine Quetzal	T	S	U	H	M/C	
Trogon melanurus	Black-tailed Trogon	T/V	S	U	M	C	
Trogon viridis	Green-backed Trogon	T	S/V	F	M	C	
Trogon ramonianus	Amazonian Trogon	S/T	S/V	U	M	C	
Trogon curucui	Blue-crowned Trogon	T/R	S	U	M	C	
ALCEDINIDAE							
Megaceryle torquata	Ringed Kingfisher	R	S	F	L	U/C	
Chloroceryle amazona	Amazon Kingfisher	R	S/M	C	L	U/M	
Chloroceryle americana	Green Kingfisher	R	S/M	C	L	U	
Chloroceryle inda	Green-and-rufous Kingfisher	V	M (P)	U	M	U	
Chloroceryle aenea	American Pygmy Kingfisher	R/T	M (P)	U	M	U	
MOMOTIDAE							
Electron platyrhynchum	Broad-billed Motmot	T	S	U	M	M	
Baryphthengus martii	Rufous Motmot	T	M	U	M	U/M	

Species	English name	Hab	Ev	Abund	Snst	Strat	Ind
Momotus momota	Amazonian Motmot	T/S/V	S/V/M (P)	C	M	U/M	
GALBULIDAE							
Galbula albirostris	Yellow-billed Jacamar	T	S/M (P)	U	H	M	
Galbula tombacea	White-chinned Jacamar	T/	S	U	L	M	
Jacamerops aureus	Great Jacamar	T	S	U	H	M/C	
BUCCONIDAE							
Bucco capensis	Collared Puffbird	T	S/M (P)	U	H	C	
Malacoptila fusca	White-chested Puffbird	T	M (P)	U	H	U	I
Nonnula brunnea	Brown Nunlet	T	M	U	H	U	
Monasa nigrifrons	Black-fronted Nunbird	T/V	S/M	F	M	M/C	
Monasa morphoeus	White-fronted Nunbird	S/T	S/M (P)	C	H	M/C	
Monasa flavirostris	Yellow-billed Nunbird	S/T	S	U	M	M/C	
Chelidoptera tenebrosa	Swallow-winged Puffbird	T	S	R	L	C	
CAPITONIDAE							
Capito auratus	Gilded Barbet	S/T	S/V/M (P)	C	M	M/C	
Eubucco richardsoni	Lemon-throated Barbet	T/V	V	U	H	C	
RAMPHASTIDAE							
Ramphastos tucanus	White-throated Toucan	T/S	S/V	A	H	C	
Ramphastos vitellinus	Channel-billed Toucan	T	S/V	F	H	C	
Selenidera reinwardtii	Golden-collared Toucanet	T	S/M (P)	F	H	C	
Pteroglossus castanotis	Chestnut-eared Araçari	S/T	S/V	F	H	C	
Pteroglossus pluricinctus	Many-banded Araçari	S/T	S/M (P)	C	H	C	
Pteroglossus azara	Ivory-billed Araçari	T	S	U	H	C	
PICIDAE							
Picumnus rufiventris	Rufous-breasted Piculet	T	S/M (P)	U	L	U/M	
Melanerpes cruentatus	Yellow-tufted Woodpecker	S/T/AG	S	C	L	C	
Veniliornis affinis	Red-stained Woodpecker	T	S	F	M	C	
Piculus rubiginosus	Golden-olive Woodpecker	S	S	U	L	C	
Colaptes punctigula	Spot-breasted Woodpecker	S	S	U	L	M/C	
Celeus flavus	Cream-coloured Woodpecker	S/AG	S	F	M	M/C	
Celeus elegans	Chestnut Woodpecker	T/S	S/V	F	M	M/C	
Dryocopus lineatus	Lineated Woodpecker	S/T	S	F	L	C	
Campephilus melanoleucos	Crimson-crested Woodpecker	T	S	F	M	C	
FALCONIDAE							
Herpetotheres cachinnans	Laughing Falcon	S	S	R	L	C	
Micrastur ruficollis	Barred Forest Falcon	T	S/M	U	M	U/M	
Micrastur gilvicollis	Lined Forest Falcon	T/V	S/M (P)	R	H	U/M	I
Micrastur mirandollei	Slaty-backed Forest Falcon	T	S/M (P)	R	M	M/C	
Micrastur semitorquatus	Collared Forest Falcon	T	M	R	M	M/C	
Ibycter americanus	Red-throated Caracara	S/T	S	C	H	C	
Daptrius ater	Black Caracara	R/S	S	C	L	T/C	
Milvago chimachima	Yellow-headed Caracara	SC	S	U	L	T/C	
PSITTACIDAE							
Brotogeris cyanoptera	Cobalt-winged Parakeet	T/S	S	F	M	C	
Pionus menstruus	Blue-headed Parrot	T/S	S	F	L	C	
Amazona ochrocephala	Yellow-crowned Parrot	V	S	U	M	C	
Amazona farinosa	Mealy Parrot	T	S	U	M	C	
Amazona amazonica	Orange-winged Parrot	T/V/S	S	F	M	C	
Pionites melanocephalus	Black-headed Parrot	T/V	S/V	F	H	C	
Pyrrhura melanura	Maroon-tailed Parakeet	T	S	U	H	C	
Aratinga weddellii	Dusky-headed Parakeet	T/S	S	F	L	C	
Orthopsittaca manilatus	Red-bellied Macaw	V	S	U	M	C	
Ara ararauna	Blue-and-yellow Macaw	T/AG	S/V	F	M	C	
Ara militaris	Military Macaw	T	S	U	M	C	
Ara macao	Scarlet Macaw	T	S	U	M	C	
Ara severus	Chestnut-fronted Macaw	T/S	S	C	M	C	

Species	English name	Hab	Ev	Abund	Snst	Strat	Ind
Psittacara leucopthalmus	White-eyed Parakeet	T/V	S	U	L	C	
THAMNOPHILIDAE							
Frederickena fulva	Fulvous Antshrike	T	M (P)	F	H	U	
Taraba major	Great Antshrike	T/S	S	F	L	U	
Thamnophilus schistaceus	Plain-winged Antshrike	T/V	V/M	F	H	M	
Thamnophilus aethiops	White-shouldered Antshrike	T	M	C	H	U	I
Neoctantes niger	Black Bushbird	T	S/M	U	H	U	
Thamnomanes ardesiacus	Dusky-throated Antshrike	T	M	F	H	U	I
Thamnomanes caesius	Cinereous Antshrike	T	V/M	F	H	U/M	I
Isleria hauxwelli	Plain-throated Antwren	T	M (P)	C	H	U	
Pygiptila stellaris	Spot-winged Antshrike	T	M	U	H	C	
Epinecrophylla erythrura	Rufous-tailed Antwren	T	M (P)	U	H	U/M	I
Myrmotherula brachyura	Pygmy Antwren	T/V	S	U	L	C	
Myrmotherula ignota	Moustached Antwren	T/V	M	U	M	C	
Myrmotherula axillaris	White-flanked Antwren	T/V/S	S/V/M (P)	C	M	U/M	
Myrmotherula sunensis	Río Suno Antwren	T	M (P)	R	H	U/M	
Myrmotherula longipennis	Long-winged Antwren	T	M	F	H	U/M	I
Myrmotherula menetriesii	Grey Antwren	T	M	F	H	M/C	
Dichrozona cincta	Banded Antbird	T	M (P)	U	H	T	
Herpsilochmus dugandi	Dugand's Antwren	T	M	R	H	C	
Microrhopias quixensis	Dot-winged Antwren	T	M	U	M	M	
Hypocnemis peruviana	Peruvian Warbling Antbird	T/V/S	S/V/M	F	M	U/M	
Cercomacroides serva	Black Antbird	T	M	U	M	U	
Cercomacroides nigrescens	Blackish Antbird	T/S	M	U	M	U	
Cercomacra cinerascens	Grey Antbird	T	M	U	H	C	
Myrmoborus myotherinus	Black-faced Antbird	T	M	F	H	U	I
Sclateria naevia	Silvered Antbird	V	M	U	M	T	
Myrmelastes leucostigma	Spot-winged Antbird	T	M (P)	U	H	T/U	
Akletos melanoceps	White-shouldered Antbird	V	M (P)	U	M	T	
Hafferia fortis	Sooty Antbird	T	M (P)	U	H	T/U	
Pithys albifrons	White-plumed Antbird	T	S/M (P)	C	H	U	I
Gymnopithys leucaspis	White-cheeked Antbird	T/S	S/M (P)	C	M	U	
Rhegmatorhina melanosticta	Hairy-crested Antbird	T	M (P)	F	H	U	
Hylophylax naevius	Spot-backed Antbird	T/V	M (P)	C	H	U	
Hylophylax punctulatus	Dot-backed Antbird	V	M	U	M	U	
Willisornis poicilinotus	Common Scale-backed Antbird	T	M	U	M	U	
Phlegopsis nigromaculata	Black-spotted Bare-eye	T	M	F	M	U	
Phlegopsis erythroptera	Reddish-winged Bare-eye	T	S/M (P)	F	H	U	
CONOPOPHAGIDAE							
Conopophaga aurita	Chestnut-belted Gnateater	T	M	U	H	U	I
Conopophaga peruviana	Ash-throated Gnateater	T	M	U	H	U	I
GRALLARIIDAE							
Myrmothera campanisona	Thrush-like Antpitta	T	M (P)	U	H	T	I
FORMICARIIDAE							
Formicarius colma	Rufous-capped Antthrush	T	M (P)	U	H	T	I
Formicarius analis	Black-faced Antthrush	T/V/S	S/V/M	C	M	T	
Chamaeza nobilis	Striated Antthrush	T	S/M (P)	U	H	T	I
FURNARIIDAE							
Sclerurus rufigularis	Short-billed Leaftosser	T	M	U	H	T	I
Sclerurus caudacutus	Black-tailed Leaftosser	T	M	U	H	T	I
Certhiasomus stictolaemus	Spot-throated Woodcreeper	T	M	U	H	M	
Dendrocincla fuliginosa	Plain-brown Woodcreeper	T/S	S/V/M	C	H	U/M	I
Glyphorynchus spirurus	Wedge-billed Woodcreeper	T/S	S/V/M (P)	C	M	U/M	
Dendrocolaptes certhia	Amazonian Barred Woodcreeper	T	M	U	H	U/M	I
Dendrocolaptes picumnus	Black-banded Woodcreeper	T/S	M	U	H	M	
Xiphocolaptes promeropirhynchus	Strong-billed Woodcreeper	T	S/M	U	H	M/C	

Species	English name	Hab	Ev	Abund	Snst	Strat	Ind
Xiphorhychus obsoletus	Striped Woodcreeper	V	M	U	M	U/M	
Xiphorhychus ocellatus	Ocellated Woodcreeper	T	M (P)	F	H	U/M	
Xiphorhychus elegans	Elegant Woodcreeper	T	S/M (P)	C	H	U/M	
Xiphorhychus guttatus	Buff-throated Woodcreeper	T/V/S	M	F	L	U/C	
Xenops minutus	Plain Xenops	T/S	M (P)	F	M	U/M	
Philydor erythrocercum	Rufous-rumped Foliage-gleaner	T	S/M (P)	U	H	M	
Philydor erythropterum	Chestnut-winged Foliage-gleaner	T	S	U	H	C	
Philydor pyrrhodes	Cinnamon-rumped Foliage-gleaner	T/V	S/M (P)	U	H	M	
Anabacerthia ruficaudata	Rufous-tailed Foliage-gleaner	T	M	R	H	M	
Ancistrops strigilatus	Chestnut-winged Hookbill	T	S/M	U	H	M/C	
Clibanornis rubiginosus	Ruddy Foliage-gleaner	T	M (P)	U	M	U	
Automolus melanopezus	Brown-rumped Foliage-gleaner	T/V	M (P)	U	H	U	
Automolus ochrolaemus	Buff-throated Foliage-gleaner	T	M	U	M	U	
Automolus subulatus	Striped Woodhaunter	T/S	M (P)	U	H	M	
Automolus infuscatus	Olive-backed Foliage-gleaner	T	M	U	H	U	I
Cranioleuca gutturata	Speckled Spinetail	T/S	S	R	H	C	
TYRANNIDAE							
Elaenia gigas	Mottle-backed Elaenia	S	M	U	L	C	
Corythopis torquatus	Ringed Antpipit	T	M	U	H	T	I
Zimmerius chrysops	Golden-faced Tyrannulet	S	S	U	M	C	
Mionectes olivaceus	Olive-striped Flycatcher	T/S	M (P)	F	M	U/M	
Mionectes oleagineus	Ochre-bellied Flycatcher	T/V/S	M	C	M	U/C	
Lophotriccus vitiosus	Double-banded Pygmy Tyrant	T/V	M	R	M	U/M	
Poecilotriccus capitalis	Black-and-white Tody-Flycatcher	T/V	M	R	M	U/C	
Cnipodectes subbrunneus	Brownish Twistwing	T	M	R	H	U	I
Rhynchocyclus olivaceus	Olivaceous Flatbill	T	M	U	H	M	
Tolmomyias assimilis	Yellow-margined Flycatcher	T	M (P)	U	H	C	
Tolmomyias poliocephalus	Grey-crowned Flycatcher	V/T	M	U	M	C	
Platyrinchus coronatus	Golden-crowned Spadebill	T	M	U	H	U/M	I
Onychorhynchus coronatus	Royal Flycatcher	T/V	M (P)	R	H	M	
Myiobius barbatus	Sulphur-rumped Flycatcher	T	M	U	H	U/M	I
Terenotriccus erythrurus	Ruddy-tailed Flycatcher	T	S/M (P)	U	M	M/C	
Sayornis nigricans	Black Phoebe	R	S	R	L	T/C	
Ochthornis littoralis	Drab Water Tyrant	R	S	C	M	T/U	
Myiozetetes similis	Social Flycatcher	S/T	S	U	L	M/C	
Myiozetetes luteiventris	Dusky-chested Flycatcher	S/V	S	U	M	C	
Pitangus sulphuratus	Great Kiskadee	R/S	S/V	C	L	T/C	
Pitangus lictor	Lesser Kiskadee	R	S/V	F	L	U	
Myiodynastes maculatus	Streaked Flycatcher	S/T	S	U	L	M/C	
Megarynchus pitangua	Boat-billed Flycatcher	R/S	S/V	C	L	C	
Tyrannopsis sulphurea	Sulphury Flycatcher	S	S	R	M	C	
Tyrannus melancholicus	Tropical Kingbird	S/T/R	S	C	L	C	
Myiarchus tuberculifer	Dusky-capped Flycatcher	T/S	M	U	L	M/C	
Attila spadiceus	Bright-rumped Attila	T	S	U	M	M/C	
COTINGIDAE							
Querula purpurata	Purple-throated Fruitcrow	T	S	U	M	C	
Cotinga cayana	Spangled Cotinga	T	S	R	H	C	
Lipaugus vociferans	Screaming Piha	T	V	C	H	M/C	
Gymnoderus foetidus	Bare-necked Fruitcrow	V/T	S	U	M	C	
PIPRIDAE							
Tyranneutes stolzmanni	Dwarf Tyrant-Manakin	T	M	U	H	M	
Chiroxiphia pareola	Blue-backed Manakin	T	M (P)	U	H	U/M	I
Cryptopipo holochlora	Green Manakin	T	M	F	H	U	
Lepidothrix coronata	Blue-crowned Manakin	T/S	S/V/M (P)	C	M	U/M	
Manacus manacus	White-bearded Manakin	T/S/V	S/V/M (P)	F	L	U	
Pipra filicauda	Wire-tailed Manakin	T/V	S/M (P)	F	M	U/M	

Species	English name	Hab	Ev	Abund	Snst	Strat	Ind
Machaeropterus regulus	Striped Manakin	T/S	S/M (P)	C	M	U/M	
Ceratopipra erythrocephala	Golden-headed Manakin	T/S	S/V/M (P)	C	H	U/M	I
TITYRIDAE							
Tityra inquisitor	Black-crowned Tityra	T/S	S	U	M	C	
Tityra cayana	Black-tailed Tityra	T/V	S/V	C	M	C	
Tityra semifasciata	Masked Tityra	T/S	S	U	M	C	
Laniocera hypopyrra	Cinereous Mourner	T	M	U	H	M/C	
Iodopleura isabellae	White-browed Purpletuft	T	S	R	M	C	
Pachyramphus castaneus	Chestnut-crowned Becard	T	S	U	M	C	
Pachyramphus polychopterus	White-winged Becard	T	V	U	L	L	
Pachyramphus minor	Pink-throated Becard	T	S	R	H	C	
INCERTAE SEDIS							
Piprites chloris	Wing-barred Piprites	T	M	U	H	C	
VIREONIDAE							
Tunchiornis ochraceiceps	Tawny-crowned Greenlet	T	M	F	M	U/M	I
CORVIDAE							
Cyanocorax violaceus	Violaceous Jay	T/S/R	S/V	A	L	C	
HIRUNDINIDAE							
Pygochelidon cyanoleuca	Blue-and-white Swallow	SC	S	C	L	A	
Atticora fasciata	White-banded Swallow	R	S	C	M	A	
Atticora tibialis	White-thighed Swallow	S	S	F	M	A	
Stelgidopteryx ruficollis	Southern Rough-winged Swallow	R	S	U	L	A	
Progne chalybea	Grey-breasted Martin	SC	S	F	L	A	
Tachycineta albiventer	White-winged Swallow	R	S	C	L	A	
TROGLODYTIDAE							
Microcerculus marginatus	Scaly-breasted Wren	T/S	S/V/M	C	H	T/U	
Microcerculus bambla	Wing-banded Wren	T	M (P)	U	H	T/U	
Troglodytes aedon	House Wren	S/SC	S/V	C	L	T/U	
Campylorhynchus turdinus	Thrush-like Wren	S/T	S/V	F	L	M/C	
Pheugopedius coraya	Coraya Wren	T/V	V	F	L	U	
Cantorchilus leucotis	Buff-breasted Wren	T/V/S	S	F	L	U	
Henicorhina leucostica	White-breasted Wood Wren	T	M (P)	F	M	U	
Cyphorhinus arada	Musician Wren	T	S/V/M (P)	F	H	T/U	
POLIOPTILIDAE							
Microbates cinereiventris	Half-collared Gnatwren	T	M	U	H	U	
DONACOBIIDAE							
Donacobius atricapilla	Black-capped Donacobius	M	S	R	M	U	
TURDIDAE							
Catharus minimus	Grey-cheeked Thrush	T/S	M (P)	U	M	A	
Catharus ustulatus	Swainson's Thrush	T	M	U	M	A	
Turdus lawrencii	Lawrence's Thrush	T/V	V/M (P)	F	H	C	
Turdus albicollis	White-necked Thrush	T	M (P)	F	M	U/M	
THRAUPIDAE							
Hemithraupis flavicollis	Yellow-backed Tanager	T	S	U	M	C	
Volatinia jacarina	Blue-black Grassquit	SC	S	U	L	T/U	
Tachyphonus cristatus	Flame-crested Tanager	T	S/M	U	M	C	
Tachyphonus surinamus	Fulvous-crested Tanager	T	M (P)	U	M	U/M	
Tachyphonus luctuosus	White-shouldered Tanager	T	S	U	M	M/C	
Ramphocelus nigrogularis	Masked Crimson Tanager	R	S	U	M	U/C	
Ramphocelus carbo	Silver-beaked Tanager	S/R	S (P)	C	L	U/C	
Lanio fulvus	Fulvous Shrike-Tanager	T	S/M	U	H	C	I
Cyanerpes caeruleus	Purple Honeycreeper	T/V	S/M	U	M	C	
Dacnis lineata	Black-faced Dacnis	T/V	S	U	M	C	
Dacnis cayana	Blue Dacnis	T	S	U	L	C	
Sporophila castaneiventris	Chestnut-bellied Seedeater	SC	S	U	L	U	
Sporophila angolensis	Chestnut-bellied Seed Finch	R	S/V/M	C	L	U/M	

Species	English name	Hab	Ev	Abund	Snst	Strat	Ind
Saltator maximus	Buff-throated Saltator	T/S	M	U	L	M/C	
Coereba flaveola	Bananaquit	S	S	U	L	C	
Paroaria gularis	Red-capped Cardinal	S/R	S	U	L	T/M	
Cissopis leverianus	Magpie Tanager	S/R	S	C	L	U/C	
Tangara nigrocincta	Masked Tanager	T/S	S	U	M	C	
Tangara mexicana	Turquoise Tanager	S/V	S	U	M	C	
Tangara chilensis	Paradise Tanager	T/S	S	U	M	U/C	
Tangara schrankii	Green-and-gold Tanager	T/V	S/M (P)	U	H	M/C	
Thraupis episcopus	Blue-grey Tanager	T/S	S/V	F	L	C	
Thraupis palmarum	Palm Tanager	T/S	S/V	F	L	C	
Ixothraupis xanthogastra	Yellow-bellied Tanager	T	S/M (P)	U	H	C	
EMBERIZIDAE							
Ammodramus aurifrons	Yellow-browed Sparrow	SC/AG	S	U	L	T	
Arremon aurantiirostris	Orange-billed Sparrow	T	S	R	M	T	
CARDINALIDAE							
Habia rubica	Red-crowned Ant Tanager	T	S/M (P)	U	H	U/M	
Cyanoloxia cyanoides	Blue-black Grosbeak	T/S	M (P)	F	M	U	
PARULIDAE							
Myiothlypis fulvicauda	Buff-rumped Warbler	T	S/M	U	M	T	
ICTERIDAE							
Psarocolius angustifrons	Russet-backed Oropendola	T/S/V/R	S/V	A	L	C	
Psarocolius viridis	Green Oropendola	T	S/V	U	H	C	
Psarocolius decumanus	Crested Oropendola	T/S/V/R	S/V (P)	A	M	C	
Cacicus solitarius	Solitary Black Cacique	S	S	U	L	U/M	
Cacicus cela	Yellow-rumped Cacique	T/S/V	S	A	L	M/C	
Cacicus oseryi	Casqued Cacique	T	S	U	H	C	
Icterus croconotus	Orange-backed Troupial	S/AG	S	U	L	C	
Icterus cayanensis	Epaulet Oriole	S	S	U	L	C	
Gymnomystax mexicanus	Oriole Blackbird	SC	S	U	L	U/M	
Molothrus oryzivorus	Giant Cowbird	R	S	U	L	T/C	
Molothrus bonariensis	Shiny Cowbird	R	S	F	L	T/C	
FRINGILLIDAE							
Euphonia minuta	White-vented Euphonia	T/S	S	U	M	C	
Euphonia xanthogaster	Orange-bellied Euphonia	T/S	S/M (P)	C	M	U/C	
Euphonia rufiventris	Rufous-bellied Euphonia	T	S/M	F	M	C	

First observations of Plumbeous Vireo *Vireo plumbeus* in eastern Honduras

Jesse Fagan

Received 22 May 2015; final revision accepted 27 November 2017
Cotinga 40 (2018): 69–73
published online 16 June 2018

El autor hace los primeros registros de *Vireo plumbeus* para la región Oriental de Honduras. Cinco individuos fueron observados el 15 y 17 de febrero del 2012, en la Reserva Biológica Rus Rus, departamento Gracias a Dios, Honduras. El autor realizó fotografías y grabaciones de algunos individuos. Los individuos de Rus Rus aparecen en aislamiento de otras poblaciones conocidas de *V. plumbeus* y posiblemente representan una nueva subespecie sin nombre. Además, el autor discute la taxonomía histórica y actual de *V. plumbeus* en Centro América y urgen más estudios para determinar las relaciones entre todas las poblaciones.

Plumbeous Vireo *Vireo plumbeus* forms part of the 'Solitary Vireo' complex, which consists of three similar-looking vireo species formerly considered to represent a single species, *V. solitarius*[1]. Based on a study limited to the USA, Johnson[8] proposed splitting *V. s. plumbeus* (Plumbeous Vireo) from *V. s. cassinii* (Cassin's Vireo) based on genetic differences, and further suggested a split of *V. s. cassinii* from *V. s. solitarius* (Blue-headed Vireo) based on genetic and vocal differences. The AOU accepted this proposal[2] largely based on the genetic work of Johnson[8] and Murray *et al.*[12], as well as differences in morphology and vocalisations[4]. However, populations in Mexico (including southern Baja California) and Central America seem to have been ignored.

Four subspecies of Plumbeous Vireo are generally accepted; another three (*pinicolus*, *repetens* and *jacksoni*) are of questionable status and are not considered further here[13]. Nominate *V. p. plumbeus* breeds in the Rocky Mountains of the western USA south to Oaxaca, Mexico, with northern populations wintering to western Mexico[7,13,15]. The slightly larger and darker *gravis* breeds in eastern Mexico, while smaller *montanus* breeds from southern Mexico (south-east Oaxaca) to north-west Nicaragua, and the smallest race *notius* breeds in Belize. Interestingly, the AOU[2] noted that the assignment 'of populations from Central America to *V. plumbeus* is tentative.'

V. p. notius is found only in the low-lying mountains of central Belize generally above 600 m, but occurs locally to near sea level (for example, at Cockscomb Basin Wildlife Sanctuary, Stan Creek district)[5,9]. This small region of the Mayan Mountains and Mountain Pine Ridge (Cayo and Toledo districts) comprises mainly pine savanna (*Pinus caribaea*) and broadleaf forest with a dense scrub understorey. *V. p. montanus* occurs in the highlands of southern Mexico (Oaxaca and Chiapas states), Guatemala, and central Honduras to north-west Nicaragua, down to 600 m, but more commonly above 1,200 m, in mixed pine-oak forest (*Quercus* spp.), pine-savanna forest (predominately *P. oocarpa*), and in shade-grown coffee plantations[5,7,10,11,13] (pers. obs.). Populations of *montanus* and *notius* are allopatric (Fig. 1).

V. p. notius was described by J. Van Tyne on 4 March 1931, based on an adult male collected 20 km south of El Cayo (now San Ignacio), Cayo district, Belize, on a 'pine ridge'[16]. This individual was described as having 'a very short, rounded wing and proportionately longer tail.' The fifth primary being longer than the ninth and the tenth being 'decidedly larger' than 'other known forms of this species.' Primaries were numbered one to ten with one being the innermost (adjacent to the secondaries) and ten the outermost. The plumage was described as 'like *Vireo solitarius cassinii* [Cassin's Vireo] but the upper parts especially the crown, darker. Crown and auricular region pure gray, not washed with green. Outer web of the outer most tail feathers more extensively white.' Van Tyne[16] also noted that birds were in 'full song' between 16 February and 4 March. Race *montanus* was described by van Rossem[14], an adult male collected at Hacienda Chilata, dpto. Sonsonate, El Salvador, on 23 April 1927. (It should be noted that van Rossem published his description after Van Tyne, as he originally ascribed the individuals he collected in El Salvador to '*V. s. cassinii*'.) It was described as similar to *V. p. notius*, but 'decidedly larger and underparts more heavily overlaid with dusky olive green.' It was further described as being different from Cassin's Vireo in its 'more leaden upper parts, darker and more greenish underparts' with more white edging on the tail, a longer tenth primary, and more rounded wings (the fifth primary being longer than the ninth). It is curious that the description of this race should come from El Salvador given that there have been few modern observations of *montanus* in this country[5] (O. Komar pers. comm.).

Figure 1. Range of Plumbeous Vireo *Vireo plumbeus* in northern Central America.

Figure 2. Plumbeous Vireo *Vireo plumbeus notius* at Mountain Pine Ridge, Cayo district, Belize, 13 April 2012 (Dominic Sherony)

Figure 3. Plumbeous Vireo *Vireo plumbeus montanus*, San Buenaventura, dpto. Francisco Morazán, Honduras, 6 January 2012 (John Van Dort)

I studied specimens (Louisiana State University Museum of Natural Science, Baton Rouge) and available photographs, along with my personal field observations, which show minor differences between *notius* and *montanus*. *V. p. notius* is the coldest-looking in appearance. The upperparts are nearly uniform slate-grey with only a slight yellowish wash to the back and rump; little contrast between the back and nape; the throat is white and contrasts strongly with the darker head; and the flanks and vent show a dingy yellow wash. This race is most similar to *V. p. plumbeus*, but *notius* is overall slightly paler grey above and smaller in size (Fig. 2). *V. p. montanus* has a yellow wash to the back and rump affording this area a more olive appearance. There is an obvious contrast with the soft grey head; contrast between the white throat and grey head is less obvious as the borders between the throat and malar region are less distinct; the flanks and vent are washed yellow. The primaries and most secondaries are fringed yellow (visible on the folded wing), which feature is less obvious or absent in *notius*. *V. p. montanus* resembles brighter examples of Cassin's Vireo *V. cassinii* of North America (Fig. 3).

