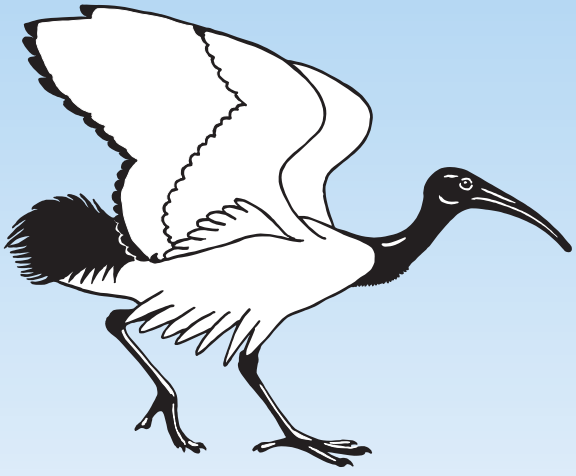
Bulletin of the British Ornithologists' Club



Volume 136 No. 4
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FORTHCOMING MEETINGS

See also BOC website: **http://www.boc-online.org**

BOC MEETINGS are open to **all**, not just BOC members, **and are free**.

Evening meetings are in **an upstairs room at The Barley Mow, 104 Horseferry Road, Westminster, London SW1P 2EE.** The nearest Tube stations are Victoria and St James's Park; and the 507 bus, which runs from Victoria to Waterloo, stops nearby. For maps, see http://www.markettaverns.co.uk/the_barley_mow.html or ask the Chairman for directions.

The cash bar opens at **6.00 pm** and those who wish to eat after the meeting can place an order. **The talk will start at 6.30 pm** and, with questions, will last *c*.1 hour.

Please note that in 2017 evening meetings will take place on a Monday, rather than Tuesday as hitherto.

It would be very helpful if those intending to come can notify the Chairman no later than the day before the meeting.

Monday 13 March 2017—6.30 pm—Julian Hume—*In search of the dwarf emu: extinct emus of Australian islands*.

Abstract: King Island and Kangaroo Island were once home to endemic species of dwarf emu that became extinct in the early 19th century. Emu egg shells have also been found on Flinders Island, which suggests that another emu species may have formerly occurred there. In 1906 J. A. Kershaw undertook a survey of King Island searching for fossil specimens and found emu bones in sand dunes in the south of the island. The available results included a photograph of the fossil locality, but gave no further information as to its whereabouts. Armed with this photograph, I recently travelled to King Island to try and discover where Kershaw had been 110 years before, and in this talk I will present the results of my palaeontological surveys of all three southern Australian islands to find emu subfossil bones. These surveys included a photographic record of many of the surviving birds and also demonstrate how the islands have been radically altered since their discovery in the first decade of the 19th century.

Biography: Julian Hume has travelled widely in search of avian palaeontological deposits, especially in the Mascarene Islands of Mauritius, Réunion and Rodrigues, as well as Hawaii, Madagascar and the islands off southern Australia. By profession, he is an artist specialising in extinct birds, but also has a Ph.D. in avian palaeontology and is a Scientific Associate of the Natural History Museum, Tring. He has written four books and published many papers on birds and their fossil history, with the second edition of his *Extinct birds* due out in 2017.

Monday 12 June 2017—details to be announced.

The Chairman: Chris Storey, 22 Richmond Park Road, London SW14 8JT UK. Tel. +44 (0)208 8764728. E-mail: c.storey1@btinternet.com

Bulletin of the
BRITISH ORNITHOLOGISTS' CLUB

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CLUB ANNOUNCEMENTS

Report on the joint meeting on *Neotropical birds* with the Neotropical Bird Club and the Natural History Museum in the Flett Theatre, NHM, London, 17 September 2016

This second joint one-day meeting between BOC, NBC and NHM took place five years after the inaugural one in 2011. A highly enthusiastic, but in size somewhat disappointing, audience of *c*.60 people was treated to five impressive main talks, as well as shorter contributions by Raymond Jeffers on the NBC fundraising tours programme and by Chris Storey, who outlined the planned changes to how the BOC will operate.

During the morning session, Christina Banks-Leite, Imperial College London, opened with a presentation on *How to save birds in the Brazilian Atlantic Forest on a shoestring*. The endangered species-rich avifauna here inhabits one of the most threatened biodiversity hotspots in the world. Despite few recorded avian extinctions, the bird community has been strongly impacted by extensive deforestation, which in turn has had important consequences for functioning of ecosystems. Based on research to date, she highlighted cost-effective approaches to reforestation aimed at providing adequate habitat for long-term conservation of the unique bird community. She was followed by Alex Lees, formerly at the Goeldi Museum in Belém but just taking up a position at Manchester Metropolitan University, who drew on his long-term experience of working on the ecology and conservation of Amazonian avifauna to address the broader issue of *Bridging shortfalls in Brazilian ornithology*. He approached this by considering current shortfalls in understanding of bird biodiversity within seven contexts: evolutionary patterns (Darwinian), species taxonomy (Linnean), species distribution (Wallacean), abiotic tolerance (Hutchinsonian), abundance (Prestonian), species traits (Raunkiaeran) and biotic interactions (Eltonian). To have any hope of addressing massive ongoing habitat loss and likely concomitant avian extinctions, ornithology in Brazil needs to make full use of new technologies from full genome sequencing through satellite telemetry to large-scale citizen science initiatives, to provide the evidence necessary to bring about political and legal action.

In the afternoon, Thomas Donegan, council member of Fundación ProAves de Colombia, summarised much of his research on a diverse array of Colombian birds over the past 20 years in a complex talk addressing the topic of *What is a species and what is a subspecies? A new look at an old question, based on Colombian birds.* Developing and extending the approach being used by BirdLife in the new *HBW-BirdLife illustrated checklist of the birds of the world*, the subject of Nigel Collar's final talk of the day (see below), Thomas provided and defended novel recommendations for assessing species and subspecies rank in a consistent manner. Moving from the general to the particular, Fabrice Schmitt, recently returned to France after living and studying birds in Chile for ten years, presented a fascinating travelogue entitled *White-masked Antbird unmasked*, hung on a seven-man amateur expedition to the Amazonian lowlands of northern Peru in 2013. Primarily aimed at rediscovering the rare and enigmatic *Pithys castaneus* at the location where it was first found in 1937, the talk ranged widely over the habitats visited and diversity of organisms found, highlighting successes and failures alike. Closing the conference, Nigel Collar of BirdLife International provided a heavyweight but involving contribution on *Changes and challenges in the HBW-BirdLife checklist of Neotropical passerine species.* BirdLife's aim of promoting effective conservation priorities by applying a set of standard criteria (the Tobias criteria), based on morphological and acoustic evidence, to resolving problems of species limits in the global avifauna produced a mixed response, part laudatory and part critical, following the publication of the first (non-passerine) volume of the *Illustrated checklist of the birds of the world* in 2014. Nigel outlined how Neotropical passerines will fare in the forthcoming second volume, highlighting some of the challenges both to taxonomy and to conservation that have emerged from the endeavour.

Robert Prŷs-Jones

REVIEWS

Beehler, B. M. & Pratt, T. K. 2016. *Birds of New Guinea: distribution, taxonomy, and systematics*. Princeton University Press, Princeton, NJ. 668 pp, two pages of colour photographs. ISBN 978-0-691-16424-3. £55.95.

The publication in 2015 of a revised field guide to the birds of New Guinea, also by Thane Pratt and Bruce Beehler, was cause for widespread relief among the ever-growing legion of travelling birdwatchers eager to sample the avian delights of the world's second-largest island, as the only previous such work (Beehler *et al*.

1986, *Birds of New Guinea*) had long been out of print and was available only on the second-hand market at a hefty price. The present work represents the all-important 'bricks-and-mortar' underpinning the content in the new field guide, providing a detailed résumé of the status and distribution, in addition to taxonomy, of all bird species currently accepted to have occurred in New Guinea. For anyone with a serious interest in the avifauna of the Australo-Papuan region as a whole, or indeed global avian taxonomy, Beehler & Pratt's field guide sequel will be quite simply an indispensable and frequently referred-to purchase.

Fairly brief introductions to the New Guinea region, particularly its geography and bird habitats, as well as avian taxonomy generally, explained with specific reference to the region's birds, as well as explanatory notes concerning the layout of the species accounts commence the work. The meat of the book, more than 480 pages, comprises the family, genera, species and subspecies accounts. Resident species and those (many) endemic to New Guinea receive the most detailed treatment, with in-depth range statements, sometimes including lists of known localities (but no maps), data concerning elevational distribution, range outside New Guinea (where relevant), discussions of subspecific diagnosis, and occasionally extensive notes that treat all manner of additional topics, e.g. knowledge of the species, conservation status, alternative taxonomic treatments, gaps in our understanding, and so forth. For all generic, species and subspecies taxa, full citation details are presented. Throughout the accounts, the authors' personal research shines through, but also deep knowledge of the literature (the bibliography that follows the species accounts runs to 35 pages) and an extensive array of contact with other observers. The book terminates in an extensive gazetteer that runs to more than 70 pages, plus the usual indices.

My only criticism is for the publisher rather than the authors. The two pages of 14 colour photographs of specimens that precede the species accounts seem positively churlish, given the number of images that presumably could have usefully been included. Of course, a significant amount of colour would have necessitated an ever-higher retail price for what is already a fairly expensive book, but I would imagine that most would-be purchasers of this work (many fewer than for the field guide inevitably) would have 'stomached' a few extra pounds, dollars or euros.

As already intimated above, this work is a positive goldmine and no-one with a serious interest in the birds of New Guinea should be without it. Those, like me, yet to visit, will surely revel in such a magnificent introduction to the region, with the extensive bibliography and gazetteer alone being substantial navigational aids. Much of the literature on bird distributions in New Guinea is in relatively hard-to-find local newsletters and reports (although *Muruk* is now happily available online: http://s2travel.com.au/WP/muruk-papua-new-guinea-bird-society/), making this book an exceptional guide even for those better initiated than myself. Bruce Beehler, Thane Pratt and the book's technical editor, Mary LeCroy, have done the ornithological world proud, yet again.

Guy M. Kirwan

Perron, R. M. 2016. *Taxonomy of the genus Casuarius*. Quantum Conservation, Aylesbury, UK. 95 pp, many colour photographs. ISBN 978-3-86523-272-4. £15.95.

Despite being a small family of a very large and impressive birds, the cassowaries (family Casuariidae) have presented something of a problem for avian taxonomists, with three or four species in one genus, *Casuarius*, being typically recognised in recent works. Whereas Dickinson & Remsen (2013, *The Howard and Moore complete checklist of the birds of the world*), del Hoyo & Collar (2014, *The HBW and BirdLife International illustrated checklist of the birds of the world*) and Beehler & Pratt (2016, see above) all treated the genus as comprising three species, Southern Cassowary *C. casuarius*, Dwarf Cassowary *C. bennetti* and Northern Cassowary *C. unappendiculatus*, Davies (2002, *Ratites and tinamous*) accepted a fourth species, Westermann's Cassowary *C. papuanus*. Subspecific variation and the ranges ascribed to the various taxa are even more complex.

In this booklet-sized work, Richard Perron recognises three species, in line with the majority of other recent authors. Following a short general introduction to the history and taxonomy of the genus, the meat of the book comprises a taxon-by-taxon listing of all 48 names erected for different *Casuarius*. Each one is illustrated (in full colour) either by a photograph (some of rather average quality) or, more typically, using a reproduction from the relevant type description. The text for each taxon includes, among others, its currently accepted synonym, author, type locality, collector, the whereabouts of the holotype, original description (usually repeated verbatim) and any remarks or notes. In truth, in these days of the Biodiversity Heritage Library (http://www.biodiversitylibrary.org/), much of this information is relatively easily accessible to anyone with a computer, or even a smartphone, but those with a serious interest in ratites will probably welcome having all of it in one place.

Having reviewed the evidence, Perron accepts the following subspecific taxa of Southern Cassowary, *C. c. casuarius*, *C. c. galeatus*, *C. c. aruensis*, *C. c. johnsonii* and *C. c. sclateri*. Under Dwarf Cassowary, Perron recognises four groups and admits that one of them, the *C. b. westermanni* group, might be better treated specifically (supporting Davies' position), although he is unclear as to how many subspecies should be recognised. As for Northern Cassowary, the author regards all variation as clinal, thereby apparently advocating monotypy.

The book closes with a single page each devoted to acknowledgements and references.

Guy M. Kirwan

REFEREES

I am grateful to the following, who have reviewed manuscripts submitted to the Bulletin during the last year (those who refereed more than one manuscript are denoted by an asterisk in parentheses): George Angehr (*), Leo Batten, Bruce M. Beehler, Rob Bjilsma, Walter Boles, Frederick Brammer, Vincent Bretagnolle (*), Graham Carpenter, R. Terry Chesser (*), David Christie, Charles Collins, Edward C. Dickinson, Thomas Donegan (*), Guy Dutson, Errol Fuller, Héctor Gómez de Silva, Harold F. Greeney, Marcel Güntert, Carlos Gussoni, Steve N. G. Howell, Morton L. Isler, Ron Johnstone, Leo Joseph, Mary LeCroy (*), Alexander C. Lees, Wayne Longmore (*), Clive F. Mann, Manuel Marín, Gerald Mayr, Andy Mitchell, Nicholas Mundy, Ricardo Palma, Juan Parra, Robert Payne, David Pearson, Aasheesh Pittie, Thane K. Pratt, Pamela C. Rasmussen, Eleanor Rowley, Peter Ryan, Roger Safford, Richard Schodde (*), Tom Schulenberg, Manuel Schweizer, Karl Schulze-Hagen, Frank Steinheimer (*), Alan Tennyson, Till Töpfer (*), Andrew Vallely (*), George Wallace, David Whitacre, Andrew Whittaker, James W. Wiley, Raffael Winkler, Iain Woxvold and Kevin J. Zimmer.—The Hon. Editor

Notes on the avifauna of the northern Serranía de Pirre, Panama

by Jack P. Hruska, Sarah A. Dzielski, Benjamin M. Van Doren & Justin M. Hite

Received 12 January 2016

Summary.—We surveyed the avifauna of the foothills and lowlands of the northern Serranía de Pirre, in Darién National Park, on 20–22 April and 4 June–8 July 2014. The survey was conducted in conjunction with a study of the natural history and ecology of Sapayoa *Sapayoa aenigma*. In total, we recorded 219 species of 43 families, including seven classed as globally Near Threatened, three as Vulnerable and one as Endangered. Notes on the natural history of 19 species are presented, including some of the first published data on the breeding biology of poorly known species such as Double-banded Greytail *Xenerpestes minlosi* and Slate-throated Gnatcatcher *Polioptila schistaceigula*. Furthermore, we include previously unpublished notes on the natural history of *Sapayoa aengima*.

Spanning 5,800 km^2 on the Colombia / Panama border, Darién National Park (hereafter DNP) and UNESCO World Heritage Site is one of the largest protected areas in Central America (IUCN 1992). Located within the Tumbes–Chocó–Magdalena global biodiversity hotspot, the DNP supports a substantial part of the Chocó biogeographic region (hereafter Chocó) found within Panamá. With an area of 260,595 km^2, the Chocó represents one of the smallest and most threatened biogeographic regions in the Neotropics, harbouring many endemic flora and fauna. The DNP falls within two BirdLife International Endemic Bird Areas (EBA): the Darién Highlands EBA, with 17 range-restricted species, all of which occur in Panamá, and the Darién Lowlands EBA, also with 17 restricted-range species, 15 of which occur in Panamá (Angehr *et al*. 2004). The DNP represents one of the last refuges in Central America for species requiring large tracts of continuous habitat, including Harpy Eagle *Harpia harpyja*, Giant Anteater *Myrmecophaga tridactyla* and Jaguar *Panthera onca*. Additionally, the area still is ripe for discovery, as shown by the description of new species of *Eleutherodactylus* (Anura: Leptodactylidae) in 2002 (Ibáñez D. & Crawford 2004) and *Pristimantis* (Anura: Strabomantidae) in 2010 (Crawford *et al*. 2010).

Several ridges, or 'serranías', dominate the topography of DNP. The Serranía de Tacarcuna, reaching 1,875 m, flanks the Caribbean slope of the park. The Serranía de Pirre (hereafter SDP) is centrally located and reaches 1,550 m (Angehr *et al*. 2004, Myers *et al*. 2007). The Pacific slope includes the Serranías de Sapo and Jingurudó, which reach elevations of 1,145 m and *c*.1,700 m, respectively (Angehr *et al*. 2004). Between these ridges lie the valleys of the Tuira, Chucunaque, Sambú, Jaqué and Balsas rivers.

Within DNP, the SDP and surrounding environs, especially the Chucunaque and Tuira river valleys, have received substantial attention from ornithologists and collectors. The nearby towns of El Real and Yaviza have also received considerable attention, and substantial collections at these localities were made, especially in the first half of the 20th century (Siegel & Olson 2008).

The composition of the avifauna at SDP is one of the best-studied in Panamá (Goldman 1920, Griscom 1929, Wetmore 1965, 1968, 1972, Wetmore *et al*. 1984, Robbins *et al*. 1985). However, most of these efforts have focused on the southern SDP, specifically the higher

elevations of Cerro Pirre and the area around Cana camp (Goldman 1920, Griscom 1929, Robbins *et al*. 1985). Even fewer data are available on the avifauna of the northern SDP (Robbins *et al*. 1985). The majority of publications to date have focused on species lists, range extensions and other notable records for the area (Angehr *et al*. 2006b, Campos-Cedeño & Vallely 2014, Jones & Komar 2014, 2015). Here we include several observations that contribute substantially to our knowledge of avian natural history from the northern SDP.

We surveyed lower and middle elevations of SDP (*c*.90–650 m) around Rancho Frío station on 20–22 April and 4 June–8 July 2014. These observations were made during a study of the natural history and ecology of Sapayoa *Sapayoa aenigma*. Here we highlight novel findings concerning this species, in addition to those for 18 other species, including the first published nest description for Double-banded Greytail *Xenerpestes minlosi*, as well as observations of locally threatened and declining species, such as Red-throated Caracara *Ibycter americanus* and Grey-cheeked Nunlet *Nonnula frontalis*.

Study area

Rancho Frío station (08°01′10.1640″N, 77°43′56.2800″W; 93 m), operated by the Autoridad Nacional del Ambiente (ANAM), lies at the base of the Pacific slope of the northernmost SDP (Fig. 1). The name 'Rancho Frío' was originally applied to a campsite on the Rancho Frío–Cerro Pirre trail; in the present day, it refers only to the ANAM station (Siegel & Olson 2008). Approximately 50 km in length and 25 km wide, the SDP extends south from here to the Colombian border (Robbins *et al*. 1985). The station is accessed via a 17 km-road and trail, the El Real–Rancho Frío trail, which originates in the town of El Real de Santa Maria, on the Tuira River. The nearest town, Pirre Uno, is 4 km from the station. Topography along this route is predominantly flat, with the vegetation community containing elements of both more humid forests to the south and seasonally drier forests to

Figure 1. Map of the study locality and the northern Serranía de Pirre, Panama.

the north. The first 13 km traverses a landscape mosaic dominated by agricultural fields and cattle pastures, with isolated patches of second growth and occasional marshes. The last 4 km traverses a protected buffer zone and the outer limits of DNP. Habitat along this section is predominantly secondary with a mean canopy height of 15–20 m. Taller trees that have not been selectively logged still occur, including several emergent *Ceiba pentandra* and *Cavanillesia platanifolia*.

Climate at Rancho Frío station is reminiscent of a humid tropical forest and is marked by two seasons, dry (January–April) and wet (May–December). Mean annual temperature fluctuates around 22–25°C with mean annual rainfall of >2,500 mm (Dalfelt & Morales 1978). The foothills and higher elevations experience more precipitation and increased cloud cover (Gradstein & Salazar-Allen 1992). We recorded rain on fewer than ten of 36 days.

From the station, two main trails ascend into SDP. The most utilised trail, the Rancho Frío–Cerro Pirre trail, climbs south to 1,550 m on the highest peak of Cerro Pirre (Robbins *et al*. 1985). We reached a max. elevation of 650 m. The second, the Antenna trail ascends the northernmost SDP. We reached 600 m elevation here. Forest structure in the lower foothills (*c*.90–650 m) is markedly distinct from the surrounding lowlands: foothill forest includes an open understorey and mean canopy height of 20–25 m. Flanking both trails is a series of steep gullies carved out by small streams (*c*.3 m in width).

Methods

On 20–22 April 2014, JPH, C. Hruska & S. Gladstone visited the environs of Rancho Frío station and the northern SDP. The area was revisited and surveyed by the authors on 4 June–8 July 2014. The avifauna was surveyed primarily via the two aforementioned trails, with additional opportunistic observations on the El Real–Rancho Frío trail. Additionally, we also surveyed the steep gullies along the Rancho Frío–Cerro Pirre and Antenna trails. Total survey effort comprised 336 observational hours and 70 mist-net hours. We mist-netted at six locations, at 123 m, 156 m, 176 m, 213 m, 291 m and 300 m elevation. With the exception of that at 300 m, all mist-netting sites were beside forested streams. We used ten mist-nets (12 × 2.6 m; 32–36 mm mesh) and checked open nets every 30 minutes. We made audio-recordings using a MKH 20 microphone and Telinga 55.6 cm parabola. We also captured video with Canon EOS 7D and 5D Mark II cameras fitted to 400 mm, 500 mm and 100–400 mm lenses. Records from the 20–22 April scouting trip are not included in the overall list of species (Appendix 1), but an observation of Double-banded Greytail *Xenerpestes minlosi* is mentioned in the species accounts. Taxonomy follows the American Ornithologists' Union (http://checklist.aou.org/taxa/).

TABLE 1
Coordinates and survey effort at mist-netting localities.