Figure 4. Pine-savanna forest in Reserva Biológica Rus Rus, eastern Honduras (Jesse Fagan)

Figure 5. The Reserva Biológica Rus Rus study area in eastern Honduras marked with a red star.

Figure 6. Plumbeous Vireo *Vireo plumbeus*, Reserva Biológica Rus Rus, Honduras, 15 February 2012 (Jesse Fagan)

Figures 7–8. Plumbeous Vireo *Vireo plumbeus*, Reserva Biológica Rus Rus, Honduras, 17 February 2012 (Jesse Fagan)

Methods

I conducted field work in Rus Rus Biological Reserve (RRBR) in eastern Honduras (dpto. Gracias a Dios) on 8–20 February 2012. RRBR is c.80 km south-west of Puerto Lempira (15°15'N 83°47'W; 10 m) and 25 km north of the Nicaraguan border (Fig. 5). RRBR is a large area consisting of upland pine savanna mixed with patches of humid lowland

rainforest. The area is intersected by many small streams and rivers, the largest being the Coco River, which forms the border with Nicaragua. The pine savanna is characterised by tall (>15 m) *P. caribaea* trees with a grassy understorey typical of other fire-maintained ecosystems (Fig. 4). Dpto. Gracias a Dios is a sparsely populated region with an estimated human density of just 4.6 people per km^2. Its remoteness and lack of infrastructure has meant that the region has received little ornithological attention.

During my field work I made sound-recordings using a Sound Devices 702 digital recorder with a ME66 Sennheiser shotgun microphone. All recordings have been uploaded to www.xeno-canto.org (XC). Analysis of recordings was made using Sony Sound Forge v9.0. In addition, photographs were taken using a Canon D50 and 100–400 lens.

Results

During February 2012, in RRBR, I recorded several Plumbeous Vireos. At the time, there were no previous published reports of the species from eastern Honduras[3,6,11]. The first individual was observed on 15 February (14°51'N 84°29'W; 148 m), singing and foraging 5–10 m above ground at the ecotone between humid riparian forest and pine savanna. The song was sound-recorded, and playback used to draw the bird closer, permitting me to photograph it and confirm the identification (XC155164, XC155167; Fig. 6).

The only really similar species in northern Central America with which Plumbeous Vireo may be confused is Blue-headed Vireo *V. solitarius*, but the latter species has stronger contrast between the colours of the head, throat and upperparts. In addition, although Blue-headed Vireo is a fairly common transient and winter visitor in the interior highlands of northern Central America, generally above 1,000 m, it is quite rare along the Caribbean coast and in eastern Honduras[5,7,11]. Furthermore, Blue-headed Vireo would be less likely to sing so early in the season prior to northbound migration (pers. obs.) and has a different song. On 17 February, in an area of pine savanna c.3 km from the initial site (14°50'N 84°29'W; 142 m), a second individual was recorded singing in the canopy of a pine tree c.15 m above ground (XC111990, XC155160). Subsequently, a third individual was photographed nearby (14°50'N 84°30'W; 133 m) (Figs. 7–8). In total, I encountered at least five individuals (heard or seen) in RRBR. The birds at RRBR have a grey head that contrasts with a slightly olive back. The secondaries and primaries on the folded wing are fringed yellow and there is a yellowish wash to the flanks and vent. The population in eastern Honduras most resembles *V. p. montanus*.

The song of individuals at RRBR is typical of Solitary Vireo. Each longer series (the 'song') consists of 3–8 elements alternated on average every 2.5 seconds. Sometimes there are breaks in the series of >5 seconds and the song begins again. The elements can be clear whistles or combine buzzy beginnings with clear whistled endings. Some elements are broken into two parts. The elements are short and quick, delivered in 0.25 seconds. Compared to *V. solitarius*, the song seems higher pitched, and the entire series sounds more upbeat and less 'solemn'.

Discussion

The entire region of eastern Honduras is known as La Moskitia, which includes the RRBR. It is a vast area of primary lowland rainforest and pine savanna. The avifauna shares many pine-savanna specialists with similar habitats in Belize and Nicaragua. I found Black-throated Bobwhite *Colinus nigrogularis* and Botteri's Sparrow *Aimophila botterii* to be quite common in the grassy understorey, and Grace's Warbler *Setophaga graciae* in the pine canopy. The distribution of *V. p. montanus* extends at least as far south as Yucul Reserve, dpto. Jinotega, Nicaragua (12°54'N 85°46'W)[5]. Perhaps Plumbeous Vireo occurs in pine savanna further east along the Caribbean coast of Nicaragua (where it has not previously been recorded), which extends in small patches nearly as far south as Bluefields (12°00'N 83°45'W). However, a 2017 ornithological expedition by the University of Kansas in this region failed to find the species at two different sites (M. B. Robbins pers. comm.). One hypothesis is that these are migratory or wandering *montanus* from the highlands. Morphologically, birds from RRBR appear very similar to *montanus*, but until now it has been assumed that this race is largely sedentary. If populations of *montanus* (e.g., from western Honduras) are prone to wander or make short-distance altitudinal migrations, it may be expected that a few wandering birds would appear out of range, or that a noticeable decrease or increase in local populations would be detected. To my knowledge, this has not been documented. Further, in addition to my initial sightings in February 2012, there have been subsequent observations of singing birds at RRBR, in May 2017[5], which seems to eliminate this last hypothesis.

Resident subspecies of Plumbeous Vireo in northern Central America (and Mexico) merit further taxonomic analysis. Genetic studies could help to resolve their relatedness, especially to the three named northern species. Furthermore, there is also the curious case of *V. cassinii lucasanus* from the Cape District of southern Baja California (Mexico), which looks like *V. solitarius* but is vocally closer to *V. cassinii*, and was also not covered by Johnson's study[8]. Specimens of RRBR birds should be collected, as they could represent an unnamed

taxon. There are recordings of vocalisations of the two named subspecies in northern Central America and recordings of the RRBR birds, and although they sound very similar (typical of 'Solitary Vireo' songs), appropriate analysis might detect differences in speed, pace, number of elements, modulation and frequency, which could act as isolating mechanisms. Furthermore, there are subtle plumage differences between most populations, at least between *notius* and *montanus*. That these are resident, non-migratory and isolated populations should be sufficient grounds to promote additional investigation of their taxonomic rank. Given the genetic history of other taxa in Middle America vs. North America (e.g., Chipping Sparrow *Spizella passerina*, Pine Siskin *Spinus pinus*, juncos *Junco* spp.) it is possible that Middle American 'Solitary' Vireos could be basal to the northward expansion and divergence that gave rise to the three recognised North American species.

Acknowledgements

I thank my excellent local guide in RRBR, Jorge Emilio Salaverri H. I would like to thank Oliver Komar, Steve N. G. Howell, Daniel Lane and Mark B. Robbins for commenting on earlier drafts of this paper. J. V. Remsen provided access to specimens housed at Louisiana State University Museum of Natural Science, Baton Rouge. I also thank John Van Dort and Dominic Sherony for use of their photographs.

References

1. American Ornithologists' Union (AOU) (1983) *Checklist of North American birds*. Sixth edn. Washington DC: American Ornithologists' Union.
2. American Ornithologists' Union (AOU) (1998) *Checklist of North American birds*. Seventh edn. Washington DC: American Ornithologists' Union.
3. Bonta, M. & Anderson, D. L. (2002) *Birding Honduras: a checklist and guide*. Tegucigalpa: ECOARTE.
4. Borror, D. J. (1972) Yellow-green Vireo in Arizona, with notes on vireo songs. *Condor* 74: 80–86.
5. eBird (2017) eBird: an online database of bird distribution and abundance. Ithaca, NY: Cornell Lab of Ornithology. www.ebird.org (accessed 27 November 2017).
6. Gallardo, R. J. (2014) *Guide to the birds of Honduras*. Tegucigalpa: privately published.
7. Howell, S. N. G. & Webb, S. (1995) *A guide to the birds of Mexico and northern Central America*. Oxford: Oxford University Press.
8. Johnson, N. K. (1995) Speciation in vireos. I. Macrogeographic patterns of allozyme variation in the *Vireo solitarius* complex in the contiguous United States. *Condor* 97: 903–919.
9. Jones, H. L. (2003) *Birds of Belize*. Austin: University of Texas Press.
10. Land, H. C. (1970) *Birds of Guatemala*. Wynnewood, PA: Livingston Publishing.
11. Monroe, B. L. (1968) *A distributional survey of the birds of Honduras*. *Orn. Monogr.* 7.
12. Murray, B. W., McGillivray, W. B., Barlow, J. C. & Beech, R. N. (1994) The use of cytochrome b sequence variation in estimation of phylogeny in the Vireonidae. *Condor* 96: 1037–1054.
13. Phillips, A. R. (1991) *The known birds of North and Middle America*, 2. Denver, CO: privately published.
14. van Rossem, A. J. (1933) A new Solitary Vireo from Central America. *Trans. San Diego Soc. Nat. Hist.* 7: 285–286.
15. Stokes, D. & Stokes, L. (2010) *The Stokes field guide to the birds of North America*. New York: Little, Brown & Co.
16. Van Tyne, J. (1933) A new Solitary Vireo from British Honduras. *Occ. Pap. Mus. Zool., Univ. Michigan* 256.

Jesse Fagan
613 Arias Aragues, San Antonio, Miraflores, Lima, Peru. E-mail: heliomaster76@yahoo.com.

Largest aggregation of Spectacled Petrel *Procellaria conspicillata* in Argentine waters

Javier Quiñones and Santiago Imberti

Received 25 June 2017; final revision accepted 16 October 2017
Cotinga 40 (2018): 74–78
published online 16 June 2018

Durante el verano austral del 2016, una agregación del Petrel de Anteojos *Procellaria conspicillata* fue fotografiada. La especie es endémica de la isla Inaccesible, en el grupo de Tristan da Cunha (Atlántico Sur Central). Es considerada una visitante ocasional en Argentina durante su dispersamiento pelágico, existen algunos pocos registros en aguas nacionales argentinas. El 18 de enero de 2016, nueve aves fueron fotografiadas a 134 millas náuticas al sureste de Mar del Plata, Argentina (38°25.835'S 54°48.592'W). Se sugiere que aguas productivas del norte del mar argentino en la zona del frente de quiebre de plataforma sería una zona de alimentación secundaria de esta especie. Este registro representa la más alta agregación del Petrel de Anteojos en Argentina.

Spectacled Petrel *Procellaria conspicillata* breeds almost exclusively on Inaccessible Island in the Tristan da Cunha group (37°18'S 12°41'W). The population was declining in the late 1930s due to predation by introduced feral pigs *Sus scrofa* with only a few tens of pairs remaining by 1937[11]. Subsequently, following a long period without information, more recent censuses have shown a consistent recovery, with 4,500 nests in 1999[18], approximately 10,000 in 2004[19] and 14,400 pairs in 2009[20]. One of the main causes of mortality was fishery bycatch at sea. During the 1990s substantial numbers were killed by longliners off eastern South America, and consequently the species is listed as Critically Endangered[17,19]. Bycatch continues to be of concern in a wide area of the south-west Atlantic Ocean due to longlining, trawling and drift gillnets[4,5,13,14].

Prior to 2017 there were just a few records of Spectacled Petrels in the Argentine Economic Exclusion Zone (EEZ), within 200 nautical miles (nm) of the country's coasts. The first report was in February 2000 and the most recent in January 2016 (the present report). There were 26 separate sightings within this period but just three of these were documented photographically: a single 127 nm south-east of Mar del Plata on 3 February 2013[10]; two 89 nm south-east of Mar del Plata on 13 February 2014[22]; and one 43 nm south-east of Mar del Plata on 15 March 2015 (D. E. Oscar; eBird[9]). None of the previous records involved more than three individuals each. Details of all reported sightings in Argentine waters are presented in Table 1.

On 18 January 2016, at 07h00, nine Spectacled Petrels were photographed (Fig. 1) at 38°25'50.1"S 54°48'35.5"W, all of them on the water, 134 nm south-east off Mar del Plata, Buenos Aires province. Moreover, more birds apparently with the same characteristics were seen further away from the boat, but it is only possible to be sure of nine individuals from the photograph (Fig. 1). The water depth was 803 m, just above the shelf break. Chlorophyll was 8 mg/m^3 and the sea surface temperature (SST) was 15°C[15,16]. The birds had distinctive white facial markings (spectacles) and white chins; their spectacles almost reached the nape, and varied in width and length. Some individuals were also photographed feeding in the area (Fig. 2). The Spectacled Petrels were observed together with two White-capped Albatross *Thalassarche steadi*, 15 Black-browed Albatross *T. melanophris*, 12 Southern Giant Petrel *Macronectes giganteus*, three Northern Giant Petrel *M. halli*, 22 White-chinned Petrel *Procellaria aequinoctialis* and two Great Shearwater *Ardenna gravis*.

This sighting was made opportunistically from the Argentine CONICET scientific trawler *ARA Puerto Deseado*, on its voyage between Mar del Plata and Antarctica, during 17 January to 5 March 2016, via the South Orkney Islands, Elephant Island, King George Island, Half Moon Island, and finishing in Ushuaia. This voyage was undertaken together with personnel from the Peruvian Marine Research Institute (IMARPE).

This is the species' highest reported aggregation in Argentine waters. In the period 2000–17, a total of 40 individuals was observed, of which the present report constitutes some 22.5% (n = 9) of birds. Concerning the number of individuals per observation, 77% (n = 20) of records involved just one bird, 15% were of just two birds (n = 4) and 8% (n = 2) involved more, namely three on 9 February 2000[21] and the nine in the present report.

Regarding their spatial distribution, the vast majority of sightings (77%) were over the continental shelf (<200 m) and just 23% in slope or shelf-break waters. The relatively large number of birds in the present report could reflect a synergy of fishing activity, frontal areas and high productivity waters. Our sighting was made just over the shelf break, as was reported by Bugoni *et al.*[6] off south-east

Figure 1. Panoramic view of the observation point 134 nm south-east of Mar del Plata, Buenos Aires, Argentina, 18 January 2016 at, with each of the nine Spectacled Petrels *Procellaria conspicillata* circled in red (Javier Quiñones)

Figure 2. Spectacled Petrels *Procellaria conspicillata* showing the individually different white spectacles and white chin marks, with a Northern Giant Petrel *Macronectes halli* also depicted (Javier Quiñones)

Table 1. Observations of Spectacled Petrel *Procellaria conspicillata* in the Argentine EEZ between 2000 and 2016, with photographically documented sightings marked (*) in the Reference column. UY = Uruguay, SC = Santa Cruz, BA = Buenos Aires, CH = Chubut.

Longitude	Latitude	No. of birds	Water depth	Distance from coast	Date	Reference
62.3500	48.7833	3	141	147 mn SE of Puerta Medanosa, SC	9 Feb 2000	Savigny[21]
57.6833	50.3333	1	203	64 nm NE of the Falklands	Mar 2000	White *et al.*[24]
59.1833	46.2333	1	1,499	278 nm E of Cabo Blanco, SC	13 Mar 2000	Imberti[12]
58.9000	45.4667	1	1,999	283 nm SE of Camarones, CH	13 Mar 2000	Imberti[12]
57.6000	41.7333	2	454	220 nm SE of San Blas, BA	14 Mar 2000	Imberti[12]
60.8667	51.1333	1	5	Jason Island, Falklands	14 Feb 2004	Black *et al.*[3]
55.7333	38.7833	1	92	98 nm SE of Mar del Plata, BA	24 Feb 2008	Chavez *et al.*[8]
55.7333	38.7667	1	90	98 nm SE of Mar del Plata, BA	27 Feb 2008	Chavez *et al.*[8]
55.6833	38.6500	2	98	97 nm SE of Mar del Plata, BA	4 Mar 2008	Chavez *et al.*[8]
55.8667	39.0500	1	115	100 nm SE of Mar del Plata, BA	9 Mar 2008	Chavez *et al.*[8]
55.8833	39.0333	1	109	98.5 nm SE of Mar del Plata, BA	13 Mar 2008	Chavez *et al.*[8]
55.8833	39.0000	1	108	97 nm SE of Mar del Plata, BA	15 Mar 2008	Chavez *et al.*[8]
55.8500	39.0667	1	129	101 nm SE of Mar del Plata, BA	19 Mar 2008	Chavez *et al.*[8]
54.1500	36.4333	1	93	100 nm SE of San Borombóm, BA	10 Apr 2010	Chavez *et al.*[8]
61.2500	44.3333	1	106	158 nm SE of Puerta Ninfas, CH	30 Jan 2012	Chavez *et al.*[8]
54.9167	38.1833	1	735	127 nm SE of Mar del Plata, BA	3 Feb 2013	Ginsburg & DeWitt[10]*
59.7667	43.8167	1	159	181 nm SE of Península Valdez, CH	24 Feb 2013	Chavez *et al.*[8]
59.6833	43.6500	1	162	183 nm SE of Península Valdez, CH	25 Feb 2013	Chavez *et al.*[8]
59.5500	43.5667	1	293	187 nm SE of Península Valdez, CH	26 Feb 2013	Chavez *et al.*[8]
59.6667	43.4500	1	162	181 nm SE of Península Valdez, CH	27 Feb 2013	Chavez *et al.*[8]
58.5500	42.0167	1	95	185 nm SE of San Blas, BA	1 Mar 2013	Chavez *et al.*[8]
52.4167	34.5333	2	71	70 nm SE of Cabo Polonio, UY	19 Nov 2013	Chavez *et al.*[8]
56.0000	38.9166	2	84	89 nm SE of Mar del Plata, BA	13 Feb 2014	Seco Pon & Stein[22]*
58.2500	42.1000	1	155	193 nm SE of San Blas, BA	28 May 2014	Chavez *et al.*[8]
56.7018	38.1453	1	43	43 nm SE of Mar del Plata, BA	15 Mar 2015	D. E. Oscar (eBird[9])*
54.8099	38.4306	9	802	134 nm SE of Mar del Plata, BA	18 Jan 2016	Present study*

Brazil, but oceanographic conditions differed, in the present case SST was 7°C colder and productivity was almost 1.5 orders of magnitude greater. It appears that the synergy of a strong frontal area, cold SST and high productivity[15,16] could have influenced the presence of the Spectacled Petrels. High productivity in the area of the sighting could be a consequence of the northern expansion of the cold Malvinas (subantarctic) current[1,16]. In addition, Argentine shelf break frontal zones support plankton blooms in the neritic-oceanic transition and high concentrations of Argentine Shortfin Squid *Illex argentinus* usually occur at the shelf break[1,2]. Dietary studies of Spectacled Petrel show its preference for cephalopods[7]. Spectacled Petrels are also associated with longliners in the south-west Atlantic[4,5]; off south-east Brazil their interaction with commercial trawlers has also been reported[23].

This report confirms that northern Argentine waters, specifically the shelf-break frontal area off Buenos Aires province, could represent an important secondary feeding area for the species during their pelagic dispersal from Inaccessible Island. In addition, individuals from the main pelagic feeding area off south-east Brazil might also use Argentine waters. Further studies to monitor and study this species' attendance around commercial trawlers should be attempted, along with training programmes to improve the skills of Argentine fishery observers.

Acknowledgements

This project was largely funded by the Argentine government via CONICET (Consejo Nacional de Investigaciones Científicas y Técnicas) and partially by the Peruvian government via IMARPE (Instituto del Mar del Peru). Thanks to Pablo Moscoso of the Universidad Nacional de la Patagonia Austral, San Julian, Santa Cruz, Argentina, for his comments on an early version of the manuscript, Diego Emmanuel Oscar, Sandpiper Birding & Tours, Mar del Plata, Argentina, for information concerning his sighting, Natalia Rosciano, Universidad de Buenos Aires, Argentina, for her comments on the manuscript, and the crew of the *ARA Puerto Deseado*, the scientific vessel operated by CONICET.

References

1. Acha, E. M., Mianzan, H., Guerrero, R., Favero, M. & Bava, J. (2004) Marine fronts at the continental shelves of austral South America. Physical and ecological processes. *J. Mar. Syst.* 44: 83–105.
2. Acha, E. M., Piola, A., Iribarne, O. & Mianzan, H. (2015) *Ecological processes at marine fronts: oases in the ocean*. New York: Springer.
3. Black, A., Morrison M. & Woods, R. W. (2005) Rare and vagrant birds in the Falkland Islands 2004. *Wildl. Conserv. Falkland Islands* 5: 12–14.
4. Bugoni, L., Mancini, P. L., Monteiro, D. S., Nascimento, L. & Neves, T. S. (2008) Seabird bycatch in the Brazilian pelagic longline fishery and a review of the capture rates in the southwestern Atlantic Ocean. *Endangered Species Res.* 5: 137–147.
5. Bugoni, L., Neves, T. S., Leite, N. O., Carvalho, D., Sales, G., Furness, R. W., Stein, C. E., Peppes, F. V., Giffoni, B. B. & Monteiro, D. S. (2008) Potential bycatch of seabirds and turtles in hook-and-line fisheries of the Itaipava Fleet, Brazil. *Fisheries Res.* 90: 217–224.
6. Bugoni, L., D'Alba, L. & Furness, R. W. (2009) Marine habitat use of wintering spectacled petrels *Procellaria conspicillata*, and overlap with longline fishery. *Mar. Ecol. Prog. Ser.* 374: 273–285.
7. Colabuono, F. I. & Vooren, C. M. (2007) Diet of Black-browed *Thalassarche melanophrys* [*sic*] and Atlantic Yellow-nosed *T. chlororhynchos* albatrosses and White-chinned *Procellaria aequinoctialis* and Spectacled *P. conspicillata* petrels off southern Brazil. *Mar. Orn.* 35: 9–20.
8. Chavez, L. N., Tamini, L., Coppa, L. & Aguilar, E. (2014) Asociación del Petrel de Anteojos (*Procellaria conspicillata*) con buques pesqueros en el Mar Argentino. *Hornero* 29: 73–79.
9. eBird (2015) eBird: an online database of bird distribution and abundance. www.ebird.org (accessed 11 September 2017).
10. Ginsburg, P. A. & DeWitt, B. (2013) Primera documentación del petrel de anteojos (*Procellaria conspicillata*) para Argentina. *Nuestras Aves* 58: 55–56.
11. Hagen, Y. (1952) Birds of Tristan da Cunha. *Results of the Norwegian Scientific Expedition to Tristan da Cunha 1937-1938*. No. 20. Oslo: Kommisjon Hos Jacob Dybwad.
12. Imberti, S. (2002) At-sea records of three rarely reported petrel species in the south-western Atlantic Ocean. *Mar. Orn.* 30: 32–33.
13. Jiménez, S., Domingo, A., Márquez, A., Abreu, M., D'Anatro, A. & Pereira, A. (2009) Interactions of long-line fishing with seabirds in the south-western Atlantic Ocean, with a focus on White-capped Albatrosses (*Thalassarche steadi*). *Emu* 109: 321–326.
14. Jiménez, S., Abreu, M., Pons, M., Ortiz, M. & Domingo, A. (2010) Assessing the impact of the pelagic longline fishery on albatrosses and petrels in the southwest Atlantic. *Aquatic Living Resources* 23: 49–64.
15. NASA (2017) Goddard Space Flight Center, Ocean Ecology Laboratory, Ocean Biology Processing Group. Moderate-resolution imaging spectro-radiometer (MODIS) aqua sea surface temperature (11 µ nighttime) data; NASA OB.DAAC, Greenbelt, MD. https://oceancolor.gsfc.nasa.gov/cgi/l3/A20160172016024.L3m_8D_NSST_sst_9km.nc.png?sub=img (accessed 11 September 2017).
16. NASA (2017) Goddard Space Flight Center, Ocean Ecology Laboratory, Ocean Biology Processing Group. Moderate-resolution imaging spectro-radiometer (MODIS) chlorophyll II concentration, OCI algorithm data; NASA OB.DAAC, Greenbelt, MD. https://oceancolor.gsfc.nasa.gov/cgi/l3/A20160172016024.L3m_8D_CHL_chlor_a_9km.nc.png?sub=img (accessed 11 September 2017).
17. Ryan, P. G. 1998. The taxonomic and conservation status of the Spectacled Petrel *Procellaria conspicillata*. *Bird. Conserv. Intern.* 8: 223–235.
18. Ryan, P. G. & Moloney, C. L. (2000) The status of Spectacled Petrels *Procellaria conspicillata* and other seabirds at Inaccessible Island. *Mar. Orn.* 28: 93–100.
19. Ryan, P. G., Dorse, C. & Hilton, G. M. (2006) The conservation status of the spectacled petrel *Procellaria conspicillata*. *Biol. Conserv.* 131: 575–583.
20. Ryan, P. G. & Ronconi, R. A. (2011) Continued increase in numbers of spectacled petrels *Procellaria conspicillata*. *Antarctic Sci.* 23: 332–336.
21. Savigny, C. (2002) Observaciones sobre aves marinas en aguas argentinas, sudeste Bonaerense y Patagonia. *Cotinga* 18: 81–84.
22. Seco Pon, J. P. & Stein, W. (2015) A second documented record of Spectacled Petrel *Procellaria conspicillata* in Argentine waters. *Rev. Bras. Orn.* 23: 29–30.
23. Traversi, G. S., & Vooren, C. M. (2013) Interactions between seabirds and the trawl fishery in coastal waters of southern Brazil in summer. *Rev. Bras. Orn.* 18: 11.

24. White, R., Gillon, K. W., Black, A. D. & Reid, J. B. (2002) *The distribution of seabirds and marine mammals in Falkland Islands waters*. Peterborough: Joint Nature Conservation Committee.

Javier Quiñones
Laboratorio Costero de Pisco, Instituto del Mar del Perú IMARPE, Av. Los Libertadores A-12, Urb. El Golf, Paracas, Ica, Perú; y Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Mar del Plata, Deán Funes 3350, B7602AYL Mar del Plata, Buenos Aires, Argentina. E-mails: javierantonioquinones@gmail.com; jquinones@imarpe.gob.pe.

Santiago Imberti
Asociación Ambiente Sur, Carlos Gardel 389, Río Gallegos, 9400, Santa Cruz, Argentina. E-mail: santiagoimberti@hotmail.com.

A Eurasian Wigeon *Mareca penelope* in Trinidad and Tobago: first documented record for South America

Tom Johnson

Received 19 August 2017; final revision accepted 28 November 2017
Cotinga 40 (2018): 79–80
published online 16 June 2018

Este artículo incluye detalles del primer registro fotografiado del Silbón Europeo *Mareca penelope* para el subcontinente de América del Sur. Un macho Silbón Europeo fue descubierto por el autor el 2 de enero de 2016 en Bon Accord en la isla de Tobago, Trinidad y Tobago. El pájaro parecía ser un macho inmaduro y asociado con otros patos, incluyendo un par de Silbón Americano *M. americana*. Hay un reporte previo de la especie en Venezuela, pero ese registro no fue apoyado con fotografías.

At 09h15 on 2 January 2016, my Field Guides, Inc. birding group with nine participants arrived at Bon Accord together with G. James, our local guide. After briefly viewing an adult Little Egret *Egretta garzetta*, we reached one of the sewage treatment cells where there were several ducks. The first birds I noticed were a male American Wigeon and a male Eurasian Wigeon—quite a shock! Further scrutiny revealed a female American Wigeon, a female Green-winged Teal *Anas crecca* (race unknown), a Glossy Ibis *Plegadis falcinellus*, two American Coots *Fulica americana*, a Sand Martin *Riparia riparia* and three Cliff Swallows *Petrochelidon pyrrhonota*, all of which are rarities on Tobago despite their familiarity to a group of US birders (documentation at eBird: http://ebird.org/ebird/view/checklist/S26617588). We photographed the Eurasian Wigeon (Fig. 1). It was similar in size and shape to the adjacent male American Wigeon except for its subtly smaller head. The head / neck was rusty orange-brown with a paler, creamy forehead and some pale blotches on the cheeks. The back was faded and dull brown, and the flanks were a mix of grey and rust (paler than the head and neck). Because hybrids between American and Eurasian Wigeons are reported regularly in North America, I scrutinised this individual for any signs of American Wigeon ancestry but was unable to find any. Instead of hinting at hybridisation, the 'messy' plumage suggests that it was a first-winter male (adult males in January typically show fairly pristine courtship plumage), although we did not see this individual's upperwing pattern to confirm its age. We returned to see the bird again on the afternoon of 4 January 2016, prior to our departure from Tobago, when I obtained better photos (Fig. 2). The Eurasian Wigeon lingered at Bon Accord until at least 14 January 2016 (M. Schoeller, P. Moynahan, *fide* eBird).

Consultation with M. Kenefick of the Trinidad & Tobago Rare Bird Committee confirmed that Eurasian Wigeon had not been previously reported in the country. Documentation was submitted to the Trinidad & Tobago Rare Bird Committee, and the record was subsequently accepted (M. Kenefick pers. comm. Apr. 2016). Although Eurasian Wigeon is a regular migrant to North America and a vagrant to Mexico and the Caribbean, the only previous report for South America is a multiple-observer sight record from Cuare Bay, northern

Figure 1. Male American Wigeon *Mareca americana* (left) and Eurasian Wigeon *M. penelope* (right), Bon Accord, Tobago, Trinidad & Tobago, 2 January 2016 (Tom Johnson)

Figure 2. Male Eurasian Wigeon *Mareca penelope* showing the 'scruffy' head and flanks feathering, Bon Accord, Tobago, Trinidad & Tobago, 4 January 2016 (Tom Johnson)

Venezuela, on 4 March 2002[1]. Though that record was surely correct given the published description, it lacked photographic documentation. Therefore, the 2016 Tobago record provides the first physical documentation for Eurasian Wigeon in South America.

Acknowledgments

Thanks to Martyn Kenefick, Guy Kirwan and Van Remsen for their help in ascertaining the status of Eurasian Wigeon in South America and to Michael O'Brien for reviewing the photos. Additional thanks go to Gladwyn James for his assistance on Tobago and to Field Guides, Inc. for sending me afield in the first place.

Reference

1. Williams, R. S. R. & Beadle, D. D. (2003) Eurasian Wigeon *Anas penelope* in Venezuela: a new bird for South America. *Cotinga* 19: 71.

Tom Johnson
3960 Bayshore Road, Cape May, NJ 08204, USA.
E-mail: tbj4@cornell.edu.

Two new records of Ocellated Crake *Micropygia schomburgkii* in the Coastal Cordillera and a review of its distribution in Venezuela

Galo Buitrón-Jurado and Hugo Rodríguez-García

Received 2 September 2017; final revision accepted 6 February 2018
Cotinga 40 (2018): 81–85
published online 16 June 2018

Presentamos nuevos registros documentados de la Cotarita de Ocelos *Micropygia schomburgkii* en Altos de Pipe, cordillera de la Costa y revisamos la información sobre su distribución en Venezuela. Los nuevos registros incrementan 300 m el límite altitudinal de la especie en el país y sugieren que el área de distribución es más extensa de lo conocido anteriormente, con registros en 31 localidades y presencia confirmada en la cordillera de la Costa. La información recopilada indica que la Cotarita de Ocelos frecuenta principalmente herbazales subtropicales como los de la Gran Sabana en el sur de Venezuela, y a lo largo de la cordillera de la Costa donde ha sido registrada frecuentemente en la última década, y que sugieren la existencia de una población residente, aunque no se descartan individuos errantes.

Ocellated Crake *Micropygia schomburgkii* is one of the least-known species of Rallidae in South America. Two subspecies are recognised based on plumage coloration and size differences: the nominate subspecies is spottily distributed in northern South America east of the Andes in Colombia, Venezuela, Guyana, Suriname and northern Brazil[5,20], while *M. s. chapmani* inhabits central and south-east Brazil, Paraguay, Bolivia and the Pampas del Heath in eastern Peru[17]. There are also a few records in Costa Rica that may represent an undescribed taxon due to their darker plumage[5]. This complex distribution has been related to the species' association with dense grassland habitats, both well drained and seasonally flooded[13], although it might also reflect the difficulty of recording this secretive species[8,9]. Most information concerning the distribution and ecology of Ocellated Crake comes from the Cerrado region in central and south-east Brazil, where it is found in dry grassland dominated by *Trystachia leiostachya* (Poaceae)[8,11,13].

In Venezuela, most published records of Ocellated Crake are scattered and from south of the Orinoco River in the tall pastures of the Gran Sabana and adjacent tepuis in Bolívar state, with single records each in the states of Amazonas, Delta Amacuro, and Monagas, Carabobo and Miranda in the Coastal Cordillera[2,7,14], a mountain range of c.720 km extending along the Caribbean littoral from the states of Yaracuy to Miranda in the west, to Anzoátegui, Monagas and Sucre in the east[6]. Previous records of the species in this region have been suggested to involve vagrants[7,14], although its distribution in northern Venezuela, as well as its habitat and status, are poorly understood. Here, we present two new records in the Coastal Cordillera, documented with a specimen and photographs, and review previous knowledge of its distribution in Venezuela, with an emphasis on presence and habitats in the Coastal Cordillera.

Study area and Methods

Two new records of Ocellated Crake were obtained in Altos de Pipe (10°24'N 66°55'W; 1,400–1,700 m), a summit of an internal branch of the Coastal Cordillera, in Miranda state, north-central Venezuela. Altos de Pipe comprises a small (c.300 ha) fragment of montane forest around the Instituto Venezolano de Investigaciones Científicas. The site is covered with mist for most of the year and the climate is wet with an annual precipitation of 1,063 mm, and a mean annual temperature of 17°C[4]. Both records were opportunistic and obtained independently as part of field work by the authors. For both individuals, measurements of wing chord, tail, bill and tarsus were taken to the nearest 0.1 mm using dial callipers. They were photographed, and one of the individuals was collected and deposited in the Phelps Ornithological Collection (COP), Caracas.

We also review the Ocellated Crake's distribution in Venezuela in order to improve our limited knowledge. We gathered all records in the country using several sources, including data from ornithological collections, literature and online resources. Ornithological collections visited were: Phelps Ornithological Collection (COP), Museo de Historia Natural La Salle, Caracas (MHNLS), Museo de Ciencias de Caracas (MCN) and Museo de Historia Natural de Rancho Grande, Maracay (MEBRG). Online data were obtained from eBird (http://ebird.org), Macaulay Library of Sounds (ML; www.macaulaylibrary.org), xeno-canto (XC; www.xeno-canto.org) and VertNet portal (http://portal.vertnet.org). All records were ordered

chronologically to review their temporal and geographical distribution, to assess their range in Venezuela, with an emphasis on the Coastal Cordillera.

New documented and compilation of previous records

Ocellated Crake was initially recorded in Altos de Pipe in the morning (09h00) of 25 April 2016 when an individual was captured in a mist-net (10°40'N 66°98'W; 1,705 m) as part of a survey of the site's avian diversity. It was identified, collected and deposited at the Phelps Ornithological Collection (COP 84458) (Fig. 1). Vegetation in this area comprises forest clearings dominated by grasslands of *Melinis*, *Pennisetum* and several Cyperaceae (Fig. 2). On 21 October 2016 a second individual was found in the early morning (08h30) at the entrance to one of the buildings. The individual was captured by hand, measured, photographed and released (10°39'N 66°98'W; 1,550 m; Fig. 1). Vegetation here consists of secondary forest dominated by tree species such as *Clethra lanata*, *Inga villosissima* and *Oyedaea verbesinoides* and small patches of grasses. The birds were presumably adults as they lacked extensive white and barring ventrally[5]. Measurements of the captured individuals, as well as specimens in Venezuelan collections, are presented in Table 1.

Our compilation prior to November 2017 numbered 65 records from 32 independent locations in Venezuela (Fig. 2, Table 2). Most records are from south of the Orinoco River in the states of Amazonas and mainly Bolivar (69%), while 28% are from the Coastal Cordillera in Yaracuy (three records), Carabobo (two), Aragua (three) and Miranda (ten), with isolated records in Monagas and Delta Amacuro. The occurrence of Ocellated Crake in the Venezuelan Coastal Cordillera was known only from two old specimens collected in Los Teques in 1905 (MCN 3272) and in Baruta municipality in 1947 (MHNLS 289)[7,14], as well as tape-recordings from Simon Bolívar University (ML 40457) and Cerro de Paja, Carabobo state (XC 225770)[2]. Ocellated Crake has not been recorded in Altos de Pipe previously despite intensive mist-net, aural and visual surveys. Our records confirm the species' presence in these mountains and are the highest-elevation records in the country (previous published records are from up to 1,400 m[7]). Also, Altos de Pipe, and La Tiama, represent the easternmost localities for Ocellated Crake in the western Coastal Cordillera. In the east of this range, Ocellated Crake is known from a single record in Caripe[7]. Notably, 11 records were made in the Coastal Cordillera during 2016, most from grassland habitats in Macarao National Park. Our compilation suggests that populations of the species north of the Orinoco are more widespread than previously known and the species is most appropriately considered resident in the Coastal Cordillera.

Habitat preferences of Ocellated Crake in Venezuela are currently unknown. Published data indicate a preference for dry-grass savannas or savannas bordered by marshes, where several specimens were collected in 1938 around Mount Auyán-tepui in Bolívar state[5,7]. Our compilation also indicated that most records in Bolívar are from Conucos de Venancio near El Paují and the Gran Sabana within Canaima National Park, where there is a mosaic of several forest types and grasslands on nutrient-poor soils[15,18]. Records in the Auyán-tepui area in Canaima are from grasslands comprising Poaceae such as *Trachypogon vestitus*, *Axonopus pulcher*, *Panicum lanciflorum* and *Paspalum lanciflorum*, or by *Axonopus pruinosus*, *A. kaietukensis*, *Trachypogon vestitus* and several Cyperaceae in the east, around Santa Elena de Uairén[15,18] (Fig. 2). This suggests the species occurs in several grassland ecosystems different from Brazil, where it has been usually recorded in *Trystachia*-dominated grasslands[8,11,13]. Records in the Coastal Cordillera indicate that Ocellated Crake also occurs in tall- and short-stature pastures dominated by Cyperaceae, Poaceae and other grasses, and is not especially associated with watercourses (e. g. Altos de Pipe, La Tiama) (Fig. 2). These grasslands are mostly anthropogenic or successional habitats[12], which might explain the scarcity of records, but is reinforced by records in southern Venezuela, Guyana and Brazil, where the species is found in regularly burned savannas[7,10,13].

Most dated records (n = 57) are from December to April, during the dry season in the Coastal Cordillera and the Gran Sabana (Fig. 2). Grassland and forest fires are frequent in Venezuela during

Table. 1. Data and measurements (in mm) of Ocellated Crake *Micropygia schomburgkii* specimens in Venezuela.

Individual	Locality	Sex	Culmen	Width	Depth	Wing	Tail	Tarsus
MCN 3272	Los Teques	M	11.4	5.2	5.5	72	25	23.8
COP 9936	Auyán-tepui	M	13.7	4.6	6.6	74	29	22.6
COP 9937	Auyán-tepui	F	12.9	5.9	6.9	73	27	25.4
COP 84458	Altos de Pipe	F	12.8	5.3	7.6	74	27	24.4
Released	Altos de Pipe	?	13.5	5.5	7.1	76	34	19.1

Figure 1. Above: ventral and dorsal views of Ocellated Crake *Micropygia schomburgkii* specimen (COP 84458; top) collected in Altos de Pipe, Miranda, Venezuela, compared to two specimens from Auyán-tepui in Phelps Ornithological Collection, Caracas (Hugo Rodríguez-García); below: individual captured and released in Altos de Pipe, Miranda, October, 2016 (G. Buitrón-Jurado)

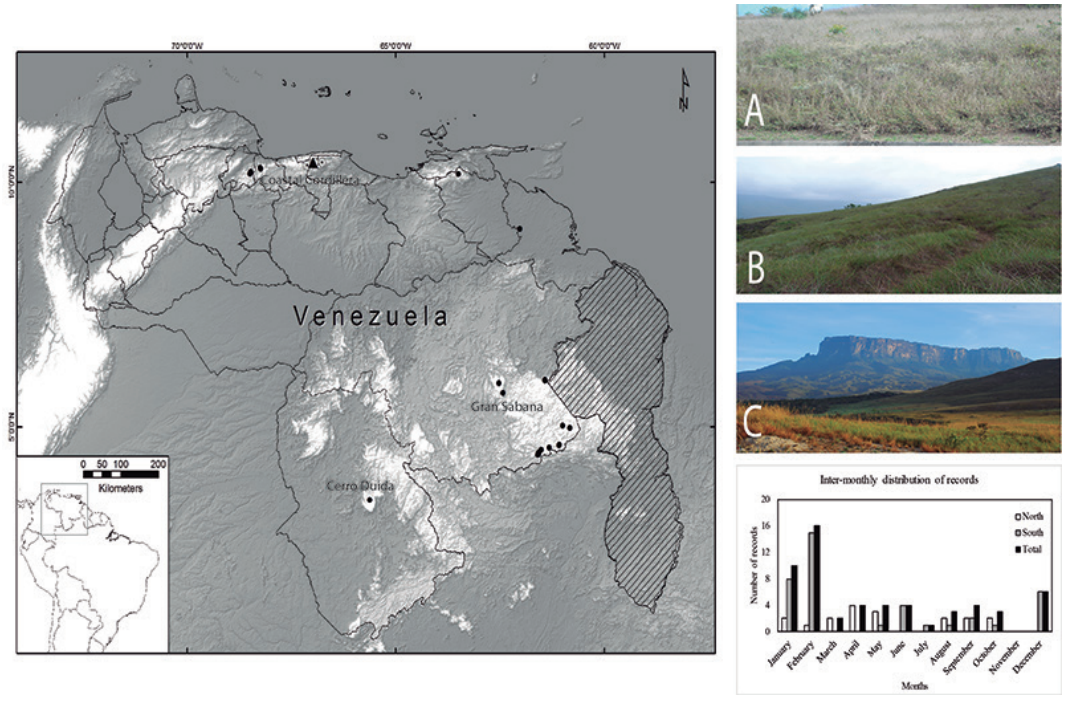


Figure 2. Geographic and temporal distribution, and grassland habitats where Ocellated Crake *Micropygia schomburgkii* has been recorded in Venezuela (black dots), Altos de Pipe (triangle) and elsewhere in the central Coastal Cordillera (black-dotted circle). Main grassland habitats: A = Altos de Pipe (G. Buitrón-Jurado); B = Poza Honda, Macarao National Park (I. Lau & F. Machado-Strudel); C = Gran Sabana near Kukenan-tepui, Canaima National Park (I. Stachowicz). Monthly distribution of all dated records (*n* = 57) (black) and those north (white) and south (grey) of the Orinoco River.

Table 2. Records of Ocellated Crake *Micropygia schomburgkii* in Venezuela. Sources: COP = Colección Ornitológica Phelps; MCN = Museo de Ciencias Naturales Caracas; MHNLS = Museo de Historia Natural La Salle; XC = Xeno-canto; eBird = eBird database.

Location	Latitude	Longitude	Elevation (m)	No. of birds	Source
Amazonas					
56 km NNW Esmeralda, río Cunucunuma, Cerro Duida	03°51	65°63	1,100	1	USNM 504063
Aragua					
PN Macarao, Quebrada Honda Post	10°35	67°15	1,660	3	eBird
Bolívar					
Aruyen	05°07	62°43	460	1	eBird
Auyán-tepui	05°07	62°43	460	16	COP 9936–37
Conucos de Venancio	04°45	61°58	906	6	eBird
East of El Paují	04°54	61°52	885	1	eBird
El Abismo	04°44	61°06	1,034	1	eBird
El Paují	04°47	61°59	843	2	eBird
Gran Sabana, south side	04°98	60°83	900	2	XC 225772–773
Guarayaca	05°09	62°53	1,100	1	eBird
La Escalera	05°95	61°43	1,400	2	XC 247161–162
La Escalera	05°97	61°43	1,400	2	XC 354946
Mount Roraima, Arabopo	05°14	60°76	1,190	1	eBird
Parai-tepui	05°03	61°00	1,160	1	eBird
Sabana Cerro Grande	04°64	61°08	935	2	eBird
Santa Elena de Uairén	04°63	61°09	899	2	eBird
Sendero Amariba	04°49	61°57	852	3	eBird
Wairampay, El Paují	04°58	61°33	1,015	1	eBird
Carabobo					
Casa María	10°28	68°24	1,161	1	eBird
Cerro de Paja	10°03	68°25	1,420	1	XC 225770
Delta Amacuro					
Delta Amacuro	09°05	62°03	not known	1	Hilty[7]
Miranda					
Altos de Pipe	10°04	66°98	1,707	2	COP 84458
Baruta	10°38	66°85	1,120	1	MHNLS 289
La Tiama	10°41	66°76	917	1	eBird
Los Teques	10°35	67°03	1,190	1	MCN 3272
Parque Nacional Macarao, Laguneta de la Montaña	10°35	67°12	1,670	3	eBird
San Antonio de los Altos	10°04	66°94	1,407	1	eBird
Universidad Simón Bolivar	10°41	66°88	1,196	1	ML 40457
Monagas					
Caripe	10°18	63°51	not known	1	Hilty[7]
Yaracuy					
Hacienda las Martinas	10°18	68°05	786	1	eBird
Las Martinas to Rabo Frito	10°21	68°49	1,009	1	eBird
Rabo Frito	10°22	68°48	1,242	1	eBird

the dry season suggesting that such factors may influence the species' distribution as they do other Rallidae such as Yellow Rail *Coturnicops noveboracensis*[1,20]. Grassland fires are known to provoke short-distance movements in Rallidae[16,20], and vagrants could be involved in records from urban or suburban areas such as Baruta, Los Teques and San Antonio de los Altos near Macarao National Park. The monthly distribution of records, however, could represent sampling biases. Many species of Rallidae also perform long-distance movements[3,16], and records of vagrants attracted to lights in urban areas are known for Ocellated Crake[8,9,10,19]. Migratory or seasonal movements

could occur in Venezuela as have been suggested in Brazil, and might explain our second record in Altos de Pipe and records in Caripe or Delta Amacuro[7]. On the other hand, the species' discontinuous geographic distribution in Venezuela could be related to its preference for particular grassland habitats in subtropical regions such as in the Coastal Cordillera and Gran Sabana. Future studies should focus on determining the importance of grasslands, environmental conditions and fire on the distribution of Ocellated Crake and other rallids in Venezuela, to determine if populations are connected and to locate suitable habitats in new areas.

Acknowledgements

We acknowledge all of those curators who granted us access to specimens and provided information: Miguel Lentino and Margarita Martínez at the Colección Ornitológica Phelps, Caracas; Vicky Malavé at Fundación La Salle de Ciencias Naturales, Caracas; Hyram Moreno at Centro Adolfo Ernst, Museo de Ciencias Naturales, Caracas; and Marco Salcedo at Museo de la Estación Biológica Rancho Grande, Maracay. Thanks to Ivan Lau, Fernando Machado-Stredel and Izabela Stachowicz for photographs, and Grisel Velázquez of UNISIG IVIC for help with the map. Bird surveys in Altos de Pipe were conducted by GBJ with the support of Rufford Small Foundation (no. 18162-1) and authorised by the hunting licenses for scientific purposes nos. 1449 and 1532 of the Ministerio del Poder Popular para Ecosocialismo y Aguas.

References

1. Austin, J. E. & Buhl, D. A. (2013) Relating Yellow Rail (*Coturnicops noveboracensis*) occupancy to habitat and landscape features in the context of fire. *Waterbirds* 36: 199–213.
2. Boesman, P. (2006) *Birds of Venezuela*. MP3 collection (1.0). Winsum: Birdsounds.nl.
3. Buitrón, G. & Freile, J. F. (2006) Registros inusuales de aves migratorias y de bosques subtropicales en Quito, Ecuador. *Cotinga* 26: 54–56.
4. Buitrón-Jurado, G. & Sanz, V. (2016) Notes on the diet of the endemic Red-eared Parakeet *Pyrrhura haematotis* and other Venezuelan montane parrots. *Ardeola* 63: 357–367.
5. Dickerman, R. W. (1968) Notes on the Ocellated Rail (*Micropygia schomburgkii*) with first record from Central America. *Bull. Brit. Orn. Club* 88: 25–30.
6. González de Juana, C., Iturralde, J. M. & Picard, X. (1980) *Geología de Venezuela y de sus cuencas petrolíferas*. Caracas: Ed. Foninves.
7. Hilty, S. L. (2003) *Birds of Venezuela*. Princeton, NJ: Princeton University Press
8. Lopes, L. E., Malacco, G. B., Alteff, E. F., Vasconcelos, M. F., Hoffmann, D. & Silveira, L. F. (2010) Range extensions and conservation of some threatened or little known Brazilian grassland birds. *Bird Conserv. Intern.* 20: 84–94.
9. Lopes, L. E., Pinho, J. B., Gaiotti, M. G., Evangelista, M. M. & Vasconcelos, M. F. (2012) Range and natural history of seven poorly-known Neotropical rails. *Waterbirds* 35: 470–478.
10. Mazar Barnett, J. (2000) An extra-limital record of Ocellated Crake *Micropygia schomburgkii* from coastal São Paulo, Brazil. *Ararajuba* 8: 141–142.
11. Mazzoni, L. G., Perillo, A., Malacco, G. B., Oliveira, T., Peixoto, H. J. C., Oliveira Souza, T., Carvalho Dutra, E. & França, E. A. (2012) Aves, *Micropygia schomburgkii* (Schomburgk, 1848), *Veniliornis mixtus* (Boddaert, 1783), *Culicivora caudacuta* (Vieillot, 1818) and *Coryphaspiza melanotis* (Temminck, 1822): documented records in the southern Espinhaço Range, Minas Gerais, Brazil. *Checklist* 8: 138–142.
12. Meier, W. (2011) Los bosques nublados de la cordillera de la costa en Venezuela. *BioLlania* 121: 106–121.
13. Negret, A. & Teixeira, D. M. (1984) The Ocellated Crake (*Micropygia schomburgkii*) of central Brazil. *Condor* 86: 220.
14. Phelps, W. H. & Phelps, W. H. Jr. (1958) *Lista de las aves de Venezuela con su distribución*. Tomo II. Parte I. Caracas: Ed. Sucre.
15. Ramírez, N., Dezzeo, N. & Chacón, N. (2007) Floristic composition, plant species abundance, and soil properties of montane savannas in the Gran Sabana, Venezuela. *Flora* 202: 316–327.
16. Remsen, J. V. & Parker, T. A. (1990) Seasonal distribution of the Azure Gallinule (*Porphyrula flavirostris*), with comments on vagrancy in rails and gallinules. *Wilson Bull.* 102: 380–399.
17. Ripley, S. D. & Beehler, B. M. (1985) Rails of the world, a compilation of new information, 1975–1983 (Aves: Rallidae). *Smiths. Contrib. Zool.* 417: 1–28.
18. Señaris, J. C., Lew, D. & Lasso, C. (2009) *Biodiversidad del Parque Nacional Canaima: bases técnicas para la conservación de la Guayana venezolana*. Caracas: Fundación La Salle de Ciencias Naturales & The Nature Conservancy
19. Silva, R., Gurgel, R. A., Santista, B. & Grande, P (2007) Adendas e registros significativos para a avifauna dos manguezais de Santos e Cubatão, SP. *Rev. Bras. Orn.* 15: 551–560.
20. Taylor, P. B. (1996) Family Rallidae (rails, gallinules and coots). In: del Hoyo, J., Elliott, A. & Sargatal, J. (eds.) *Handbook of the birds of the world*, 3. Barcelona: Lynx Edicions.

Galo Buitrón-Jurado
Centro de Ecología, Instituto Venezolano de Investigaciones Científicas, Caracas 1020-A, Apartado 2032, Venezuela. E-mail: galobuitronj@yahoo.es.

Hugo Rodríguez-García
Centro de Ecología, Instituto Venezolano de Investigaciones Científicas, Caracas 1020-A, Apartado 2032, Venezuela. Current address: Fundación La Salle de Ciencias Naturales, Museo de Historia Natural La Salle, Apartado 1930, Caracas 1010-A, Venezuela.

Celeus obrieni: um 'especialista em bambu' forrageando em *Cecropia* sp.

Marco Aurélio Crozariol

Received 22 September 2017; final revision accepted 12 December 2017
Cotinga 40 (2018): 86–90
published online 16 June 2018

I documented Kaempfer's Woodpecker *Celeus obrieni* feeding on ants of the genus *Azteca* in *Cecropia* sp. in Tocantins state, Brazil. *C. obrieni* had previously been observed in *Cecropia* trees, but this is the first record of foraging in this genus. I discuss this species' degree of specialisation for foraging in bamboo, and that of its congener Rufous-headed Woodpecker *C. spectabilis*.

O pica-pau-do-parnaíba *Celeus obrieni* foi descrito através de um único exemplar, coletado por E. Kaempfer, em 1926 no município de Uruçuí, Piauí, como uma subespécie de *C. spectabilis*[33]. Após a sua coleta por Kaempfer a espécie, embora observada e coletada, permaneceu no anonimato devido a identificação errônea, sendo questionada quanto a sua real validade taxonômica[21,22], até que o ornitólogo Advaldo Prado[29] a reencontrou no município de Goiatins, norte do Estado do Tocantins, 80 anos depois. Após sua redescoberta e gravação de sua vocalização[29], novos registros vieram a luz, tanto para aqueles exemplares 'perdidos' em museus[8,14] como registros no campo[5,9,26,27,31]. Atualmente é considerada espécie plena[2,3,6].

O pica-pau-do-parnaíba vem sendo encontrado principalmente em áreas de Cerrado onde a presença de bambu, basicamente as pertencentes ao gênero *Guadua*, são abundantes[8,14,26,27,28]. Leite *et al*.[20] em estudo sobre o comportamento de forrageamento e os tipos alimentares da espécie consideraram *C. obrieni* como 'a bamboo specialist', se alimentando exclusivamente de formigas que habitam as hastes de bambu.

Devido aos raros encontros dessa espécie em áreas com ausência de bambu e após algumas observações pessoais de *C. obrieni* forrageando e se alimentando de formigas em *Cecropia* sp. (Urticaceae), tenho como objetivo neste trabalho discutir sobre a real especificidade de *C. obrieni* e *C. spectabilis* como espécies especialistas em bambu. Todas as observações foram realizadas esporadicamente, entre maio e junho de 2010 com a utilização de binóculo e máquina fotográfica.

Observações

No dia 29 de maio de 2010, na RPPN Canguçu, próximo à margem direita do rio Javaés, município de Pium, TO (09°58'44.9"S 50°01'22.4"W), observei um pica-pau que voou dentro da mata e pousou em uma embaúba (*Cecropia* sp.). O pica-pau foi fotografado e identificado como sendo uma fêmea de *C. obrieni* (Fig. 1).

A RPPN Canguçu está inserida na margem direita do rio Javaés, dentro da APA Ilha do Bananal / Cantão, tendo como limite norte o Parque Estadual do Cantão. O local é uma região ecotonal entre os biomas Amazônia e Cerrado, formado por uma mata relativamente alta e classificada como Floresta Ombrófila Aberta Aluvial. É composta por um conjunto de espécies vegetais presentes nestes dois biomas, como por exemplo: *Callophylum brasiliense* (landim), *Terminalia brasiliensis* (mirindiba), *Copaifera langsdorffii* (copaíba), *Hymenaea stilbocarpa* (jatobá), *Caryocar brasiliense* (pequizeiro), *Astrocaryum vulgare* (tucum), *Vochysia divergens* (cangerana) e *Inga* cf. *fagifolia* (ingazeiro). Próximo ao rio aparecem em grandes quantidades o sarã *Sapium* sp. e as embaúbas, identificadas no local como *Cecropia pachystachia*[35].