Elevation	Coordinates	Hours
c.300 m	08°00′57.708″N, 77°43′0.588″W	8
c.125 m	08°00′50.388″N, 77°43′38.96″W	20
c.215 m	08°00′48.744″N, 77°43′34.50″W	8
c.175 m	08°00′53.010″N, 77°43′28.34″W	20
c.290 m	08°00′32.364″N, 77°43′15.20″W	8
c.155 m	08°00′48.527″N, 77°43′40.40″W	6

We collected specimens of three species: Crested Owl *Lophostrix cristata*, Streak-chested Antpitta *Hylopezus perspicillatus* and Sapayoa *Sapayoa aenigma*. These are deposited at the Cornell University Museum of Vertebrates, Ithaca, NY (CUMV) and Museo de Vertebrados of the Universidad de Panamá, Panama City (MVUP). Audio and video-recordings are archived at the Macaulay Library of Natural Sounds (ML, http://macaulaylibrary.org) of the Cornell Lab of Ornithology. All work was conducted in accordance with research permits

(#SE/A-54-14) and IACUC protocols (#2014-0601-2017-5) issued by the Autoridad Nacional del Ambiente (ANAM) and Smithsonian Tropical Research Institute (STRI).

Results

We encountered a total of 219 species of 43 families in the vicinity of Rancho Frío and the towns of El Real, Yaviza, and Pirre Uno (Appendix 1). Of these, seven species are currently classified as Near Threatened, three as Vulnerable and one as Endangered. We present observations of 19 species.

Species accounts

KING VULTURE *Sarcoramphus papa*

Our only observation was on 12 June (at *c*.120 m), when we observed a juvenile and adult *c*.12 m above the forest floor. Wetmore (1965) noted that *S. papa* was 'found in small numbers', and Ridgely & Gwynne (1989) listed it as locally uncommon to fairly common in Panama. We observed the juvenile for several minutes, during which it begged for food by pinching and nudging the adult's bill. Despite being a widespread and relatively common species across the Neotropics, only a few nests have been described, and breeding biology remains poorly understood (Carvalho Filho *et al*. 2004). *S. papa* is presumed to breed every two years and little is known concerning parent–offspring dynamics during the dependence period of at least one year (Clinton-Eitniear 1986). Our observation suggests that young are fed by adults post-fledging.

PLUMBEOUS KITE *Ictinia plumbea*

On 16 June, we found a group of four (three adults and a juvenile) on the El Real–Rancho Frío trail, *c*.2 km from Rancho Frío station. The juvenile gave begging calls and was fed by an adult. Migratory in the northern and southern parts of its range, status and distribution in Panama is poorly known (Seavy *et al*. 1998); several migratory and resident populations may be involved. Surprisingly, very few data on breeding are available from Panama. Other than a male collected at Cana in breeding condition (Griscom 1929) during the 'spring and summer', no other published information exists (Wetmore 1965, Ridgely & Gwynne 1989, Bierregaard *et al*. 2016).

RED-THROATED CARACARA *Ibycter americanus*

We routinely encountered several (typically 3–4) individuals on the Rancho Frío–Cerro Pirre trail; they were frequently heard calling early morning and late afternoon. The species' presence in SDP had been noted previously (Wetmore 1965, Angehr *et al*. 2008), but continued monitoring is important, given the declines it has suffered since the 1950s and 1960s (Bierregaard 1994, Ferguson-Lees & Christie 2001, Narish & Jenner 2004). In Panama, *I. americanus* was formerly considered locally common on the Caribbean slope, where it has apparently been extirpated at some localities (Wetmore 1965, Ridgely & Gwynne 1989). Although not considered globally threatened as some populations remain robust (e.g., in Amazonia), elsewhere in Central and South America there have been precipitous declines (Ferguson-Lees & Christie 2001). The causes of these are unknown, but they do not appear to be associated with habitat loss (Ridgely & Gwynne 1989). Video (ML 515063) and audio (e.g., ML 514918) recordings have been archived.

CRESTED EAGLE *Morphnus guianensis*
On 9 June we visited a nest (at *c*.145 m) on the Antenna trail. It was *c*.20 m above ground in the fork of a large tree (Fabaceae). We observed a fledged juvenile (video ML 476245-7, 476235-8, 477357, 515047-8). Of note is the proximity of this nest (1.1 km) to a nest of Harpy Eagle *Harpia harpyja*. Territories of *M. guianensis*, estimated to be up to 25 km^2 (Whitacre *et al*. 2013), are often considered to be non-overlapping with those of *H. harpyja* (Thiollay 1989). In some areas, however, such as Pará in east Amazonian Brazil and southern Venezuela, this appears not to be the case (Crease & Tepedino 2013). We assume that the territories in Panama were overlapping, given the nests' proximity. In eastern Ecuador, *M. guianensis* has nested within 3 km of two *H. harpyja* nests (Vargas *et al*. 2006). Furthermore, an adult *M. guianensis* has been documented feeding a post-fledged *H. harpyja* in Panama (Vargas *et al*. 2006), suggesting that more remains to be learned concerning interactions between the two species. On 20 June, we observed a dark-morph adult *M. guianensis c*.1.5 km (at 175 m) from the station, on the Rancho Frío–Cerro Pirre trail. It was perched on a narrow midstorey branch, *c*.3 m above ground, where it remained for *c*.1 hour. On the ground nearby was a swarm of *Eciton burchellii* army ants. *M. guianensis* has been observed soaring *c*.200 m above ground and assuming high perches (Pearman 2001), but reports of birds perching in the subcanopy for long periods are rare. Video is archived at ML (ML 476270, 476279-86, 477351-4).

RUDDY QUAIL-DOVE *Geotrygon montana*
On 14 June, we found a nest (at *c*.175 m) on a stream bank (Fig. 2). Approximately 0.5 m above ground, the nest was a platform of loosely assembled sticks and fibres placed atop an unidentified plant. We observed a male incubating for *c*.30 minutes. After it departed, we found two whitish eggs. On 15 June, the nest was revisited, when the male was brooding

Figure 2. Ruddy Quail-Dove *Geotrygon montana* nestlings and nest, Darién National Park, Panama, 15 June 2014 (Benjamin M. Van Doren)

two nestlings, which had pinkish skin sparsely covered in blond down. This supports other observations of males incubating by day and females by night (Skutch 1949, Wetmore 1968). On 17 June, the nestlings were gone, presumably having been predated. Despite being relatively common and widespread in Panama, few nests have been described there (Wetmore 1968, Ridgely & Gwynne 1989).

SAFFRON-HEADED PARROT *Pyrilia pyrilia*
On 22 June, we found a group of three (at *c*.315 m) in the upper canopy along the Antenna trail, and made the first sound-recordings of the species in Panama (ML 186874). *P. pyrilia* is considered Near Threatened due to extensive habitat loss throughout its limited range in Panama, Colombia and Venezuela (Snyder 2000). Around Cerro Pirre, Robbins *et al*. (1985) noted that *P. pyrilia* was 'encountered infrequently' up to 1,400 m, with the largest flock of ten. Originally suggested to have a 'temporary' presence in eastern Panama (Haffer 1975), Ridgely & Gwynne (1989) stated that it is uncommon in the lowlands and lower foothills of eastern Darién, whereas Wetmore (1968) commented that the species' status was uncertain, being then known from just two records on the lower Tuira in Darién. No single eBird observation in Panama involves more than five individuals.

RED-AND-GREEN MACAW *Ara chloropterus*
On 12 June, we found two (at *c*.290 m) feeding on palm (Arecaceae) fruits, *c*.5 m above ground on the Antenna trail. *A. chloropterus* was the most frequently encountered *Ara* in SDP. Most sightings involved 2–3 individuals, with one record of six birds. Our sighting on 12 June was the only observation of the species feeding. Wetmore (1968) noted that *A. chloropterus* occurs locally in eastern Panama, potentially as far west as the Canal Zone. Currently, it is an uncommon and local resident (Ridgely & Gwynne 1989). Around Cerro Pirre, Robbins *et al*. (1985) noted that *A. chloropterus* was the 'commonest *Ara*', with records of up to 12 individuals. However, recent sightings in SDP have not exceeded eight, suggesting a decline (eBird 2016). Still considered common in the south of its range in South America, *A. chloropterus* has been extirpated locally across much of the north and north-west of its range, including Panama, due to intense pressure from the pet trade and habitat loss (Hilty 2003).

LONG-BILLED HERMIT *Phaethornis longirostris*
We found a nest (at *c*.100 m) containing two nestlings along a stream around Rancho Frío station on 5 June, *c*.1.25 m above ground. The nestlings had black skin with a few downy feathers. The nest was cup-shaped and attached by fibrous strands to the leaf of a small palm (Arecaceae: *Calyptrogyne*). Nest materials included fine twigs and moss. Previous nests have been also attached to *Calyptrogyne*, suggesting that *P. longirostris* favours this palm (Skutch 1964). *P. longirostris* is considered one of the commonest hummingbirds in Panama (Wetmore 1968, Ridgely & Gwynne 1989).

TODY MOTMOT *Hylomanes momotula*
On 19 June, we found two (at *c*.130 m) attending an *Eciton burchellii* ant swarm. They were perched motionless during the observation. Although we did not observe them foraging, their presence suggests that *H. momotula* attends ant swarms opportunistically. Other Momotidae have also been observed attending ant swarms (Willis 1981, Willis *et al*. 1982). Little is known concerning the species' foraging ecology, although stomach contents (Wetmore 1968, Remsen *et al*. 1993) and observations (Stiles & Skutch 1989) suggest that it is entirely insectivorous, unlike the preferences of most motmots, which favour a more

varied diet (Remsen *et al*. 1993). Angehr *et al*. (2008) reported the presence of *H. momotula* in this region, although it was previously thought to be absent east of San Blas (Ridgely & Gwynne 1989).

GREY-CHEEKED NUNLET *Nonnula frontalis*

On 15 June, we encountered a group of three (*c*.90 m) on the El Real–Rancho Frío trail. They were perched *c*.5 m above ground in a dense vine tangle, and were expanding and contracting their breast feathers (ML 515088). Angehr *et al*. (2008) noted the species' presence around El Real and Pirre station. This was our only record; its presence is of note given recent local extirpations, e.g. it was formerly known from central Panama but has not been recorded there since 1985 (Wetmore 1968, Willis & Eisenmann 1979, Robinson *et al*. 2004, eBird 2016). The subspecies that occurs from central Panama to extreme north-west Colombia is *N. f. stulta* (Wetmore 1953). Formerly found as far west as Coclé province, it now appears to be confined to local pockets in the Darién, eastern Panamá province and the Comarca Emberá-Wounaan (Angehr *et al.* 2006a, eBird 2016). Considered uncommon in Darién by Ridgely & Gwynne (1989) and local by Wetmore (1968), this appears to still hold true (eBird 2016).

SPOT-CROWNED BARBET *Capito maculicoronatus*

On 30 June, we observed one (at *c*.290 m) excavating a cavity in a 5 m-high, severely rotten tree. The tree was at the edge of a small clearing, with the cavity *c*.0.5 m from the top. The cavity was apparently in the later stages of excavation because it was sufficiently large to accommodate nearly the entire bird. The observation is of note given how few published data are available concerning the species' breeding biology. In Colombia birds have been found in breeding condition in December–April and June (Short & Horne 2011), with nest excavation observed in March (Hilty & Brown 1986). In Panama, individuals in breeding condition have been found in January–March and July, with fledged young observed in early June (Short & Horne 2001).

DOUBLE-BANDED GREYTAIL *Xenerpestes minlosi*

We observed one in a heavily deforested area in the town of Pirre Uno on 24 April, exiting and re-entering a nest (Fig. 3), *c*.4 m above ground, primarily comprising twigs and sticks *c*.25 cm in length, and sited in the fork of an entirely defoliated tree. The nest's structure and its placement in a defoliated tree is repeated in Pink-legged Graveteiro *Acrobatornis fonsecai*, a putative relative of *X. minlosi* (Whitney *et al*. 1996, Remsen 2003). The tree contained another apparently unoccupied nest, similar in structure and materials. Whether the unoccupied nest had been utilised during a previous breeding

Figure 3. Double-banded Greytail *Xenerpestes minlosi* nest, Pirre Uno, Panama, 24 April 2014 (Jack Hruska)

attempt or was a 'dummy' is unknown. Previously, a stick nest found at Cana was believed to possibly belong to *X. minlosi*, but this was not confirmed (Ridgely & Gwynne 1989). Recent video and photographs by V. Wilson in Reserva Arimae, Darién, have confirmed that *X. minlosi* does build stick nests (https://vimeo.com/19959759). On 16 June, we revisited Pirre Uno and used playback of the species' song; one individual approached to within a few metres and vocalised aggressively. Our record provides another nesting locality for this poorly known species and suggests that territories are occupied for extended periods.

LONG-TAILED WOODCREEPER *Deconychura longicauda*

On 21 June, we captured one at *c*.175 m. We colour-banded the bird and took several measurements. It had a mass of 25.3 g, with tarsus, wing chord and head to bill lengths of 20.5 mm, 105.0 mm and 45.0 mm, respectively. The same bird was re-sighted on 1 July at *c*.250 m, and a linear distance of *c*.900 m from its original location. *D. longicauda* has a propensity to disperse over large elevational gradients and has been recorded from near sea level in Costa Rica to *c*.1,050 m in Darién (McDade 1994). *D. longicauda* is suspected to be less tolerant of disturbance than other Dendrocolaptidae, apparently requiring large tracts of continuous forest (Stouffer & Bierregaard 1995). In Peru, mean territory size is 16 ha (Servat *et al*. 1996) while density at one site in Panama was *c*.5 pairs / 100 ha (Hespenheide 1980). The species' presence at this location is significant given its poorly understood status in Central America, where it is very local. In Chiriquí, Panama, it was thought to have been extirpated, but recent records from the Chiriquí Highlands and Burica Peninsula confirm its persistence (Ridgely & Gwynne 1989, eBird 2016). The subspecies around El Real and Pirre station, *D. l. dariensis*, is range-restricted (in eastern Panama and north-west Colombia) and considered rare (Angehr *et al*. 2008, Wetmore 1972).

SAPAYOA *Sapayoa aenigma*

Originally described as a Pipridae, recent molecular studies have confirmed *S. aenigma* as very closely related to the Old World suboscines (Chesser 2004, Irestedt *et al*. 2006, Moyle *et al*. 2006). Until recently, very little was known of its natural history (Kirwan & Green 2011). The first description of the nest, nestlings and parental behaviour was published by Christian (2001). Dzielski *et al*. (2016) provided an in-depth account of the breeding and social dynamics of *S. aenigma*. Wetmore (1975) described it as local from the Canal Zone east to the Darién, and Ridgely & Gwynne (1989) suggested it was uncommon to rare. The lack of recent documented records from the Canal Zone (Pipeline Road) might indicate that the species has been locally extirpated (eBird 2016). Angehr *et al.* (2008) confirmed its presence in SDP.

Foraging.—*S. aenigma* has been traditionally considered to be mostly insectivorous and partially frugivorous, and a regular participant in mixed-species flocks. It has been noted to 'perch and sally' for prey (Ridgely & Gwynne 1989). Here we report observations of its foraging ecology, with more detailed notes on prey and the species composition of the mixed flocks they attend. We observed both individuals and groups with mixed-species flocks. On 13 June, a male was feeding with a mixed flock that was moving through its territory, but did not follow the flock after it had left the territory. On 14 June, a family group of four was attending a mixed-species flock. On 15 June, a group of at least two attended a mixed-species foraging flock, comprising lower and midstorey species such as Tawny-crowned Greenlet *Tunchiornis ochraceiceps*, Lesser Greenlet *Pachysylvia decurtata*, Dull-mantled Antbird *Myrmeciza laemosticta*, Chestnut-backed Antbird *M. exsul*, Wedge-billed Woodcreeper *Glyphorynchus spirurus*, Cocoa Woodcreeper *Xiphorhynchus susurrans*, Checker-throated Antwren *Epinecrophylla fulviventris*, Rufous Piha *Lipaugus*

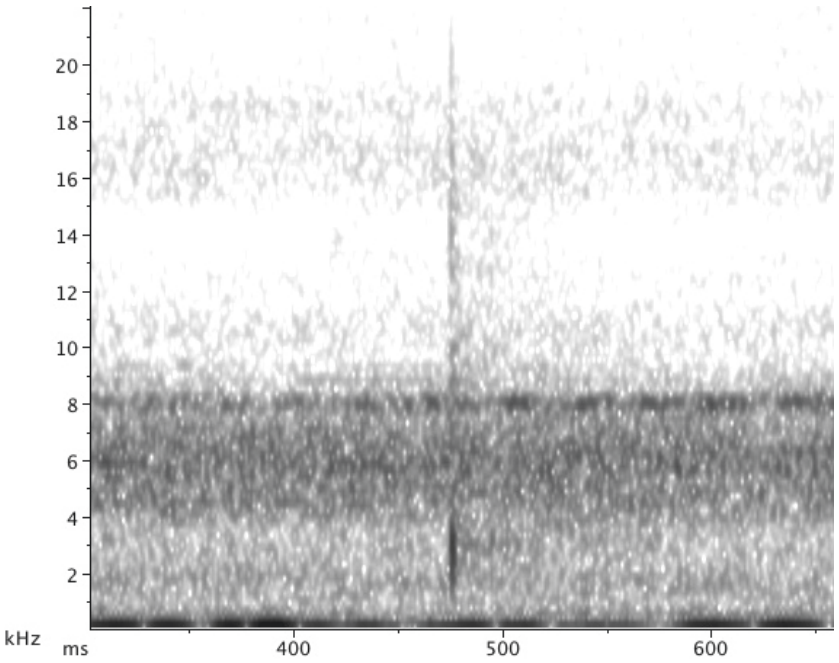

Figure 4. Sapayoa *Sapayoa aenigma* sonation, recorded 8 June 2014, Serranía de Pirre, Panama; sonogram produced using Raven software from recording ML 186853 (http://macaulaylibrary.org/audio/186853) by Sarah Dzielski.

unirufus, Slaty-winged Foliage-gleaner *Philydor fuscipenne*, Lemon-spectacled Tanager *Chlorothraupis olivacea*, Pacific Antwren *Myrmotherula pacifica*, Moustached Antwren *M. ignota*, White-flanked Antwren *M. axillaris*, Dot-winged Antwren *Microrhopias quixensis* and Buff-throated Foliage-gleaner *Automolus ochrolaemus*. We observed many fly-catching maneouvres, including steep diving sallies from perches, but never definitely observed fruit consumption. Although some authors (Hilty & Brown 1986, Snow 2004) have stated that Sapayoa feeds on fruit and insects, our observations suggest the species is predominately insectivorous. Identified prey were few, although we did observe a male on 22 April take a wasp (Hymenoptera). Furthermore, we observed moths, butterflies (Lepidoptera) and katydids (Orthoptera) being delivered to nestlings and sometimes consumed (Dzielski *et al*. 2016).

Sonation.—On 8 June we encountered a male at *c*.170 m on the Rancho Frío–Cerro Pirre trail and obtained audio and video recordings. We used playback to locate it. One of the recordings (ML 186853) captured a sonation, or non-vocal acoustic signal (Bostwick 2006), produced either by wing- or bill-snaps. At 4:17 minutes, the bird emits a dull, mechanical 'snap' followed by a couple of short notes and a wing flutter. A sonogram (Fig. 4) reveals that the frequency of the sound ranges from *c*.1 to 22 kHz, with a duration of <0.01 seconds. This is the first recording of sonation in *S. aenigma*. Common in New World suboscines, especially Tyrannidae (Bostwick & Zyskowksi 2001), non-vocal sounds have been increasingly documented in Old World suboscines, especially Calyptomenidae and Philepittidae (Lambert & Woodcock 1996). Additionally, African Pitta *Pitta angolensis*, Green-breasted Pitta *P. reichenowi*, Black-crowned (Garnet) Pitta *P.* (*granatina*) *ussheri* and Eared Pitta *P. phayrei* have all been recorded making sonations during flight and displays (Chapin 1953, Round 2002, Pegan *et al*. 2013). The mechanics of this non-vocal sound in *S. aenigma* are unknown.

BLUE-CROWNED MANAKIN *Lepidothrix coronata*
We found a nest at *c*.290 m on 18 June, *c*.1.5 m above ground in the fork of a tree. The female was incubating two eggs. Despite being well known, this is the first published nesting data for *L. c. minuscula* in Panama (Kirwan & Green 2011). The nest was similar in appearance and placement to other described nests of *L. coronata* (Skutch 1969, Wetmore 1972, Hidalgo *et al*. 2008).

BLACK-TIPPED COTINGA *Carpodectes hopkei*
On 1 July a male was seen on the Antenna trail at *c*.300 m, our only observation. The northern SDP and Cerro Sapo (on the Pacific slope) are the northernmost known localities for this Chocó endemic (Ridgely & Gwynne 1989). Like congenerics, it is poorly known and its nest undescribed (Kirwan & Green 2011). Only two recordings of its vocalisations exist (XC290028, 289689). In SDP, the status of *C. hopkei* is poorly known. Considered by Wetmore (1972) as fairly common at 300–600 m on Cerro Nique, Kirwan & Green (2011) suggested that it was at least formerly fairly common on Cerro Pirre as well, while also noting that it is tolerably common below 600 m in Panamanian Darién. All five published reports in the El Real–Rancho Frío area are apparently recent, since 2008 (Angehr *et al*. 2008, eBird 2016). Once considered Near Threatened, it is now classed as Least Concern. Continued habitat destruction in the Chocó could warrant a reconsideration of its conservation status (Snow 2004).