Figura 1. Fêmea do pica-pau-da-parnaíba *Celeus obrieni* pousado em uma embaúba (*Cecropia* sp.). Não foi observado forrageamento nessa ocasião (Marco A. Crozariol)

Figura 2. Macho do pica-pau-da-parnaíba *Celeus obrieni* forrageando em uma fina haste de embaúba (*Cecropia* sp.), cerca de 2 m do solo (Marco A. Crozariol)

Figura 3. Furos abertos pelo macho de *Celeus obrieni* em haste de embaúba (*Cecropia* sp.) (Marco A. Crozariol)

Figura 4. Imagem que possibilita ver as diferentes circunferências das hastes de *Cecropia* sp. onde a observação foi realizada (Marco A. Crozariol)

Pelo conhecimento prévio do autor sobre os hábitos de forrageamento de *C. obrieni* e da ausência de tabocais próximo ao local do avistamento, o exemplar observado foi seguido por algum tempo e logo desapareceu na mata. Embora tenha pousado em uma embaúba, em nenhum momento foi observado forrageamento nesta árvore.

Posteriormente, no dia 6 de junho, a espécie foi novamente observada próxima ao local onde foi visualizada pela primeira vez, mas nesta ocasião era um casal. Foi possível acompanhar o macho que logo pousou em uma fina haste de *Cecropia* sp. e começou a forragear, perfurando-a com seu bico (Fig. 2; veja também www.youtube.com/watch?v=FoIJBnIfjr8). A busca pelo alimento iniciou a cerca de 1 m do solo, e a ave, enquanto subia, bicava a haste da *Cecropia* abrindo pequenos furos (Fig. 3), que variaram de 3 a 5 cm um do outro. As formigas saiam continuadamente do furo, de modo que, a ave as capturava, comportamento que durou cerca de cinco minutos. Nesse curto período o indivíduo abriu sete furos em uma única haste, alçando voo logo em seguida para dentro da mata enquanto o autor se preocupou em coletar as formigas para uma posterior identificação, ao invés de acompanhar o referido indivíduo.

As formigas foram coletadas enquanto saiam dos furos ou caminhavam pelos galhos da *Cecropia*. Posteriormente identificadas como pertencentes ao gênero *Azteca*, provavelmente *Azteca fasciata*. Vale ainda ressaltar que mesmo a *Cecropia* sendo árvore de porte significativo (c.15–20 m) e com diferentes circunferências de colmo (Fig. 4), o forrageamento ocorreu apenas numa haste mais fina, que variou entre 7 e 9 cm de circunferência.

Discussão

Este é o primeiro relato da utilização de outro tipo de grupo vegetal, além do bambu, para o forrageamento de *C. obrieni*.

Santos & Vasconcelos[31] gravou um indivíduo de *C. obrieni* em São Pedro da Água Branca, Maranhão, em uma mata ripária secundária em setembro de 2004. Nessa mata o pesquisador reporta não ocorrer bambus, porém encontrou na área *Cecropia obtusa* e *C. sciadipholia*, sendo o exemplar observado pousado em uma *C. obtusa*, sem forragear. Esses autores foram os primeiros a chamarem a atenção sobre a possibilidade de uma dependência não muito forte entre *C. obrieni* e o bambu. Devido a isso, Pinheiro & Dornas[27] realizando buscas em áreas com possível ocorrência da espécie, investiram também em locais dominados por *Cecropia,* nas margens do rio Javaés. Os pesquisadores não obtiveram sucesso, embora a busca tenha sido muito curta nesse ambiente (apenas quatro dias). O local de investigação realizado por Pinheiro & Dornas[27] é o mesmo que realizamos nossas observações em 2010. Como *C. obrieni* possui uma extensa área de vida[7], bem como não respondem eventualmente tão bem ao playback (obs. pess.), o esforço amostral realizado por esses autores pode não ter sido suficiente para detectar a espécie. No entanto, Leite *et al.*[20] também realizaram buscas na mesma área e em uma maior extensão. Foram cerca de 18 meses (entre agosto de 2008 e janeiro 2010), num total de 12 pontos dispersos nas margens do rio Javaés, sendo cada um deles visitados três vezes ao mês e o playback realizado por cinco minutos. Isso resultou em aproximadamente 18 horas de busca efetiva, não sendo a espécie registrada em nenhum momento.

No Equador, em locais onde o bambu está ausente, *Celeus spectabilis*, seu co-específico do oeste amazônico e também considerado um especialista em bambu[12,18,19,39] pode habitar os ambientes onde estão presentes *Cecropia*, *Gynerium* e *Heliconia*[18,31]. Neste mesmo país G. M. Kirwan (*in litt.* 2017) o observou forrageando em *Cecropia* sp., perto do Sani Lodge, em agosto de 2010. Winkler & Christie[39] também reportam que *C. spectabilis* forrageia em *Cecropia*, informação provavelmente proveniente da publicação de Whittaker & Oren[38], que observaram um macho, em 26 de maio de 1995, fazendo cavidades em um tronco de *Cecropia* sp. viva, no Estado do Acre.

Hidasi *et al.*[14] citam que, um dos exemplares de *C. obrieni* do museu de Ornitologia de Goiânia (MOG) foi coletado em 'Cerrado aberto, distante cerca de 30 m de um córrego' e que 'no momento da coleta, a ave forrageava em um tronco seco', não indicando a espécie vegetal.

Embora as definições de 'especialista' sejam de difícil categorização[11], com as informações anteriormente mencionadas podemos concluir que *C. obrieni*, embora recorrentemente observado em locais onde o bambu é abundante (principalmente *Guadua* spp.) ele não é exclusivamente dependente desse tipo de vegetal para forragear, podendo buscar seu alimento também em plantas do gênero *Cecropia*.

Assim como as formigas são abundantes nos colmos de *Guadua* na área de ocorrência de *C. obrieni*[1], elas são também muito abundantes em *Cecropia*[4,13,37]. Em *Cecropia* ainda existem as interessantes interações, onde a planta fornece alimento (corpúsculos müllerianos e pérolas[30]) e locais de nidificação para as formigas, enquanto as formigas providenciam proteção para a planta[16,17,32,36].

Da mesma forma que foi observado para *C. spectabilis*[39], embora ainda pouco se conheça sobre a alimentação dessa espécie, o principal item alimentar de *C. obrieni* são as formigas. Leite *et al.*[20] encontraram *Azteca fasciata* como a segunda mais consumida pelo pica-pau-da-parnaíba em bambus *Guadua paniculata*, seguido pela mais consumida *Camponotus depressus*. Bonato *et al.*[4] encontraram na Amazônia Central uma dominância

de *Azteca alfari* e *Camponotus balzani* em *Cecropia purpurascens* e, para Oliveira[25], formigas do gênero *Azteca* são as mais comuns no que se refere a associação com *Cecropia*.

Embora ainda não saibamos se nas áreas com ausência de bambu e presença de *Cecropia* o pica-pau-da-parnaíba determina território, ele parece ser muito mais 'especialista' em forragear em espécies vegetais com características semelhantes ao bambu e *Cecropia*, ou seja, vegetais com o colmo oco e segmentado por nós e entrenós, do que um especialista em bambu. O mesmo pode ser estendido para *C. spectabilis*.

Vale ainda investigar, principalmente no caso dos bambus, se *C. obrieni* não está de alguma forma sendo favorecido pelo desmatamento em algumas regiões. Sabe-se que tanto *Guadua* quanto *Cecropia* são plantas pioneiras[34] e, portanto, com grande capacidade de dispersão e estabelecimento em áreas abertas e / ou clareiras. À abertura de estradas permite que a abundância de *Guadua* nas bordas das matas de Cerrado recém abertas se tornem mais elevadas, condição que provavelmente pode favorecer *C. obrieni* com o aumento na disponibilização de mais recursos vegetais para a alimentação. É preciso, no entanto, ter cautela e avaliar com pesquisas esse potencial benefício, pois *C. obrieni* depende também de outros recursos alheios as tabocas para dormitório, proteção e reprodução (p.e. Corrêa[7]).

Conforme discutido ao longo de todo o artigo, mesmo que a busca de formigas em *Cecropia* seja apenas um recurso ocasional para *C. obrieni*, não posso concordar com a proposta feita por Dornas *et al*.[10] para as alterações dos nomes vernaculares técnicos da espécie: 'pica-pau-da-taboca' e 'Brazilian Bamboo-Woodpecker'. Complementarmente, os resultados apresentados confirmam o uso de outra espécie vegetal na busca de alimento, refletindo um ponto positivo para uma espécie, considerada global e nacionalmente Vulnerável de extinção[15] , cujos ambientes encontram-se fortemente fragmentados e ameaçados pelo rápido e descontrolado desenvolvimento humano[23,24].

Agradecimentos

Agradeço ao amigo Filipe Viegas de Arruda pela identificação das formigas coletadas na *Cecropia* e ao revisor anônimo pelas enriquecedoras colocações. Também a Guy M. Kirwan pela disponibilização da observação de *C. spectabilis* no Equador.

Referências

1. Arruda, F. V., Pesquero, M. A., Marcelino, D. G., Leite, G. A., Delabie, J. H. C. & Fagundes, R. (2016) Size and condition of bamboo as structural factors behind the vertical stratification of the bamboo-nesting ant community. *Insect. Soc*. 63: 99–107.
2. Azevedo, L. S., Aleixo, A., Santos, M. P. D., Sampaio, I., Schneider, H., Vallinoto, M. & Rêgo, P. S. (2013) New molecular evidence supports the species status of Kaempfer's Woodpecker (Aves, Picidae). *Genet. & Mol. Biol*. 36: 192–200.
3. Benz, B. W. & Robbins, M. B. (2011) Molecular phylogenetics, vocalizations, and species limits in *Celeus* woodpeckers (Aves: Picidae). *Mol. Phyl. & Evol*. 61: 29–44.
4. Bonato, V., Cogni, R. & Venticinque, E. M. (2003) Ants nesting on *Cecropia purpurascens* (Cecropiaceae) in central Amazonia: influence of tree height, Domatia volume and food bodies. *Sociobiology* 42: 719–727.
5. Bragança, R. A., Assis, F. A., Prado, A. D. & Melo, C. K. (2008) Distribuição de *Celeus obrieni* (Piciformes: Picidae) no Estado do Tocantins. Em: *Resumos XVI Congr. Bras. Orn*., Palmas, TO.
6. CBRO (Comitê Brasileiro de Registros Ornitológicos) (2011) Listas das aves do Brasil. 10ª edição, www.cbro.org.br (acesso em 19 de fevereiro de 2011).
7. Corrêa, A. G. (2012) Uso de habitat e distribuição do pica-pau-do-parnaíba *Celeus obrieni*. Dissertação. Palmas: Universidade Federal do Tocantins.
8. Dornas, T., Valle, N. C. & Hidasi, J. H. (2009) *Celeus obrieni*: dois novos registros históricos para o estado de Goiás. *Atualidades Orn*. 147: 18–19.
9. Dornas, T., Leite, G. A., Pinheiro, R. T. & Crozariol, M. A. (2011) Primeiro registro do criticamente ameaçado pica-pau-da-parnaíba *Celeus obrieni* no Estado de Mato Grosso (Brasil) e comentários sobre distribuição geográfica e conservação. *Cotinga* 33: 91–93.
10. Dornas, T., Luiz, E. R., Pesquero, M. F., Pinheiro, R. T., Corrêa, A. G., Leite, G. & Marcelino, D. G. (2017) Proposta de alteração dos nomes vernáculos técnicos em português e inglês de duas aves endêmicas do Brasil: *Pyrrhura pfrimeri* (Psittaciformes: Psittacidae) e *Celeus obrieni* (Piciformes: Picidae). *Atualidades Orn*. 196: 8–13.
11. Fox, L. R. & Morrow, P. A. (1981) Specialization: species property or local phenomenon? *Science* 211: 887–893.
12. Guilherme, E. & Santos, M. P. D. (2009) Birds associated with bamboo forests in eastern Acre, Brazil. *Bull. Brit. Orn. Club* 129: 229–240.
13. Harada, A. Y. & Benson, W. W. (1988) Espécies de *Azteca* (Hymenoptera, Formicidae) especializadas em *Cecropia* spp. (Moraceae): distribuição geográfica e considerações ecológicas. *Rev. Bras. Ent*. 32: 423–435.
14. Hidasi, J., Mendonça, L. G. A. & Blamires, D. (2008) Primeiro registro documentado de *Celeus obrieni* (Picidae) para o Estado de Goiás, Brasil. *Rev. Bras. Orn*. 16: 373–375.
15. IUCN (2010) IUCN Red List of threatened species. Versão 04/2010. www.iucnredlist.org (acesso em 10 de janeiro de 2011).

16. Janzen, D. H. (1969) Allelopathy by myrmecophytes: the ant *Azteca* as an allelopathic agent of *Cecropia*. *Ecology* 50: 147–153.
17. Janzen, D. H. (1973) Dissolution of mutualism between *Cecropia* and its *Azteca* ants. *Biotropica* 5: 15–28.
18. Kratter, A. W. (1997) Bamboo specialization by Amazonian birds. *Biotropica* 29: 100–110.
19. Kratter, A. W. (1998) The nest of two bamboo specialists: *Celeus spectabilis* (Rufous-headed Woodpecker) and *Cercomacra manu* (Manu Antbird). *J. Field Orn*. 69: 37–44.
20. Leite, G. A., Pinheiro, R. T., Marcelino, D. G., Figueira, J. E. C. & Delabie, J. H. C. (2013) Foraging behavior of Kaempfer's Woodpecker (*Celeus obrieni*), a bamboo specialist. *Condor* 115: 221–229.
21. Mallet-Rodrigues, F. (2005) Táxons de aves de validade questionável com ocorrência no Brasil. I – introdução e lista geral. *Rev. Bras. Orn*. 13: 210–211.
22. Mallet-Rodrigues, F. (2007) Táxons de aves de validade questionável com ocorrência no Brasil. VII – Picidae. *Atualidades Orn*. 140: 8–9.
23. Marcelino, D. G. & Pinheiro, R. T. (2014) Análise estrutural da paisagem de uma das localidades de ocorrência do pica-pau-do-Parnaíba *Celeus obrieni*, na região norte do Estado de Goiás, Brasil. *Braz. Geog. J.: Geosci. & Humanities Res. Medium* 1: 84–92.
24. Marcelino, D. G., Corrêa, A. G., Dornas, T. & Pinheiro, R. T. (2012) Diagnóstico ambiental das áreas de ocorrência do pica-pau-do-parnaíba *Celeus obrieni*, na região norte de Goiás, Brasil. *Neotrop. Biol. & Conserv*. 7: 129–139.
25. Oliveira, G. A. (2013) Interação entre *Cecropia* (Cecropiaceae) e formigas associadas ao longo de uma faixa longitudinal no sudeste da Bahia. Dissertação. Ilhéus: Universidade Estadual de Santa Cruz.
26. Pacheco, J. F. & Maciel, E. (2009) Um registro recente e documentado de *Celeus obrieni* (Piciformes: Picidae) para o Estado de Goiás. *Atualidades Orn*. 150: 14.
27. Pinheiro, R. T. & Dornas, T. (2008) New records and distribution of Kaempfer's Woodpecker *Celeus obrieni*. *Rev. Bras. Orn*. 16: 167–169.
28. Pinheiro, R. T., Dornas, T., Leite, G. A., Crozariol, M. A., Marcelino, D. G. & Corrêa, A. G. (2012) Novos registros do pica-pau-da-parnaíba *Celeus obrieni* e status conservação no estado de Goiás, Brasil. *Rev. Bras. Orn*. 20: 59–64.
29. Prado, A. D. (2006) *Celeus obrieni*: 80 anos depois. *Atualidades Orn*. 134: 4–5.
30. Rickson, F. R. (1976) Anatomical development of the leaf trichilium and Müllerian bodies of *Cecropia peltata* L. *Amer. J. Bot*. 63: 1266–1271.
31. Santos, M. P. D. & Vasconcelos, M. F. (2007) Range extension for Kaempfer's Woodpecker *Celeus obrieni* in Brazil, with the first male specimen. *Bull. Brit. Orn. Club* 127: 249–252.
32. Schupp, E. W. (1986) *Azteca* protection of *Cecropia*: ant occupation benefits juvenile trees. *Oecologia* 70: 379–385.
33. Short, L. L. (1973) A new race of *Celeus spectabilis* from eastern Brazil. *Wilson Bull*. 85: 465–467.
34. Tabarelli, M. & Mantovani, W. (1999) Clareiras naturais e a riqueza de espécies pioneiras em uma floresta atlântica montana. *Rev. Brasil. Biol*. 59: 251–261.
35. Tocantins (2004) *Plano de manejo do Parque Estadual do Cantão*. Palmas: Secretaria do Planejamento e Meio Ambiente do Estado do Tocantins.
36. Vasconcelos, H. L. & Casimiro, A. B. (1997) Influence of *Azteca alfari* ants on the exploitation of *Cecropia* trees by a leaf-cutting ant. *Biotropica* 29: 84–92.
37. Vieira, A. S., Faccenda, O., Antonialli-Junior, W. F. & Fernandes, W. D. (2010) Nest structure and occurrence of three species of *Azteca* (Hymenoptera, Formicidae) in *Cecropia pachystachya* (Urticaceae) in non-floodable and floodable Pantanal areas. *Rev. Bras. Ent*. 54: 441–445.
38. Whittaker, A. & Oren, D. C. (1999) Important ornithological records from the Rio Juruá, western Amazonia, including twelve additions to the Brazilian avifauna. *Bull. Brit. Orn. Club* 119: 235–260.
39. Winkler, H. & Christie, D. A. (2002) Family Picidae (woodpeckers). Em: del Hoyo, J., Elliott, A. & Sargatal, J. (eds.) *Handbook of the birds of the world*, 7. Barcelona: Lynx Edicions.

Marco Aurélio Crozariol
Museu Nacional/UFRJ, Departamento de Vertebrados, Setor de Ornitologia, Quinta da Boa Vista, São Cristóvão, s/n, CEP 20940-040. Rio de Janeiro, RJ, Brasil. E-mail: marcocrozariol@gmail.com.

Primeros avistamientos de *Setophaga pitiayumi* para la isla Cozumel, Quintana Roo, México

Setophaga pitiayumi es una especie residente en la mayor parte de su área de distribución, la cual va desde el sur de Estados Unidos hasta Perú y el norte de Argentina. En México también es una especie residente y sólo se han reportado algunos movimientos altitudinales en la especie cuando no se encuentra anidando. Se distribuye en la costa del Pacífico y en la costa del golfo de México, sin reportarse para la península de Yucatán[2].

Realizamos una revisión bibliográfica extensa de todas las especies reportadas para la isla Cozumel desde 1884; revisamos también el Atlas de las aves de México[3] que reúne registros de aves que se han colectado en México y que se encuentran en colecciones ornitológicas y museos de historia natural de diversas instituciones de México, Estados Unidos, Canadá y Europa. Finalmente buscamos también datos de distribución de la especie en páginas electrónicas especializadas en el registro de avistamiento de aves. En base a esta búsqueda establecimos que no existen reportes publicados previos de esta especie en la península de Yucatán, y únicamente en los registros de avibase.bsc-eoc.org se menciona la presencia de la especie en el estado de Campeche, aunque no pudimos rastrear más información sobre este registro.

Figura 1. *Setophaga pitiayumi*, Parque Ecológico Estatal Laguna Colombia "Parque Punta sur", isla Cozumel, México, marzo del 2017 (Héctor González)

El 15 y 18 de marzo del 2017 realizamos en el Parque Ecológico Estatal Laguna Colombia "Parque Punta sur" localizado al sur de la isla Cozumel los avistamientos de *S. pitiayumi*. Estos fueron obtenidos de forma directa al encontrar al ave perchando en un árbol de *Chiloroleucon mangense* que se encuentra sobre un cenote a 150 m al suroeste del faro Celarain. Se obtuvieron fotografías detalladas de los individuos, y la identificación de la especie se fundamentó con el parche negro que se presenta alrededor del ojo y que la distingue de *Setophaga americana*.

La especie fue observada en el tipo de vegetación correspondiente a selva baja subcaducifolia, que está compuesta por un estrato arbóreo principal y otro arbustivo sin presentarse un estrato herbáceo. Esta comunidad limita con el manglar, dunas costeras y selva mediana subcaducifolia[1,5].

El registro obtenido es interesante, ya que además de ser el primero para la península de Yucatán, se trata de una especie que se considera residente en la mayor parte de su rango de distribución. Consideramos que la presencia de esta especie en la isla posiblemente responde al cambio en los patrones de distribución de las especies que se está observando a lo largo de los hábitats debido al cambio climático y que se ha documentado en diversos trabajos como el de Peterson *et al.*[4].

Agradecimientos

Agradecemos a Adolfo Navarro Sigüenza, Facultad de Ciencias, Universidad Nacional Autónoma de México y a A. Townsend Peterson, Universidad de Kansas por permitirnos el acceso a los datos contenidos en el Atlas de las aves de México, así como por la revisión y los comentarios hechos a este manuscrito. Agradecemos al revisor anónimo los comentarios hechos al manuscrito y a Guy Kirwan su invaluable ayuda editorial.

Referencias

1. Flores, J. S. & Espejel, I. (1994) *Etnoflora Yucatanense: tipos de vegetación de la península de Yucatán*. Mérida: Universidad Autónoma de Yucatán.
2. Howell, S. N. G. & Webb, S. (1995) *A guide to the birds of Mexico and northern Central America*. Oxford: Oxford University Press.
3. Navarro Sigüenza, A. G. (2002) *Atlas de las aves de México: fase II; database from SNIB-CONABIO Projects E018 y A002*. México, D.F.: Facultad de Ciencias, Universidad Nacional Autónoma de México.
4. Peterson, A. T., Navarro-Sigüenza, A. G., Martínez-Meyer, E., Cuervo-Robayo, A. P., Berlanga, H. & Soberón, J. (2015) Twentieth century turnover of Mexican endemic avifaunas: landscape change versus climate drivers. *Sci. Advances* 1: e1400071.
5. Téllez, V. O., Cabrera, C. E. F., Linares, M. E. & Bye, R. (1989) *Las plantas de Cozumel. Guía botánica-turística de la isla Cozumel, Quintana Roo*. México, D.F.: Ed. Instituto de Biología, Universidad Nacional Autónoma de México.

Héctor González C.
Parque Ecológico Estatal Laguna Colombia "Parque Punta Sur", Fundación de Parques y Museos de Cozumel, Quintana Roo. Av. Pedro Joaquín Coldwell 70 entre Juárez y 1ra Sur Col. Centro, 77600, San Miguel, Cozumel, Quintana Roo, México. E-mail: hgc231@gmail.com.

Tania Macouzet F.
E-mail: tmacouzet@gmail.com.

Received 12 October 2017; final revision accepted 4 February 2018; published online 16 June 2018.

Lincoln's Sparrow *Melospiza lincolnii*: first record for Colombia and second record for South America

On 30 March 2017, at 06h20, we spotted a Lincoln's Sparrow *Melospiza lincolnii* perched on a small sandy mound, along the dirt road near the Recurve-billed Bushbird Bird Reserve, Agua de la Virgen, Ocaña, Norte de Santander, Colombia (08°11'46.860"N 73°22'53.400"W; 1,530 m). We watched the bird through binoculars for a few minutes hopping along the roadside flanked by grasses at c.20–25 m distance. It was immediately identified as a Lincoln's Sparrow by its combination of rufous-brown stripes bordering a grey central crown-stripe, prominent grey supercilium extending well behind the eye, relatively fine bill, white throat and pale malar separated by a dark brown lateral throat-stripe, complete buffy breast-band and buffy flanks with prominent but narrow black streaks, and white central belly towards the vent[3]. It also had a greyish-buff back heavily streaked dark brown.

Both of us have experience with Lincoln's Sparrow as a passage migrant and on its breeding grounds in the eastern USA, as well as extensive experience of the most likely confusion species. We were able to exclude juvenile Rufous-collared Sparrow *Zonotrichia capensis* (broad breast streaks extending to lower belly on pale underparts without a buffy breast-band and flanks, brownish supercilium in front of the eye becoming white / pale grey, and no lateral throat-stripe[6]), Song Sparrow *Melospiza melodia* (broad breast streaks on paler breast, with no brown patch in centre, thicker bill[4]) and Swamp Sparrow *M. georgiana* (grey breast with no to faint blurry streaks[5]), plus Savannah Sparrow *Passerculus sandwichensis* (broad long streaks on white central belly, yellowish lores[7]).

Having flown off, we spent another c.30 minutes trying to relocate the bird. We eventually found it perched in a low tree c.150 m from the original location. It then flew into scrubby growth on a steep roadside slope, affording further brief but conclusive views. The bird then ascended the slope into impenetrable scrub. We were unable to obtain photographic evidence (no camera) or a sound-recording (the bird did not vocalise).

Lincoln's Sparrow breeds in the boreal zone and the Rocky Mountains of North America, wintering on the Pacific coast and in the southern USA, south to Central America and the Caribbean[3]. There is a single record in South America: a vagrant mist-netted at Portachuelo Pass, Henri Pittier National Park, Aragua, in northern Venezuela[8]. There are also records in Costa Rica[9] and Panama[3], which given that these are from a similar latitude as Ocaña (albeit slightly further north) offer additional support for Lincoln's Sparrow's vagrancy potential. Our record represents the first for Colombia and the second for South America[1,2].

Acknowledgements

We thank two anonymous reviewers and G. Kirwan for their comments.

References

1. Avendaño, J. E., Bohórquez, C. I., Rosselli, L., Arzuza-Buelvas, D., Estela, F. A., Cuervo, A. M., Stiles, F. G. & Renjifo L. M. (2017) Lista de chequeo de las aves de Colombia: una síntesis del estado de conocimiento desde Hilty & Brown (1986). *Orn. Colombiana* 16: eA01.
2. Donegan, T., Verhelst, J. C., Ellery, T., Cortés-Herrera, O. & Salaman, P. (2016) Revision of the status of bird species occurring or reported in Colombia 2016 and assessment of BirdLife International's new parrot taxonomy. *Conserv. Colombiana* 24: 12–36.
3. Rising, J. (2017) Lincoln's Sparrow (*Melospiza lincolnii*). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Barcelona: Lynx Edicions (retrieved from www.hbw.com/node/61916 on 19 November 2017).
4. Rising, J. (2017) Song Sparrow (*Melospiza melodia*). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Barcelona: Lynx Edicions (retrieved from www.hbw.com/node/61915 on 19 November 2017)
5. Rising, J. (2017) Swamp Sparrow (*Melospiza georgiana*). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Barcelona: Lynx Edicions (retrieved from www.hbw.com/node/61917 on 19 November 2017)
6. Rising, J. & Jaramillo, A. (2017) Rufous-collared Sparrow (*Zonotrichia capensis*). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Barcelona: Lynx Edicions (retrieved from www.hbw.com/node/61910 on 19 November 2017).
7. Rising, J., Christie, D. A. & Garcia, E. F. J. (2017) Savannah Sparrow (*Passerculus sandwichensis*). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Barcelona: Lynx Edicions (retrieved from www.hbw.com/node/61918 on 19 November 2017)
8. Rodner, C., Lentino, M. & Restall, R. (2000) *Checklist of the birds of northern South America*. New Haven, CT: Yale University Press.
9. Sandoval, L., Sánchez, C., Biamonte, E., Zook, J. R., Sánchez, J. E., Martínez, D., Loth, D. & O'Donahoe, J. (2010) Recent records of

new and rare bird species in Costa Rica. *Bull. Brit. Orn. Club* 130: 237–245.

David P. Edwards
Dept. of Animal and Plant Sciences, University of Sheffield, Sheffield, UK. E-mail: david.edwards@sheffield.ac.uk.

Brett R. Scheffers
Dept. of Wildlife Ecology and Conservation, University of Florida, Gainesville, Florida, USA.

Received 12 June 2017; final revision accepted 24 November 2017; published online 16 June 2018.

Ampliación del rango de distribución del Tororoi Carimanchado *Hylopezus macularius* en Colombia

El Tororoi Carimanchado *Hylopezus macularius* es una especie poco común y local que se distribuye hasta 500 m de elevación desde el sur de Venezuela (estado Amazonas), sur de Colombia (depto. Amazonas), norte del Perú desde el occidente del río Ucayali y la orilla occidental de los ríos Negro y Branco en Brasil (estado Amazonas) (*H. m. dilutus*), hasta el escudo Guyanés desde la orilla oriental de los ríos Negro y Branco hacia el este en Venezuela (estado Bolívar), Guyana, Surinam, Guyana Francesa y nororiente de Brasil (estado Amapá) (*H. m. macularius*)[1,4,7–10]. En Colombia solo se ha registrado en el depto. de Amazonas al noroeste de la ciudad de Leticia (río Loreto-Yacú) en el Parque Nacional Natural Amacayacu[5,7] (Fig. 1). Esta especie habita el suelo y sotobosque denso de bosques húmedos, especialmente alrededor de árboles caídos y a lo largo de arroyos en bosques de tierra firme.

Presentamos dos observaciones de *H. m. dilutus* en el margen izquierdo del río Guaviare, en el predio La Ceiba, vereda Playa Nueva, municipio de Puerto Concordia, depto. de Meta, muy cerca del municipio de San José del Guaviare, depto. de Guaviare (Fig. 1). Estos registros representan una considerable ampliación de su distribución hacia el norte del país. El bosque inundable donde se realizaron las dos observaciones presenta intervención antrópica, ya que en su interior se talan árboles maderables y en sus alrededores existen asentamientos humanos y cultivos agrícolas como plátano, cacao y maíz por temporadas (WAR obs. pers.).

El 12 de enero de 2015 observamos un individuo en el suelo sobre la hojarasca (02º35'17"N 72º39'09"W; 190 m), a 150 m de una laguna y 800 m del río Guaviare (Fig. 2). En esta observación de diez minutos solo registramos un individuo dando pequeños saltos en el suelo, posiblemente en busca de insectos. Este lugar fue visitado durante el mismo mes en dos ocasiones y dos veces más en abril 2015, pero no fue posible registrarlo nuevamente.

El 11 de diciembre de 2016 observamos un individuo en el suelo de un bosque inundable con predominio de platanillo (*Heliconia* sp.) en el sotobosque, en el borde de una laguna (02°35'20"N 72°39'07"W; 190 m) a 110 m de la primera observación (Fig. 2). El individuo observado voló c.2 m hasta un bejuco a 1 m del suelo. Desde allí vocalizó en varias ocasiones haciendo una serie de llamados, para luego volar de nuevo al piso y seguir vocalizando.

Los registros aquí presentados amplían el rango de distribución de la especie en Colombia 760 km hacia el norte y son los primeros fuera de su localidad histórica (río Loreto-Yacú en el Parque Nacional Natural Amacayacu). A su vez, amplia la distribución global 695 y 655 km lineales hacia el oeste de río Vaciva-Brazo Casiquiare (National Museum of Natural History, Washington DC: USNM 327112) y Puerto Yapacana (Colección Ornitológica Phelps, Caracas: COP 39363–374) en Amazonas, Venezuela; 580 y 630 km lineales hacia el norte de Cocha Águila-Campamento Cashimbo y Campo Medio-Algodones en Loreto, Perú[2], y 895 km hacia el noroeste del Lago Cumapi en Amazonas, Brasil (Field Museum of Natural History, Chicago: FMNH 457233) (H. F. Greeney com. pers.).

Los registros en el depto. de Loreto, Perú, al norte del río Amazonas (río Mazan, quebrada Sucusari y Sabalillo, en el margen izquierdo del río Napo), y en el centro del estado de Amazonas, Venezuela (Puerto Yapacana y Cerro Duida, en el río Orinoco; Caño Durutomoni y El Merey, en el río Casiquiare)[1,2,4,10], sugieren que la especie podría encontrarse en otras localidades a lo largo de la región amazónica colombiana. Por ello, es necesario revisar su distribución en Colombia y evaluar su estado de conservación.

Además, es importante seguir estudiando los departamentos de la región amazónica colombiana (Caquetá, Guaviare, Putumayo y zonas aledañas), los cuales durante décadas han presentado situaciones de conflicto armado que han dificultado la generación de información científica, al ser regiones con alta diversidad de aves[2,3] y que mantienen la mayor tasa de deforestación en Colombia[6].

Agradecimientos

A Alexandre Aleixo, curador de la colección de ornitología del departamento de zoología del Museo Paraense Emílio Goeldi (Belém, Brasil) por la información suministrada, a J. F. Freile y H. F. Greeney por los comentarios y sugerencias al manuscrito.

Referencias

1. Carneiro, L. S., Gonzaga, L. P., Rêgo, P. S., Sampaio, I., Schneider, H. & Aleixo, A. (2012) Systematic revision of the Spotted Antpitta (Grallariidae: *Hylopezus macularius*), with description of a cryptic new species from Brazilian Amazonia. *Auk* 129: 338–351.
2. eBird (2017) eBird: una base de datos en línea para la abundancia y distribución de las aves. Ithaca, NY: Cornell University. www.ebird.org (accedido mayo de 2017).

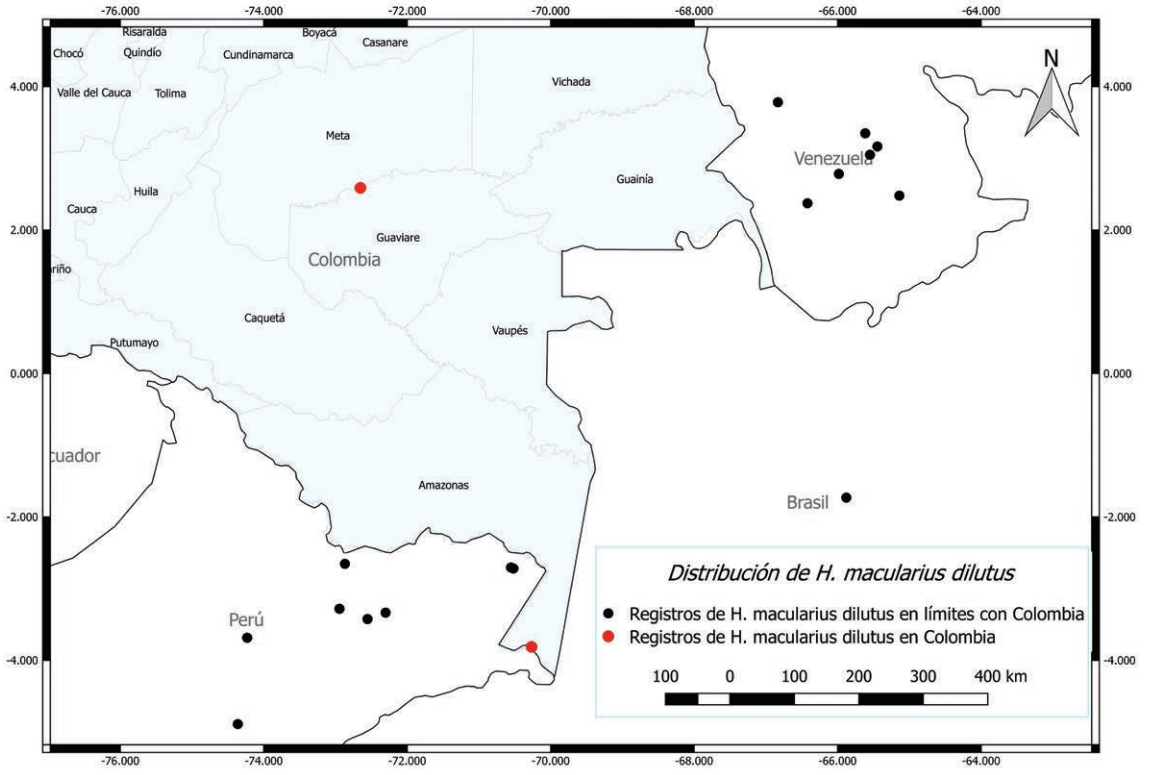


Figura 1. Registros de *Hylopezus macularius dilutus* en Colombia y localidades cercanas en Perú, Venezuela y Brasil.
Figura 2. Registros de *Hylopezus macularius dilutus* en municipio de Puerto Concordia, depto. del Meta, Colombia, en enero de 2015 (A) y en diciembre de 2016 (B) (Wilmer A. Ramírez)

3. Haffer, J. (1969) Speciation in Amazonian forest birds. *Science* 165: 131–137.
4. Hilty, S. L. (2003) *Birds of Venezuela*. Princeton, NJ: Princeton University Press.
5. Hilty, S. L. & Brown, W. L. (1986) *A guide to the birds of Colombia*. Princeton, NJ: Princeton University Press.
6. IDEAM (2015) Sistema de monitoreo de bosques y carbono. Actualización de cifras oficiales deforestación en Colombia. Bogotá: Instituto de Hidrología, Meteorología y Estudios Ambientales (IDEAM) y Ministerio de Ambiente y Desarrollo Sostenible (MADS). http://www.ideam.gov.co/ (accedido 28 diciembre de 2016).
7. Krabbe, N. K. & Schulenberg, T. S. (2003) Spotted Antpitta (*Hylopezus macularius*). In: del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, 8. Barcelona: Lynx Edicions.
8. Restall, R., Rodner, C. & Lentino, M. (2006) *Birds of northern South America*. New Haven, CT: Yale University Press.
9. Ridgely, R. S. & Tudor, G. (2009) *Field guide to the songbirds of South America: the passerines*. Austin: University of Texas Press.
10. Schulenberg, T. S., Stotz, D. F., Lane, D. F., O'Neill, J. P. & Parker, T. A. (2007) *Birds of Peru*. Princeton, NJ: Princeton University Press.

Wilmer A. Ramírez, Sergio Chaparro-Herrera, Ramón Carrillo López, César Arredondo y Adriana Sua-Becerra
Grupo de Observadores de Aves del Guaviare (GOAG). SC-H: Grupo de Ecología y Evolución de Vertebrados Universidad de Antioquia, Colombia. E-mails: waramirez69@hotmail.com; sergioupn@gmail.com.

Received 2 February 2017; final revision accepted 12 June 2017; published online 16 June 2018.

Presencia del Chango Colombiano *Hypopyrrhus pyrohypogaster* en el departamento del Meta, Colombia

El Chango Colombiano o Chango Ventrirrojo *Hypopyrrhus pyrohypogaster* es una especie endémica de Colombia[5], categorizada como Vulnerable (VU) a nivel nacional y global debido a que presenta una distribución severamente fragmentada, y a que se estima que tanto su distribución como su población continúan en disminución en cuanto a extensión de ocurrencia, área de ocupación, extensión y / o calidad del hábitat, número de subpoblaciones y número de individuos maduros[11]. Se estima que el tamaño de sus subpoblaciones es inferior a 1.000 individuos maduros reproductivos[11]. Habita al interior de bosques premontanos maduros y secundarios en diferente estado de sucesión, así como bordes de bosque, vegetación ribereña en zonas semiabiertas y plantaciones forestales cercanas a bosques en buen estado en algunas localidades[7–10]. Se alimenta de frutos y bayas de diversas plantas (*Cupania*, *Miconia*, *Ficus*) y en algunas ocasiones de semillas de bambú (*Chusquea*) y artrópodos (arañas, ortópteros, orugas)[7–9].

Existen registros discontinuos de la especie entre 800 y 2.750 msnm (principalmente por encima de 1.200 m) en las dos vertientes de la cordillera Occidental, desde la región de Frontino y Urrao (Antioquia) hasta La Celia y Pueblo Rico (Risaralda) (sector Cerro Tatamá) y un registro en el municipio de El Águila (Valle del Cauca)[3,6,9–11] (www.humboldt.org.co/es/investigacion/programas/colecciones-biologicas/sonidos, http://ipt.sibcolombia.net/iavh/resource.do?r=aves_iavh, http://ipt.sibcolombia.net/rnoa/resource.do?r=censo_aves_rnoa). También se encuentra en ambas vertientes de la cordillera Central, desde Valdivia, Anorí y Peque (Antioquia) hasta Salento y Filandia (Quindío), y Pereira (Risaralda; Santuario de Fauna y Flora Otún Quimbaya); probablemente esté extinta locamente en estas tres últimas localidades. Adicionalmente, se ha registrado de manera puntual desde Planadas y Anzoátegui (Tolima), por el

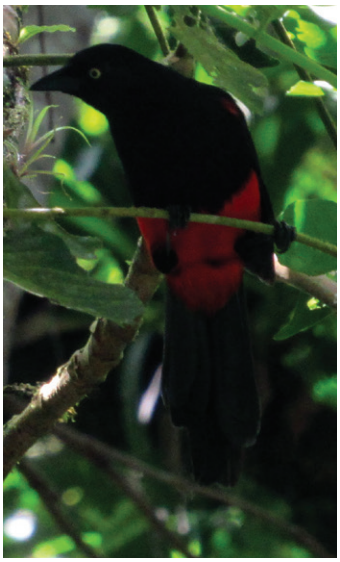


Figura 2. Uno de los individuo del Cacique Colombiano *Hypopyrrhus pyrohypogaster* registrado en el municipio de Cubarral, depto. del Meta, agosto 2017 (Derly Callejas Ávila)

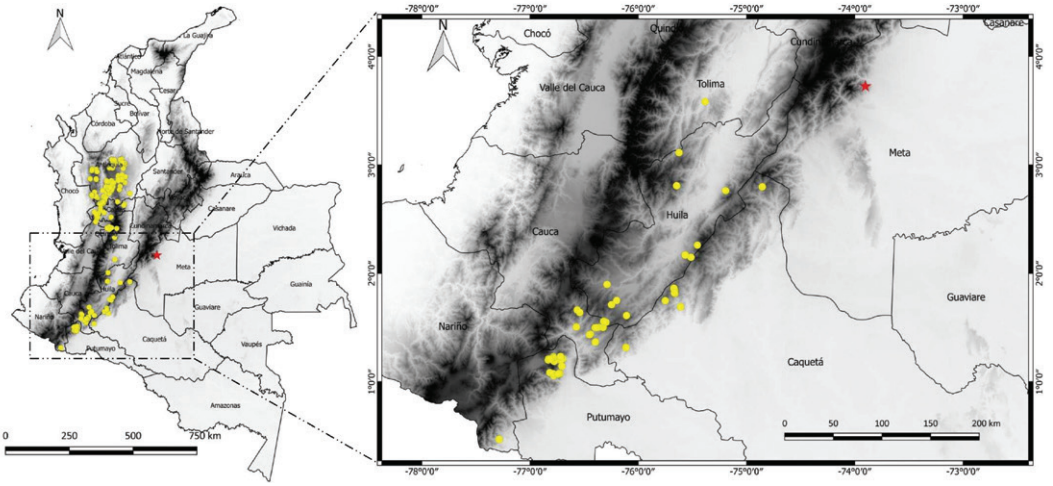


Figura 1. Distribución del Chango Colombiano *Hypopyrrhus pyrohypogaster* (puntos amarillos). Izquierda, mapa de distribución a lo largo de Colombia; derecha, distribución al sur del país y nuevo registro para Colombia en el departamento del Meta (estrella roja).

sur, hasta la cabecera de valle del río Magdalena en el este y sur de Huila, y sureste del Cauca[2,3,6,9,11] (www.humboldt.org.co/es/investigacion/programas/colecciones-biologicas/sonidos, http://ipt.sibcolombia.net/iavh/resource.do?r=aves_iavh, http://ipt.sibcolombia.net/rnoa/resource.do?r=censo_aves_rnoa). Finalmente, se encuentra en la vertiente este de la cordillera Oriental en el oeste de Putumayo y Caquetá, y hay un registro al sureste de Nariño en Ipiales (Territorio Kofán) (www.xeno-canto.org) (Fig. 1)[1–3,6,9,11] (www.humboldt.org.co/es/investigacion/programas/colecciones-biologicas/sonidos, http://ipt.sibcolombia.net/rnoa/resource.do?r=censo_aves_rnoa).

A continuación, presentamos un nuevo registro en el departamento del Meta, que amplía su rango de distribución en c.150 km hacia el norte por la vertiente orinocense de la cordillera Oriental, y se convierte en la localidad publicada más al noreste de los Andes. El 8 agosto 2017, a las 11h00, observamos un grupo de seis individuos de *H. pyrohypogaster* alimentándose de semillas de sangregado (*Croton* sp., Euphorbiaceae) en el borde de un bosque húmedo, en el caño Los Tonoitas, vereda Monserrate, municipio Cubarral, departamento del Meta (03°43'29,5"N, 73°54'06,3"O, 1.310 msnm; Figs. 1–2). El último registro en la vertiente oriental de la cordillera Oriental (1997) proviene del Parque Nacional Natural Cordillera de Los Picachos, municipio de San Vicente del Caguán, departamento de Caquetá (www.xeno-canto.org/117291), en donde no existen registros recientes. Existen varios registros recientes (2016) en la porción sur de la vertiente oriental de la cordillera Oriental, en las localidades Río Tarqui, El Caraño y Mirador de los Tucanes[6], municipio de Florencia, departamento de Caquetá, 290 km lineales al sur de la nueva localidad presentada en esta nota. Estas son las localidades con registros más recientes y provienen de una zona de paso entre tierras bajas del oriente de los Andes y los Andes propiamente, en la denominada depresión o valle de Suaza-Pescado (base de la cordillera Oriental)[4].

La abundancia de *H. pyrohypogaster* es variable a lo largo de su distribución, siendo localmente común en el norte de la cordillera Central y Occidental, pero con densidades bajas en la cordillera Oriental y centro de la cordillera Central, y con extinciones locales en los departamentos de Risaralda y Quindío[8,10,11]. Consideramos necesario realizar estimaciones poblacionales a lo largo de su distribución para evaluar las dinámicas y / o fluctuaciones, tomar medidas de conservación en los hábitats a lo largo de su distribución y mitigar posibles extinciones locales. A su vez se debe realizar la búsqueda de nuevas localidades con hábitats propicios y monitorear si son áreas estables o de paso para la especie, como puede ser el caso del municipio de Cubarral o regiones al norte de la depresión de Suaza-Pescado y de Andalucía[4]. Según la evaluación de idoneidad de hábitat realizada por Renjifo *et al.*[11], el área donde fue registrada la especie y otras áreas más al norte del municipio de Florencia, departamento de Caquetá, no presentan ningún grado de idoneidad, lo que evidencia que aún se necesita entender mejor los requerimientos de hábitat de esta especie.

Agradecimientos

A Andrea Lopera, Néstor Espejo y Juan Lara por los aportes a las versiones iniciales del manuscrito, y a Andrés Cuervo, David Ocampo y Juan Freile por los aportes y evaluación del manuscrito.

Referencias

1. Arbeláez-Cortés, E., Marín-Gómez, O. H., Duque-Montoya, D., Cardona-Camacho, P. J., Renjifo, L. M. & Gómez, H. F. (2011) Birds, Quindío Department, Central Andes of Colombia. *Check List* 7: 227–247.
2. Ayerbe-Quiñones, F., López-Ordóñez, J. P., González-Rojas, M. F., Estela, F. A., Ramírez-Burbano, M. B., Sandoval-Sierra J. V. & Gómez-Bernal, L. G. (2008) Aves del departamento del Cauca-Colombia. *Biota Colombiana* 9: 77–132.
3. Biomap (2006) Base de Datos Darwin: Proyecto BioMap base de datos de distribución de la avifauna Colombiana. www.biomap.net (accesido 10 agosto 2017).
4. Cadena, C. D., Pedraza, C. A. & Brumfield, R. T. (2016) Climate, habitat associations and the potential distributions of Neotropical birds: implications for diversification across the Andes. *Rev. Acad. Colombiana Cienc. Exactas, Físicas Natur.* 40: 275–287.
5. Chaparro-Herrera, S., Echeverry-Galvis, M. Á., Córdoba-Córdoba, S. & Sua-Becerra, A. (2013) Listado actualizado de las aves endémicas y casi-endémicas de Colombia. *Biota Colombiana* 14: 235–272.
6. eBird (2017) eBird: una base de datos en línea para la abundancia y distribución de las aves. Ithaca, NY: Cornell University. http://ebird.org/ (accesido septiembre de 2017).
7. Fraga, R. & Sharpe, C. J. (2017) Red-bellied Grackle (*Hypopyrrhus pyrohypogaster*). En: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Barcelona: Lynx Edicions. www.hbw.com/node/62306 (accesido 28 septiembre 2017).
8. Garizábal, J. A., Londoño, L. V. & Cuervo, A. M. (2014) *Hypopyrrhus pyrohypogaster*. En: Renjifo, L. M., Gómez, M. F., Velásquez-Tibatá, J., Amaya-Villarreal, A. M., Kattan, G. H., Amaya-Espinel, J. D. & Burbano-Girón, J.

(eds.) *Libro rojo de aves de Colombia*, 1. Bogotá: Pontificia Universidad Javeriana & Instituto Alexander von Humboldt.
9. Hilty, S. L. & Brown, W. L. (1986) *A guide to the birds of Colombia*. Princeton, NJ: Princeton University Press.
10. Ocampo, D., Estrada-F., M. C., Muñoz, J. M., Londoño, L. V., David, S., Valencia, G., Morales, P. A., Garizábal, J. A. & Cuervo, A. M. (2012) Breeding biology of the Red-bellied Grackle (*Hypopyrrhus pyrohypogaster*): a cooperative breeder of the Colombian Andes. *Wilson J. Orn.* 124: 538–546.
11. Renjifo, L. M., Gómez, M. F., Velásquez-Tibatá, J., Amaya-Villarreal, A. M., Kattan, G. H., Amaya-Espinel, J. D. & Burbano-Girón, J. (2014) *Libro rojo de aves de Colombia*, 1. Bogotá: Pontificia Universidad Javeriana & Instituto Alexander von Humboldt.

Derly Callejas Ávila
Parque Nacional Natural Sumapaz, Cubarral, Colombia. E-mail: roki.tese@gmail.com.

Sergio Chaparro-Herrera
Parque Nacional Natural Sumapaz, Bogotá; Asociación Bogotana de Ornitología (ABO), Bogotá; y Grupo de Ecología y Evolución de Vertebrados Universidad de Antioquia, Medellín, Colombia. E-mail: sergioupn@gmail.com.

Received 5 September 2017; final revision accepted 16 March 2017 ; published online 16 June 2018.

First documented record of Ruff *Calidris pugnax* in Ecuador

On 2 August 2016, at 08h30, I arrived at Cerro Brujo beach, San Cristóbal Island, Galápagos (00º76'N 89º45'W) during an organised cruise. On scanning the muddy, saline pool just behind the beach I noted a shorebird that I did not immediately recognise. I was using only binoculars and viewing the bird into some glare but I identified it as a male Ruff *Calidris pugnax*, a species I am very familiar with in Europe and the Middle East. I watched the bird for c.10 minutes at a range of c.75 m and managed to get some photographs (Fig. 1).

The only other species present for comparison was Black-necked Stilt *Himantopus mexicanus*. Identification was straightforward based on size, structure and plumage. Size and, especially, the obvious blackish blotches on the breast-sides indicated a male moulting out of breeding plumage. This blotchy plumage is typical in late summer, as males initiate post-breeding moult while still on their breeding grounds[1].

Unfortunately, my field guide[7] was in the hotel in Quito and I did not return there until 8 August. After returning home in mid August, I researched the record and discovered its significance. I then contacted D. M. Brinkhuizen, but unfortunately the bird was not reported again. This is the first documented record of Ruff for Ecuador, although the species has previously been considered hypothetical[3]. The record was accepted by the Committee for Ecuadorian Records in Ornithology (CERO) in October 2017 (J. Freile *in litt*. 2017).

Ruff is an abundant and widespread breeding bird, mainly on Arctic and sub-Arctic grasslands across the Palearctic, from Western Europe to eastern Siberia. It is a rare migrant (rather than a vagrant) in North America, with widespread reports across the continent[8]. Given this, and that in the Old World wintering birds regularly reach as far south as South Africa[4], its rarity in South America is puzzling. Only a few records are summarised online[6], most of them from French Guiana, and Trinidad & Tobago where Ruff is by far the most regularly reported Palearctic shorebird[5]. Single old records are available for both Venezuela and Peru, although there has been a recent report from Brazil[2] and the species was reported from Fiji in December 2016[4], so vagrancy on remote islands of the tropical Pacific is not unprecedented.

Acknowledgements
I thank Dušan Brinkhuizen and Juan Freile (both CERO) for assistance with preparing this short note.

References
1. Cramp, S. & Simmons, K. E. L. (eds.) (1983) *The birds of the Western Palearctic*, 3. Oxford: Oxford University Press.
2. Dias, D., Rocha, R. P. & Lees, A. C. (2013) First documented record of the Ruff *Philomachus pugnax* (Scolopacidae) in Brazil. *Rev. Bras. Orn.* 21: 126–128.
3. Freile, J. F., Brinkhuizen, D. M., Greenfield, P. J., Lysinger, M., Navarrete, L., Nilsson, J., Ridgely, R. S., Solano-Ugalde, A., Ahlman, R. & Boyla, K. A. (2015–17) Lista de las aves del Ecuador / Checklist of the birds of Ecuador. Quito: Comité Ecuatoriano de Registros Ornitológicos. https://ceroecuador.wordpress.com/ (accessed 26 May 2017).
4. van Gils, J., Wiersma, P. & Kirwan, G. M. (2017) Ruff (*Calidris pugnax*). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Barcelona: Lynx Edicions. (retrieved from www.hbw.com/node/53943 on 26 May 2017).
5. Kenefick, M. & Hayes, F. E. (2006) Transatlantic vagrancy of Palearctic birds in Trinidad and Tobago. *J. Carib. Orn.* 19: 61–72.
6. Remsen, J. V., Areta, J. I., Cadena, C. D., Claramunt, S., Jaramillo, A., Pacheco, J. F., Pérez-Emán, J., Robbins, M. B., Stiles, F. G., Stotz, D. F. & Zimmer, K. J. (2017) A classification of the bird species of South America. www.museum.lsu.edu/~Remsen/SACCBaseline.htm (accessed 26 May 2017).

Figure 1. Ruff *Calidris pugnax*, Cerro Brujo, San Cristóbal, Galápagos, Ecuador, 2 August 2016 (Oscar Campbell)

7. Ridgely, R. S. & Greenfield, P. J. (2001) *The birds of Ecuador*. Ithaca, NY: Cornell University Press.
8. Sibley, D. A. (2000) *The Sibley guide to birds*. New York: Alfred A Knopf.

Oscar Campbell
British School Al Khubairat, PO Box 4001, Abu Dhabi, United Arab Emirates. E-mail: ojcampbell25@yahoo.com.

Received 14 June 2017; final revision accepted 13 February 2017; published online 16 June 2018.

Two Harpy Eagles *Harpia harpyja* at high elevation in Peru

Manu National Park and Biosphere Reserve, in the departments of Madre de Dios and Cusco in south-east Peru, protects >1.8 million ha[8] of diverse habitat. Restricted zones have been established for research and cultural activities, but most of the park is inaccessible and represents some of the most pristine habitat in the world. Despite restricted access, it is possible to follow the road north-east from Cusco to Paucartambo, which becomes the Manu Road and continues north between the national park and Reserva Comunal Amarakaeri crossing elevations of c.500–3,800 m and is referred to as the buffer zone. The Manu Road and buffer zone are popular ecotourism destinations, especially for birdwatchers, and more than 1,000 species of birds have been recorded in the area of Manu Biosphere Reserve[8].

Harpy Eagle *Harpia harpyja* is a strictly forest species that ranges from southern Mexico to South America[15]. Published nesting records from Peru include Lago Sandoval and Tambopata[2], and the native community of Infierno[9]. The species is resident in Manu National Park within an elevational range of 250–500 m[16]. Here we describe observations and interactions between two Harpy Eagles in the buffer zone near Manu National Park at 1,045 m, and document a new elevational record for the species in Peru.