BLACK-CAPPED PYGMY TYRANT *Myiornis atricapillus*
On 15 June, in a forest clearing adjacent to Rancho Frío station (*c*.90 m), we found a male constructing a nest. Listed as uncommon on the Darién Pacific slope (Wetmore 1972) and notably absent from SDP (Angehr *et al*. 2008), *M. atricapillus* has been regularly found around Rancho Frío station (eBird 2016). The nest, dome-shaped with a rounded base, was suspended *c*.4 m above ground from a narrow branch and primarily comprised mosses and fine twigs. Despite being relatively common, few data concerning its breeding biology have been published (Clock 2004). Eggs have been reported in late March in Panama (Wetmore 1972) and mid April in Costa Rica (Stiles & Skutch 1989). Our observation indicates that the breeding season, at least in Panama, is more prolonged than was thought (Wetmore 1972, Stiles & Skutch 1989). Wetmore (1975) reported that a nest with two eggs was visited only by the female, but our observations indicate that males participate in nest construction at least.

OLIVACEOUS FLATBILL *Rhynchocyclus olivaceus*
We found several active and inactive nests around Rancho Frío station. Several were initially assigned incorrectly to *Sapayoa aenimga*, whose nest architecture and composition is similar. Nests of both species are described as 'pear-shaped', with a tapered top, and are suspended from a drooping branch (Ridgely & Gwynne 1989, Christian 2001). An active nest of *R. olivaceus* was found on 10 June, confirming our previous identifications as incorrect. Nests of *R. olivaceus* appeared more ragged and disheveled, with a less rounded base, and were also segregated by habitat from those of *S. aenimga*, which were exclusively sited above streams in deep ravines. *R. olivaceus* nests were never found over streams, but often were on the tops of ridges, especially along trails (Dzielski *et al*. 2016). Two congenerics, Fulvous-breasted Flatbill *R. fulvipectus* and Eye-ringed Flatbill *R. brevirostris*, do nest above streams (Stiles & Skutch 1989, Greeney *et al*. 2004), but this tendency has not been documented in *R. olivaceus* (Todd & Carriker 1922, Skutch 1960).

SLATE-THROATED GNATCATCHER *Polioptila schistaceigula*
On 7 June we observed an adult (at *c*.90 m) and two fledglings in a *Cecropia* at the edge of a clearing adjacent to Rancho Frío station. We identified the fledglings by plumage, with prominent downy feathers on their flanks. Ours is the first published observation of a fledgling (Atwood & Lerman 2006). The population in eastern Panama and western Colombia has been speculated to represent an undescribed race, and it has been suggested that the species should be considered Near Threatened (Atwood & Lerman 2006).

Discussion

Despite having received considerable attention from ornithologists (Goldman 1920, Griscom 1929, Wetmore 1965, 1968, 1972, Wetmore *et al*. 1984, Robbins *et al*. 1985), the natural history of avifauna in SDP is poorly known. Here we highlight unusual behaviours, nest records, and records of declining and range-restricted species. In particular, we focused our efforts on Sapayoa *Sapayoa aenigma*, a particularly enigmatic species.

We encourage more studies of the avifauna of DNP, especially in its foothills and lowlands. The area around Rancho Frío station is an ideal location to study several uncommon species, e.g. *Ibycter americanus* and *Nonnula frontalis*, and others sensitive to habitat perturbation, such as *Harpia harpyja* and *Morphnus guianensis*. Included within the Darién Lowlands EBA, the area is assigned 'critical' priority designation by BirdLife International and is considered of the highest biological importance (Stattersfield *et al*. 1998). Not only is the habitat threatened by rapidly expanding agriculture and cattle ranching, it supports a unique avifaunal community that is severely under-studied and of significant ecotourism value. We trust that our efforts, in conjunction with others of its kind, will expand our knowledge of this threatened region's biodiversity.

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References:
Angehr, G., Christian, D. & Aparicio, K. 2004. A survey of the Serranía de Jungurudó, an isolated mountain range in eastern Panama. *Bull. Brit. Orn. Cl*. 124: 51–61.
Angehr, G. R., Engleman, D. & Engleman, L. 2006a. *Annotated checklist of the birds of Panama*. Panama Audubon Society, Panama City.
Angehr, G. R., Engleman, D. & Engleman, L. 2006b. *Where to find birds in Panama: a site guide for birders*. Cornell Univ. Press, Ithaca, NY.
Angehr, G. R., Engleman, D. & Engleman, L. 2008. *A bird-finding guide to Panama*. Cornell Univ. Press, Ithaca, NY.
Atwood, J. L. & Lerman, S. B. 2006. Slate-throated Gnatcatcher (*Polioptila schistaceigula*). Pp. 375–376 *in* del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, vol. 11. Lynx Edicions, Barcelona.
Bierregaard, R. O. 1994. Red-throated Caracara *Daptrius americanus*. P. 249 *in* del Hoyo, J., Elliott, A. & Sargatal, J. (eds.) *Handbook of the birds of the world*, vol. 2. Lynx Edicions, Barcelona.
Bierregaard, R. O., Marks, J. S. & Kirwan, G. M. 2016. Plumbeous Kite (*Ictinia plumbea*). *In* del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the birds of the world Alive*. Lynx Edicions, Barcelona (retrieved from www.hbw.com/node/52976 on 23 September 2016).

Bostwick, K. 2006. Mechanisms of feather sonation in Aves: unanticipated levels of diversity. *Acta Zool. Sinica* 52 (Suppl.): 68–71.
Bostwick, K. S. & Zyskowski, K. 2001. Mechanical sounds and sexual dimorphism in the Crested Doradito. *Condor* 103: 861–865.
Carvalho Filho, E. P. M., Zorzin, G. & Specht, G. V. 2004. Breeding biology of the King Vulture (*Sarcoramphus papa*) in southeastern Brazil. *Orn. Neotrop*. 15: 219–224.
Chapin, J. 1953. The birds of the Belgian Congo. Part 3. *Bull. Amer. Mus. Nat. Hist*. 75A.
Chesser, R. T. 2004. Molecular systematics of New World suboscine birds. *Mol. Phyl. & Evol*. 32: 11–24.
Christian, D. G. 2001. Nests and nesting behavior of some little known Panamanian birds. *Orn. Neotrop*. 12: 327–336.
Clock, B. 2004. Black-capped Pygmy-tyrant (*Myiornis atricapillus*). P. 316 *in* del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world,* vol. 9. Lynx Edicions, Barcelona.
Clinton-Eitniear, J. 1986. King Vulture conservation and research program. *Endangered Species Tech. Bull*. 3: 1–2.
Crawford, A. J., Ryan, M. J. & Jaramillo, C. A. 2010. A new species of *Pristimantis* (Anura: Strabomantidae) from the Pacific coast of the Darien Province, Panama, with a molecular analysis of its phylogenetic position. *Herpetologica* 66: 192–206.
Crease, A. & Tepedino, I. 2013. Observations at a nest of Crested Eagle *Morphnus guianensis* in the southern Gran Sabana, Venezuela. *Cotinga* 35: 90–93.
Dalfelt, A. & Morales, R. 1978. *Plan maestro, Parque Nacional Darién*. CATIE, Turrialba.
Dzielski, S., Van Doren, B., Hruska, J. P. & Hite, J. M. 2016. Reproductive biology of the Sapayoa (*Sapayoa aenigma*), the 'Old World suboscine' of the New World. *Auk* 133: 347–363.
eBird. 2016. eBird: an online database of bird distribution and abundance. Cornell Lab of Ornithology, Ithaca, NY. www.ebird.org (accessed September 2016).
Ferguson-Lees, J. & Christie, D. A. 2001. *Raptors of the world*. Christopher Helm, London.
Goldman, E. A. 1920. Mammals of Panama. *Smiths. Misc. Coll.* 69: 1–309.
Gradstein, S. R. & Salazar-Allen, N. 1992. Bryophyte diversity along an altitudinal gradient in Dárien National Park, Panama. *Trop. Bryology* 5: 61–71.
Greeney, H. F., Krabbe, N., Lysinger, M. & Funk, W. C. 2004. Observations on the breeding and vocalizations of the Fulvous-breasted Flatbill (*Rhynchocyclus fulvipectus*) in eastern Ecuador. *Orn. Neotrop*. 15: 365–370.
Griscom, L. 1929. A collection of birds from Cana, Danen. *Bull. Mus. Comp. Zool.* 69: 148–190.
Haffer, J. 1975. Avifauna of northwestern Colombia, South America. *Bonn. Zool. Monogr*. 7.
Hespenheide, H. 1980. Bird community structure in two Panama forests: residents, migrants, and seasonality during the non-breeding season. Pp. 227–237 *in* Keats, A. & Morton. E.S. (eds.) *Migrant birds in the Neotropics: ecology, behavior, distribution, and conservation*. Smithsonian Institution Press, Washington DC.
Hidalgo, J., Ryder, T. B., Tori, W. P., Durães, R., Blake, J. G. & Loiselle, B. A. 2008. Nest architecture and placement of three manakin species in lowland Ecuador. *Cotinga* 29: 57–61.
Hilty, S. L. 2003. *Birds of Venezuela*. Princeton Univ. Press.
Hilty, S. L. & Brown, W. L. 1986. *A guide to the birds of Colombia*. Princeton Univ. Press.
Ibáñez D., R. & Crawford, A. J. 2004. A new species of *Eleutherodactylus* (Anura: Leptodactylidae) from the Darién Province, Panamá. *J. Herpetology* 38: 240–243.
Irestedt, M., Ohlson, J. I., Zuccon, D., Källersjö, M. & Ericson, P. G. 2006. Nuclear DNA from old collections of avian study skins reveals the evolutionary history of the Old World suboscines (Aves, Passeriformes). *Zool. Scripta* 35: 567–580.
IUCN. 1992. *Protected areas of the world: a review of national systems*, vol. 4. IUCN, Gland & Cambridge, UK.
Jones, H. L. & Komar, O. 2014. Central America. *North Amer. Birds* 67: 525–531.
Jones, H. L. & Komar, O. 2015. Central America. *North Amer. Birds* 68: 435–440.
Lambert, F. R. & Woodcock, M. 1996. *Pittas, broadbills and asities*. Pica Press, Robertsbridge.
McDade, L. A. 1994. *La Selva: ecology and natural history of a Neotropical rain forest*. Univ. of Chicago Press.
Moyle, R. G., Chesser, R. T., Prum, R. O., Schikler, P. & Cracraft, J. 2006. Phylogeny and evolutionary history of Old World suboscine birds (Aves: Eurylaimides). *Amer. Mus. Novit*. 3544: 1–22.
Myers, C. W., Ibáñez, R. D. & Cadle, J.E. 2007. On the uniquely fragmented distribution of a rare Panamanian snake, *Dipsas nicholsi* (Colubridae: Dipsadinae). *Amer. Mus. Novit*. 3554: 1–18.
Narish, A. & Jenner, T. 2004. Notes on the Red-throated Caracara *Ibycter americanus* in Honduras. *Cotinga* 22: 100.
Pearman, M. 2001. Notes and range extensions of some poorly known birds of northern Argentina. *Cotinga* 16: 76–80.
Pegan, T. M., Hruska, J. P. & Hite, J.M. 2013. A newly described call and mechanical noise produced by the Black-and-crimson Pitta *Pitta ussheri*. *Forktail* 29: 160–162.
Remsen, J. V. 2003. Double-banded Greytail (*Xenerpestes minlosi*). P. 319 *in* del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, vol. 8. Lynx Edicions, Barcelona.
Remsen, J. V., Hyde, M. A. & Chapman, A. 1993. The diets of Neotropical trogons, motmots, barbets and toucans. *Condor* 95: 178–192.

Ridgely, R. S. & Gwynne, J. A. 1989. *A guide to the birds of Panama, with Costa Rica, Nicaragua, and Honduras*. Second edn. Princeton Univ. Press.
Robbins, M. B., Parker, T. A. & Allen, S. E. 1985. The avifauna of Cerro Pirre, Darién, eastern Panama. Pp. 198–232 *in* Buckley, P. A., Foster, M. S., Morton, E. S., Ridgely, R. S. & Buckey, F. G. (eds.) *Neotropical ornithology*. Orn. Monogr. 36.
Robinson, W. D., Angehr, G. R., Robinson, T. R., Petit, L. J., Petit, D. R. & Brawn, J. D. 2004. Distribution of bird diversity in a vulnerable Neotropical landscape. *Conserv. Biol*. 18: 510–518.
Round, P. D. 2002. Systematic notes on Asian birds. 30. An undescribed acoustic display of the Eared Pitta *Anthocincla phayrei* Blyth, 1863. *Zool. Verhand*. 340: 197–199.
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.
Servat, G., Wilson, D. & Sandoval, A. 1996. An annotated list of birds of the BIOLAT Biological Station at Pakitza, Perú. Pp. 555–576 *in* Wilson, D. E. & Sandoval, A. (eds.) *Manu: the biodiversity of southeastern Peru*. Smithsonian Institution Press, Lima.
Siegel, D. C., Olson, S. L. & Wetmore, A. 2008. *The birds of the Republic of Panama: ornithological gazetteer and bibliography*. Buteo Books, Shipman, VA.
Short, L. & Horne, J. F. 2001. *Toucans, barbets, and honeyguides*, vol 8. Oxford Univ. Press.
Skutch, A. F. 1949. Life history of the ruddy quail-dove. *Condor* 51: 3–19.
Skutch, A. F. 1960. *Life histories of Central American birds*, II. Pacific Coast Avifauna 34. Cooper Orn. Soc., Berkeley, CA.
Skutch, A. F. 1964. Life histories of hermit hummingbirds. *Auk* 81: 5–25.
Skutch, A. F. 1969. *Life histories of Central American birds*, III. Pacific Coast Avifauna 35. Cooper Orn. Soc., Berkeley, CA.
Snow, D. W. 2004. Black-tipped Cotinga (*Carpodectes hopkei*). P. 98 *in* del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world,* vol. 9. Lynx Edicions, Barcelona.
Snyder, N. F. 2000. *Parrots: status survey and conservation action plan 2000–2004*. IUCN, Gland & Cambridge, UK
Stattersfield, A. J., Crosby, M. J., Long, A. J. & Wege, D. C. 1998. *Endemic Bird Areas of the world: priorities for biodiversity conservation*. BirdLife International, Cambridge, UK.
Stiles, F. G. & Skutch, A. F. 1989. *A guide to the birds of Costa Rica*. Christopher Helm, London.
Stouffer, P. C. & Bierregaard, R. O. 1995. Use of Amazonian forest fragments by understory insectivorous birds. *Ecology* 76: 2429–2445.
Thiollay, J. M. 1989. Area requirements for the conservation of rain forest raptors and game birds in French Guiana. *Conserv. Biol*. 3: 128–137.
Todd, W. E. C. & Carriker, M. A. 1922. The birds of the Santa Marta region of Colombia: a study in altitudinal distribution. *Ann. Carnegie Mus*. 14: 3–611.
Vargas, G., Mosquera, R. & Watson, M. 2006. Crested Eagle (*Morphnus guianensis*) feeding a post-fledged young Harpy Eagle (*Harpia harpyja*) in Panama. *Orn. Neotrop*. 17: 581–584.
Wetmore, A. 1953. Further additions to the birds of Panama and Colombia. *Smiths. Misc. Coll.* 122: 1–12.
Wetmore, A. 1965. *The birds of the Republic of Panamá*, vol. 1. Smithsonian Institution Press, Washington DC.
Wetmore, A. 1968. *The birds of the Republic of Panamá*, vol. 2. Smithsonian Institution Press, Washington, DC.
Wetmore, A. 1972. *The birds of the Republic of Panamá*, vol. 3. Smithsonian Institution Press, Washington DC.
Wetmore, A., Pasquier, R. F. & Olson, S. L. 1984. *The birds of the Republic of Panamá*, vol. 4. Smithsonian Institution Press, Washington DC.
Whitacre, D. F., López, J. & López, G. 2013. Crested Eagle. Pp. 164–184 *in* Whitacre, D. F. (ed.) *Neotropical birds of prey: biology and ecology of a forest raptor community*. Cornell Univ. Press, Ithaca, NY.
Whitney, B. M., Pacheco, J. F., Fonseca, P. S. M. & Barth, R. H. 1996. The nest and nesting ecology of *Acrobatornis fonsecai* (Furnariidae), with implications for intrafamilial relationships. *Wilson Bull*. 108: 434–448.
Willis, E. O. & Eisenmann, E. 1979. A revised list of birds of Barro Colorado Island, Panama. *Smiths. Contrib. Zool*. 291: 1–31.
Willis, E. O. 1981. *Momotus momota* and *Baryphthengus martii* (Momotidae) as army ant followers. *Ciência e Cultura* 33: 1636–1640.
Willis, E. O., Wechsler, D. & Kistler, S. 1982. *Galbula albirostris* (Aves, Galbulidae), *Trogon rufus*, (Trogonidae), and *Electron platyrinchum* (Momotidae) as army ant followers. *Rev. Brasil. Biol*. 42: 761–766.

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Appendix 1

List of species encountered in the northern Serranía de Pirre, Panama. Most surveys were conducted in the Rancho Frío vicinity, with opportunistic observations along the Tuira River and El Real–Rancho Frío road. Documentation: SP = specimen; P = photograph; R = sound-recording; V = video-recording, SH = seen or heard only. Global conservation status categories (in brackets): E = Endangered; VU = Vulnerable; NT = Near Threatened.

English name	Scientific name	Tuira River	Rancho Frío	El Real–Rancho Frío	Documentation
TINAMIDAE					
Little Tinamou	*Crypturellus soui*		x	x	SH
Great Tinamou (NT)	*Tinamus major*		x	x	SH
CRACIDAE					
Great Curassow (VU)	*Crax rubra*		x		SH
ODONTOPHORIDAE					
Marbled Wood Quail (NT)	*Odontophorus gujanensis*		x		SH
CICONIIDAE					
Wood Stork	*Mycteria americana*	x			SH
PHALACROCORACIDAE					
Neotropic Cormorant	*Phalacrocorax brasilianus*	x			SH
ARDEIDAE					
Rufescent Tiger Heron	*Tigrisoma lineatum*		x	x	SH
Great Blue Heron	*Ardea herodias*	x			SH
Cocoi Heron	*Ardea cocoi*	x			SH
Little Blue Heron	*Egretta caerulea*	x			SH
Green Heron	*Butorides virescens*	x			SH
CATHARTIDAE					
Black Vulture	*Coragyps atratus*	x	x	x	SH
Turkey Vulture	*Cathartes aura*	x	x	x	SH
King Vulture	*Sarcoramphus papa*		x	x	P,V,SH
ACCIPITRIDAE					
Swallow-tailed Kite	*Elanoides forficatus*		x	x	P, V, SH
Crested Eagle (NT)	*Morphnus guianensis*		x		P, V, SH
Harpy Eagle (NT)	*Harpia harpyja*		x		P, V, SH
Black Hawk-Eagle	*Spizaetus tyrannus*		x	x	P, V, SH
Ornate Hawk-Eagle (NT)	*Spizaetus ornatus*		x		SH
Plumbeous Kite	*Ictinia plumbea*		x		SH
Plumbeous Hawk (VU)	*Cryptoleucopteryx plumbea*		x		P, V, SH
Great Black Hawk	*Buteogallus urubitinga*	x	x	x	P, V, SH
Roadside Hawk	*Rupornis magnirostris*		x	x	SH
White Hawk	*Pseudastur albicollis*		x		P, V, SH
Semiplumbeous Hawk	*Leucopternis semiplumbeus*		x		P, V, SH
EURYPYGIDAE					
Sunbittern	*Eurypygya helias*		x		P, SH
COLUMBIDAE					
Pale-vented Pigeon	*Patagioenas cayennensis*		x	x	SH
Plumbeous Pigeon	*Patagioenas plumbea*		x		SH
Ruddy Pigeon (VU)	*Patagioenas subvinacea*		x		SH
Plain-breasted Ground Dove	*Columbina minuta*	x			SH

English name	Scientific name	Tuira River	Rancho Frío	El Real–Rancho Frío	Documentation
Blue Ground Dove	*Claravis pretiosa*		x		SH
Ruddy Quail-Dove	*Geotrygon montana*		x		P, V, SH
Violaceous Quail-Dove	*Geotrygon violacea*		x		SH
Olive-backed Quail-Dove	*Leptotrygon veraguensis*		x		SH
Grey-chested Dove	*Leptotila cassinii*		x		SH
CUCULIDAE					
Squirrel Cuckoo	*Piaya cayana*		x	x	SH
Striped Cuckoo	*Tapera naevia*	x			SH
Greater Ani	*Crotophaga major*	x		x	SH
Smooth-billed Ani	*Crotophaga ani*	x			SH
STRIGIDAE					
Vermiculated Screech Owl	*Megascops guatemalae*		x		SH
Crested Owl	*Lophostrix cristata*		x		SP, SH
Spectacled Owl	*Pulsatrix perspicillata*		x		P, SH
Central American Pygmy Owl	*Glaucidium griseiceps*		x		SH
CAPRIMULGIDAE					
Short-tailed Nighthawk	*Lurocalis semitorquatus*		x		SH
APODIDAE					
White-collared Swift	*Streptoprocne zonaris*		x	x	SH
Band-rumped Swift	*Chaetura spinicaudus*		x	x	SH
Short-tailed Swift	*Chaetura brachyura*		x	x	SH
TROCHILIDAE					
White-tipped Sicklebill	*Eutoxeres aquila*		x		P, V, SH
Band-tailed Barbthroat	*Threnetes ruckeri*		x		SH
Long-billed Hermit	*Phaethornis longirostris*		x	x	P, V, SH
Pale-bellied Hermit	*Phaethornis anthophilus*			x	SH
Stripe-throated Hermit	*Phaethornis striigularis*		x	x	SH
Tooth-billed Hummingbird	*Androdon aequatorialis*		x		SH
Black-throated Mango	*Anthracothorax nigricollis*			x	SH
Crowned Woodnymph	*Thalurania colombica*		x		SH
Violet-bellied Hummingbird	*Damophila julie*		x		SH
Violet-headed Hummingbird	*Klais guimeti*		x		SH
Green Thorntail	*Discosura conversii*		x		SH
White-vented Plumeleteer	*Chalybura buffoni*		x		SH
Purple-crowned Fairy	*Heliothryx barroti*		x		SH
TROGONIDAE					
Slaty-tailed Trogon	*Trogon massena*		x	x	SH
Black-tailed Trogon	*Trogon melanurus*		x		SH
White-tailed Trogon	*Trogon chionurus*		x		SH
Gartered Trogon	*Trogon caligatus*		x	x	SH
Black-throated Trogon	*Trogon rufus*		x		SH
MOMOTIDAE					
Tody Motmot	*Hylomanes momotula*		x		P, SH
Blue-crowned Motmot	*Momotus momota*		x	x	SH
Rufous Motmot	*Baryphthengus martii*		x		SH