On 28 July 2016 (the dry season), two adults were observed simultaneously on the lower part of Manu Road (13°01'41"S 71°29'56"W). Both were identified based on overall large size, double-pointed crest and black chest-band. They were observed for >1 hour (08h30–09h37) during which time, photographs, video and notes were made. The observations were from the road facing south towards the top of a ridge (c.1 km from the road). The first Harpy was identified at 08h30 flying east just below the horizon of the ridgetop. It landed in a large tree. We watched the bird with binoculars and a telescope for *c.*10 minutes before we noticed another individual flying in the same direction. It landed slightly below the first individual in the same tree (Fig. 1). At 09h07 both individuals flew together in a circle before returning to the tree. They were immediately identified as adults based on plumage[2]. The two birds changed position in the tree several times and were very active, bobbing and shaking their heads, raising crests, stretching wings, and looking in all directions, including to the forest floor. Once, the lower individual turned its head up towards the other and fanned its crest in display. At approximately 09h37 we departed.

The surrounding dense second-growth habitat consisted of palms and *Cecropia* sp. Several snags were located throughout the area but we were unable to identify the flora in the area or the tree used by the eagles.

No published records exist of this species in the buffer zone of Manu National Park, making our sighting of two individuals unexpected. Harpy Eagle is considered rare in Peru and Bolivia[1], and it is solitary in nature, except when breeding[13]. Nesting behaviour is described in detail by Rettig[10] and others, but mating is not well known for wild individuals.

Harpy Eagle typically occurs below 800 m[1,8,11,16]. We are unable to locate any published mid- or high-elevation records for the species in Peru and only a few records exist in nearby areas. However, Bierregaard *et al.*[1] mentioned a record in Colombia (1,600 m) and another in south-east Brazil (1,150 m). For Bolivia, Hennessey *et al.*[3] listed Harpy Eagle as occurring up to 1,100 m based on local folklore. Herzog[4] reported sightings to eBird from Río Cocos, La Paz (14°04'19.2"S 68°51'3.6"W) in Bolivia at c.1,000 m on 21, 23 and 27 February 2005, including two birds on the first date.

Figure 1. Two Harpy Eagles *Harpia harpyja* (inserted black circles), in the buffer zone area (1,045 m) near Manu National Park, Peru, July 2016 (S. Llactahuaman)

These sightings were just c.300 km south-east of our record. Spencer[14] photographed one at Flor de Cafe, San Martín, Peru, at approximately 1,700 m on 8 October 2016. Another sight record, on 20 October 2010, near Quita Calzones bridge (13°01'38.6"S 71°29'53.9"W) at 1,018 m was reported by Lane[6].

Although Harpy Eagles still occur over much of their original range in South America, they are probably declining due to habitat loss and hunting pressure[13]. The species is listed globally as Near Threatened[5] and is a species of high concern over its entire range. Because Harpy Eagles may require nearly 4,300 ha for nesting in Peru[9] this observation underscores the importance of including unprotected areas (including higher elevations) within Peru's protected areas system to improve biodiversity conservation[12]. Further, Lerner *et al.*[7] found high levels of mitochondrial genetic diversity and differentiation within subgroups of Harpy Eagles, indicating that local population conservation is important for maximum genetic diversity.

Our observation, together with recent eBird sightings in Peru and elsewhere, may indicate lack of detection previously, or suggest expansion of the species' range into higher elevation environments. Further monitoring in the Manu buffer zone and continued documentation of high-elevational sightings is warranted to better understand the species' habitat requirements or distributional changes.

Acknowledgements

Special thanks to Doris Valencia, Habitats Peru Travel, for arranging the itinerary and excellent guide services by Saturnino Llactahuaman for this trip. Gary Graves provided comments and guidance on this account. Daniel Lane provided additional high-elevation records. Video is available on request from Llactahuaman@hotmail.com. Careful critique by three reviewers greatly improved the manuscript.

References

1. Bierregaard, R. O., Kirwan, G. M. & Sharpe, C. J. (2017) Harpy Eagle (*Harpia harpyja*). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Barcelona: Lynx Edicions (retrieved from www.hbw.com/node/53150 on 6 September 2017).

2. Clements, J. F. & Shany, N. (2001) *A field guide to the birds of Peru*. Temecula, CA: Ibis Publishing.
3. Hennessey, B. A., Herzog, S. H., Kessler, M. & Robinson, D. (2003) Avifauna of the Pilón Lajas Biosphere Reserve and Communal Lands, Bolivia. *Bird Conserv. Intern*. 13: 319–349.
4. Herzog, S. (2005) eBird checklist: http://ebird.org/ebird/view/checklist?subID=S9311703. eBird: an online database of bird distribution and abundance. Ithaca, NY: eBird (accessed 18 September 2017).
5. IUCN (2011) *Harpia harpyja*. IUCN Red List of threatened species. Version 3.1. Gland: IUCN. www.iucnredlist.org.
6. Lane, D. (2010) eBird checklist: https://ebird.org/ebird/view/checklist/S39534646. eBird: an online database of bird distribution and abundance. Ithaca, NY: eBird (accessed 16 October 2017).
7. Lerner, H. R. L., Johnson, J. A., Lindsay, A. R., Kiff, L. F. & Mindell, D. P (2009) It's not too late for the Harpy Eagle (*Harpia harpyja*): high levels of genetic diversity and differentiation can fuel conservation programs. *PLoS ONE* 4(10): e7336.
8. Patterson, B. D., Stotz, D. F. & Solari, S. (2006) Mammals and birds of the Manu Biosphere Reserve, Peru. *Fieldiana Zool*. 110: 1–49.
9. Piana, R. P. (2007) Anidamiento y dieta de *Harpia harpyja* Linnaeus en la Comundidad Nativa de Infierno, Madre de Dios, Perú. *Rev. Peru. Biol*. 14: 135–138.
10. Rettig, N. L. (1978) Breeding behavior of the Harpy Eagle (*Harpia harpyja*). *Auk* 95: 629–643.
11. Robinson, S. K. (1994) Selection and foraging ecology of raptors in Amazonian Peru. *Biotropica* 26: 443–458.
12. Rodriguez, L. O. & Young, K. R. (2000) Biological diversity of Peru: determining priority areas for conservation. *AMBIO* 29: 329–337.
13. Schulenberg, T. S. (2009) Harpy Eagle (*Harpia harpyja*). In: Schulenberg, T. S. (ed.) Neotropical Birds Online. Ithaca, NY: Cornell Lab of Ornithology. https://neotropical.birds.cornell.edu/Species-Account/nb/species/hareag1 (accessed 10 October 2017).
14. Spencer, A. (2016) eBird checklist: https://ebird.org/ebird/view/checklist/S31981843 eBird: an online database of bird distribution and abundance. Ithaca, NY: eBird (accessed: 10 October 2017).
15. Vargas, J. J., Whitacre, D., Mosquera, R., Albuquerque, J., Piana, R., Thiollay, J.-M., Márquez, C., Sánchez, J. E., Lezama-López, M., Midence, S., Matola, S., Aguilar, S., Rettig, N. & Sanaiotti, T. (2006) Estado y distribución actual del Águila arpía (*Harpia harpyja*) en Centro y Sur América. *Orn. Neotrop*. 17: 39–55.
16. Walker, B., Stotz, D. F., Pequeño, T. & Fitzpatrick, J. W. (2006) Birds of the Biosphere Reserve. In: Patterson, B. D., Stotz, D. F. & Solari, S. (eds.) Mammals and birds of the Manu Biosphere Reserve, Peru. *Fieldiana Zool*. 110: 1–49.

Carla J. Dove and Christopher M. Milensky
Smithsonian Institution, National Museum of Natural History, Division of Birds, PO Box 37012, MRC 116, Washington DC 20013-7012, USA.

Saturnino Llactahuaman
Urb. Huancaro C-4, Cusco, Peru.

B. Holt Thrasher
E-mail: bhthrasher@gmail.com.

Received 14 November 2017; final revision accepted 16 January 2018; published online 16 June 2018.

Primer registro del Pato Gargantilla *Anas bahamensis* en el departamento de La Paz, Bolivia

La familia Anatidae está compuesta por 46 especies en Sudamérica[10], de los cuales 26 especies ocurren en Bolivia[7]. El Pato Gargantilla *Anas bahamensis* se distribuye en Sudamérica a lo largo de las costas tropicales y subtropicales, principalmente en el océano Pacífico, desde el sudeste de Bolivia hasta el centro de Argentina, ocasionalmente cruzan el sur de los Andes a Chile[3]. En Bolivia, *A. bahamensis* se distribuye al sudeste del país, principalmente en los departamentos de Tarija, este de Chuquisaca y sudoeste de Santa Cruz, es también considerado residente en el centro de Cochabamba[7]. Se reportan los primeros registros del Pato Gargantilla en el departamento de La Paz, al oeste de Bolivia.

El área de estudio se ubica en la laguna Jacha Kkota, localidad de Achocalla (16º33'–16º37'S 68º06'–68º11'O; 3.730 m), a 10 km de la ciudad de La Paz, departamento de La Paz. Entre la vegetación típica de la laguna, figuran los totorales de *Schoenoplectus californicus totora* formando típicos cinturones en las orillas de la laguna, donde también es típica *Eleocharis dombeyana* (Cyperaceae), otras plantas acuáticas incluyen a *Elodea potamogeton* (Hydrocharitaceae), *Roripa nana* (Cruciferaceae), *Juncus andicola* (Juncaceae), *Lemna gibba* (Lemnaceae), *Potamogeton pectinatus* (Potamogetaceae), *Miryophyllium quitense* (Haloragaceae), *Hydrocotyle ranunculoides* (Umbelliferae) y *Zannichellia palustris* (Zannichellaceae)[1,4].

El 7 de julio de 2017 se registró un individuo de *A. bahamensis* en la laguna Jacha Kkota (Fig. 1). El primer avistamiento se realizó a horas 09h10, con un grupo de 20 *Anas georgica*. Al día siguiente (8 de julio), el individuo arribo conjuntamente los 20 individuos de *A. georgica* al mismo sector de la laguna, alrededor de las 10h00. El Pato Gargantilla, se

mantuvo altamente activo, en la zona pelagial de la laguna, hasta promediar las 12h45. A partir de ese momento se mantuvo inactivo, quedándose a 'dormir' en un punto determinado del cuerpo de agua. La tercera visita a este humedal, fue el 28 de julio de 2017. Similarmente, la especie fue muy activa en el periodo de 10h00 a 12h20. A partir de esa hora, redujo drásticamente su actividad, hasta quedar en reposo, totalmente inmóvil, aparentemente durmiendo muy cerca de un macho de *Anas cyanoptera*, otro anátido residente de esta laguna. Durante el periodo activo, a menudo se lo vio comiendo pequeños peces (*Orestias* sp.). En esta oportunidad, ya se lo vio más apartado del grupo numeroso de *A. georgica*. La cuarta visita a la laguna fue el 18 de agosto de 2017, pero ya no se registró a la especie, lo cual nos indica que abandonó el cuerpo de agua en el periodo comprendido entre 1 de agosto hasta mediados de dicho mes.

Las comunidades de aves del valle de la ciudad de La Paz y regiones aledañas fueron ampliamente estudiadas durante el periodo 1996 al 2003, cuando 30 localidades, entre ellas Achocalla, fueron visitadas periódicamente, sin registrar la especie en cuestión[9]. Estudios anteriores[11] y posteriores[5–7], tampoco dan cuenta de la especie en el valle de la ciudad de La Paz. Por otra parte, como parte del Censo Neotropical de Aves Acuáticas en sus diez primeros años (1990–99) tampoco se registró la especie en este humedal[2]. Sin embargo, como una iniciativa de este proyecto, la laguna Jacha Kkota de Achocalla se venía censando continuamente desde 1997 hasta julio de 2017, y *A. bahamensis* no había sido registrado en este cuerpo de agua.

La laguna Jacha Kkota de Achocalla en los últimos años ha proveído nuevos registros de especies de aves acuáticas, como el caso del Flamenco Chileno *Phoenicoparrus chilensis*[8] o el Falaropo Tricolor *Phalaropus tricolor*. *A. bahamensis*, en el invierno austral realiza migraciones hacia el centro de Sudamérica y por la región costera del Pacífico. Aunque la especie en los Andes ocupa la zona de vida de la puna y altiplano, los registros en valles interandinos son poco frecuentes. Se reporta un registro histórico de la especie en el altiplano del departamento de Oruro[3,7], que sería el registro más occidental conocido de la especie en el país, pero la especie es extremadamente rara al oeste de Bolivia. Se la considera accidental a 4.080 m en el lago Junín, centro de Perú, y en el altiplano de Bolivia, y es considerado regular a 2.550 m cerca a Cochabamba (Bolivia)[3]. En 2011, la especie fue observada en las laguna Alalay y la represa de Corani (Cochabamba) con 23 y siete individuos, respectivamente (obs. pers.). Similarmente, el 3 de diciembre de 2015, el autor observó un individuo de *A. bahamensis* en el río Cumandayti, cerca de la comunidad del mismo nombre, en el Parque Nacional y Área Natural de Manejo Integrado Serranía del Iñao, departamento de Chuquisaca, Bolivia. En la página www.ebird.org, se reporta de registros de *A. bahamensis* en el lago Titicaca (3.810 m), principalmente en el lado peruano de este humedal, aunque se mencionan dos registros en el lado boliviano del lago: el primero de cuatro individuos en Huarina y el otro de un individuo en el sur de Copacabana. Estos se ubican en el altiplano, en un ambiente acuático muy extenso (c.8.800 km^2), muy diferente al presente registro en valles interandinos y un humedal de sólo 4,3 km^2, aproximadamente.

Agradecimientos

A Wetlands International por promocionar el programa de Censo Neotropical de Aves Acuáticas de las Américas. A Susan Davis, coordinadora del Programa de Censo Neotropical de Aves Acuáticas—Programa de Bolivia, por su apoyo incondicional a la iniciativa. A mis colegas biólogas, Karen Asturizaga y Heidy López-Strauss de la Universidad Mayor de San Andrés (UMSA), por su apoyo en varias salidas al campo.

Referencias

1. Beck, S. & Valenzuela, E. (1991) Lista de las especies vegetales. En: Forno, E. & Baudoin, M. (eds.) *Historia natural de un valle en los Andes: La Paz*. La Paz: Instituto de Ecología (UMSA).
2. Davis, S. E. (2001) Bolivia. En: Blanco, D. E. & Carbonell, M. (eds.) *El censo Neotropical de aves acuáticas. Los primeros 10 años: 1990-1999*. Buenos Aires: Wetlands International & Memphis, TN: Ducks Unlimited.
3. Fjeldså, J. & Krabbe, N. (1990) *Birds of the high Andes*. Copenhagen: Zool. Mus., Univ. of Copenhagen & Svendborg: Apollo Books.
4. Franken, M. (1991) Plantas acuáticas. En: Forno, E. & Baudoin, M. (eds.) *Historia natural de un valle en los Andes: La Paz*. La Paz: Instituto de Ecología (UMSA).
5. Garitano, A. & Gómez, M. I. (2015) Aves del valle de La Paz. En: Moya, M. I., Meneses, R. I. & Sarmiento, J. M. (eds.) *Historia natural de un valle en los Andes: La Paz*. La Paz: Museo Nacional de Historia Natural.
6. Hennessey, A. B., Herzog, S. K. & Sagot, F. (2003) *Lista anotada de las aves de Bolivia*. Santa Cruz de la Sierra: Asociación Armonía.
7. Herzog, S. K., Terrill, R. S., Jahn, A. E., Remsen, J. V., Maillard Z., O., García-Solíz, V. H., Macleod, R., Maccormick, A. & Vidoz, J. Q. (2016) *Birds of Bolivia: field guide*. Santa Cruz de la Sierra: Asociación Armonía.
8. Martínez, O. & Morales, A. (2016) Primer registro del flamenco "Tokoko" (*Phoenicopterus chilensis*) en el valle de la ciudad de La Paz: Laguna de Achocalla. *Kempffiana* 12(2): 39–47.
9. Martínez, O., Olivera, M., Quiroga, C. & Gómez, I. (2010) Evaluación de la avifauna de la ciudad de La Paz, Bolivia. *Rev. Peru. Biol.* 17: 197–206.

Figura 1. El Pato Gargantilla *Anas bahamensis*, laguna Jacha Kkota, departamento de La Paz, Bolivia, julio de 2017 (Omar Martínez)

10. Remsen, J. V., Areta, J. I., Cadena, C. D., Jaramillo, A., Nores, M., Pacheco, J. F., Pérez-Emán, J., Robbins, M. B., Stiles, F. G., Stotz, D. F. & Zimmer, K. J. (2016) A classification of the bird species of South America. www.museum.lsu.edu/~Remsen/SACCBaseline.html.
11. Ribera, M. O. (1991) Aves. En: Forno, E. & Baudoin, M. (eds.) *Historia natural de un valle en los Andes: La Paz.* La Paz: Instituto de Ecología (UMSA).

Omar Martínez
Museo Nacional de Historia Natural, Colección Boliviana de Fauna, Universidad Mayor de San Andrés, Casilla 8706, La Paz, Bolivia. E-mail: marte13fenix@yahoo.com.

Received 29 September 2017; final revision accepted 17 January 2018; published online 16 June 2018.

First documented record of Black-banded Owl *Strix huhula* for Roraima, northern Brazil

Black-banded Owl *Strix huhula* inhabits South American tropical and subtropical forests, including forest clearings and *Araucaria* forest, and in some areas has adapted to man-modified habitats such as coffee and banana plantations[6,8]. Its conservation status is evaluated as Least Concern[1], despite forest clearance for monocultures and pastures[6,8].

Two subspecies have been described: *S. h. huhula* and *S. h. albomarginata*. The latter occurs in south-east Brazil and adjacent north-east Argentina and eastern Paraguay, while *S. h. huhula* is found across much of central and northern South America[6,11]. In Brazil, *S. h. huhula* is principally known from central Amazonia[2–5]. Here we present a documented record from extreme northern Amazonian Brazil.

The record was made during field work by the Laboratory of Ecology, Systematics and Evolution of Birds (OrnitoLab), Universidade Federal de Pernambuco (UFPE), in Viruá National Park, Roraima (01°29'25.24"N 61°00'08.28"W). Within its 241,948,070 ha, Viruá National Park supports the greatest biodiversity of vertebrates known from a protected area in Brazil (1,257 species), including the highest species richness for freshwater fishes (500 species) and the third largest avian diversity (531 species)[7,9].

An adult Black-banded Owl was observed on 28 July 2015, at 03h40, for 20 minutes at the headquarters of Viruá National Park. It was perched c.5 m above ground on a pole and it was documented with photographs (Fig. 1) and videos. Photographs have also been archived at Wikiaves (WA1785222, WA1781857) and videos can be viewed at https://youtube.com/6HGtLND0ddQ and https://youtube.com/Dfb5ghJ1_58.

S. huhula had been mentioned for the state of Roraima in an unpublished thesis[12], but it was

Figure 1. Black-banded Owl *Strix h. huhula*, Viruá National Park, Roraima, Brazil, July 2015 (Yuri Raia Mendes)

not included on the list of birds recorded in the state[10], apparently due to lack of documentation. Our record becomes the first documented for Roraima and expands the known distribution of *S. h. huhula* in Brazil. It also evidences the fact that the avifauna of Viruá National Park remains incompletely known.

Acknowledgements

We thank Luciano Naka and all of the OrnitoLab UFPE for their support, Beatriz Ribeiro for logistical support, Maria Linna for her wonderful meals and all of the Viruá National Park staff for their friendship. We also thank Flor Maria, Jonathas Lins and the referees for their comments and suggestions that improved the manuscript.

References

1. BirdLife International (2016) Species factsheet: *Ciccaba huhula*. http://www.birdlife.org/datazone/speciesfactsheet.php?id=2252 (accessed 8 April 2017).
2. Borges, S. H. (2007) Análise biogeográfica da avifauna da região oeste do baixo Rio Negro, amazônia brasileira. *Rev. Bras. Zool.* 24: 919–940.
3. Borges, S. H., Henriques, L. M. & Carvalhaes, A. (2004) Density and habitat use by owls in two Amazonian forest types. *J. Field Orn.* 75: 176–182.
4. Cohn-Haft, M., Whittaker, A. & Stouffer, P. C. (1997) A new look at the "species-poor" central Amazon: the avifauna north of Manaus, Brazil. In: Remsen, J. V. (ed.) *Studies in Neotropical ornithology honoring Ted Parker*. *Orn. Monogr.* 48.
5. Esclarski, P. & Cintra, R. (2014) Effects of terra firme-forest structure on habitat use by owls (Aves: Strigiformes) in central Brazilian Amazonia. *Orn. Neotropical* 25: 433–458.
6. Holt, D. W., Berkley, R., Deppe, C., Enríquez Rocha, P., Petersen, J. L., Rangel Salazar, J. L., Segars, K. P., Wood, K. L. & de Juana E. (2017) Black-banded Owl (*Ciccaba huhula*). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Barcelona: Lynx Edicions (retrieved from http://www.hbw.com/node/55049 on 8 April 2017).

7. ICMBio (2014) *Plano de manejo do Parque Nacional do Viruá*. Brasília: ICMBio.
8. König, C., Weick, F. & Becking, J.-H. (2008) *Owls of the world*. Second edn. London, UK: Christopher Helm.
9. Lisboa, B. R. & Lisboa, A. (2015) Parcerias em pesquisa no Parque Nacional do Viruá: estratégias para a gestão eficiente e geração de benefícios a partir da biodiversidade. *Biodiversidade Brasileira* 1: 21–31.
10. Naka, L. N., Cohn-Haft, M., Mallet-Rodrigues, F., Santos, M. P. D. & Torres, M. F. (2006) The avifauna of the Brazilian state of Roraima: bird distribution and biogeography in the Rio Branco basin. *Rev. Bras. Orn.* 14: 197–238.
11. Partridge, W. H. (1956) Variaciones geograficas en la Lechuza Negra, *Ciccaba huhula*. *Hornero* 10: 143–146.
12. Santos, M. P. D. (2005) Avifauna do Estado de Roraima: biogeografia e conservação. Ph.D. thesis. Belém: Universidade Federal do Pará / Museu Paraense Emílio Goeldi.

Yuri Raia Mendes
Universidade Federal de Pernambuco, Centro de Biociências, Depto. de Zoologia, OrnitoLab UFPE, Recife, Pernambuco, Brazil. E-mail: yuriraia@yahoo.com.br.

Hevana Santana de Lima
Programa de Pós-graduação em Ecologia, Instituto Nacional de Pesquisas da Amazônia, Av. André Araújo 2936, Petrópolis, Manaus, Amazonas, Brazil. E-mail: hevanaslima@hotmail.com.

Lilia D'ark Nunes dos Santos
Universidade Federal de Pernambuco, Centro de Biociências, Depto. de Zoologia, OrnitoLab UFPE, Recife, Pernambuco, Brazil. E-mail: liliadark002@gmail.com.

Lays Viturino de Freitas
Programa de Pós-graduação em Biologia Animal, Universidade Federal de Pernambuco, Centro de Biociências, Depto. de Zoologia, OrnitoLab UFPE, Recife, Pernambuco, Brazil. E-mail: laale.freitas@gmail.com.

Received 8 May 2017; final revision accepted 7 October 2017; published online 16 June 2018.

Novos registros de ninhos do pato-mergulhão *Mergus octosetaceus* na região do Jalapão, Tocantins, Brasil

O pato-mergulhão é uma espécie ameaçada de extinção e classificada como Criticamente Em Perigo[8,10]. Tem uma população estimada em menos de 250 indivíduos sobrevivendo na natureza[8] e alguns espécimes já são mantidos em cativeiro, oriundos em sua maioria de ovos coletados na natureza (A. Netto com. pess.). Atualmente a espécie está distribuída em populações disjuntas, ocorrendo nos estados de Goiás[5,14], Minas Gerais[4,12,13] e no Tocantins na região do Jalapão[1,6], sendo que esta última apresenta uma população estimada em c.14 indivíduos[3] sobrevivendo no rio Novo.

A espécie se reproduz durante a estação seca, quando os rios e riachos apresentam ótimas condições de limpidez da água, sendo julho o período de eclosão dos ovos e nascimento dos filhotes[1–3,7,11]. Utiliza-se de cavidades arbóreas[2,7,11], rochosas[9,11] e terrícolas[11] encontradas diretamente nas margens dos rios e riachos para a instalação dos ninhos. No Jalapão são conhecidos dois ninhos em cavidades arbóreas[2] e aqui apresento outros três instalados no mesmo substrato. Os ninhos foram identificados durante a realização de duas expedições para coleta de ovos da espécie que integrariam indivíduos do programa de reprodução em cativeiro (Licença SISBio 26006–8/10), onde foi usando bote inflável para percorrer trechos do rio Novo à jusante e à montante da ponte sobre a rodovia TO-255 totalizando c.30 km do rio. As expedições foram realizadas durante o período reprodutivo da espécie.

Descrição e características dos ninhos

Em 17 de julho de 2015, no trecho do rio Novo à montante da ponte sobre a rodovia TO-255, um ninho foi identificado (Figs. 1a–c) em uma *Vochysia pyramidalis* (Vochysiaceae). Na ocasião, havia sete ovos em fase inicial de eclosão. O ninho estava posicionado na margem esquerda do rio Novo na borda de uma estreita faixa de vegetação ciliar com uma área de campo úmido adjacente, dentro da APA do Jalapão (10º37'S 46º45'W), c.11 km à montante da ponte supracitada e a c.2,8 km à jusante dos limites da Estação Ecológica Serra Geral do Tocantins. A árvore de porte médio, tronco espesso e apresentando folhas verdes estava disposta de modo inclinado e posicionada de forma isolada no barranco arenoso do rio a c.1,5 m do leito. Apresentava uma abertura pouco acima da base do tronco, formada a partir do nó de um galho secundário quebrado, voltada para o leito do rio, de onde era possível ser visualizada. A câmara de incubação estava posicionada na base do tronco a c.60 cm de profundidade a partir do orifício de entrada e apresentava uma camada de areia fina sob os ovos cobertos por plumas. Entre margens, o leito do rio neste local media c.55 m de largura, apresentava fundo areno-rochoso e sem corredeiras. Essa cavidade foi revisitada em junho de 2017 e verificou-se a não reutilização da mesma pelo casal.

Em 28 de junho de 2017, percorrendo o mesmo trecho do ninho acima, outro ninho foi identificado (Figs. 2a–c) instalado em *Humiria balsamifera* (Humiriaceae), no qual havia oito ovos cobertos por plumas e sobre substrato de areia fina, sendo que apenas três ovos apresentavam desenvolvimento embrionário constatado por meio de ovoscopia. O ninho estava posicionado na

Figura 1. (a) Vista frontal e aproximada da entrada do ninho; (b) vista parcial da árvore e da entrada do ninho; (c) vista parcial lateral da espécie arbórea *Vochysia pyramidalis* e do leito do rio Novo (Marcelo O. Barbosa)

margem direita do rio Novo em uma estreita faixa de vegetação ciliar e uma área de campo úmido adjacente, dentro da APA do Jalapão (10º34'S 46º45'W), c.2,1 km à montante da ponte sobre o rio na rodovia TO-255. A árvore de porte alto e tronco espesso apresentava ramificações com desenvolvimento vegetativo a partir da base e estava posicionada no barranco imediatamente ao leito do rio com largura entre margens de c.46 m e ausência de corredeiras. Apresentava uma abertura formada pela quebra de uma das ramificações voltada para o leito do rio e posicionada sobre a lâmina d'água a c.1,8 m de altura, a qual servia de entrada de acesso. De uma pequena abertura lateral próxima à base do tronco foi possível observar a câmara de incubação e de uma estreita fenda que se estendia da base do tronco até a entrada do ninho utilizada pela fêmea foi possível acessar a câmara de incubação, posicionada na base do tronco. Este ninho dista c.10,5 km do ninho descrito acima.

Em 29 de junho de 2017, percorrendo o trecho à jusante da ponte sobre a TO-255, outro ninho foi identificado (Figs. 3a–d) instalado em *Protium* cf. *pilosissimum* (Burseraceae). No ninho havia sete ovos cobertos por plumas e sobre substrato de areia fina. Em visita posterior à área do ninho, realizada em 17 de julho de 2017, foi possível observar o nascimento de sete filhotes. O ninho estava posicionado na margem direita do rio Novo, dentro do Parque Estadual do Jalapão (10º27'S 46º51'W), em um pequeno fragmento de vegetação ciliar de c.0,6 ha e campo úmido adjacente, localizado a c.2,5 km do segundo ninho descrito por Barbosa *et al.*[2]. A árvore de porte alto, tronco espesso e apresentando ramificações com desenvolvimento vegetativo a partir da base, estava posicionada no barranco a c.1,5 m do leito do rio, com largura entre margens de c.48 m e ausência de corredeiras. Apresentava uma ampla abertura facilmente detectável, voltada para o leito do rio e formada pela quebra de tronco ramificado. A câmara de incubação estava localizada na base do tronco a c.1,2 m da entrada do ninho e facilmente visível a partir desta.

Implicações ecológicas

É notória a forte dependência da espécie com o leito e margens do rio para sua sobrevivência e reprodução. A seleção do local de nidificação, diretamente às margens dos rios, torna a necessidade da proteção dos ambientes de vegetação marginal ribeirinhos extremamente fundamentais para a conservação da espécie em toda a sua área de distribuição.

Figura 2. (a) Vista parcial lateral mostrando a espécie arbórea *Humiria balsamifera* e uma abertura lateral de onde se via a câmara de incubação; (b) vista parcial frontal aproximada mostrando a entrada do ninho; (c) vista geral do ninho (Marcelo O. Barbosa)

A utilização de cavidades rochosas, arbóreas e terrícolas, demonstra a versatilidade da espécie na escolha dos locais de nidificação. Barbosa *et al*.[2] já chamava a atenção pelo fato da espécie priorizar a escolha de cavidades arbóreas como sítio reprodutivo na região do Jalapão, notadamente pelo nível de conservação da vegetação ciliar local e disponibilidade de árvores com cavidades potenciais existentes nas margens do rio Novo. O contrário acontece na Serra da Canastra e em Patrocínio–MG, onde ninhos têm sido construídos utilizando-se de cavidades terrícolas[11] como substrato. O que pode acontecer em função da realidade local, considerando a tipologia da vegetação ciliar e a pouca disponibilidade de cavidades arbóreas, além de uma forte pressão antrópica existente na região que levou à supressão da vegetação ribeirinha.

Chama a atenção, o fato de todos os ninhos identificados no Jalapão possuírem uma camada de areia fina depositada no interior da cavidade, principalmente na câmara de incubação. Essa areia, quando em suspensão na água, é carreada para o interior da cavidade durante o regime de cheias. Durante a estação chuvosa, e consequente elevação do nível do rio, o fluxo de água exerce um papel importante na formação das cavidades, seja pela quebra de galhos provocada pela força do fluxo, e que possibilitam o seu surgimento inicial, seja pela aceleração do processo de decomposição do interior do cerne vegetal e consequente escavação/aprofundamento destas.

Portanto, fica evidente que garantir a manutenção do regime hidrológico (dinâmica de fluxo) do rio é extremamente importante para os aspectos reprodutivos da espécie, tanto durante as cheias, conforme abordado acima, quanto durante o período de estiagem quando os ninhos são confeccionados. A interferência ou interrupção desse regime de fluxo, provocado principalmente por centrais hidroelétricas, coloca em risco sua sobrevivência em longo prazo, podendo ainda, provocar uma extinção local. Projetos desse tipo estão previstos para a calha do rio Sono/Soninho (PCH Monte Santo), o que pode ser um fator determinante na extinção da espécie na região do Jalapão, visto que a espécie apresenta uma baixa densidade populacional[1]. O rio Novo é um afluente direto do rio Sono e pode sofrer interferências no seu regime de fluxo, sendo, portanto, desaconselhado a instalação de tais empreendimentos de geração de energia.

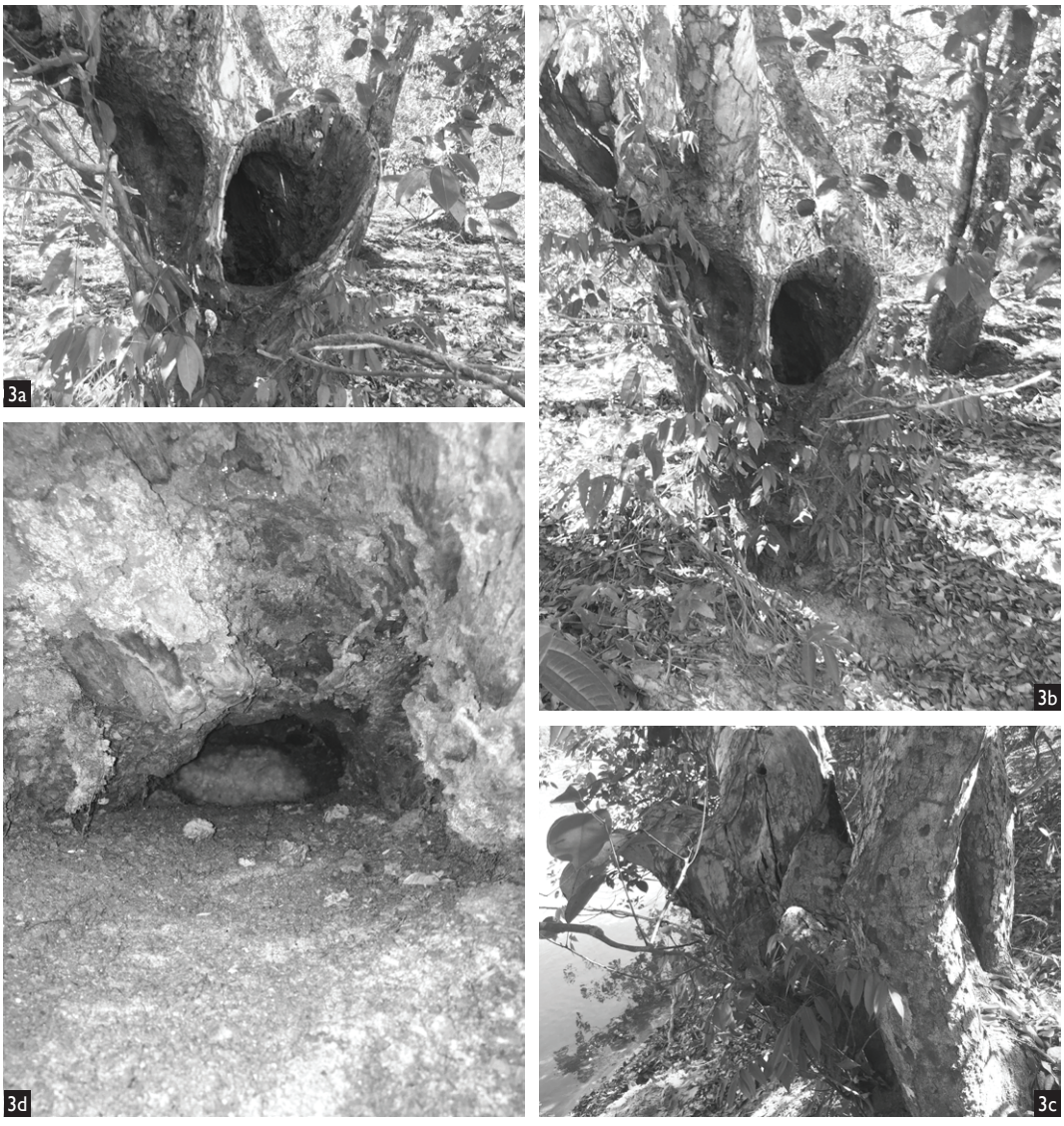


Figura 3. (a) Vista frontal e aproximada da ampla entrada do ninho; (b) Vista frontal do ninho mostrando o ambiente em volta; (c) vista lateral e parcial da espécie arbórea *Protium* cf. *pilosissimum* e do leito do rio Novo; (d) vista interna do ninho mostrando a câmara de incubação com ovos cobertos de plumas (Marcelo O. Barbosa)

Agradecimentos

Meus agradecimentos ao Instituto Natureza do Tocantins (NATURATINS), aos membros do Grupo Assessor do Plano de Ação Nacional para a Conservação do Pato-Mergulhão, ao ZooParque de Itatiba e ao Criadouro Conservacionista Piracema pelo apoio dado em campo. Especial agradecimento ao Prof. Eduardo R. dos Santos da Universidade do Tocantins (UNITINS) pela identificação botânica das espécies arbóreas e ao revisor anônimo pela importante contribuição ao manuscrito.

Referências

1. Barbosa, M. O. & Almeida, M. L. (2010) Novas observações e dados reprodutivos do pato-mergulhão *Mergus octosetaceus* na região do Jalapão, Tocantins, Brasil. *Cotinga* 32: 109–113.
2. Barbosa, M. O, Pinheiro, R. T. & Carvalho, V. F. (2011) Descrição de ninhos do pato-mergulhão (*Mergus octosetaceus*) em cavidade arbórea na região do Jalapão, Tocantins, Brasil. *Cotinga* 33: 71–75.
3. Barbosa, M. O, Pinheiro, R. T. & Barbosa, K. V. C. (2015) Population estimate of *Mergus octosetaceus* in the Jalapão region, Tocantins,

Brazil. *Rev. Bras. Orn.* 23: 417–427.
4. Bartmann, W. (1988) New observations on the Brazilian Merganser. *Wildfowl* 39: 7–14.
5. Bianchi, C. A., Brant, S., Brandão, R. A. & Brito, B. F. (2005) New records of Brazilian Merganser *Mergus octosetaceus* in the rio das Pedras, Chapada dos Veadeiros, Brasil. *Cotinga* 24: 72–74.
6. Braz, V. S., Abreu, T. L. S., Lopes, L. E., Leite, L. O., França, F. G. R., Vasconcelos, M. M. & Balbino, S. F. (2003) Brasilian Merganser *Mergus octosetaceus* discovered in Jalapão State Park, Tocantins, Brazil. *Cotinga* 20: 68–71.
7. Bruno, S. F., Andrade, R. D., Lins, L. V., Bessa, R. & Rigueira, S. E. (2010) Breeding behaviour of Brazilian Merganser *Mergus octosetaceus*, with a tree-cavity nest in Serra da Canastra National Park, Minas Gerais, Brazil. *Cotinga* 32: 84–89.
8. IUCN (2017) IUCN Red List of threatened species. www.iucnredlist.org (acessado em 29 de outubro de 2017).
9. Lamas, I. R. & Santos, J. P. (2004) A Brazilian Merganser *Mergus octosetaceus* nest in a rock crevice, with reproductive notes. *Cotinga* 22: 38–41.
10. MMA (2014) Lista nacional oficial de espécies da fauna ameaçadas de extinção. www.icmbio.gov.br (acessado em 29 de outubro de 2017).
11. Ribeiro, F. (2016) Biologia reprodutiva do pato-mergulhão *Mergus octosetaceus* na região do Parque Nacional da Serra da Canastra, Minas Gerais, Brasil. Dissertação. Belo Horizonte: Universidade Federal de Minas Gerais.
12. Silveira, L. F. (1998) The birds of Serra da Canastra National Park and adjacent areas, Minas Gerais, Brazil. *Cotinga* 10: 55–63.
13. Silveira, L. F. & Bartmann, W. (2001) Natural history and conservation of the Brazilian Merganser *Mergus octosetaceus* at Serra da Canastra National Park, Minas Gerais, Brazil. *Bird Conserv. Intern.* 11: 287–300.
14. Yamashita, C. & Valle, M. C. (1990) Ocorrência de duas aves raras no Brasil Central: *Mergus octosetaceus* e *Tigrisoma fasciatum fasciatum*. *Ararajuba* 1: 107–109.

Marcelo O. Barbosa
Instituto Natureza do Tocantins (NATURATINS), Diretoria de Biodiversidade e Áreas Protegidas, Quadra 302 Norte, CEP 77.006-336, Palmas, TO, Brasil; e Grupo Assessor do Plano de Ação Nacional para a Conservação do Pato-Mergulhão–ICMBio, Brasil.
E-mail: mobarbos@yahoo.com.br.

Received 29 September 2017; final revision accepted 6 February 2018; published online 16 June 2018.

Novos registros da forma híbrida e pareamento interespecífico entre *Paroaria baeri* × *Paroaria gularis* na região do médio rio Araguaia, Brasil

No Estado do Tocantins são conhecidas três espécies do gênero *Paroaria*: *P. gularis* presente no médio e baixo rio Araguaia e no rio Tocantins até as proximidades da cidade de Pedro Afonso (www.wikiaves.com.br; WA2598941); *P. baeri*, espécie endêmica da planície inundável do vale do rio Araguaia[3,5] entre os municípios de Aruanã, Goiás e Araguacema, Tocantins. Ambas ocorrem em simpatria em parte do vale do médio rio Araguaia. Por fim, *P. dominicana*, espécie tipica do bioma Caatinga, ocorrendo na região central do estado e na região do Jalapão[2] (presumidamente oriunda de soltura de cativeiro).

Areta *et al.*[1] descrevem a existência de uma zona híbrida linear unidimensional com c.160 km ao longo do médio rio Araguaia e rio Javaés, entre Araguacema e o Centro de Pesquisa Canguçu (CPC), onde *P. baeri* e *P. gularis* ocorrem em simpatria / sintopia. Os autores confirmaram hibridismo entre *P. baeri* × *P. gularis* por meio de análises moleculares das sequências de genes mitocondriais e nucleares de indivíduos dos três fenótipos. Os espécimes híbridos apresentam um fenótipo de plumagem intermediário, lembrando indivíduos de *P. nigrogenis*, cardeal com distribuição associada aos lhanos venezuelanos. Adicionalmente, os autores sugerem que as formas híbridas podem ser capazes de produzir descendentes viáveis.

Embora as evidências de hibridização estejam confirmadas, assim como a ocorrência simpátrica / sintópica das espécies, nunca havia sido documentado o pareamento interespecífico entre *P. baeri* e *P. gularis*. Apresentamos, portanto, o registro documentado de tal pareamento, reavaliamos a identificação de alguns registros anteriores, assim como novos registros de indivíduos híbridos na região do Parque Estadual do Cantão (PEC).

No fim da manhã, do dia 15 de novembro de 2005, TD visualizou na porção norte do PEC, na região da Praia da Ilha, confluência entre o rio do Coco e rio Araguaia, um bando com nove indivíduos de *P. baeri* e doze indivíduos de *P. gularis*. Este registro já havia sido divulgado[4], contudo, após a confirmação da ocorrência da forma híbrida tornou-se prudente se estabelecer uma ressalva. Os nove indivíduos de *P. baeri* visualizados possuíam plumagem pura, confirmados claramente devido à detecção das pequenas manchas vermelhas / roxas na cabeça e na garganta, sem a formação dos colares brancos em ambos os lados do pescoço que se estende até a nuca, típicos em *P. gularis* e na forma híbrida. No entanto, em nenhum dos 12 indivíduos declarados *P. gularis*, foi possível afirmar com segurança que se tratam todos da forma pura. Com a descrição da forma híbrida[1],

o mais provável é que TD tenha observado indivíduos de plumagem pura de *P. gularis* e também de plumagem híbrida. Em campo foi notado uma extensa mancha vermelha que cobria toda a cabeça e garganta, com a presença de faixas brancas laterais no pescoço em direção à nuca, presentes tanto na forma pura e híbrida de *P. gularis*, porém sem haver uma confirmação da faixa negra posterior aos olhos, típica dos indivíduos híbridos. Esse grande bando forrageava em um capinzal, a beira da vegetação inundada de sarã (*Sapium haematospermen* e *Psidium riparium*). Bastante arredios e agitados, alçaram voo ao longo da margem se distanciando gradativamente, não sendo possível uma documentação.

No final da tarde de 6 de junho de 2017, MOB observou um pareamento interespecífico entre *P. baeri* e *P. gularis*, o qual foi fotografado (Fig. 1A) em área de vegetação de sarã localizada em um lago às margens do rio do Coco, em frente ao píer da área de recepção do PEC, em Caseara, Tocantins (09º18'37"S 49º57'45"W). Na ocasião, o par foi observado por c.10 minutos enquanto forrageava na vegetação e se deslocava com sobrevoos curtos entre as margens do lago, às vezes vocalizando. A observação e o registro fotográfico permitiu verificar haver uma estreita relação entre o par, uma vez que os indivíduos se seguiam amiúde, durante o deslocamento ao longo do sarã, permanecendo muito próximos, porém sem nenhum ato de cópula verificado. Também, no mesmo dia, foram observados pares de indivíduos com plumagem híbrida e pares de *P. gularis* puros compartilhando as vegetações marginais de sarã em um mesmo lago (09º22'40"S 49º58'31"W) localizado às margens do rio do Coco.

A presença confirmada de indivíduos híbridos entre *P. baeri* e *P. gularis* é relacionada até então a cinco localidades[1]: Araguacema, confluência dos rios Coco e Araguaia, Caseara, Barreira de Campo e a região próxima ao CPC. Desde então, dezenas de registros fotográficos de indivíduos híbridos têm sido realizados, sobretudo próximo às sedes do PEC e do CPC, localidades já descritas[1]. Tais registros encontram-se depositados no portal WikiAves (WA) e são provenientes de atividades de turismo de observação de aves. Em visita ao CPC em 27 de agosto de 2017, TD fotografou um casal de indivíduos híbridos a uma distância de 2 km de outro casal de *P. baeri*, nas margens do rio Javaés (Fig. 1B, 1C).

Uma nova localidade de ocorrência da forma híbrida, diferente daquelas listadas por Areta *et al.*[1] é apresentada para o rio Araguaia. TD fotografou um indivíduo híbrido (WA2774137) em vegetação de sarã nas proximidades da Pousada Cantão, margem do rio Araguaia, na região do PEC (09°40'21"S 50°08'25"W). Este registro corresponde a uma localidade intermediária entre CPC e a porção norte do PEC, onde se concentram a grande maioria dos contatos com a forma híbrida, preenchendo uma lacuna entre o limite sul e a porção norte de distribuição da forma híbrida (Fig. 2).

Cabe salientar que a latitude correspondente ao CPC tem se mostrado o limite sul de ocorrência da forma híbrida. A montante desta latitude, tanto no rio Araguaia quanto no rio Javaés, há somente registros da forma pura de *P. baeri* (WA1619410; 732960; 1010104). As dezenas de fotografias da espécie depositadas no portal WikiAves para os estados de Mato Grosso e Goiás, e para o município de Formoso do Araguaia, em Tocantins, trazem somente *P. baeri* com plumagens puras.

Futuros inventários ornitológicos e a crescente atividade de observação de aves ao longo do rio Araguaia, tanto à montante quanto à jusante do PEC, informarão por meio de registro documentados, se a extensão desta zona de hibridização se estende além dos 160 km inicialmente mencionados[1]. Situação semelhante é esperada com relação a novos registros documentados, frutos de inventários e atividades de observação de aves, que demonstrem o pareamento de *P. baeri* e *P. gularis* na região, reforçando cada vez mais, a condição de cruzamento entre as espécies com a geração de indivíduos híbridos.

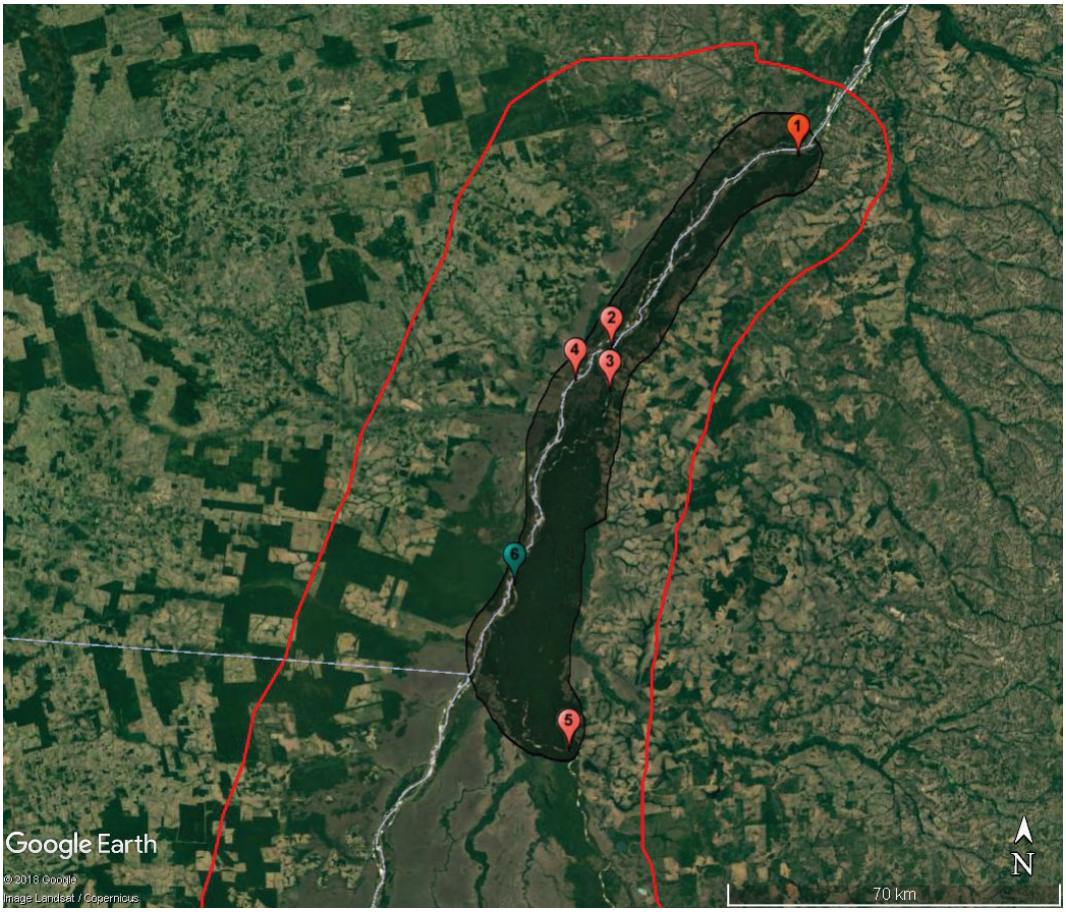
Agradecimentos

MOB agradece a Thelma Gatuzzo e Maria das Graças Albers pela realização dos registros fotográficos e suporte dado às observações em campo. TD agradece à Ben Valks, Nuno Negrões Soares e ao Governo do Tocantins por oportunizar visita à Pousada Cantão, assim como a André Grassi Côrrea e Gianni Valenti pela logística durante visita ao CPC.

Referências

1. Areta, J. I., Dornas, T., Kirwan, G. M., Araújo-Silva, L. E. & Aleixo, A. (2017) Mixing the waters: a linear hybrid zone between two riverine Neotropical cardinals (*Paroaria baeri* and *P. gularis*). *Emu Austral Orn.* 117: 40–50.
2. Dornas, T., Barbosa, M. O. & Leite, Y. F. C. (2011) Palmas, Tocantins: uma nova localidade de ocorrência do cardeal-do-nordeste, *Paroaria dominicana* (Passeriformes: Thraupidae). *Atualidades Orn.* 162: 11–13.
3. Lopes, L. E. & Gonzaga, L. P. (2013) Taxonomy, natural history and conservation of *Paroaria baeri* (Aves: Thraupidae). *Trop. Zool.* 26: 1–17.
4. Pinheiro, R. T. & Dornas, T. (2009) Novos registros ornitológicos para o Parque Estadual do Cantão: distribuição e conservação da avifauna do ecótono Amazônia-Cerrado. *Ararajuba* 17: 73–76.
5. Sick, H. (1950) Uma nova raça de cardeal procedente do Brasil central *Paroaria baeri xinguensis* n. ssp. (Fringillidae, Aves). *Rev. Bras. Biol.* 10: 465–468.

Figura 1. (A) Par interespecífico de *P. baeri* (direita) e *P. gularis* (esquerda) registrado em vegetação de sarã localizada em lago da margem direita do rio do Coco, Tocantins, Brasil (Thelma Gatuzzo); (B) Par de indivíduos puros de *P. baeri*; e (C) par de indivíduos híbridos, registrados no rio Javaés c.2 km de distância um do outro (Túlio Dornas)



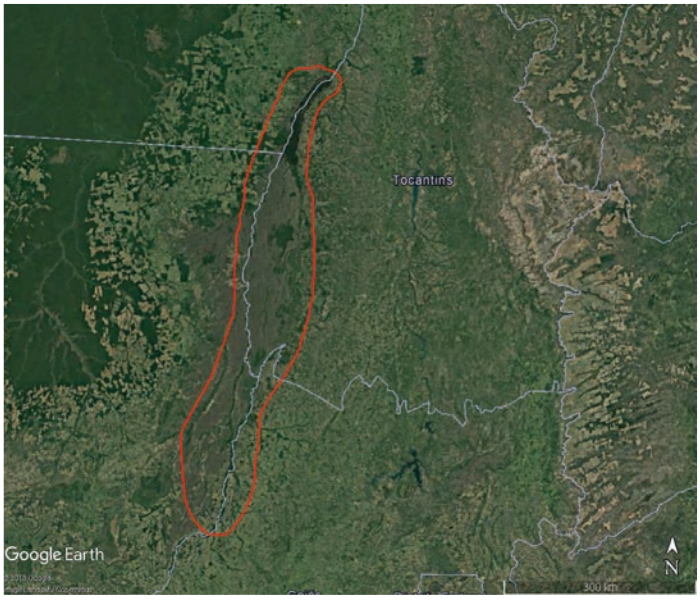


Figura 2. Distribuição de *P. baeri* ao longo do vale do rio Araguaia (polígono vermelho) e distribuição da zona de ocorrência de hibridização descrita em Areta *et al.*[1] (polígono preto). 1—Araguacema, 2—Confluência rio do Araguaia/rio do Coco; 3—Caseara e sede do PEC; 4—Barreira de Campos; 5—Centro de Pesquisa Canguçu (CPC) e 6—Pousada Cantão, nova localidade de indivíduo hibrido (adaptado Google Earth; imagem de satélite cortesia de Google Inc. Todos os direitos reservados © 2018).

Marcelo O. Barbosa
Grupo de Pesquisa em Ecologia e Conservação das Aves (ECOAVES), pesquisador colaborador, Universidade Federal do Tocantins, Palmas, TO, Brasil. E-mail: mobarbos@yahoo.com.br.

Túlio Dornas
Universidade Estadual do Tocantins/Unitins, Pró-Reitora de Pesquisa e Pós-Graduação, Palmas, Tocantins, Brasil. E-mail: tuliodornas@yahoo.com.br.

Received 17 November 2017; final revision accepted 1 April 2018; published online 16 June 2018.

Registro documentado de taperuçu-velho *Cypseloides senex* em Pernambuco, Brasil

O gênero *Cypseloides* é composto por oito espécies, das quais cinco são registradas Brasil[6], algumas espécies ocorrentes na Mata Atlântica que é um dos 25 hotspots da biodiversidade mundial[5]. Um de seus centros de endemismos, o Centro de Endemismo Pernambuco, situado ao norte do rio São Francisco, de Alagoas ao Rio Grande do Norte, abriga vários grupos de animais e vegetais, sendo um dos pontos de maior diversidade no Nordeste[4,8]. Pernambuco atualmente conta com 442 espécies registrada para o estado, em seu último levantamento[3].

O *Cypseloides senex* tem sua biologia reprodutiva associada a cachoeiras[1,10]. A espécies tem sido registrada em quase todos os estados brasileiros, com ênfase para os estados do Mato Grosso, Pará, Goiás, Bahia, São Paulo, Paraná e Santa Catarina, também ocorrendo no Paraguai e Argentina[1]. Vivem em bandos com centenas de indivíduos junto das quedas d'agua cachoeiras sobre os quais voam[1]. Durante o dia, reservam-se a forragear voando alto sobre as matas, alimentando-se principalmente de insetos que são capturados em vôo[9].