English name	Scientific name	Tuira River	Rancho Frío	El Real–Rancho Frío	Documentation
Broad-billed Motmot	*Electron platyrhynchum*		x		SH
ALCEDINIDAE					
Amazon Kingfisher	*Chloroceryle amazona*	x	x	x	SH
Green Kingfisher	*Chloroceryle americana*	x	x		SH
BUCCONIDAE					
White-necked Puffbird	*Notharchus hyperrhynchus*		x	x	SH
Black-breasted Puffbird	*Notharchus pectoralis*		x		SH
Pied Puffbird	*Notharchus tectus*		x		P, V, SH
Barred Puffbird	*Nystalus radiatus*		x		SH
White-whiskered Puffbird	*Malacoptila panamensis*		x		SH
Grey-cheeked Nunlet	*Nonnula frontalis*		x	x	P, V, SH
White-fronted Nunbird	*Monasa morphoeus*		x		P, V, SH
GALBULIDAE					
Great Jacamar	*Jacamerops aureus*		x	x	P, V, SH
Rufous-tailed Jacamar	*Galbula ruficauda*			x	SH
CAPITONIDAE					
Spot-crowned Barbet	*Capito maculicoronatus*		x		P, V, SH
RAMPHASTIDAE					
Collared Aracari	*Pteroglossus torquatus*		x	x	SH
Yellow-eared Toucanet	*Selenidera spectabilis*		x		SH
Black-mandibled Toucan	*Ramphastos ambiguus*		x	x	SH
Keel-billed Toucan	*Ramphastos sulfuratus*		x	x	SH
PICIDAE					
Olivaceous Piculet	*Picumnus olivaceus*		x		SH
Black-cheeked Woodpecker	*Melanerpes pucherani*		x	x	SH
Red-crowned Woodpecker	*Melanerpes rubricapillus*		x	x	SH
Spot-breasted Woodpecker	*Colaptes punctigula*	x			SH
Cinnamon Woodpecker	*Celeus loricatus*		x		SH
Lineated Woodpecker	*Dryocopus lineatus*		x	x	SH
Crimson-bellied Woodpecker	*Campephilus haematogaster*		x		SH
Crimson-crested Woodpecker	*Campephilus melanoleucos*		x		SH
FALCONIDAE					
Slaty-backed Forest Falcon	*Micrastur mirandollei*		x		SH
Collared Forest Falcon	*Micrastur semitorquatus*		x		SH
Red-throated Caracara	*Ibycter americanus*		x		P, V, SH
Laughing Falcon	*Herpetotheres cachinnans*		x	x	SH
American Kestrel	*Falco sparverius*			x	SH
Bat Falcon	*Falco rufigularis*		x		SH
PSITTACIDAE					
Orange-chinned Parakeet	*Brotogeris jugularis*	x	x	x	SH
Brown-hooded Parrot	*Pyrilia haematotis*		x		SH
Saffron-headed Parrot (NT)	*Pyrilia pyrilia*		x		
Blue-headed Parrot	*Pionus menstruus*		x		P, SH, R
Red-lored Parrot	*Amazona autumnalis*		x		SH
Mealy Parrot (NT)	*Amazona farinosa*		x		SH

English name	Scientific name	Tuira River	Rancho Frío	El Real–Rancho Frío	Documentation
Spectacled Parrotlet	*Forpus conspicillatus*	x		x	SH
Great Green Macaw (EN)	*Ara ambiguus*		x		SH
Blue-and-yellow Macaw	*Ara ararauna*		x		SH
Red-and-green Macaw	*Ara chloropterus*		x		P, V, SH
SAPAYOAIDAE					
Sapayoa	*Sapayoa aenigma*		x		SP, P, V, SH, R
THAMNOPHILIDAE					
Black-crowned Antshrike	*Thamnophilus atrinucha*		x		SH
Russet Antshrike	*Thamnistes anabatinus*		x		SH
Spot-crowned Antvireo	*Dysithamnus puncticeps*		x		SH
Plain Antvireo	*Dysithamnus mentalis*		x		SH
Checker-throated Antwren	*Epinecrophylla fulviventris*		x		SH
Pacific Antwren	*Myrmotherula pacifica*		x		SH
Moustached Antwren	*Myrmotherula ignota*		x		SH
White-flanked Antwren	*Myrmotherula axillaris*		x	x	SH
Dot-winged Antwren	*Microrhopias quixensis*		x	x	SH
Dusky Antbird	*Cercomacra tyrannina*		x	x	SH
Chestnut-backed Antbird	*Myrmeciza exsul*		x	x	SH, R
Dull-mantled Antbird	*Myrmeciza laemosticta*		x		P, SH, R
Wing-banded Antbird	*Myrmornias torquata*		x		P, SH, R
Bicoloured Antbird	*Gymnopithys bicolor*		x		SH
Spotted Antbird	*Hylophylax naevioides*		x	x	SH
Ocellated Antbird	*Phaenostictus mcleannani*		x		P, SH
CONOPOPHAGIDAE					
Black-crowned Antpitta	*Pittasoma michleri*		x		P, V, SH, R
GRALLARIDAE					
Streak-chested Antpitta	*Hylopezus perspicillatus*		x	x	SP, P, V, SH, R
FORMICARIIDAE					
Black-faced Antthrush	*Formicarius analis*		x	x	SH
FURNARIIDAE					
Scaly-throated Leaftosser	*Sclerurus guatemalensis*		x		SH
Long-tailed Woodcreeper	*Deconychura longicauda*		x		SH
Plain-brown Woodcreeper	*Dendrocincla fuliginosa*		x	x	SH
Wedge-billed Woodcreeper	*Glyphorynchus spirurus*		x	x	SH
Northern Barred Woodcreeper	*Dendrocolaptes sanctithomae*		x	x	SH
Cocoa Woodcreeper	*Xiphorhynchus susurrans*		x	x	SH
Black-striped Woodcreeper	*Xiphorhynchus lachrymosus*		x		SH
Streak-headed Woodcreeper	*Lepidocolaptes souleyetti*		x	x	SH
Plain Xenops	*Xenops minutus*		x	x	SH
Slaty-winged Foliage-gleaner	*Philydor fuscipenne*		x		P, SH, R
Buff-throated Foliage-gleaner	*Automolus ochrolaemus*		x		SH
Double-banded Greytail	*Xenerpestes minlosi*		x	x	P, V, SH
TYRANNIDAE					
Brown-capped Tyrannulet	*Ornithion brunneicapillus*		x	x	SH
Olive-striped Flycatcher	*Mionectes olivaceus*		x		SH

English name	Scientific name	Tuira River	Rancho Frío	El Real–Rancho Frío	Documentation
Paltry Tyrannulet	*Zimmerius vilissimus*		x	x	SH
Yellow-crowned Tyrannulet	*Tyrannulus elatus*		x	x	SH
Forest Elaenia	*Myiopagius gaimardii*		x		SH
Black-capped Pygmy Tyrant	*Myiornis atricapillus*		x	x	P, V, SH
Southern Bentbill	*Oncostoma olivaceum*		x		SH
Brownish Twistwing	*Cnipodectes subbrunneus*		x		SH, R
Olivaceous Flatbill	*Rhynchocyclus olivaceus*		x		P, V, SH
Yellow-margined Flycatcher	*Tolmomyias assimilis*		x		SH
Golden-crowned Spadebill	*Platyrinchus coronatus*		x		P, V, SH
Ruddy-tailed Flycatcher	*Terenotriccus erythrurus*		x		SH
Sulphur-rumped Flycatcher	*Myiobius sulphureipygius*		x		P, V, SH
Bright-rumped Attila	*Attila spadiceus*		x		SH
Chocó Sirystes	*Sirystes albogriseus*		x	x	SH
Rufous Mourner	*Rhytipterna holerythra*		x		SH
Dusky-capped Flycatcher	*Myiarchus tuberculifer*		x		SH
Great Kiskadee	*Pitangus sulphuratus*	x	x	x	SH
Grey-capped Flycatcher	*Myiozetetes granadensis*		x		SH
White-ringed Flycatcher	*Conopias albovittatus*		x		SH
Streaked Flycatcher	*Myiodynastes maculatus*		x		SH
Piratic Flycatcher	*Legatus leucophaius*		x	x	SH
Tropical Kingbird	*Tyrannus melancholicus*	x	x	x	SH
COTINGIDAE					
Purple-throated Fruitcrow	*Querula purpurata*		x	x	SH
Blue Cotinga	*Cotinga nattererii*		x	x	SH
Rufous Piha	*Lipaugus unirufus*		x		SH
Black-tipped Cotinga	*Carpodectes hopkei*		x		SH
PIPRIDAE					
Blue-crowned Manakin	*Lepidothrix coronata*		x	x	SH
Golden-collared Manakin	*Manacus vitellinus*		x	x	SH
Golden-headed Manakin	*Ceratopipra erythrocephala*		x		P, SH, R
TITYRIDAE					
Black-crowned Tityra	*Tityra inquisitor*		x	x	SH
Masked Tityra	*Tityra semifasciata*		x	x	SH
Russet-winged Schiffornis	*Schiffornis stenorhyncha*		x	x	SH
White-winged Becard	*Pachyramphus polychopterus*		x	x	SH
VIREONIDAE					
Tawny-crowned Greenlet	*Tunchiornis ochraceiceps*		x		SH
Lesser Greenlet	*Pachysylvia decurtata*		x	x	SH
Yellow-browed Shrike-Vireo	*Vireolanius eximius*		x		SH
CORVIDAE					
Black-chested Jay	*Cyanocorax affinis*		x	x	SH
HIRUNDINIDAE					
Southern Rough-winged Swallow	*Stelgidopteryx ruficollis*	x		x	SH
Grey-breasted Martin	*Progne chalybea*	x		x	SH
Mangrove Swallow	*Tachycineta albilinea*	x			SH

English name	Scientific name	Tuira River	Rancho Frío	El Real–Rancho Frío	Documentation
TROGLODYTIDAE					
Scaly-breasted Wren	*Microcerculus marginatus*		x		SH
House Wren	*Troglodytes aedon*	x		x	SH
Bay Wren	*Cantorchilus nigricapillus*				SH, R
White-breasted Wood Wren	*Henicorhina leucosticta*		x	x	SH
Song Wren	*Cyphorhinus phaeocephalus*		x	x	SH
White-headed Wren	*Campylorhynchus albobrunneus*		x		SH
Sooty-headed Wren	*Pheugopedius spadix*		x		SH
Stripe-throated Wren	*Cantorchilus leucopogon*		x		SH
POLIOPTILIDAE					
Tawny-faced Gnatwren	*Microbates cinereiventris*		x		SH
Slate-throated Gnatcatcher	*Polioptila schistaceigula*		x	x	SH
TURDIDAE					
Clay-coloured Thrush	*Turdus grayi*	x	x	x	SH
PARULIDAE					
Buff-rumped Warbler	*Myiothlypis fulvicauda*		x	x	P, V, SH
THRAUPIDAE					
White-shouldered Tanager	*Tachyphonus luctuosus*		x	x	SH
Blue Dacnis	*Dacnis cayana*		x	x	SH
Purple Honeycreeper	*Cyanerpes caeruleus*		x		SH
Red-legged Honeycreeper	*Cyanerpes cyaneus*		x	x	SH
Shining Honeycreeper	*Cyanerpes lucidus*		x	x	SH
Scarlet-browed Tanager	*Heterospingus xanthopygius*		x		SH
Yellow-backed Tanager	*Hemithraupis flavicollis*		x		SH
Blue-grey Tanager	*Thraupis episcopus*	x	x	x	SH
Variable Seedeater	*Sporophila corvina*	x		x	SH
Thick-billed Seed Finch	*Sporophila funerea*			x	SH
Bananaquit	*Coereba flaveola*		x	x	SH
Dusky-faced Tanager	*Mitrospingus cassinii*		x		SH
Slate-coloured Grosbeak	*Saltator grossus*		x	x	SH
CARDINALIDAE					
Lemon-spectacled Tanager	*Chlorothraupis olivacea*		x		P, SH
Blue-black Grosbeak	*Cyanocompsa cyanoides*		x		SH
ICTERIDAE					
Red-breasted Blackbird	*Sturnella militaris*			x	SH
Scarlet-rumped Cacique	*Cacicus uropygialis*		x	x	SH
Yellow-rumped Cacique	*Cacicus cela*		x	x	SH
Yellow-backed Oriole	*Icterus chrysater*			x	SH
Crested Oropendola	*Psarocolius decumanus*		x	x	SH
Black Oropendola	*Psarocolius guatimozinus*		x		P, SH
FRINGILLIDAE					
Thick-billed Euphonia	*Euphonia laniirostris*		x	x	SH
Fulvous-vented Euphonia	*Euphonia fulvicrissa*		x		SH
Orange-bellied Euphonia	*Euphonia xanthogaster*		x		SH

Range extensions and noteworthy records of birds from the Serranía de Abibe, north-west Colombia

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Summary.—Despite many avifaunal surveys in north-west Colombia and the Chocó biogeographical region during the past two decades, there have been no such assessments at the northern end of the West Andes, especially of the poorly known Serranía de Abibe. Here we present range extensions and new localities for 41 species in the Urabá region, on the Pacific slope of the West Andes. Most of these records were made in subtropical forests, above 1,000 m. Significant range extensions are reported for Baudó Guan *Penelope ortoni*, Blue-fronted Parrotlet *Touit dilectissimus*, Lined Quail-Dove *Zentrygon linearis*, Velvet-purple Coronet *Boissonneaua jardini*, Toucan Barbet *Semnornis ramphastinus*, Crimson-rumped Toucanet *Aulacorhynchus haematopygus*, Yellow-breasted Antpitta *Grallaria flavotincta*, Buffy Tuftedcheek *Pseudocolaptes lawrencii*, Long-wattled Umbrellabird *Cephalopterus penduliger*, Black-winged Saltator *Saltator atripennis*, Ochre-breasted Tanager *Chlorothraupis stolzmanni*, Golden-bellied Warbler *Myiothlypis chrysogaster* and Baudó Oropendola *Psarocolius cassini*. New localities are presented for Violet-headed Hummingbird *Klais guimeti* and Recurve-billed Bushbird *Clytoctantes alixii*. These findings demonstrate that knowledge of avifaunal distributions in Colombia is far from complete.

The number of localities surveyed for birds in the West Andes has increased in the last two decades, producing numerous noteworthy range extensions (Salaman 1994, Donegan & Dávalos 1999, Donegan *et al*. 2002, Cuervo *et al*. 2003, Krabbe *et al*. 2006, Echeverry-Galvis & Córdoba-Córdoba 2007, López-Ordóñez *et al*. 2013), and even previously undescribed species (Barrera *et al*. 2010, Krabbe & Cadena 2010, Sánchez-González *et al*. 2014). However, there are no published assessments of the avifauna on the Pacific slope north of Las Orquídeas National Park (Echeverri 1986) and Páramo de Frontino in dpto. Antioquia (Flórez *et al*. 2004, Krabbe *et al*. 2006). Moreover, although specimens were historically collected at the north end of the Pacific slope of the West Andes, none corresponds to sites above 600 m. Although birds are perhaps the best-studied group of animals in the country, there are still gaps in the distribution of many species, especially in areas where access has historically been difficult due to factors such as the security situation and topography.

Various biogeographical regions converge in north-west South America resulting in a diverse avifauna, from the tropical wet forest of the Chocó region, to the foothills and lower subtropical forests of the West Andes (Cuervo *et al*. 2008a). The West Andes is the lowest and youngest of the three Colombian Andes cordilleras (Cuervo *et al*. 2003) and extends *c*.1,200 km from the Macizo Colombiano in dptos. Nariño and Cauca north to the Paramillo Massif in dptos. Antioquia and Córdoba. In its northernmost part, the cordillera further subdivides into three ranges or serranías: San Jerónimo, Ayapel and Abibe. These have not been the subject of recent ornithological surveys. Here we present range extensions and noteworthy records for 41 species in tropical and subtropical forests on the Pacific slope of the Serranía de Abibe.

Study sites and Methods

We visited the Urabá region between 9 February and 5 March 2011 and conducted surveys at four sites, in tropical and subtropical forests on the west slope at the northern end of the West Andes, at 100–1,500 m, in the Serranía de Abibe. At each locality we sited 10–15 mist-nets strategically within the forest (La Bonga, La Llorona and Chever) or in edge habitats (Mutatasito). Mist-nets were opened from *c*.06.30 h to 12.00 h over 3–4 days. Opportunistic observations and recordings of vocalisations were also made at each site. Observations along the road between Apartadó and Dabeiba municipalities were made on a non-systematic basis in July–December 2010, and yielded the first record of Baudó Oropendola *Psarocolius cassini* in the region. The León River floodplains were also visited during this period, producing the first record of Maguari Stork *Ciconia maguari* in north-west Colombia (Olaciregui *et al*. 2013).

Site 1.—La Bonga (500–800 m: 07°11′07″N, 76°22′33″W). CO & FG visited the site on 13–17 February. The area constitutes a well-preserved forest in the valley between the rivers Bedó and Tasidó, characterised by a dense understorey and canopy.

Site 2.—Mutatasito (07°14′29″N, 76°25′49″W). Located in the basin of the Mutatá River, just 500 m from the town centre. Surveys were undertaken on 19–22 February by CO & FG along the river and Mutatasito Creek, at the ecotone between small pastures and forests of the Serranía de Abibe.

Site 3.—La Llorona Canyon (300–500 m: 07°01′57″N, 76°20′57″W; = La Llorona). At this site the Sucio River forms a deep canyon and the terrain is steep with intact forest. Vegetation is dense, although areas close to the road are disturbed. Surveys were undertaken in an area near the main road, on 23–26 February, by CO & FG.

Site 4.—Alto de Chever (900–1,500 m: 07°05′03″N, 76°22′17″W; = Chever). The study site was on a ridge within the basin of the Chever River. Here a camp was established at 1,000 m elevation and surveys were conducted at 900–1,500 m, by CO & FG on 1–5 March. Forests are well preserved and undisturbed above 500 m.

As main references for avian distributions, we took into account Hilty & Brown (1986), Cuervo *et al*. (2003), Krabbe *et al*. (2006), Echeverry-Galvis & Cordoba-Cordoba (2007), Pulgarín & Múnera (2003), Beckers & Flórez (2013) and McMullan & Donegan (2014), as well as records in Project Biomap (BIOMAP 2006), eBird (Sullivan *et al*. 2009) and SIB Colombia (Colombian Biodiversity Information System, www.sibcolombia.net/web/sib/). We report range extensions >50 km on the west slope of the West Andes; nearby records on the east slope are referenced where relevant, as well as presence at the north end of the Central Andes.

The following localities (listed alphabetically) are also mentioned (see Fig. 1): Alto de Cuevas, dpto. Antioquia (06°39′N, 76°07′W; West Andes), Alto de Pisones, dpto. Risaralda (05°17′N, 75°57′W; West Andes), Anorí, dpto. Antioquia (06°59′N, 75°08′W; Central Andes), Baudó River, dpto. Chocó (05°32′N, 76°59′W; Pacific lowlands), Buritica, dpto. Antioquia (06°40′N, 75°50′W; east slope of West Andes), Camp Albert, dpto. Chocó (07°07′N, 77°23′W; Pacific lowlands), Carmen de Atrato, dpto. Chocó (05°52′N, 76°11′W), Dusky Starfrontlet Bird Reserve, dpto. Antioquia (06°25′N, 76°05′W; West Andes), Frontino, dpto. Antioquia (06°39′N, 76°07′W; West Andes), Hacienda Potreros, Frontino, dpto. Antioquia (06°39′N 76°09′W; West Andes), Juradó River, dpto. Chocó (07°05′N, 77°45′W; Pacific coast), Katíos National Park, dpto. Chocó (07°49′N, 77°11′W; Pacific lowlands), La Balsa, dpto. Antioquia (06°45′N, 76°04′W; West Andes), La Linda, dpto. Antioquia (05°38′N, 75°48′W; West Andes), Las Orquídeas National Park, dpto. Antioquia (06°35′N, 76°16′W; West Andes), Las Tangaras Bird Reserve, dpto. Chocó (05°50′N, 76°11′W; West Andes), Páramo de Frontino,

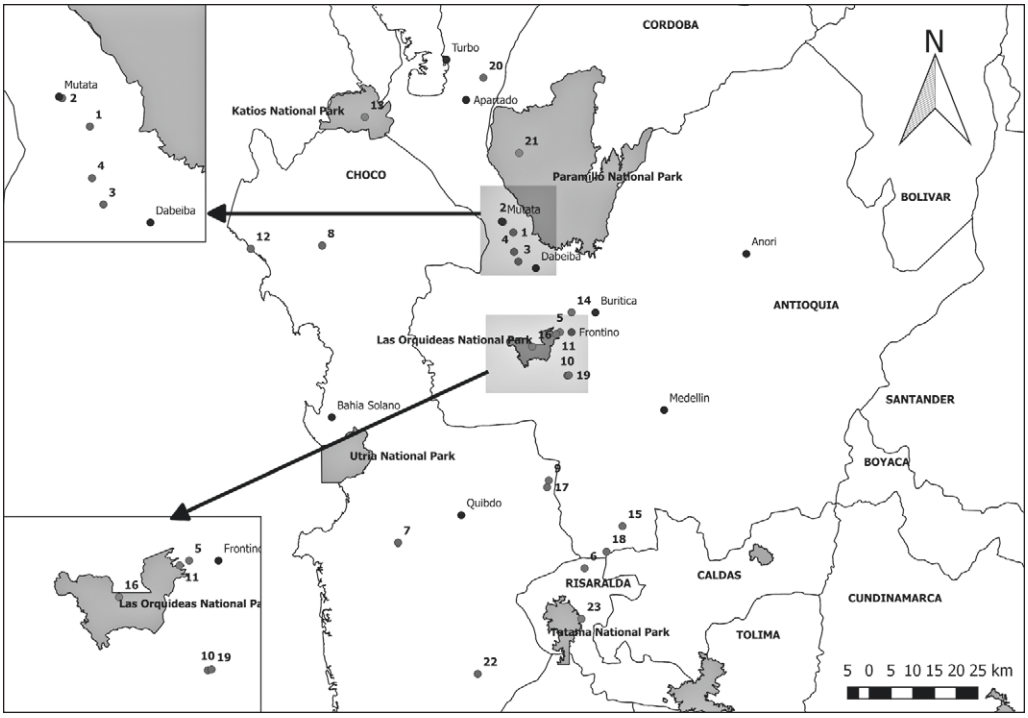

Figure 1. Study sites and important localities in north-west Colombia. 1: La Bonga; 2: Mutatasito; 3: La Llorona; 4: Alto de Chever; 5: Alto de Cuevas; 6: Alto de Pisones; 7: Baudó River; 8: Camp Albert; 9: Carmen de Atrato; 10: Dusky Starfrontlet Bird Reserve; 11: Hacienda Potreros; 12: Juradó River; 13: Katíos National Park: 14: La Balsa; 15: La Linda; 16: Las Orquídeas National Park; 17: Las Tangaras Bird Reserve; 18: Mesenia-Paramillo Natural Reserve; 19 Páramo de Frontino; 20: Saisa; 21: Salvagín River; 22 San José de Palmar; 23: Tatamá National Park.

dpto. Antioquia (06°26'N, 76°05'W; West Andes), Saisa, dpto. Córdoba (08°00'N 76°32'W; West Andes), Salvagín River, dpto. Córdoba (07°36'N, 76°20'W; West Andes), San José de Palmar, dpto. Chocó (06°39'N, 76°33'W; Pacific lowlands) and Tatamá National Park, dpto. Chocó (05°04'N, 76°10'W; West Andes).

Species accounts

Range extensions on the Pacific slope of the West Andes

BAUDÓ GUAN *Penelope ortoni*

Two photographed at La Bonga on 16 February 2011, at *c*.600 m elevation (CO), perched in the subcanopy at the edge of a pasture with the forest. First record for dpto. Antioquia and northernmost in the West Andes. Local people clearly identified the species, as they know it by a different local name from Crested Guan *P. purpurascens*, which was also present at the site. The closest records are specimens taken at Juradó River in 1936, *c*.150 km to the west and in a different mountain range, the Baudó. The species might occur in other foothill forests in the region.

BLUE-FRONTED PARROTLET *Touit dilectissimus*

A group of three was observed foraging in the subcanopy at Chever, at 1,500 m, on 5 March 2011 (CO). Parrotlets were also commonly heard on the preceding days. Although the birds

were photographed in poor light, the small size and short square tail clearly indicate a *Touit*. In the West Andes, the species was previously known north to El Carmen de Atrato municipality (Rangel *et al*. 2004), making the present record an extension of at least 120 km north.

GREENISH PUFFLEG *Haplophaedia aureliae*
At Chever (1,500 m) four were mist-netted and photographed on 3–4 March 2011. The northernmost record in the West Andes. Previously recorded north as far as Frontino municipality in the West Andes, *c*.50 km to the south. Also known from Katíos National Park (Rangel *et al*. 2004).

BROWN INCA *Coeligena wilsoni*
Nine mist-netted at Chever at 1,500 m on 3–4 March 2011 (Fig. 2). The closest known site is Las Orquídeas National Park (= Las Orquídeas NP), 56 km to the south.

VELVET-PURPLE CORONET *Boissonneaua jardini*
Four mist-netted at Chever, at 1,500 m, on 3–4 March 2011 (Fig. 3), extending its presence *c*.170 km from Las Tangaras Bird Reserve (= Las Tangaras). Also recently recorded at Mesenia-Paramillo Nature Reserve, 50 km south of Las Tangaras (Ocampo-Peñuela & Pimm 2015).

WHITE-TAILED HILLSTAR *Urochroa bougueri*
Two mist-netted at Chever, at 1,500 m. The nearest prior locality corresponds to specimens taken 54 km to the south-east at Alto de Cuevas, Frontino municipality, in 1982, and sight records at the Páramo Frontino by Beckers & Flórez (2013).

EMPRESS BRILLIANT *Heliodoxa imperatrix*
An adult female was mist-netted at Chever on 3 March 2011 (Fig. 4). The nearest site where it had been recorded is Las Orquídeas NP, 56 km to the south.

VIOLET-HEADED HUMMINGBIRD *Klais guimeti*
Individuals were mist-netted (once, Fig. 5) and seen at La Bonga, La Llorona and in the foothills at Chever. Rare in Colombia, where it is mainly distributed in the East and Central

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Figure 2. Brown Inca *Coeligena wilsoni*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Figure 3. Velvet-purple Coronet *Boissonneaua jardini*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Figure 4. Female Empress Brilliant *Heliodoxa imperatrix*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Figure 5. Violet-headed Hummingbird *Klais guimeti*, La Bonga, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Figure 6. Female Collared Trogon *Trogon collaris*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Fabián González)

Figure 7. Male Recurve-billed Bushbird *Clytoctantes alixii*, La Llorona, dpto. Antioquia, Colombia, March 2011 (Fabián González)

Figure 8. Tyrannine Woodcreeper *Dendrocincla tyrannina*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Figure 9. Brown-billed Scythebill *Campylorhamphus pusillus*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Andes. In the west it is known from few localities, and ours are the first records for the foothills in the northern West Andes, although it is known from the north end of the Central and East Andes (Donegan *et al*. 2007). In 2009 it was found in gallery forest and open areas in Paramillo National Park (Rodríguez 2016)

COLLARED TROGON *Trogon collaris*
Heard and seen at Chever, a 50 km extension north from Hacienda Potreros (Frontino municipality), where it was collected in 1950. A female was mist-netted at 1,100 m on 4 March 2011 (Fig. 6). Also found at Buritica (Corporación Autónoma Regional del Centro de Antioquia 2009), on the east slope of the West Andes, 64 km south-east of Chever, in Katíos National Park (Rangel *et al*. 1994), as well as at the north end of the Central Andes (Cuervo *et al*. 2008b).

TOUCAN BARBET *Semnornis ramphastinus*
This very distinctive species was observed at Chever, around 1,000 m, on 4 March 2011 (V. Moreno) but was not photographed or sound-recorded. The closest locality where it has been recorded is Las Tangaras, 170 km to the south.

CRIMSON-RUMPED TOUCANET *Aulacorhynchus haematopygus*
One was seen in the subcanopy at Chever at 1,400–1,500 m on 5 March 2011 (CO), extending its occurrence 170 km north from Las Tangaras. Also found at the north end of the Central Andes (Cuervo *et al*. 2008b).

RECURVE-BILLED BUSHBIRD *Clytoctantes alixii*
A male of this globally threatened species was mist-netted at La Llorona on 23 February 2011 (Fig. 7), a new locality. Unlike other sites where the species occurs (Laverde & Stiles 2007), the vegetation at La Llorona is not dominated by any species of bamboo (Poaceae), as is true for populations in the Central Andes (Colorado 2008). No records in the West Andes since 1965, when a female was observed at Saisa, on the east slope of the Serranía de Abibe. The closest site where the species had been recorded is the Salvagín River, 57 km to the north (in Paramillo National Park). Our record adds to the increasing number of localities where this rare species has been found (Laverde & Stiles 2007, Colorado 2008, Donegan *et al*. 2010, Donegan 2012).

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Figure 10. Buffy Tuftedcheek *Pseudocolaptes lawrencii*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Figure 11. Streak-necked Flycatcher *Mionectes striaticollis*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Figure 12. Long-wattled Umbrellabird *Cephalopterus penduliger*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Fabián González)

Figure 13. Black Solitaire *Entomodestes coracinus*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Figure 14. Golden-bellied Warbler *Myiothlypis chrysogaster*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Figure 15. Adult Baudó Oropendola *Psarocolius cassini* and nest, La Llorona, dpto. Antioquia, Colombia, March 2011 (Christian Olaciregui)

Figure 16. Lined Quail-Dove *Zentrygon linearis*, Alto de Chever, dpto. Antioquia, Colombia, March 2011 (Fabián González)


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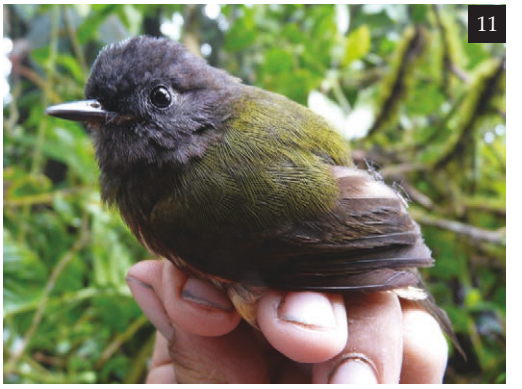
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YELLOW-BREASTED ANTPITTA *Grallaria flavotincta*
Regularly heard and sound-recorded (XC297172; www.xeno-canto.org) at Chever, at 1,000–1,500 m. The nearest site where it had been recorded is Las Orquídeas NP, 56 km to the south.

TYRANNINE WOODCREEPER *Dendrocincla tyrannina*
A single of this widely distributed but rare and local species was mist-netted at 1,500 m at Chever on 3 March 2011 (Fig. 8). The closest records are from Páramo de Frontino (Antioquia), 74 km to the south-east (Flórez *et al*. 2004).

BROWN-BILLED SCYTHEBILL *Campylorhamphus pusillus*
One mist-netted at Chever on 4 March 2011 (Fig. 9). The previous northernmost record in the West Andes was a specimen from Hacienda Potreros, Frontino municipality, in 1950, some 55 km further south. Also recorded at the north end of the Central Andes (Cuervo *et al*. 2008b).

BUFFY TUFTEDCHEEK *Pseudocolaptes lawrencii*
Two mist-netted at Chever on 3–4 March 2011 (Fig. 10) represents the northernmost record in the West Andes; previously known as far north as Las Tangaras, 170 km further south,

SCALY-THROATED FOLIAGE-GLEANER *Anabacerthia variegaticeps*
One mist-netted at Chever on 4 March 2011 is the northernmost record in the West Andes; previously known as far north as Las Orquídeas NP, 56 km to the south.

FULVOUS-DOTTED TREERUNNER *Margarornis stellatus*
A single of this Near Threatened species was seen at Chever, at 1,500 m, on 5 March 2011, moving through the canopy (CO). The nearest known site is Las Orquídeas NP, 56 km to the south.

STREAK-NECKED FLYCATCHER *Mionectes striaticollis*
One mist-netted at Chever at 1,500 m on 4 March 2011 (Fig. 11). Identified by the grey crown and nape characteristic of *M. s. columbianus*, which also occurs at the north end of the Central Andes (Cuervo *et al*. 2008b). In the West Andes, previously known as far north as the municipality of Buritica (on the east slope), thus our record is an extension of 65 km to the north-west.

SCALE-CRESTED PYGMY-TYRANT *Lophotriccus pileatus*
Observed and mist-netted (twice) at Chever at 1,000–1,500 m on 3–4 March 2011, extending its distribution 50 km north from Hacienda Potreros (Frontino municipality), where it was known from a specimen taken in 1950. This common species also occurs at the north end of the Central Andes (Cuervo *et al*. 2008b).

SLATE-HEADED TODY FLYCATCHER *Poecilotriccus sylvia*
One seen at La Llorona on 25 March 2011 (FG). Historically not known to occur on the Pacific slope of the West Andes (except in the middle Dagua Valley at Cisneros; Hilty & Brown 1986), more recently the species has been seen by many birdwatchers in this region, as far north as Urrao and Buritica (eBird 2016). This would be the first record for the Pacific slope in the northern West Andes, but it was also recorded in various habitats at Paramillo National Park in 2009 (Rodríguez 2016).

LONG-WATTLED UMBRELLABIRD *Cephalopterus penduliger*
A pair photographed in mature forest at Chever, at 1,100 m, on 3 March 2011 (FG; Fig. 12). The northernmost record to date: the nearest is a specimen from San Jose del Palmar (dpto. Chocó) in 1988, *c*.230 km further south, with recent observations at several sites in the Buenaventura area, more than 300 km to the south (eBird 2016).

GOLDEN-WINGED MANAKIN *Masius chrysopterus*
Five mist-netted at Chever at 1,000–1,500 m on 4–5 March 2011, representing the species' northernmost locality. The nearest site where it had been recorded is Las Orquídeas NP, 56 km to the south. Also occurs at the north end of the Central Andes (Cuervo *et al*. 2008b) where it is common.

CLUB-WINGED MANAKIN *Machaeropterus deliciosus*
First records for dpto. Antioquia, the species being found at two localities: Chever and La Bonga. Although previously known as far north as Alto de Pisones, municipality of Mistrató (dpto. Risaralda), it has also been found recently at Las Tangaras, which is the closest known locality, 170 km to the south (Collazos-Gonzáles & Cortés-Herrera 2015).

SHARPE'S WREN *Cinnycerthia olivascens*
A group of four was seen at Chever, at 1,400 m on 5 March 2011, moving through the understorey (CO). This extends the species' range in the West Andes *c*.75 km north-west from the Dusky Starfrontlet Bird Reserve, Páramo de Frontino (eBird 2016).

BLACK SOLITAIRE *Entomodestes coracinus*
Observed frequently on 3–5 March 2011 and mist-netted three times at Chever at 1,500 m (CO; Fig. 13). Beckers & Flórez (2013) reported this near-endemic as common at 1,500–1,900 m in Las Orquídeas NP, just 56 km to the south.

BLACK-AND-GOLD TANAGER *Bangsia melanochlamys*
This endemic was common at 1,100–1,400 m at Chever, where four were mist-netted; it was observed in mixed flocks with Rufous-throated Tanager *Tangara rufigula*. The northernmost locality; previously known as far as Las Orquídeas NP, 56 km to the south. Also occurs at the north end of the Central Andes (Cuervo *et al*. 2008b).

GOLD-RINGED TANAGER *Bangsia aureocincta*
This endemic was common above 1,400 m at Chever, where three were mist-netted. Chever represents the fourth locality where this and the previous species overlap in range (Sedano 2014). Until this survey, it was known as far north as Las Orquídeas NP, 56 km to the south.

GLISTENING-GREEN TANAGER *Chlorochrysa phoenicotis*
Two mist-netted at 1,500 m at Chever on 4 March 2011. Beckers & Flórez (2013) considered it common at Las Orquídeas NP, 56 km to the south. This near-endemic also occurs locally in the north-western Central Andes (Hilty & Brown 1986).

RUFOUS-THROATED TANAGER *Tangara rufigula*
Observed in mixed-species flocks at 1,100–1,400 m at Chever, where one was mist-netted. Beckers & Flórez (2013) mentioned it as common at Las Orquídeas NP, at 1,900–2,500 m, 56 km to the south.

EMERALD TANAGER *Tangara florida*
One seen at La Bonga on 17 February 2011, around 700 m, in the canopy of lush forest (CO). The nearest-known site is Las Orquídeas NP, 56 km to the south.

SILVER-THROATED TANAGER *Tangara icterocephala*
Five mist-netted at Chever at 1,000–1,500 m on 3–5 March 2011, extending its range at least 50 km north from Frontino municipality, where specimens have been collected (BIOMAP 2006). Also occurs at the north end of the Central Andes (Cuervo *et al*. 2008b).

GUIRA TANAGER *Hemithraupis guira*
One at La Bonga on 18 February 2011. Previously known as far north as Tatamá National Park (230 km to the south) and recently observed near Cañasgordas municipality, 57 km to the south (R. Piedrahita: http://ebird.org/ebird/view/checklist?subID=S24712890). Also occurs at the north end of the Central Andes (Cuervo *et al*. 2008b).

INDIGO FLOWEPIERCER *Diglossa indigotica*
Recorded at 1,500 m at Chever, where one was mist-netted on 4 March 2011. Previously known as far north as Las Orquídeas NP, 56 km to the south. Also occurs at the north end of the Central Andes (Cuervo *et al*. 2008b).

BLACK-WINGED SALTATOR *Saltator atripennis*
Observed at Chever at 1,300–1,500 m on several dates in March 2011. Previously recorded on the west slope of the West Andes as far north as La Balsa, Cañasgordas municipality (R. Piedrahita: http://ebird.org/ebird/view/checklist?subID=S24712890), *c*.50 km to the south. Also found 66 km to the north-east in the municipality of Ituango, on the east slope of the West Andes, and at Las Tangaras.

TRICOLOURED BRUSH-FINCH *Atlapetes tricolor*
A pair seen on a small ridge and several heard at Chever, at 1,300–1,400 m, on 5 March 2011. Previously known from Las Orquídeas NP, 56 km to the south.

OCHRE-BREASTED TANAGER *Chlorothraupis stolzmanni*
Commonly observed, sound-recorded and mist-netted at 1,300–1,500 m at Chever. Previously recorded at Las Tangaras, 170 km to the south.

BAUDÓ OROPENDOLA *Psarocolius cassini*
Observed near La Bonga, at Mutatasito and La Llorona (Fig. 14), sometimes in mixed flocks with Chestnut-headed Oropendola *Psarocolius wagleri* and / or Black-chested Jay *Cyanocorax affinis*. The first records were made on 4 September 2010 (LFB & AQ). Easily observed at La Llorona, where several nests were found suspended in a coconut palm *Cocos nucifera* within a cleared area near the main road. These localities represent the first records for dpto. Antioquia. Three observed flying over the Mutatá River on 20 February 2011 is the species' northernmost record. This oropendola is endemic to north-west Colombia and is threatened by ongoing deforestation for agricultural expansion and extraction of trees within its small range. Known from a few localities in dpto. Chocó (Strewe & López-Lanús 2002, Hernández-Jaramillo & Calderón-Franco 2014), the nearest being *c*.100 km to the west on the middle Truandó River, where a male was collected in 1858. Our new records suggest that the species' conservation status should be reviewed (BirdLife International 2012).

GOLDEN-BELLIED WARBLER *Myiothlypis chrysogaster*
Eight mist-netted at 1,000–1,500 m at Chever on 3–5 March 2011 (Fig. 15). Prior to its discovery at Las Tangaras, *c*.170 km to the south (Collazos-Gonzáles & Cortés-Herrera 2015), the species was known as far north only as Calima municipality in dpto. Valle del Cauca (BIOMAP 2006).

YELLOW-COLLARED CHLOROPHONIA *Chlorophonia flavirostris*
A pair observed at La Bonga on 16 February 2011, at the edge of a small creek within a pasture. Known from the Dusky Starfrontlet Bird Reserve, *c*.90 km to the south (eBird 2016).

First record for the West Andes

LINED QUAIL-DOVE *Zentrygon linearis*
One was mist-netted at Chever, at 1,000 m, on 5 March 2011 (Fig. 16). Identified by its cinnamon forecrown and grey nape band. First record for the West Andes. The nearest localities where it had been recorded previously are in the Central Andes, in the municipalities of Anorí, Valdivia, Santo Domingo and Jericó (eBird 2016).

Overview of avifaunal surveys in north-west Colombia

Considering that the northern sector of the Colombian West Andes has been considered one of the most under-explored and under-studied regions ornithologically (Cuervo *et al*. 2003, Pulgarín & Múnera 2006), our records contribute significantly to avifaunal knowledge of the Serranía de Abibe, specifically on the Pacific slope in Mutatá and Dabeiba municipalities. In 21 days, the presence of 256 species was confirmed (Appendix 1). Previously, Haffer (1959, 1967a,b,c, 1975) made detailed studies of birds in the Urabá and northern foothills of the West Andes, while more recently a few additional surveys have been published (Castillo *et al*. 2002, Bran-Castrillón *et al*. 2014), as well as a catalogue of birds in the Chocó biogeographical region (Rangel *et al*. 2004), including the Pacific slope of the West Andes. However, historical and recent efforts have concentrated on the lowlands, which is logical considering that the region has been the subject of political and social issues, and an arena for armed conflict since the 1960s, making montane areas dangerous to access.

Three hundred and sixty-three specimens of 143 species were collected between 1915 and 1968 in the municipalities of Mutatá and Dabeiba (BIOMAP 2006). However, none was collected above 600 m. Of the records presented here, 32 species (78%) correspond to records made at 1,000–1,500 m, and more than half of the new records represent range extensions for species known previously at just two sites in the West Andes: Las Orquídeas National Park and Las Tangaras Bird Reserve. Only one survey is available for Las Orquídeas National Park (Echeverri 1986), despite this conservation unit being established as long ago in 1974, although further records were informally presented by Beckers & Flórez (2013). The park is just 56 km south of our study sites. We consider it relevant to present our new records given the importance of this region from biogeographical and conservation standpoints. Las Tangaras reserve was established in 2009 and a checklist of its birds has been published recently (Collazos-Gonzáles & Cortés-Herrera 2015). It is *c*.170 km from our study sites.