A área de estudo consiste no Parque Ecoturístico e de Desenvolvimento sustentável Cachoeira do Urubu (PECUB; 08°19'51.0"S 35°21'14.0"W), que está localizado em um fragmento de Mata Atlântica de 30 ha. Esse fragmento apresenta-se inserido em meio ao uma matriz de cana-de-açúcar. A cachoeira encontra-se localizada na bacia hidrográfica do rio Ipojuca, localizado no município de Primavera em Pernambuco. Possui clima da região do tipo Tropical Chuvoso, com verão seco, sendo o período chuvoso iniciado em fevereiro com término no mês de outubro, sendo a precipitação média anual é em torno de 800 a 1.500 mm, e possui temperatura média anual de 24,7°C (www.condepefidem.pe.gov.br).

Os taperuçus-velhos foram avistados e fotografados nos períodos de 03 a 07 de agosto de 2015 e de 04 a 08 de janeiro de 2016, durante um levantamento faunístico realizado no PECUB. As fotos estão disponíveis no site do WikiAves, www.wikiaves.com.br (WA1958911, WA1958909 e WA1986545). Foi estimado cerca de 700 indivíduos sobrevoando o local e realizado o registro do comportamento de entrada na cachoeira. Os registros fotográficos foram depositados nos arquivos Laboratório Interdisciplinar de Anfíbios e Répteis e da Associação Observadores de Aves de Pernambuco.

Este é o primeiro registro documentado para o Estado de Pernambuco, que até então apresentava apenas registos não documentados[2,3,7], tal registro faz com que a espécie seja inserida na lista primaria do estado. É de extrema importância novos registros de *C. senex*, que tem relações ecológicas ligadas a cachoeiras e em muitos locais a construção de hidroelétricas e o processo acelerado de assoreamento dos corpos d'água vem diminuindo o fluxo de água nessas cachoeiras, fazendo com que *C. senex* procure novos ambientes[10]. Esse registro é tem importância para melhor compreender o nicho da espécie, sua distribuição e seu comportamento nestes ambientes, contribuindo deste modo para a conservação da espécie em território brasileiro.

Agradecimentos

A Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) pela bolsa de pós-graduação, bem como ao editor e ao revisor pelas sugestões na correção do manuscrito.

Referências

1. Chantler, P. & Boesman, P. (2013) Great Dusky Swift *Cypseloides senex*. Em: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) (2013) *Handbook of the birds of the world Alive*. Barcelona: Lynx Edicions (recuperado http://www.hbw.com/node/55259 em 11 de agosto de 2015).
2. Farias, G. B., Brito, M. T. & Pacheco, G. L. (2002) *Registros ornitológicos de Pernambuco*. Recife: Observadores de Aves de Pernambuco.
3. Farias, G. B., Pereira, G. A. & Silva, W. A. G. (2008) *Lista das aves de Pernambuco*. Recife: Observadores de Aves de Pernambuco.
4. Müller, P. (2007) Centres of dispersal and evolution in the Neotropical region. *Stud. Neotrop. Fauna & Environ.* 7: 321–324.
5. Myers, N., Mittermeier, R. A., Mittermeier, C. G., da Fonseca, G. A. B. & Kent, J. (2000) Biodiversity hotspots for conservation priorities. *Nature* 403: 853–858.
6. Piacentini, V. Q., Aleixo, A., Agne, C. E., Maurício, G. N., Pacheco, J. F., Bravo, G. A., Brito, G. R. R., Naka, L. N., Olmos, F., Posso, S., Silveira, L. F., Betini, G. S., Carrano, E., Franz, I., Lees, A. C., Lima, L. M., Pioli, D., Schunck, F., Amaral, F. R., Bencke, G. A., Cohn-Haft, M., Figueiredo, L. F. A., Straube, F. C. & Cestari, E. (2015) Annotated check list of the birds of Brazil by the Brazilian Ornithological Records Committee/Lista

comentada das aves do Brasil pelo Comitê Brasileiro de Registros Ornitológicos. *Rev. Bras. Orn.* 23: 91–298.
7. Pereira, G. A., Whittaker, A., Whitney, B. M., Zimmer, K. J., Dantas, S. M., Roda, S. A., Bevier, L. R., Coelho, G., Hoyer, R. C. & Albano, C. (2008) Novos registros de aves para Pernambuco, Brasil, com notas sobre algumas espécies pouco conhecidas no Estado. *Rev. Bras. Orn.* 16: 47–53.
8. Roda, S. A., Pereira, G. A. & Albano, C. (2011) *Conservação de aves endêmicas e ameaçadas do Centro de Endemismo Pernambuco*. Recife: Ed Universitária da UFPE.
9. Sick, H. (1997) *Ornitologia brasileira*. Rio de Janeiro: Ed. Nova Fronteira.
10. Stopiglia, R. & Raposo, M. A. (2007) Distribuição e biologia do andorinhão-preto-dacascata *Cypseloides fumigatus* e do andorinhão-velho-da-cascata *C. senex* no Brasil: uma síntese. *Cotinga* 27: 49–57.

Victor Leandro
Universidade Federal Rural de Pernambuco, Rua Dom Manoel de Medeiros, s/n, Dois Irmãos, Recife, PE, Brasil. E-mail: leo.silva.vls@gmail.com.

Jonathas Lins de Souza
Programa de Pós-graduação em Ecologia, Laboratório de Ornitologia, Departamento de Biologia, Universidade Federal Rural de Pernambuco, Rua Dom Manuel de Medeiros, s/n, Dois Irmãos Recife, PE, Brasil. E-mail: jonathas_lins@yahoo.com.br.

Abraão Ricardo Tenório
Universidade Federal Rural de Pernambuco, Rua Dom Manoel de Medeiros, s/n, Dois Irmãos, Recife, PE, Brasil. E-mail: Abraão.ricardo.tg@gmail.com.

Mauricio Cabral Periquito
Observadores de Aves de Pernambuco, Recife, Pernambuco, Brasil. E-mail: mauricioperiquito@superig.com.br.

Jozélia Maria de Souza Correia
Laboratório Interdisciplinar de Anfíbios e Répteis, Universidade Federal Rural de Pernambuco, Rua Dom Manoel de Medeiros, s/n, Dois Irmãos, Recife, PE, Brasil. E-mail: jozeliac@hotmail.com.

Received 12 July 2017; final revision accepted 17 October 2017; published online 16 June 2018.

Records of Fawn-breasted Tanager *Pipraeidea melanonota* in the Atlantic Forest of Pernambuco, north-east Brazil

Fawn-breasted Tanager *Pipraeidea melanonota* occurs in southern and south-east Brazil, north to southern Bahia[3,7]. Elsewhere, it is found in parts of western and northern South America, from sea level to more than 3,000 m in the Andes[2,3,5,9]. The species inhabits forest borders and clearings with scattered trees[3,7], as well as bushy pastures, cultivated, semi-open areas with large trees and riparian habitats[3,5]. Seasonal migrations or more random dispersal are reported in parts of its range, but are poorly known[3]. Populations in southern South America (e.g. Argentina) may move north during the coolest months[2].

An adult male was photographed by MJN at Lagoa Funda (07°55'S 36°02'W; 850 m), municipality of Taquaritinga do Norte, Pernambuco, on 17 July 2016 (see www.wikiaves.com.br, WA2199236). On 23–24 July and 6–7 August 2016, in the same place, up to four individuals were photographed (Figs. 1a–b; WA2206489, WA2206486).

The area where we recorded the species is in the Serra da Taquara, in an upland forest (*brejo de altitude*) named Brejo de Taquaritinga[6,10]. *Brejos de altitude* are areas of more humid forest within the Caatinga, being characterised by high altitude and high rainfall relative to surrounding areas[1]. Brejo de Taquaritinga supports semi-deciduous seasonal forest[4,6], fragmented due to human degradation[7] but covering >1,000 ha[8]. Despite very high levels of anthropogenic pressure, it is of high conservation priority[8].

Our records of *P. melanonota* may reflect seasonal from further south[3], possibly searching for food resources. In Bahia, for example, the species has been recorded in five municipalities (www.wikiaves.com.br/mapaRegistros_saira-viuva) in July–August. As the records in Pernambuco were in May and July, Pernambuco may also form part of the species' wintering area, but only additional records will prove this.

Acknowledgements
We thank John Medcraft for revising the English and especially the referee for his comments on the submitted manuscript.

References
1. Andrade-Lima, D. (1982) Present day forest refuges in northeastern Brazil. In: Prance, G. T. (ed.) *Biological diversification in the tropics*. New York: Columbia University Press.
2. Grantsau, R. (2010) *Guia completo para identificação das aves do Brasil*, 2. São Carlos: Vento Verde.
3. Hilty, S. L. (2011) Fawn-breasted Tanager *Pipraeidea melanonota*. In: del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, 16. Barcelona: Lynx Edicions.
4. IBGE (2004) *Mapa de vegetação do Brasil: escala 1:5.000.000*. Third edn. Rio de Janeiro: IBGE.
5. Isler, M. L. & Isler, P. R. (1999) *The tanagers: natural history, distribution, and identification*. Second edn. Washington DC: Smithsonian Institution Press.
6. Pôrto, K. C., Germano, S. R. & Borges, G. M. (2004) Avaliação dos brejos de altitude em Pernambuco e Paraíba, quanto à diversidade de Briófitas, para a conservação. In: Pôrto, K., Cabral, J. J. P. & Tabarelli, M. (orgs.) *Brejos de altitude*

Figure 1a Adult male and (1b) adult female Fawn-breasted Tanager *Pipraeidea melanonota*, municipality of Taquaritinga do Norte, Pernambuco, 2016 (A. G. Conceição)

em Pernambuco e Paraíba: história natural, ecologia e conservação. Brasília: Ministério do Meio Ambiente.
7. Ridgely, R. S. & Tudor, G. (1989) *The birds of South America*, 1. Austin: University of Texas Press.
8. Santos, A. M. M. & Tabarelli, M. (2004) Integridade, esforços e diretrizes para conservação dos Brejos de Altitude da Paraíba e Pernambuco. In: Pôrto, K., Cabral, J. J. P. & Tabarelli, M. (orgs.) *Brejos de altitude em Pernambuco e Paraíba: história natural, ecologia e conservação*. Brasília: Ministério do Meio Ambiente.
9. Sick, H. (1997) *Ornitologia brasileira*. Rio de Janeiro: Ed. Nova Fronteira.
10. Tabarelli, M. & Santos, A. M. M. (2004) Uma breve descrição sobre a história natural dos brejos nordestinos. In: Pôrto, K., Cabral, J. J. P. & Tabarelli, M. (orgs.) *Brejos de altitude em Pernambuco e Paraíba: história natural, ecologia e conservação*. Brasília: Ministério do Meio Ambiente.

Murilo José do Nascimento
Rua Antonio Pereira da Silva 46, bairro Silva de Cima, CEP 55790-000, Santa Cruz do Capibaribe, PE, Brazil.

Eder Aragão Neves
Rua Cabo Otávio Aragão 556, Centro, CEP 55192-355, Santa Cruz do Capibaribe, PE, Brazil.

Admilson Gomes Conceição
Rua Maria Lira de Moraes 259, bairro Nova Santa Cruz do Capibaribe, CEP 55194-303, Santa Cruz do Capibaribe, PE, Brazil.

Almir das Neves Araújo
Rua José Roberto Ramos 48, bairro Dona Dom, CEP 55192-654, Santa Cruz do Capibaribe, PE, Brazil.

Arnaldo Vitorino
Rua Carmecita Juventina 115, bairro Malaquias Cardoso, Loteamento São Jorge, CEP 55190-576, Santa Cruz do Capibaribe, PE, Brazil.

Jonathas Lins and Victor Leandro-Silva
Programa de Pós-Graduação em Ecologia, Departamento de Biologia, Universidade Federal Rural de Pernambuco, Rua Dom Manoel de Medeiros, s/n, CEP 52171-900, Dois Irmãos, Recife, PE, Brazil.

Glauco Alves Pereira
Laboratório de Ornitologia, Departamento de Biologia, Universidade Federal Rural de Pernambuco, Rua Dom Manoel de Medeiros, s/n, CEP 52171-900, Dois Irmãos, Recife, PE, Brazil. E-mail: glaucoapereira@hotmail.com.

Received 1 May 2017; final revision accepted 19 December 2017; published online 16 June 2018.

Segundo registro del Pibí Oriental *Contopus virens* para Argentina

El Pibí Oriental *Contopus virens* es una especie migratoria con un amplio rango de cría en el este de América del Norte y un área de invernada que abarca mayormente el noroeste de América del Sur, con menor cantidad de registros en el centro y centro-oeste del continente[5]. Aunque no está amenazada de extinción, algunas estimaciones señalan una aparente disminución de su población en EEUU[6]. En su área de nidificación, su distribución se solapa en una angosta franja del centro de América del Norte con su especie hermana, el Pibí Occidental *C. sordidulus*, donde se han documentado eventos de hibridación[4]. En la zona de invernada en América del Sur el solapamiento geográfico entre ambas especies es mayor[5].

En Argentina existe un único registro de Pibí Oriental, que es el más austral conocido. Una pareja fue oída y luego colectada por G. Hoy[2] el 12 de septiembre de 1978 en la zona de Orán, norte de la

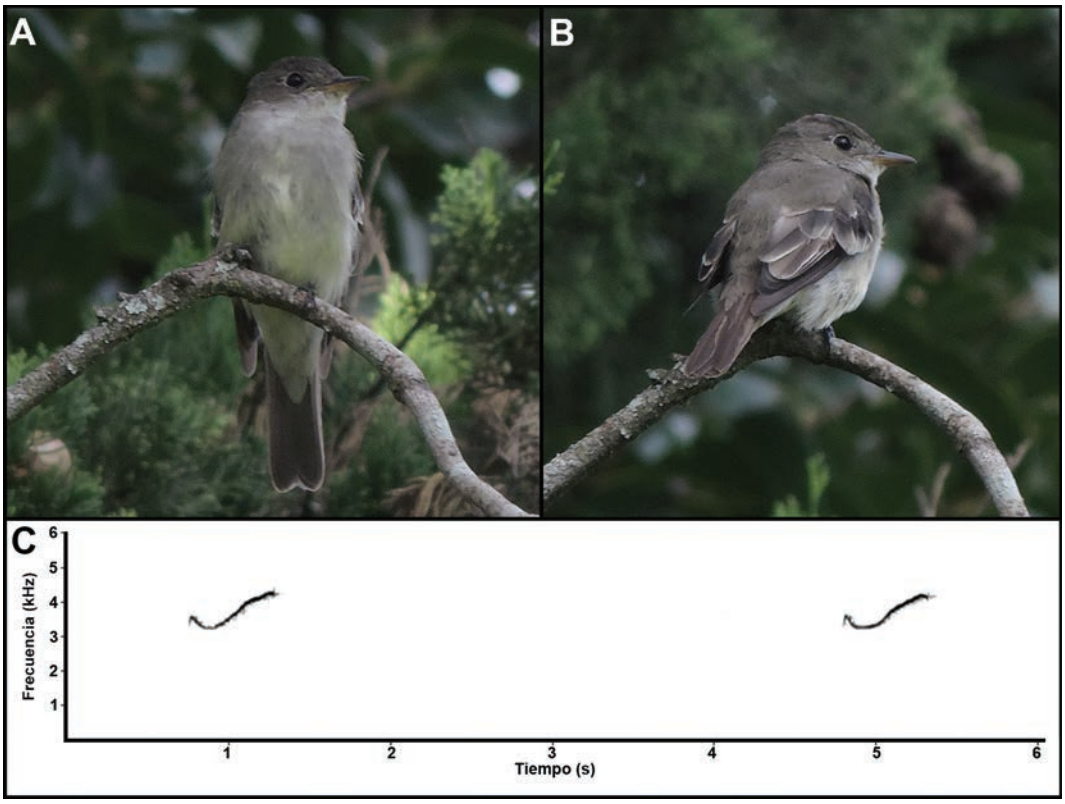


Figura 1. Fotografías y vocalizaciones del Pibí Oriental *Contopus virens* obtenidas en el paraje El Gallinato, Salta, Argentina: (a) vista ventral, 1 de marzo 2016; (b) vista dorso-lateral, 1 de marzo 2016; (c) llamados *pwee*, 18 de marzo 2016 (https://www.xeno-canto.org/402740) (O. A. Spitznagel)

provincia de Salta. En este trabajo reportamos el registro más austral y segundo registro de Pibí Oriental para Argentina.

El 27 de febrero de 2016, en el paraje El Gallinato (24°40'32,20"S 65°21'9,60"O; 1.280 m de altitud), departamento La Caldera, centro-sur de la provincia de Salta, OAS escuchó un individuo de Pibí Oriental que pudo posteriormente ser oído u observado por FNM y JIA. El mismo fue detectado casi a diario hasta el 3 de abril de 2016, y fue fotografiado, filmado y grabado (Fig. 1). Esta nueva localidad más austral está unos 200 km al sudoeste del único registro previo para Argentina[2].

El ave mostraba pico negruzco con amplia base de la mandíbula inferior amarillo / naranja, loral gris pálido poco marcado, anillo periocular blanco-amarillento poco notable, dorso pardo con un leve tinte oliváceo desde la corona hasta la rabadilla, garganta blancuzca, ancha banda pectoral grisácea y pecho inferior, vientre, subcaudal y flancos amarillo oliváceo (Fig. 1a,b). La banda alar inferior (cobertoras mayores) era blancuzca, ancha y bien marcada, mientras que la banda alar superior (cobertoras medianas) era igualmente blancuzca pero de menor espesor, y parecía poco definida, casi ausente, a principios de marzo, pero más notable a mediados de marzo e inicios de abril. A principios de marzo, las timoneras eran notablemente más pardas que el dorso y daban apariencia de estar gastadas, mientras que la proyección de las primarias era escasa, algunas secundarias nuevas eran notablemente más cortas que otras y las terciarias parecían gastadas, sugiriendo que las primarias y secundarias estaban aún en pleno crecimiento, mientras que las terciarias aún no habían sido mudadas (Fig. 1a,b). La única vocalización oída y grabada fue un llamado *pwee*: un silbido melancólico largo y suave repetido regularmente a intervalos de 3–5 segundos, y a veces emitido de manera aislada (Fig. 1c). Vocalizaba principalmente desde media mañana (c.10h00) hasta temprano en la tarde (c.16h00) en los días de sol. No se lo escuchó vocalizar en el amanecer, salvo el mismo día en que se registró por última vez su presencia. En los veranos de 2017 y hasta comienzos de abril de 2018 esperamos su presencia en la misma área donde fue registrado, pero no lo detectamos.

El individuo se movía principalmente en un parche con vegetación exótica con cipreses *Cupressus* sp., pinos *Pinus* sp. y fresnos *Fraxinus* sp., en las inmediaciones de dos viviendas.

En pocas oportunidades lo observamos en sectores con vegetación autóctona. No se realizó un seguimiento exhaustivo, pero se pudo apreciar que el área en la que se movía regularmente no excedía las 2 ha. El registro ocurrió en una quebrada con orientación este-oeste cuya vegetación corresponde a la provincia fitogeográfica de las Yungas[1]. Esta quebrada abarca un gradiente altitudinal de 640 m, e incluye comunidades pertenecientes a la selva basal y bosque montano. En la zona pedemontana se encuentran bosques en recuperación desde por lo menos 20 años, correspondientes a una sucesión secundaria de potreros donde el ambiente exhibe el mayor porcentaje de modificación. Las escasas viviendas ubicadas en el área ocupan la base de la quebrada y en la mayoría de los casos presentan especies vegetales exóticas.

Las diferencias de plumaje entre el Pibí Oriental y el Pibí Occidental son escasas y muy difíciles de observar, por lo que una certera identificación en el campo sólo es posible con individuos vocalizando[2]. El individuo de Pibí Oriental aquí reportado, en plumaje gastado y con muda en las plumas de vuelo, resulta difícilmente identificable a nivel de especie por su aspecto externo[2,3] (Fig. 1a,b). Aunque la mandíbula amarillo / naranja sugiere que se trataría de esta especie[3] (Fig. 1a,b), sus vocalizaciones diagnósticas permiten reconocerlo sin dudas[5] (Fig. 1c). En el noroeste argentino, el Piojito Silbón *Camptostoma obsoletum* y el Tangará Común *Euphonia chlorotica* emiten regularmente llamados y variantes de estos llamados que pueden parecerse superficialmente o ser confundidos a la distancia con el *pwee* del Pibí Oriental. Adicionalmente, el Burlisto Chico *Contopus cinereus pallescens* es vocalmente muy diferente, pero visto en malas condiciones de luz puede confundirse con el Pibí Oriental.

El Pibí Oriental es un migrante primaveral tardío en EEUU[6]. Las fechas extremas de registros documentados en Argentina (12 de septiembre y 3 de abril) abarcarían el lapso esperado para arribos tempranos y partidas tardías en el límite sur de su distribución invernal. Los datos presentados en este trabajo sugieren que el Pibí Oriental podría ser un visitante regular sub-observado en el noroeste argentino.

Referencias

1. Cabrera, A. L. (1971) Fitogeografía de la República Argentina. *Bol. Soc. Arg. Bot*. 14: 1–42.
2. Hoy, G. (1981) Un ave nueva para la Argentina, *Contopus virens* Linné (Aves, Tyrannidae). *Hist. Natur*. 2: 43–44.
3. Lee, C., Birch, A. & Eubanks, T. L. (2008) Field identification of Eastern and Western Wood-Pewees. *Birding* 40(5): 34–40.
4. Manthey, J. D. & Robbins, M. B. (2016) Genomic insights into hybridization in a localized region of sympatry between pewee sister species (*Contopus sordidulus* × *C. virens*) and their chromosomal patterns of differentiation. *Avian Res*. 7: 6.
5. Ridgely, R. S. & Tudor, G. (2009) *Field guide to the songbirds of South America*. Austin: University of Texas Press.
6. Watt, D. J., McCarty, J. P., Kendrick, S. W., Newell, F. L. & Pyle, P. (2017) Eastern Wood-Pewee (*Contopus virens*), version 2.0. In: Rodewald, P. G. (ed.) *The birds of North America*. Ithaca, NY: Cornell Lab of Ornithology. https://doi.org/10.2173/bna.eawpew.02.

Oscar A. Spitznagel
Dean Funes 267, Salta (4400), Argentina. E-mail: oaspitz@gmail.com.

Flavio N. Moschione
Parques Nacionales Delegación Regional NOA, Santa Fe 23, Salta (4400), Argentina. E-mail: calancate@yahoo.com.ar.

Juan I. Areta
Instituto de Bio y Geociencias del Noroeste Argentino–CONICET, Rosario de Lerma (4405), Salta, Argentina. E-mail: esporofila@yahoo.com.ar.

Received 14 February 2018; final revision accepted 1 April 2018; published online 16 June 2018.

Editorial Guidelines

The **Neotropical Bird Club's** annual journal ***Cotinga*** provides a forum for news, notices, recent publications, expedition results, reviews and publication of studies on Neotropical birds by contributors from all parts of the world. The accent of papers and short notes is on new distributional and temporal information, including new country records, new data concerning biology, particularly breeding, and novel interpretations concerning taxonomy, particularly descriptions of new taxa. *Cotinga* does not consider papers on aberrant plumages or diet. Contributions in English, Spanish or Portuguese are considered and accepted subject to editing and refereeing. Copies of new journals, books or reports for mention or reviewing are always welcomed. All contributions or enquiries should be sent to the Managing Editor Cotinga, Neotropical Bird Club, c/o The Lodge, Sandy, Bedfordshire, SG19 2DL, UK.

Guidelines for contributors

Papers These should be written clearly, scientific and vernacular names should appear together at the first mention of a species, after which either can be used alone, and names should preferably follow the South American Checklist Committee (SACC: www.museum.lsu.edu/~Remsen/SACCBaseline.html) or the American Ornithologists' Union (1998 and subsequent updates; for Middle American and Caribbean birds). For all papers, a summary, usually Spanish (but Portuguese for papers concerned with Brazil, and French for those dealing with relevant islands in the Lesser Antilles and French Guiana) is required. Authors unable to provide a summary in the alternate language should prepare text in English and apply to the editors for assistance.

Contributors of papers describing the avifauna of a particular region/locality that includes a species list should provide an evidence category denoting whether a species was recorded on the basis of the following: sight record, tape-recording, photograph or specimen. References should be cited in alphabetical order at the end of the paper in the same style as the current issue of *Cotinga*. Internet sites/pages, academic theses and unpublished reports are acceptable as references, but should only be cited *in extremis*. Submissions are preferred by e-mail to: Cotingaman@aol.com. Authors should save all graphics files in either .jpg or .tiff formats with a file resolution of at least 300 dpi. Never save graphics in MS Word or similar word-processing package. Please note that the editors reserve the right to reject any submissions that do not conform to the guidelines presented here.

All contributions, including Short Notes, are subject to peer review, by one or more independent referees. The Editorial Committee reserves the right to make changes that it deems necessary, and, in the minimum of cases, without prior reference to the author. Maps are welcome, but we cannot accept copyrighted material. Authors will receive an electronic proof to check. It is assumed that all contributors submitting material understand and accept these conditions.

Any person submitting a manuscript, photographs or other materials for publication in *Cotinga* must own all relevant intellectual property rights. On submission, all intellectual property rights in text will be assigned to the Neotropical Bird Club (NBC) and a perpetual, royalty-free licence will be granted to NBC to print and use photographs / other images. It is the responsibility of the author(s) to ensure that all relevant rights can be transferred or licensed to NBC. Where this is not possible, the author(s) should make NBC aware of any restrictions on the use of materials and will be responsible for any loss to the NBC resulting from any infringement or alleged infringement of the intellectual property rights of any third party. Any rights transferred or licensed to the NBC as described above shall revert to the author or authors or be cancelled (as applicable) only in the event of rejection or withdrawal of the manuscript.

Country Representatives

Argentina: Ignacio Roesler, Calle 64 No 674, Piso 2 dpto "c". La Plata (1900), pcia Buenos Aires. E-mail: kiniroesler@gmail.com

Belgium: Dr Johan Ingels, Galgenberglaan 9, BE-9070 Destelbergen. E-mail: johan.ingels@skynet.be

Brazil: Andy Foster, Serra dos Tucanos Lodge, CP 98125, Cachoeiras do Macacu, CEP 28.680-000, Rio de Janeiro. E-mail: serradostucanos@hotmail.com

Chile: Manuel Marin, Casilla 15, Melipilla. E-mail: mma95@hotmail.com. Alejandro Kusch, Casilla 19, Puna Arenas. E-mail: alekusch@yahoo.com

Colombia: Diego Calderón, Calle 5E # 35A-30, Apto. 237, Medellín. E-mail: tocsdiegocalderon@gmail.com

Denmark: Morten Heegaard, Admiralgade 23, DK-1066, Copenhagen K. E-mail: morten.heegaard@get2net.dk

Ecuador: Manuel Sanchez Nivicela, Pasaje Tinajillas E3-05 y Jorge Drom, Quito, Pichincha 170150. E-mail: clandestine.bird@gmail.com

France & French Guiana: Nyls de Pracontal. E-mail: nyls.depracontal@gepog.org

Italy: Giuseppe Micali, Via Volterra 3, I-20146, Milano MI. E-mail: micali_giuseppe@libero.it

Norway: Atle Ivar Olsen, Skogsoy, 8700 Nesna, Norway. E-mail: atle.i.olsen@gmail.com

Paraguay: Paul Smith. E-mail: faunaparaguay@yahoo.com.ar

Peru: Rob Williams. E-mail: robsrw@gmail.com

Uruguay: Agustín Carriquiry, Aves Uruguay, PO Box 6955, Correo Central, Montevideo. E-mail: aguscarriquiry@hotmail.com

USA: Vacant, see website for details.

Venezuela: David Ascanio. E-mail: david@abtbirds.com

Typesetting and layout by Eng-Li Green, New Mexico, USA • email engli.green@gmail.com
Colour repro & print production by Swallowtailprint of Norwich, UK • tel +44 (0)1603 403349 • email info@swallowtailprint.co.uk

Please direct correspondence to the Club's registered charity address:
The Managing Editor, Neotropical Bird Club, c/o The Lodge, Sandy, Beds. SG19 2DL, UK.