The Serrania de Abibe reaches 2,200 m and therefore more species will be found once its highlands have been surveyed. The only existing information from the adjacent highlands corresponds to collections made at Nudo de Paramillo in the *páramo* zone (3,000–3,800 m) between 1914 and 1989 (BIOMAP 2006). In total 245 specimens corresponding to 70 species are available.

The Serranía de Abibe is an area of high biogeographical interest given its proximity to the Panama isthmus, its continuity with the Andes and connection with the Chocó–Darién lowlands, and consequently has been considered an important contact zone where similar species meet (Haffer 1967c). In many cases, those species recorded in our study region also occur in the Central Andes (Cuervo *et al*. 2008b) and our records bridge a gap in the north-west corner of the Andes between previously surveyed regions.

Despite Paramillo National Park, which partially encompasses the Serranía de Abibe, being established in 1977, there have been just two published assessments of its avifauna. Franco & Bravo (2005) reported on the lack of recent surveys and estimated that the site harbours more than 400 species, based on Castaño-Uribe & Cano (1998). More recently, Rodríguez (2016) presented a preliminary characterisation of the avifauna in an important sector of the park. Other sites in north-west Colombia have been poorly surveyed since the advent of mist-netting methodology in the Neotropics, especially the Serranía del Baudó and Cerro Pirre. Research in these areas will surely provide additional novel distributional data.

We report range extensions and new localities for six globally threatened species: Baudó Guan *Penelope ortoni*, Recurve-billed Bushbird *Clytoctantes alixii*, Long-wattled Umbrellabird *Cephalopterus penduliger*, Black-and-gold Tanager *Bangsia melanochlamys*, Gold-ringed Tanager *B. aureocincta* and Baudó Oropendola *Psarocolius cassini*. Additionally, several rare and / or threatened species were described and / or reported by local people from illustrations: Wattled Guan *Aburria aburri*, Blue-billed Curassow *Crax alberti*, Harpy Eagle *Harpia harpyja*, Rufous-vented Ground Cuckoo *Neomorphus geoffroyi* and Rufous-crowned Gnatpitta *Pittasoma rufipileatum*. Other threatened species have also been found in the Serrania de Abibe, e.g. Great Green Macaw *Ara ambiguus* (recorded by us, see Appendix 1) and Saffron-headed Parrot *Pyrilia pyrilia*. Consequently, the region is a priority for biodiversity conservation and should qualify as an Important Bird Area. Furthermore, several endemic subspecies in the region have not been recorded in recent decades, e.g. Sinú Parakeet *Pyrrhura picta subandina* and Sinú Brown-throated Parakeet *Eupsittula pertinax griseipecta*. The area is partially protected within Paramillo National Park and, based on information gathered by our survey, Fundación ProAves established the Cotton-top Tamarin Natural Reserve in 2013, at Carmen del Darién, to protect important habitat for many of the threatened species in the Urabá region. Additional efforts are required to survey and protect the Serranía de Abibe, because habitat loss is occurring swiftly due to agricultural development and illegal logging.

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References:

Barrera, L. F., Bartels, A. & Fundación ProAves de Colombia. 2010. A new species of antpitta (family Grallariidae) from the Colibrí del Sol Bird Reserve, Colombia. *Conserv. Colombiana* 13: 8–24.

Beckers, J. & Flórez, P. 2013. *Birdwatching in Colombia*. Privately published.

BIOMAP. 2006. Base de datos Darwin: Proyecto Biomap, base de datos de distribución de la avifauna colombiana. http://www.biomap.net.

BirdLife International. 2012. Species factsheet: *Psarocolius cassini*. www.birdlife.org (accessed 26 January 2016).

Bran-Castrillón, C., Gaviria-Zapata, C. & Parra, J. L. 2014. Avifauna de los hábitats de la desembocadura del río Atrato (Turbo, Antioquia). *Orn. Colombiana* 14: 94–111.

Castillo-Cortés, L. F. & González, R. J. 2002. *Evaluación de los humedales de los deltas de los ríos San Juan y Baudó y ciénagas de Tumaradó, Perancho, la Honda y La Rica – bajo Atrato – departamento del Chocó, sección avifauna acuática*. Asociación para el Estudio y la Conservación de las Aves Acuáticas en Colombia, Cali.

Castaño-Uribe, C. & Cano, M. 1998. *El sistema de parques nacionales naturales de Colombia*. UAESPNN, Ministerio de Medio Ambiente, Bogotá.

Colorado, G. J. 2008. Rediscovery of the Recurve-billed Bushbird for the Cordillera Central of Colombia. *Orn. Neotrop*. 19: 467–471.

Collazos-Gonzáles, S. A. & Cortés-Herrera, O. 2015. Listado de las aves de las reservas las Tangaras, Gorrión-Andivia y Lora Carirosada de los Andes Occidentales de Colombia. *Conserv. Colombiana* 23: 58–81.

Corporación Autónoma Regional del Centro de Antioquia. 2009. Inventario de fauna presente en la jurisdicción de Corantioquia. http://ipt.sibcolombia.net/sib/resource.do?r=corantioquia-2008-fauna.

Cuervo, A. M., Stiles, F. G., Cadena, C. D., Toro, J. L. & Londoño, G. A. 2003. New and noteworthy bird records from the northern sector of the Western Andes of Colombia. *Bull. Brit. Orn. Cl*. 123: 7–24.

Cuervo, A. M., Pulgarín, P. C. & Calderón, D. 2008a. New distributional bird data from the Cordillera Central of the Colombian Andes, with implications for the biogeography of northwestern South America. *Condor* 110: 526–537.

Cuervo, A. M., Pulgarín, P. C., Calderón-F., D., Ochoa-Quintero, J. M., Delgado, C. A., Palacio, A., Botero, J. M. & Múnera, W. 2008b. Avifauna of the northern Cordillera Central of the Andes, Colombia. *Orn. Neotrop*. 19: 495–115.

Donegan, T. M. 2012. Range extensions and other notes on the birds and conservation of the Serranía de San Lucas, an isolated mountain range in northern Colombia. *Bull. Brit. Orn. Cl*. 132: 140–161.

Donegan, T. M. & Dávalos, L. M. 1999. Ornithological observations from Reserva Natural Tambito, Cauca, south-west Colombia. *Cotinga* 12: 48–55.

Donegan, T. M., Salaman, P. G. W., Cuervo, A. M., Luna, J. C. & Cortés, A. 2002. Recent records from Tambito Nature Reserve and Munchique National Park, south-west Colombia. *Cotinga* 17: 77.

Donegan, T., Avendaño-C., J. E., Briceño-L., E. R. & Huertas, B. C. 2007. Range extensions, taxonomic and ecological notes from Serranía de los Yariguíes, Colombia's new national park. *Bull. Brit. Orn. Cl*. 127: 172–213.

Donegan, T. M., Avendaño, J. E., Briceño-L., E. R., Luna, J. C., Roa, C., Parra, R., Turner, C., Sharp, M. & Huertas, B. 2010. Aves de la Serranía de los Yariguíes y tierras bajas circundantes, Santander, Colombia. *Cotinga* 32: 72–89.

eBird. 2016. eBird: an online database of bird distribution and abundance. eBird, Cornell Lab of Ornithology, Ithaca, NY. www.ebird.org.

Echeverri, H. 1986. *Avifauna parcial: Parque Nacional Natural "Las Orquídeas"*. Instituto Nacional de los Recursos Renovables y del Ambiente, Bogotá.

Echeverry-Galvis, M. A. & Córdoba-Córdoba, S. 2007. New distributional and noteworthy birds records from the Tatamá Massif of the Cordillera Occidental of Colombia. *Bull. Brit. Orn. Cl*. 127: 213–224.

Flórez, P., Krabbe, N., Castaño, J., Suárez, G. & Arango, J. D. 2004. *Evaluación avifauna del Páramo de Frontino, Antioquia, agosto 2004*. Colombian EBA Project Rep. Ser. 6. Fundación ProAves, Bogotá.

Franco, A. M. & Bravo, G. 2005. Áreas Importantes para la Conservación de las Aves en Colombia. Pp. 117–281 *in* Boyla, K. & Estrada, A. (eds.) *Áreas Importantes para la Conservación de las Aves en los Andes tropicales: sitios prioritarios para la conservación de la biodiversidad*. Conservation International & BirdLife International, Quito.

Haffer, J. 1959. Notas sobre las aves de la región de Urabá. *Lozania* (*Acta Zool. Colombiana*) 12: 1–49.

Haffer, J. 1967a. Zoogeographical notes on the "nonforest" lowland bird faunas of northwestern South America. *Hornero* 10: 315–333.

Haffer, J. 1967b. Speciation in Colombian forest birds west of the Andes. *Amer. Mus. Novit*. 2294: 1–57.

Haffer, J. 1967c. Some allopatric species pairs of birds in north-western Colombia. *Auk* 84: 343–365.

Haffer, J. 1975. *Avifauna of northwestern Colombia, South America*. Bonn. Zool. Monogr. 7. Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn.

Hernández-Jaramillo, A. & Calderón-Franco, D. 2014. *Psarocolius cassini*. Pp. 348–350 *in* 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*, vol. 1. Editorial Pontificia Universidad Javeriana & Instituto Alexander von Humboldt, Bogotá.

Hilty, S. L. & Brown, W. L. 1986. *A guide to the birds of Colombia*. Princeton Univ. Press.

Krabbe, N. & Cadena, C. D. 2010. A taxonomic revision of the Paramo Tapaculo *Scytalopus canus* Chapman (Aves: Rhinocryptidae), with description of a new subspecies from Ecuador and Peru. *Zootaxa* 2354: 56–66.

Krabbe, N., Flórez, P., Suarez, G., Castaño, J., Arango, J. D. & Duque, A. 2006. The birds of Páramo de Frontino, western Andes of Colombia. *Orn. Colombiana* 4: 39–50.

Laverde-R., O. & Stiles, F. G. 2007. Apuntes sobre el hormiguero pico de hacha (Thamnophilidae: *Clytoctantes alixii*) y su relación con un bambú en un bosque secundario de Colombia. *Orn. Colombiana* 5: 83–90.

López-Ordoñez, J. P., Cortés-Herrera, J. O., Páez-Ortiz, C. A. & González-Rojas, M. F. 2013. Nuevos registros y comentarios sobre la distribución de algunas especies de aves en los Andes Occidentales de Colombia. *Orn. Colombiana* 13: 21–36.

McMullan M. & Donegan, T. 2014. *Field guide to the birds of Colombia*. Second edn. Fundación Proaves de Colombia, Bogotá.

Ocampo-Peñuela, N. & Pimm, S. L. 2015. Elevational ranges of montane birds and deforestation in the Western Andes of Colombia. *PLoS ONE* 10(12): e0143311.

Pulgarín-R., P. & Múnera-P., W. 2006. New bird records from Farallones del Citará, Colombian Western Cordillera. *Bol. Soc. Antioqueña Orn*. 16: 44–53.

Rangel, J. O., Caycedo, P. & Garzón-C., A. 2004. Catálogo de aves en el Chocó biogeográfico. Pp. 678–723 *in* Rangel, J. O. (ed.) *Colombia diversidad biótica, IV, El Chocó biogeográfico/costa Pacífica*. Instituto de Ciencias Naturales de la Universidad Nacional de Colombia & Conservación Internacional, Bogotá.

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. 2016. A classification of the bird species of South America. www.museum.lsu.edu/~Remsen/SACCBaseline.html.

Rodríguez, E. L. 2016. Reconocimiento preliminar de la avifauna presente en el sector Río Tigre – Río Manso del Parque Nacional Natural Paramillo (Córdoba, Colombia). Pp. 172–201 *in* Pérez-Torres, J., Vidal-Pastrana, C. & Racero-Casarrubia J. (eds.) 2016. *Biodiversidad asociada a los sectores Manso y Tigre del Parque Nacional Natural Paramillo*. Parques Nacionales Naturales de Colombia, Ministerio de Ambiente y Desarrollo Sostenible, Bogotá.

Salaman, P. G. W. 1994. *Surveys and conservation of biodiversity in the Chocó, south-west Colombia*. BirdLife International, Cambridge, UK.

Sánchez-González, L. A., Navarro-Sigüenza, A. G., Krabbe, N. K., Fjeldså, J. & García-Moreno, J. 2014. Diversification in the Andes: the *Atlapetes* brush-finches. *Zool. Scripta* 44: 135–152.

Sedano, R. 2014. *Bangsia aureocincta*. Pp. 296–300 *in* 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*, vol. 1. Ed. Pontifícia Universidad Javeriana & Instituto Alexander von Humboldt, Bogotá.

Strewe, R. & López-Lanús, B. 2002. *Psarocolius cassini*. Pp. 458–462 *in* Renjifo, L. M., Franco, A. M., Amaya-Espinel, J. D., Kattan, G. H. & López, B. (eds.) *Libro rojo de aves de Colombia*. Instituto Alexander von Humboldt & Ministerio del Medio Ambiente. Bogotá.

Sullivan, B. L., Wood, C. L., Iliff, M. J., Bonney, R. E., Fink, D. & Kelling, S. 2009. eBird: a citizen-based bird observation network in the biological sciences. *Biol. Conserv*. 142: 2282–2292.

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Appendix 1

List of species recorded during our surveys. Species arrangement follows Remsen *et al*. (2016). Site numbers as follows: 1 = La Bonga; 2 = Mutatasito; 3 = La Llorona; 4 = Alto de Chever. Type of records: O = sight record; R = sound-recording; H = heard but not recorded; P = photograph; M = mist-netted but not photographed.

Family/English name	Scientific name	Sites	Record
TINAMIDAE			
Great Tinamou	*Tinamus major*	1	O,R
Little Tinamou	*Crypturellus soui*	1,2,3,4	H
CRACIDAE			
Sickle-winged Guan	*Chamapaetes goudoti*	4	O
Baudó Guan	*Penelope ortoni*	1,4	H,P
Crested Guan	*Penelope purpurascens*	1,4	O
Great Curassow	*Crax rubra*	1	O
ODONTOPHORIDAE			
Rufous-fronted Wood Quail	*Odontophorus erythyrops*	1,3,4	H
PHALACROCORACIDAE			
Neotropic Cormorant	*Phalacrocorax brasilianus*	2	O
ARDEIDAE			
Great Egret	*Ardea alba*	2	O
CATHARTIDAE			
Turkey Vulture	*Cathartes aura*	1,2,3,4	O

Family/English name	Scientific name	Sites	Record
Black Vulture	*Coragyps atratus*	1,2,3,4	O
King Vulture	*Sarcoramphus papa*	1,3,4	O
ACCIPITRIDAE			
Grey-headed Kite	*Leptodon cayanensis*	1,3	O
Swallow-tailed Kite	*Elanoides forficatus*	1,3,4	O
Black Hawk-Eagle	*Spizaetus tyrannus*	2	O
Plumbeous Kite	*Ictinia plumbea*	2	O
Crane Hawk	*Geranospiza caerulescens*	2	O
Common Black Hawk	*Buteogallus anthracinus*	2	O
Savanna Hawk	*Buteogallus meridionalis*	1,2	O
Roadside Hawk	*Rupornis magnirostris*	1,2	O
White Hawk	*Pseudastur albicollis*	3	O
Broad-winged Hawk	*Buteo platypterus*	1,2	O
CHARADRIDAE			
Southern Lapwing	*Vanellus chilensis*	4*	O
SCOLOPACIDAE			
Spotted Sandpiper	*Actitis macularius*	2	O
COLUMBIDAE			
Dusky Pigeon	*Patagioenas goodsoni*	1,2,4	O
White-tipped Dove	*Leptotila verreauxi*	1,2,3	O
Grey-chested Dove	*Leptotila cassinii*	1	O
Lined Quail-Dove	*Zentrygon linearis*	4	P
CUCULIDAE			
Smooth-billed Ani	*Crotophaga ani*	1,2,3	O
Squirrel Cuckoo	*Piaya cayana*	1,3,4	O
STRIGIDAE			
Crested Owl	*Lophostrix cristata*	3	O
Mottled Owl	*Ciccaba virgata*	1,3,4	O
CAPRIMULGIDAE			
Pauraque	*Nyctidromus albicollis*	2	O
APODIDAE			
White-collared Swift	*Streptoprocne zonaris*	2,4	O
Short-tailed Swift	*Chaetura brachyura*	2	O
swift sp.	*Chaetura* sp.	1	O
TROCHILIDAE			
White-necked Jacobin	*Florisuga mellivora*	1,2	P
White-tipped Sicklebill	*Eutoxeres aquila*	1,2,3,4	P
Rufous-brested Hermit	*Glaucis hirsutus*	2,3	P
Band-tailed Barbthroat	*Threnetes ruckeri*	1,3,4	P
Stripe-throated Hermit	*Phaethornis striigularis*	1,3,4	P
White-whiskered Hermit	*Phaethornis yaruqui*	1,3,4	P
Tawny-bellied Hermit	*Phaethornis syrmatophorus*	4	P
Long-billed Hermit	*Phaethornis longirostris*	1,2,3,4	P
Tooth-billed Hummingbird	*Androdon aequatorialis*	1,4	P
Purple-crowned Fairy	*Heliothryx barroti*	1	P
Black-throated Mango	*Anthracothorax nigricollis*	2	O
Green Thorntail	*Discosura conversii*	3	O
Violet-tailed Sylph	*Aglaiocercus coelestis*	4	P
Greenish Puffleg	*Haplophaedia aureliae*	4	P

Family/English name	Scientific name	Sites	Record
Brown Inca	*Coeligena wilsoni*	4	P
Velvet-purple Coronet	*Boissonneaua jardini*	4	P
White-tailed Hillstar	*Urochroa bougueri*	4	P
Green-crowned Brilliant	*Heliodoxa jacula*	4	P
Empress Brilliant	*Heliodoxa imperatrix*	4	P
Western Emerald	*Chlorostilbon melanorhynchus*	1	O
Violet-headed Hummingbird	*Klais guimeti*	1,2,3,4	O,P
Bronze-tailed Plumeleteer	*Chalybura urochrysia*	1	P
Crowned Woodnymph	*Thalurania colombica*	1,2,4	P
Rufous-tailed Hummingbird	*Amazilia tzcatl*	1,2,3	O,P
Blue-chested Hummingbird	*Amazilia amabilis*	1,2,3	P
TROGONIDAE			
Black-tailed Trogon	*Trogon melanurus*	2	O
White-tailed Trogon	*Trogon chionurus*	2,3,4	O
Collared Trogon	*Trogon collaris*	4	P
ALCEDINIDAE			
Ringed Kingfisher	*Megaceryle torquata*	2	O
MOMOTIDAE			
Broad-billed Motmot	*Electron platyrhynchum*	2	O
GALBULIDAE			
Rufous-tailed Jacamar	*Galbula ruficauda*	3	O
BUCCONIDAE			
Pied Puffbird	*Notharchus tectus*	2	O
White-whiskered Puffbird	*Malacoptila panamensis*	1,3	O
CAPITONIDAE			
Spot-crowned Barbet	*Capito maculicoronatus*	2,3	O
SEMNORNITHIDAE			
Toucan Barbet	*Semnornis ramphastinus*	4	O
RAMPHASTIDAE			
Black-mandibled Toucan	*Ramphastos ambiguus*	1,2,3,4	O
Chocó Toucan	*Ramphastos brevis*	1,2,3,4	O
Crimson-rumped Toucanet	*Aulacorhynchus haematopygus*	4	O
Collared Aracari	*Pteroglossus torquatus*	1,2,3	O
PICIDAE			
Black-cheeked Woodpecker	*Melanerpes pucherani*	1,2	O
Red-crowned Woodpecker	*Melanerpes rubricapillus*	1,2,3	O
Smoky-brown Woodpecker	*Picoides fumigatus*	4	O
Red-rumped Woodpecker	*Veniliornis kirkii*	2	O
Golden-olive Woodpecker	*Colaptes rubiginosus*	4	O
Cinnamon Woodpecker	*Celeus loricatus*	1,4	O,M
Lined Woodpecker	*Dryocopus lineatus*	1	O
Crimson-crested Woodpecker	*Campephilus melanoleucos*	1,3	O
FALCONIDAE			
Laughing Falcon	*Herpetotheres cachinnans*	1,3,4	H
Red-throated Caracara	*Ibycter americanus*	1,2	O
Yellow-headed Caracara	*Milvago chimachima*	1,2,3	O
PSITTACIDAE			
Blue-fronted Parrotlet	*Touit dilectissimus*	4	O
Orange-chinned Parakeet	*Brotogeris jugularis*	1,2	O

Family/English name	Scientific name	Sites	Record
Rose-faced Parrot	*Pyrilia pulchra*	1	O
Blue-headed Parrot	*Pionus menstruus*	1,2,3	O
Mealy Parrot	*Amazona farinosa*	1,2,3,4	O
Blue-and-yellow Macaw	*Ara ararauna*	2,3	O
Great Green Macaw	*Ara ambiguus*	1,4*	O
Red-and-green Macaw	*Ara chloropterus*	1,2	O
Chesnut-fronted Macaw	*Ara severus*	1,2	O
THAMNOPHILIDAE			
Black-crowned Antshrike	*Thamnophilus atrinucha*	2,3,4	O,P
Recurve-billed Bushbird	*Clytoctantes alixii*	3	P
Plain Antvireo	*Dysithamnus mentalis*	4	M
Spot-crowned Antvireo	*Dysithamnus puncticeps*	1	P
Checker-throated Antwren	*Epinecrophylla fulviventris*	1,2,3,4	M
White-flanked Antwren	*Myrmotherula axillaris*	1,2,3,4	O,P
Slaty Antwren	*Myrmotherula schisticolor*	4	P
Dot-winged Antwren	*Microrhopias quixensis*	4	O
Bare-crowned Antbird	*Gymnocichla nudiceps*	1	M
Chestnut-backed Antbird	*Poliocrania exsul*	1,2,3,4	O,P
Blue-lored Antbird	*Hafferia immaculata*	4	O
Ocellated Anbird	*Phaenostictus mcleannani*	1	P
CONOPOPHAGIDAE			
Chestnut-crowned Gnateater	*Conopophaga castaneiceps*	4	O
GRALLARIIDAE			
Yellow-breasted Antpitta	*Grallaria flavotincta*	4	H
Thicket Antpitta	*Hylopezus dives*	1,3,4	O,R
RHINOCRYPTIDAE			
tapaculo sp.	*Scytalopus* sp. 1	4	R
tapaculo sp.	*Scytalopus* sp. 2	4	O
FURNARIIDAE			
Tyrannine Woodcreeper	*Dendrocincla tyrannina*	4	P
Plain-brown Woodcreeper	*Dendrocincla fuliginosa*	1,3	O,P
Wedge-billed Woodcreeper	*Glyphorynchus spirurus*	1,2,3,4	O,P
Black-striped Woodcreeper	*Xiphorhynchus lachrymosus*	1	P
Spotted Woodcreeper	*Xiphorhynchus erythropygius*	1	O,P
Red-billed Scythebill	*Campylorhamphus trochilirostris*	2	P
Brown-billed Scythebill	*Campylorhamphus pusillus*	4	P
Plain Xenops	*Xenops minutus*	3	O
Buffy Tuftedcheek	*Pseudocolaptes lawrencii*	4	O,P
Scaly-throated Foliage-gleaner	*Anabacerthia variegaticeps*	4	O,P
Ruddy Foliage-gleaner	*Clibanornis rubiginosus*	4	P
Striped Woodhaunter	*Automolus subulatus*	1	P
Spotted Barbtail	*Premnoplex brunnescens*	4	O
Fulvous-dotted Treerunner	*Margarornis stellatus*	4	O
Red-faced Spinetail	*Cranioleuca erythrops*	4	O
Slaty Spinetail	*Synallaxis brachyura*	4	O
Pale-breasted Spinetail	*Synallaxis albescens*	1	O
TYRANNIDAE			
Yellow-bellied Elaenia	*Elaenia flavogaster*	1,2	O
Golden-faced Tyrannulet	*Zimmerius chrysops*	2,4	O

Family/English name	Scientific name	Sites	Record
Streak-necked Flycatcher	*Mionectes striaticollis*	4	P
Olive-striped Flycatcher	*Mionectes olivaceus*	1,2,3,4	O,P
Ochre-bellied Flycatcher	*Mionectes oleagineus*	2,3	O,P
Slaty-capped Flycatcher	*Leptopogon supercialaris*	1,3	P
Ornate Flycatcher	*Myiotriccus ornatus*	4	O,P
Black-capped Pygmy Tyrant	*Myiornis atricapillus*	2	O
Scale-crested Pygmy Tyrant	*Lophotriccus pileatus*	4	P
Slate-headed Tody-Flycatcher	*Poecilotriccus sylvia*	3	O
Common Tody-Flycatcher	*Todirostrum cinereum*	2,3	O
Black-headed Tody-Flycatcher	*Todirostrum nigriceps*	2,3	O
Olivaceous Flatbill	*Rhynchocyclus olivaceus*	1,3	P
Pacific Flatbill	*Rhynchocyclus brevirostris*	1	P
Yellow-olive Flycatcher	*Tolmomyias sulphurescens*	2	O
Yellow-margined Flycatcher	*Tolmomyias assimilis*	2	M
White-throated Spadebill	*Platyrinchus mystaceus*	4	O,P
Golden-crowned Spadebill	*Platyrinchus coronatus*	1	P
Sulphur-rumped Flycatcher	*Myiobius barbatus*	1,4	P
Ruddy-tailed Flycatcher	*Terenotriccus erythrurus*	2,3	P
Tufted Flycatcher	*Mitrephanes phaeocercus*	1	O
Black Phoebe	*Sayornis nigricans*	3	O
Long-tailed Tyrant	*Colonia colonus*	1,2,3,4*	O
Piratic Flycatcher	*Legatus leucophaius*	1,2	O
Rusty-margined Flycatcher	*Myiozetetes cayanensis*	1,2	O
Social Flycatcher	*Myiozetetes similis*	1,2,3	O
Grey-capped Flycatcher	*Myiozetetes granadensis*	3	O
Great Kiskadee	*Pitangus sulphuratus*	2,3	O
Streaked Flycatcher	*Myiodynastes maculatus*	2,3	O
Boat-billed Flycatcher	*Megarhynchus pitangua*	4*	O
Tropical Kingbird	*Tyrannus melancholicus*	1,2,3,4	O
Fork-tailed Flycatcher	*Tyrannus savana*	1,2,3	O
Rufous Mourner	*Rhytipterna holerythra*	3	O
Dusky-capped Flycatcher	*Myiarchus tuberculifer*	1,2	O,M
Panama Flycatcher	*Myiarchus panamensis*	1,2,3	P
Bright-rumped Attila	*Attila spadiceus*	1,2,3	O
COTINGIDAE			
Purple-throated Fruitcrow	*Querula purpurata*	2,3	O
Long-wattled Umbrellabird	*Cephalopterus penduliger*	4	O
Rufous Piha	*Lipaugus unirufus*	1	O
PIPRIDAE			
Golden-winged Manakin	*Masius chrysopterus*	4	P
Green Manakin	*Cryptopipo holochlora*	1	P
Blue-crowned Manakin	*Lepidothrix coronata*	1,2	P
White-bearded Manakin	*Manacus manacus*	1,2,3	O,P
Club-winged Manakin	*Machaeropterus deliciosus*	1,4	O,P
Striped Manakin	*Machaeropterus regulus*	1,2,4	P
Golden-headed Manakin	*Ceratopipra erythocephala*	2	M
TITYRIDAE			
Masked Tityra	*Tityra semifasciata*	1,3	O
Cinnamon Becard	*Pachyramphus cinnamomeus*	2,3	O

Family/English name	Scientific name	Sites	Record
White-winged Becard	*Pachyramphus polychopterus*	1	P
VIREONIDAE			
Red-eyed Vireo	*Vireo olivaceus*	1	O
CORVIDAE			
Black-chested Jay	*Cyanocorax affinis*	1,2,3	O
HIRUNDINIDAE			
White-thighed Swallow	*Atticora tibialis*	1,2,3	O
Southern Rough-winged Swallow	*Stelgidopteryx ruficollis*	1,2,3	O
Purple Martin	*Progne chalybea*	2	O
TROGLODYTIDAE			
Scaly-breasted Wren	*Microcerculus marginatus*	1,2,3,4	O,P
House Wren	*Troglodytes aedon*	2,3	O
White-headed Wren	*Campylorhynchus albobrunneus*	1	O
Bay Wren	*Cantorchilus nigricapillus*	1,2,3,4	P
Stripe-throated Wren	*Cantorchilus leucopogon*	1	O
Sharpe's Wren	*Cinnycerthia olivascens*	4	O
White-breasted Wood Wren	*Henicorhina leucosticta*	1,2,3	O,P
Grey-breasted Wood Wren	*Henicorhina leucophrys*	4	O,P
Chestnut-breasted Wren	*Cyphorhinus thoracicus*	1,4	P
POLIOPTILIDAE			
Half-collared Gnatwren	*Microbates cinereiventris*	1,4	O,P
TURDIDAE			
Andean Solitaire	*Myadestes ralloides*	4	O,P
Swainson's Thrush	*Catharus ustulatus*	1,2,3	P
Black Solitaire	*Entomodestes coracinus*	4	O,P
THRAUPIDAE			
White-shouldered Tanager	*Tachyphonus luctuosus*	2	O
Tawny-crested Tanager	*Tachyphonus delatrii*	1,2,3	P
White-lined Tanager	*Tachyphonus rufus*	1,2	O
Crimson-backed Tanager	*Ramphocelus dimidiatus*	1,2,3	O,P
Flame-rumped Tanager	*Ramphocelus flammigerus*	1,2,3,4	O
Black-and-gold Tanager	*Bangsia melanochlamys*	4	O,P
Gold-ringed Tanager	*Bangsia aureocincta*	4	O,P
Glistening-green Tanager	*Chlorochrysa phoenicotis*	4	P
Blue-grey Tanager	*Thraupis episcopus*	1,2,3	O
Palm Tanager	*Thraupis palmarum*	1,2,3	O
Golden-hooded Tanager	*Tangara larvata*	1,2,3,4	O
Rufous-throated Tanager	*Tangara rufigula*	4	O,P
Plain-coloured Tanager	*Tangara inornata*	2,3	O
Rufous-winged Tanager	*Tangara lavinia*	1	O
Bay-headed Tanager	*Tangara gyrola*	4	P
Blue-whiskered Tanager	*Tangara johannae*	1,2	P
Emerald Tanager	*Tangara florida*	1	O
Silvery-throated Tanager	*Tangara icterocephala*	4	O,P
Scarlet-thighed Dacnis	*Dacnis venusta*	2	O
Blue Dacnis	*Dacnis cayana*	1,3	O
Purple Honeycreeper	*Cyanerpes caeruleus*	1	O
Green Honeycreeper	*Chlorophanes spiza*	2	O
Guira Tanager	*Hemithraupis guira*	2	O

Family/English name	Scientific name	Sites	Record
Indigo Flowerpiercer	*Diglossa indigotica*	4	O
Buff-throated Saltator	*Saltator maximus*	1,2,3	O,M
Black-winged Saltator	*Saltator atripennis*	4	O,H,M
Slate-coloured Grosbeak	*Saltator grossus*	1,2,4	O
Thick-billed Seed Finch	*Sporophila funerea*	1,2,3	O,P
Variable Seedeater	*Sporophila corvina*	1,3	O
Bananaquit	*Coereba flaveola*	3,4	O
INCERTAE SEDIS			
Dusky-faced Tanager	*Mitrospingus cassinii*	1,2,3,4	P
EMBERIZIDAE			
Black-headed Brush Finch	*Arremon atricapillus*	4	O
Orange-billed Sparrow	*Arremon aurantiirostris*	2,3	P
Chestnut-capped Brush Finch	*Arremon brunneinucha*	4	O
Tricoloured Brush Finch	*Atlapetes tricolor*	4	O
CARDINALIDAE			
Hepatic Tanager	*Piranga flava*	1	O
Summer Tanager	*Piranga rubra*	1,2	O
Lemon-spectacled Tanager	*Chlorothraupis olivacea*	1	P
Ochre-breasted Tanager	*Chlorothraupis stolzmanni*	4	O
Blue-black Grosbeak	*Cyanocompsa cyanoides*	1,2,3	P
PARULIDAE			
Northern Waterthrush	*Parkesia noveboracensis*	2	O
Black-and-white Warbler	*Mniotilta varia*	3	O
Bay-breasted Warbler	*Setophaga castanea*	1,2	O
Blackburnian Warbler	*Setophaga fusca*	4	O
Yellow Warbler	*Setophaga petechia*	2	O
Buff-rumped Warbler	*Myiothlypis fulvicauda*	1,2,3,4	O
Golden-bellied Warbler	*Myiothlypis chrysogaster*	4	P
ICTERIDAE			
Chesnut-headed Oropendola	*Psarocolius wagleri*	1,2,3	O
Crested Oropendola	*Psarocolius decumanus*	1,2,3	O
Baudó Oropendola	*Psarocolius cassini*	1,2,3	O
Scarlet-rumped Cacique	*Cacicus uropygialis*	1	O
Orchard Oriole	*Icterus spurius*	2	O
Baltimore Oriole	*Icterus galbula*	1,2	O
Giant Cowbird	*Molothrus oryzivorus*	1,2,3	O
Shiny Cowbird	*Molothrus bonariensis*	1	O
FRINGILLIDAE			
Thick-billed Euphonia	*Euphonia laniirostris*	2,3	O
Fulvous-vented Euphonia	*Euphonia fulvicrissa*	2	O
White-vented Euphonia	*Euphonia minuta*	2	O
Orange-bellied Euphonia	*Euphonia xanthogaster*	1,4	O,P
Yellow-collared Chlorophonia	*Cholorophonia flavirostris*	1	O

New and noteworthy bird records from the Mt. Wilhelm elevational gradient, Papua New Guinea

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Summary.—The elevational gradient of Mt. Wilhelm, the highest peak in Papua New Guinea, represents one of the best-surveyed elevational gradients in the Indo-Pacific region. Based on field work undertaken in 2013 and 2015, we report range extensions, new elevational records and add 24 species to the list of bird species recorded along this gradient. This includes information on poorly known species such as Long-billed Cuckoo *Chrysococcyx megarhynchus*, Leaden Honeyeater *Ptiloprora plumbea*, Yellow-breasted Satinbird *Loboparadisaea sericea* and Sooty Shrikethrush *Colluricincla tenebrosa*.

New Guinea is the largest tropical island (>750,000 km^2) and well known for its exceptional avian diversity, characterised by a large number of endemic lineages (Pratt & Beehler 2014, Beehler & Pratt 2016). During the last 200 years, the island has been the subject of a multitude of expeditions and surveys that have aimed to document the distribution and diversity of its avifauna (summarised in Pratt & Beehler 2014). New Guinea and neighbouring archipelagos have also served as a natural laboratory that has aided in the development of modern biological theories and syntheses pertaining to speciation, community assemblies, and the effects of climate change on biodiversity and biogeography, often using birds as model organisms (e.g. Diamond 1973, Deiner *et al*. 2011, Jønsson *et al*. 2011, Freeman & Class Freeman 2014a, Irestedt *et al*. 2015). Despite these efforts, knowledge of New Guinean avifauna remains incomplete, largely due to the region's enormous topographic complexity and lack of infrastructure, which has made some areas near-impossible to access for the purposes of biological surveys. Consequently, detailed information concerning both complete geographic and elevational distributions, in addition to life-history traits are currently lacking for a considerable number of species.

At 4,509 m, Mt Wilhelm, the highest peak in Papua New Guinea, is located in the Bismarck Range, which forms part of New Guinea's extensive Central Range. Despite being historically under-surveyed (although see, e.g., Mayr & Gilliard 1954), recent field work in 2010 and 2012 considerably improved knowledge of the local avifauna (Sam & Koane 2014). Here we report new and noteworthy records from the elevational gradient on the north-east slope of Mt. Wilhelm. Our new records are based on field observations by the authors along this elevational gradient in 2013 and 2015.

Study area and Methods

Study sites (Table 1) and survey methods generally follow those outlined in Sam & Koane (2014), with some exceptions noted here. First, as of 2015 the study site at 1,700 m was moved to a new location, named Degenumbu (05°45′45″S, 145°11′54″E). Second, records made during the current field trips did not follow fully standardised approaches, but were gathered opportunistically using a combination of point counts, mist-netting and field observations. Finally, the 3,700 m study site at Lake Piunde was incorrectly labelled as Lake Aunde in Sam & Koane (2014), a mistake corrected herein. Field work took place on 15

TABLE 1
Locations along the Mt. Wilhelm elevational gradient surveyed during 2013 and 2015.

Site name	Elevation (m)	Latitude	Longitude
Kausi	200	05°44′33″S	145°20′01″E
Numba	700	05°44′14″S	145°16′12″E
Memeku	1,200	05°43′18″S	145°16′17″E
Degenumbu	1,700	05°45′45″S	145°11′54″E
Sinopass	2,100	05°45′34″S	145°10′49″E
Bruno Sawmill	2,700	05°48′57″S	145°09′02″E
Kombuno Mambuno	3,200	05°48′18″S	145°04′20″E
Lake Piunde	3,700	05°47′10″S	145°03′32″E

June–20 August 2013 (KS, BK, two days of mist-netting, three days of point counts, and field observations) and 23 September–21 October 2015 (PZM, JBK, JDK, KAJ, BK, 27 days of mist-netting, 29 days of field observations) and 27 October–28 November 2015 (KS, two days of mist-netting, three days of point counts, and field observations; see Sam & Koane 2014).

Results

As of 2012, 260 species had been recorded along the north-east elevational gradient on Mt. Wilhelm (Sam & Koane 2014). We present significant observations and 24 additions made to the local avifauna during our 2013 and 2015 field trips, which also include extensions to the geographic range and elevational distributions for several taxa. Species not previously recorded by Sam & Koane (2014) are indicated by an asterisk. Taxonomy and nomenclature follow those of the IOC world bird list version 6.1 (Gill & Donsker 2016).

GREY-HEADED GOSHAWK *Accipiter poliocephalus**
Several observations were made in 2013 along the road at 200–700 m. In addition, singles were observed and mist-netted at 200 m in October 2015, and one was mist-netted at 700 m in November 2015. An uncommon and easily overlooked species of lowland and hill forests.

BROWN GOSHAWK *Accipiter fasciatus**
An active nest was observed at 2,700 m and a single individual at 2,200 m in November 2015. These observations represent an extension to the previously reported upper elevational range of 1,950 m (Coates 1985, Beehler & Pratt 2016).

COMMON SANDPIPER *Actitis hypoleucos**
One was seen along the Imbrum River on 21 October 2015, at the 200 m study site. A common Palearctic migrant to New Guinea, usually found along interior rivers and the coast.

COLLARED IMPERIAL PIGEON *Ducula mullerii**
Three observed in a village clearing on 21 October 2015 at 200 m. Thereafter, KS, BK, M. Kigl and B. Iova observed one for several minutes along the river at 1,600 m on 8 November 2015. It was seen well by all four observers, who observed several key features characteristic of the species including the distinctive black collar and bright maroon upper mantle. The latter observation represents an extreme elevational range extension from the previously reported upper limit of 200 m (Beehler & Pratt 2016). Our records presumably refer to the

smaller and paler, northern subspecies *aurantia*, although Beehler & Pratt (2016) suggested that the species is best treated as monotypic.

LONG-BILLED CUCKOO *Chrysococcyx megarhynchus**
An immature (Fig. 1) mist-netted in forest on 20 October 2015 at 200 m is the first record for the survey area. A rare and poorly known species. Whereas Sorenson & Payne (2005) suggested that it should be removed to the genus *Chrysococcyx*, Erritzøe *et al*. (2012) and Beehler & Pratt (2016) chose to retain it within a monospecific *Rhamphomantis* given its distinctive appearance. Interestingly, this species, especially in juvenile plumage, bears a striking resemblance to Tawny-breasted Honeyeater *Xanthotis flaviventer* (Coates 1985), a potential host species. PZM also observed an adult male *C. megarhynchus* in close association with *X. flaviventer* at Kau Wildlife Area (*c*.05°08′43″S, 145°46′19″E), near Madang town, on 24 October 2015.

MOUNTAIN OWLET-NIGHTJAR *Aegotheles albertisi*
Previously reported to 3,700 m on the Huon Peninsula, and mostly at 1,200–2,900 m over the rest of its range (Beehler & Pratt 2016). However, we mist-netted two in cloud forest, at 3,700 m (Fig. 2) and 3,200 m, on 26 and 27 September 2015, respectively. Although no definite records exist for the Eastern Ranges, Archbold's Owlet-Nightjar *A. archboldi* might be expected at such elevations. However, the individuals recorded possessed characters consistent with *A. albertisi*, appearing finely patterned on the back and underparts, and lacking prominent white speckles. Nonetheless, pending further research, Beehler & Pratt (2016) have recently suggested that the two forms are best treated as a single, highly variable, species.

BLYTH'S HORNBILL *Rhyticeros plicatus*
A nest found at 1,700 m in November 2015 is very high for the species, which previously had only rarely been recorded to 1,800 m (Coates & Peckover 2001, Beehler & Pratt 2016).

ORIENTAL HOBBY *Falco severus**
A single perched in a dead tree near a village clearing at 200 m on 17 October 2015.

BROWN FALCON *Falco berigora**
A single seen soaring at Keglsugl village at 2,500 m (05°49′53″S, 145°5′54″E); the species occurs primarily in open country.

MODEST TIGER-PARROT *Psittacella modesta**
Single male observed near our camp at 2,700 m on 29 September 2015; identified by yellow collar on the hindneck and lack of yellow spotting on the head that distinguishes it from the very similar male of Madarasz's Tiger-Parrot *P. madaraszi*. Our record represents an eastward range extension, as the species was thought to be absent east of the Mt. Hagen area (*c*.100 km to the west). To date, *P. madaraszi* is unrecorded from the gradient, although it might be expected to occur.

JOSEPHINE'S LORIKEET *Charmosyna josefinae**
We observed two near our 1,700 m camp on 10 October 2015 and several foraging individuals were recorded at 2,200 m in November 2015. An uncommon and possibly overlooked species, whose identification is complicated by its close similarity to the commoner Papuan

Figure 1. Immature Long-billed Cuckoo *Chrysococcyx megarhynchus*, Mt. Wilhelm, Papua New Guinea, 20 October 2015 (P. Z. Marki)

Figure 2. Mountain Owlet-Nightjar *Aegotheles albertisi*, Mt. Wilhelm, Papua New Guinea, 26 September 2015 (P. Z. Marki)

Figure 3. Leaden Honeyeater *Ptiloprora plumbea*, Mt. Wilhelm, Papua New Guinea, 9 October 2015 (P. Z. Marki)

Figure 4. Male Yellow-breasted Satinbird *Loboparadisaea sericea*, Mt. Wilhelm, Papua New Guinea, 6 October 2015 (P. Z. Marki)

Figure 5. Female (left) and male (right) Spotted Berrypecker *Rhamphocharis crassirostris*, Mt. Wilhelm, Papua New Guinea, 6 October 2015 (P. Z. Marki)

Figure 6. Sooty Shrikethrush *Colluricincla tenebrosa*, Mt. Wilhelm, Papua New Guinea, 4 October 2015 (P. Z. Marki)

Lorikeet *C. papou*. The Bismarck Mountains lie at the north-east edge of the species' known range (Beehler & Pratt 2016).

RUBY-THROATED MYZOMELA *Myzomela eques**
A single of this generally uncommon species was mist-netted in forest at 200 m on 17 October 2015.

LEADEN HONEYEATER *Ptiloprora plumbea**
One mist-netted at 1,700 m on 9 October 2015 (Fig. 3) and a second mist-netted on 20 November 2015. We also observed the species in the surrounding area on a few occasions, usually in pairs foraging inconspicuously in the subcanopy, with tails frequently cocked. A rare and patchily distributed species of mid-mountain forest, with records scattered throughout the Central Range, but previously unrecorded on the Mt. Wilhelm gradient (Sam & Koane 2014, Beehler & Pratt 2016).

RUFOUS-BACKED HONEYEATER *Ptiloprora guisei*
One of the most frequently mist-netted species at 2,700 m, despite Grey-streaked Honeyeaters *P. perstriata* also being present at the same site albeit in smaller numbers. Beehler & Pratt (2016) reported that *P. guisei* only reaches 2,400 m in the presence of *P. perstriata*. Our observations support those of Sam & Koane (2014), who also reported that the elevational ranges of these two species overlap broadly and that they are locally sympatric. This contradicts Diamond's (1973) suggestion that the two species exhibit significant elevational segregation due to strong interspecific competition. The two species differ markedly in size and thus potentially also in their ecological niches.

SPOTTED HONEYEATER *Xanthotis polygrammus**
A generally uncommon species primarily found in hill and lower montane forest (Beehler & Pratt 2016). We mist-netted the species twice and observed it once at our 1,200 m camp. We recorded the call of one individual at 680 m in November 2015, and observed two at *c*.800 m in 2013.

ORNATE MELIDECTES *Melidectes torquatus**
We observed one in a forest gap along the track (at *c*.1,000 m) between our camps at 700 m and 1,200 m, in July 2013, representing a new record for the area. Local villagers reported that they are familiar with the species, but that it is rarely encountered and only in some years. Often associated with second growth and disturbed habitats, and can be expected to increase in response to potentially greater human activities along the gradient (Higgins *et al*. 2008).

YELLOW-BREASTED SATINBIRD *Loboparadisaea sericea*
Another rare and little-known denizen of mid-mountain forest, with a patchy distribution in the Central Ranges. We observed it at 2,200 m in July 2013 and at 2,700 m in November 2015, which is significantly higher than the species' previously reported upper elevational range (625–2,000 m: Coates 1990, Beehler & Pratt 2016). In addition, we mist-netted two males (Fig. 4) and a female at 1,700 m, and observed the species frequently in the environs in October 2015. At the same site, a male and a juvenile were observed feeding on fruits of the tree *Trema orientalis*, where they were joined by several Common Smoky Honeyeaters *Melipotes fumigatus* and a female Superb Bird-of-Paradise *Lophorina superba*. Although the nominate subspecies is believed to occur in the Eastern Ranges, including the Bismarcks,

both mist-netted males exhibited characters consistent with the south-east subspecies *L. s. aurora*, including a pale blue bill-wattle and an olive wash to the crown. However, as the two subspecies are weakly differentiated, possibly representing clinal variation from east to west, more study is needed to assess their validity (Beehler & Pratt 2016).

SPOTTED BERRYPECKER *Rhamphocharis crassirostris**
We mist-netted three and observed a fourth individual near our camp at 1,700 m (Fig. 5). A generally rare species not recorded by Sam & Koane (2014), although it has been reported to be locally common elsewhere, such as on the Huon Peninsula (Freeman *et al*. 2013). One of the mist-netted birds was an adult male that appeared quite different to existing descriptions of male plumage (e.g. Pratt & Beehler 2014), with a distinct blue-black gloss to the upperparts, including the head, scapulars and tail, reminiscent of an immature male Fan-tailed Berrypecker *Melanocharis versteri*. It is possible that this represents an age-related feature. Beehler & Pratt (2016) treated the eastern subspecies *R. c. piperata* as specifically distinct from the western nominate.

SOOTY SHRIKETHRUSH *Colluricincla tenebrosa**
A male was mist-netted in primary cloud forest on 4 October 2015 at 2,700 m (Fig. 6). The bird was caught at ground level in dense bamboo undergrowth also inhabited by Forbes's Forest Rail *Rallicula forbesi* and Lesser Melampitta *Melampitta lugubris*. Our record represents a significant range and elevational extension, as the species had previously been recorded east only to the western Schrader Range and only to 2,150 m (Pratt & Beehler 2014, Beehler & Pratt 2016). A shy and poorly known species with few recent records. We did not identify the individual to subspecies, as the two currently recognised taxa were described from atypical specimens of a highly variable species perhaps best treated as monotypic (Beehler & Pratt 2016).

LONG-TAILED SHRIKE *Lanius schach**
Unrecorded by Sam & Koane (2014), we observed one at 2,500 m in Keglsugl village on 28 September 2015.

BLACK-HEADED WHISTLER *Pachycephala monacha**
We observed at least three between 600 m and 700 m in November 2015. An active nest was reported by villagers at *c.*850 m during our stay. The species appears to swiftly utilise newly opened areas, in this instance those cleared in late 2014 in close proximity to our camp.

WILLIE WAGTAIL *Rhipidura leucophrys**
Common and widespread throughout most of Australia and Melanesia. Several were observed around Keglsugl village at 2,500 m in September 2015.

CHESTNUT-BELLIED FANTAIL *Rhipidura hyperythra**
Moderately common in hill and lower montane forest throughout New Guinea. We observed a single at 1,200 m on 14 October 2015, and three at 700 m in November 2015.

GLOSSY-MANTLED MANUCODE *Manucodia ater**
We observed one at 700 m in August 2013, and two at the same elevation in November 2015, which were identified by their distinctive call. Crinkle-collared Manucode *M. chalybatus* and *M. ater* were both observed during the November 2015 survey, foraging at the forest edge close to the 700 m camp.

SHORT-TAILED PARADIGALLA *Paradigalla brevicauda**
One was observed in forest at *c*.2,800 m on 20 June 2013, and a single was seen foraging in roadside forest on 4 October 2015 at *c*.2,500 m.

KING-OF-SAXONY BIRD-OF-PARADISE *Pteridophora alberti**
We observed a single female and heard three calling males on several occasions on 4 October 2015, along the road between the 2,700 m and 3,200 m study sites. Not previously recorded in the proximity of the study sites, suggesting that its occurrence in the area might be highly local.

GOLDEN MYNA *Mino anais**
Several recorded at 200 m and 700 m in August 2013 and November 2015. Unrecorded by Sam & Koane (2014), but expected to occur in the region. The species is apparently uncommon and our record from 700 m is slightly higher than its previously reported elevational range (0–570 m: Coates 1990, Beehler & Pratt 2016).

PAPUAN GRASSBIRD *Megalurus macrurus**
A highly variable species found at all elevations throughout New Guinea (Beehler & Pratt 2016). We observed several at 1,700 m in November 2015.

BLUE-FACED PARROTFINCH *Erythrura trichroa*
A male was mist-netted in cloud forest on 24 September 2015 at 3,700 m, and one was observed at 3,200 m in November 2015. In addition, we recorded the species on several occasions along the road between 2,700 m and 3,200 m in June 2013. Previously reported only to 3,000 m (Beehler & Pratt 2016), but it is a highly nomadic species that could potentially appear anywhere in New Guinea.

Discussion

Our recent surveys confirm that, despite being one of the best-surveyed areas in New Guinea, there is still undocumented avian diversity on the Mt. Wilhelm elevational gradient. As well as documenting additions to the regional avifauna, we present new data on species habits and elevational ranges. Our results will potentially aid further study of tropical mountain gradients, including work on speciation, community assemblies and species responses to climate change.

We recorded six extensions to upper elevational range limits reported in the literature, but none to lower limits. This corroborates previous studies, which have documented many upslope shifts among New Guinea birds (Sam & Koane 2014, Freeman & Class Freeman 2014a,b), a trend that has been postulated to represent responses to global warming (Freeman & Class Freeman 2014a, but see Rehm 2014). However, as stressed by Sam & Koane (2014), the absence of historical records along the Mt. Wilhelm gradient means that the significance of our elevational records should be treated cautiously in respect of their cause. Furthermore, during the latter half of 2015, Papua New Guinea experienced some of the most severe droughts in decades, associated with a strong El Niño event. The decrease in precipitation, especially at lower elevations, might have influenced local bird distribution and abundance, including shifts in elevation, with some species potentially moving upslope where conditions were less severe. Notably, several species that are usually common at lowland sites appeared to be less abundant or absent. Finally, breeding activity also appeared to be limited at lower elevation sites, suggesting that some species might have abandoned or postponed nesting attempts given the conditions. Significant effects of El

Niño Southern Oscillation events on the timing of breeding and reproductive output have been documented elsewhere in the world (e.g. Sillett *et al*. 2000, Wilson & Arcese 2003), but to our knowledge not from New Guinea.

Despite considerable survey effort, a number of species that might be expected to occur in the local area have to date not been recorded, including several widespread upper hill forest / montane species such as Madarasz's Tiger-Parrot *Psittacella madaraszi*, Fairy Lorikeet *Charmosyna pulchella*, Mountain Myzomela *Myzomela adolphinae*, Red Myzomela *M. cruentata*, Papuan Black Myzomela *M. nigrita*, Marbled Honeyeater *Pycnopygius cinereus* and Varied Sittella *Daphoenositta chrysoptera*. We predict that further surveys along the gradient may reveal their presence. Given that several of these are primarily canopy-dwelling species, they might simply have been overlooked. Furthermore, a number of widespread species primarily associated with lowland forest are unrecorded to date. This might in part reflect the limited extent and fragmented nature of lowland forest at the base of the gradient (Sam & Koane 2014). Finally, another noteworthy group of species that appears to be absent from the area are birds-of-paradise of the genus *Parotia*. Despite the high cultural value of birds-of-paradise in most regions of New Guinea, local villagers along the gradient are not familiar with parotias. This, coupled with intensive surveys that have failed to detect the presence of this normally conspicuous group of birds, suggests that their absence may be real. However, the reasons for this are unclear and therefore require explanation.

Our records signify that knowledge of the distribution of New Guinean birds is still incomplete, even for well-surveyed areas. We encourage more detailed avifaunal surveys be undertaken in New Guinea, both in well-surveyed areas and regions that to date have been surveyed to a limited degree, such as the many outlying ranges (e.g. North Coastal Range, Cyclops and Foja Mountains). In particular, we recommend further data collection concerning abundance, dispersal and life-history traits of the island's birds. The New Guinea avifauna represents an excellent study system for investigating a series of long-standing ecological and evolutionary questions that would benefit from more and detailed data.

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References:

Beehler, B. M. & Pratt, T. K. 2016. *Birds of New Guinea: distribution, taxonomy, and systematics*. Princeton Univ. Press.

Boles, W. E. 2007. Family Petroicidae (Australasian robins). Pp. 438–489 *in* del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, vol. 12. Lynx Edicions, Barcelona.

Coates, B. J. 1985. *The birds of Papua New Guinea*, vol. 1. Dove Publications, Alderley, Queensland.

Coates, B. J. 1990. *The birds of Papua New Guinea*, vol. 2. Dove Publications, Alderley, Queensland.

Coates, B. J. & Peckover, W. S. 2001. *Birds of New Guinea and the Bismarck archipelago*. Dove Publications, Alderley, Queensland.

Deiner, K., Lemmon, A. R., Mack, A. L., Fleisher, R. C. & Dumbacher, J. P. 2011. A passerine bird's evolution corroborates the geological history of the island of New Guinea. *PLoS ONE* 6: e19479.

Diamond, J. M. 1973. Distributional ecology of New Guinea birds: recent ecological and biogeographical theories can be tested on the bird communities of New Guinea. *Science* 179: 759–769.

Erritzøe, J., Mann, C. F., Brammer, F. & Fuller, R. A. 2012. *Cuckoos of the world*. Christopher Helm, London.

Freeman, B. G., Class, A., Mandeville, J., Tomassi, S. & Beehler, B. M. 2013. Ornithological survey of the mountains of the Huon Peninsula, Papua New Guinea. *Bull. Brit. Orn. Cl*. 133: 4–18.

Freeman, B. G. & Class Freeman, A. M. 2014a. Rapid upslope shifts in New Guinean birds illustrate strong distributional responses of tropical montane species to global warming. *Proc. Natl. Acad. Sci. USA* 111: 4490–4494.

Freeman, B. G. & Class Freeman, A. M. 2014b. The avifauna of Mt. Karimui, Chimbu Province, Papua New Guinea, including evidence for long-term population dynamics in undisturbed tropical forest. *Bull. Brit. Orn. Cl.* 134: 30–51.

Gill, F. & Donsker, D. (eds.) 2016. IOC world bird list (version 6.1). www.worldbirdnames.org.

Higgins, P. J., Christidis, L. & Ford, H. A. (2008). Family Meliphagidae (honeyeaters). Pp. 498–691 *in* del Hoyo, J., Elliott, A. & Christie, D.A. (eds.) *Handbook of the birds of the world*, vol. 13. Lynx Edicions, Barcelona.

Irestedt, M., Batalha-Filho, H., Roselaar, C. S., Christidis, L. & Ericson, P. G. P. 2015. Contrasting phylogeographic signatures in two Australo-Papuan bowerbird species complexes (Aves: *Ailuroedus*). *Zool. Scripta* 45: 365–379.

Jønsson, K. A., Fabre, P.-H., Ricklefs, R. E. & Fjeldså, J. 2011. Major global radiation of corvoid birds originated in the proto-Papuan archipelago. *Proc. Natl. Acad. Sci. USA* 108: 2328–2333.

Mayr, E. & Gilliard, E. T. 1964. Birds of central New Guinea: results of the American Museum of Natural History expeditions to New Guinea in 1950 and 1952. *Bull. Amer. Mus. Nat. Hist*. 103: 311–374.

Pratt, T. K. & Beehler, B. M. 2014. *Birds of New Guinea*. Second edn. Princeton Univ. Press.

Rehm, E. M. 2014. Rates of upslope shifts for tropical species depend on life history and dispersal mode. *Proc. Natl. Acad. Sci. USA* 111: E1676.

Sam, K. & Koane, B. 2014. New avian records along the elevational gradient of Mt. Wilhelm, Papua New Guinea. *Bull. Brit. Orn. Cl.* 134: 116–133.

Sillett, T. S., Holmes, R. T. & Sherry, T. W. 2000. Impacts of a global climate cycle on population dynamics of a migratory songbird. *Science* 288: 2040–2042.

Sorenson, M. D. & Payne, R. B. 2005. A molecular genetic analysis of cuckoo phylogeny. Pp. 68–94 *in* Payne, R. B. *The cuckoos*. Oxford Univ. Press.

Wilson, S. & Arcese, P. 2003. El Niño drives timing of breeding but not population growth in the song sparrow (*Melospiza melodia*). *Proc. Natl. Acad. Sci. USA* 100: 11139–11142.

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New distributional and temporal bird records from Chihuahua, Mexico

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Summary.—We present noteworthy records from Chihuahua, northern Mexico, including several first state occurrences (e.g. White Ibis *Eudocimus albus*, Red-shouldered Hawk *Buteo lineatus*) or species with very few previous state records (e.g. Tricoloured Heron *Egretta tricolor*, Baltimore Oriole *Icterus galbula*). We also report the first Chihuahuan records of Red-tailed Hawk *Buteo jamaicensis harlani* and 'White-winged' Dark-eyed Junco *Junco hyemalis aikeni* (the latter only the second Mexican record). Other records improve our knowledge of the distribution of winter visitors to the Chihuahuan Desert ecoregion that formerly were considered transients, including several parulids. Our field work has also improved knowledge of the distribution of certain Near Threatened (e.g. Snowy Plover *Charadrius nivosus*) and Vulnerable species (e.g. Pinyon Jay *Gymnorhinus cyanocephalus*). We also confirmed various breeding localities for Yellow-crowned Night Heron *Nyctanassa violacea* in Chihuahua.

The avian diversity of Mexico encompasses 95 families, 493 genera and 1,150 species following IOC taxonomy (*cf*. Navarro-Sigüenza *et al*. 2014) or *c*.11% of total avian richness worldwide. Mexico is ranked as the 11th most important country in terms of bird species richness and fourth in the proportion of endemic species (Navarro-Sigüenza *et al*. 2014). However, Chihuahua—the largest Mexican state—is poorly surveyed ornithologically, mostly at sites in and around the Sierra Madre Occidental (e.g., Stager 1954, Miller *et al*. 1957, Webb 1984, Gómez de Silva 2002a, Dieni *et al*. 2003, Flesch *et al*. 2016), with few publications referring to a handful of localities away from there (Vuilleumier & Williams 1964, Leukering & Bradley 1997, Mondaca-Fernández & Moreno-Contreras 2014, Moreno-Contreras *et al*. 2015a, Torres-Vivanco *et al*. 2015). Here, we present new distributional data for 29 bird species in Chihuahua and compare these with recent assessments of their status and distribution in adjacent states of Mexico and the USA. Three species and two subspecies represent new records for the state and six 'transients' are demonstrated to be winter visitors. Of the species reported here, five and two are nationally and / or globally threatened, respectively.

Methods

Between 2007 and 2016, we conducted field work at 36 Chihuahuan localities at altitudes of 970–2,700 m (Fig. 1, Table 1). Birds were identified using binoculars, telescopes and by their vocalisations. Geographical coordinates for each locality are largely taken from CONABIO (2014) and digital gazetteers (http://www.fallingrain.com/; Table 1). Taxonomy and nomenclature follow the IOC (Gill & Donsker 2016). Elevational data were obtained by extracting point values for each locality from the Hydro 1k project, a digital elevation model (DEM) projected at WGS84 (https://lta.cr.usgs.gov/HYDRO1K). Subspecies are stated if known with certainty. Conservation status is based on Mexican law (SEMARNAT 2010) and

TABLE 1
Localities surveyed in Chihuahua, Mexico.

Locality	Municipality	Coordinates	Elevation (m)
1. Vado de Meoqui	Meoqui	28°15′45.5′′N, 105°28′21.0′′W	1,150
2. Presa Chuvíscar	Chihuahua	28°35′56′′N, 106°06′59′′W	1,485
3. Naica	Saucillo	27°51′17′′N, 105°29′33′′W	1,495
4. Presa Francisco I. Madero	Rosales	28°05′40.12′′N, 105°40′49′′W	1,255
5. Delicias	Delicias	28°10′17.6′′N, 105°29′09.1′′W	1,180
6. El Torreón	Meoqui	28°19′33′′N, 105°24′51′′W	1,140
7. Río Conchos (I)	Camargo	27°42′49′′N, 105°11′08.1′′W	1,240
8. Río Falomir, Maclovio Herrera	Aldama	29°03′50.2′′N, 105°08′45.6′′W	1,010
9. Jesús Carranza	Juárez	31°29′19.73′′N, 106°13′50.09′′W	1,115
10. La Mesa	Aldama	28°46′11′′N, 105°58′05′′W	1,325
11. near Rancho El Refugio	La Cruz	27°51′0.8′′N, 105°11′35.5′′W	1,215
12. El Floreño	Camargo	27°46′50.5′′N, 105°09′48.8′′W	1,210
13. Colonia Vicente Guerrero	Saucillo	28°02′02′′N, 105°18′55′′W	1,205
14. Colonia 10 de Mayo	Meoqui	28°25′28′′N, 105°33′29′′W	1,175
15. Orinda	Rosales	28°15′54′′N, 105°33′54′′W	1,255
16. El Gato Negro	Saucillo	28°05′07′′N, 105°20′42′′W	1,210
17. Vado de Rosales	Rosales	28°11′11.4′′N, 105°32′60′′W	1,185
18. Camargo	Camargo	27°42′03.3′′N, 105°10′38′′W	1,225
19. Río Conchos (II)	Julimes	27°25′58.8′′N, 105°25′22.8′′W	1,140
20. Estación Consuelo	Meoqui	28°19′00′′N, 105°35′60′′W	1,195
21. La Garita	Rosales	28°08′12.8′′N, 105°11′35.5′′W	1,195
22. Loma Blanca	Juárez	31°34′47′′N, 106°17′55′′W	1,120
23. Laguna San Juan	Ascensión	31°12′24′′N, 108°00′09.7′′W	1,295
24. El Herradero	Chihuahua	28°34′38.9′′N, 106°09′35.8′′W	1,540
25. Hidalgo del Parral	Hidalgo del Parral	28°55′57′′N, 105°39′47′′W	1,710
26. Barrancas del Cobre	Urique	27°13′33.1′′N, 107°52′49.8′′W	970
27. Ojo de Enmedio	Juárez	31°22′44′′N, 106°35′11′′W	1,240
28. El Chamizal	Juárez	31°45′31.8′′N, 106°27′24′′W	1,130
29. Sierra San Luis	Janos	31°18′32.4′′N, 108°44′49.2′′W	1,965
30. Cinco Millas	Madera	29°19′53′′N, 108°12′27′′W	2,700
31. Mesa de las Guacamayas	Janos	30°32′17.9′′N, 108°35′49.2′′W	2,295
32. Presa El Rejón	Chihuahua	28°34′15.6′′N, 106°09′57.7′′W	1,540
33. near Neder	Rosales	28°12′11.4′′N, 105°31′49.1′′W	1,175
34. Cumbres de Majalca National Park	Chihuahua	28°48′14.4′′N, 106°30′18′′W	2,135
35. near Río Sacramento	Chihuahua	28°29′37.1′′N, 105°31′58.5′′W	1,150
36. near El Jaral	Chihuahua	28°42′42.1′′N, 105°59′12.1′′W	1,350

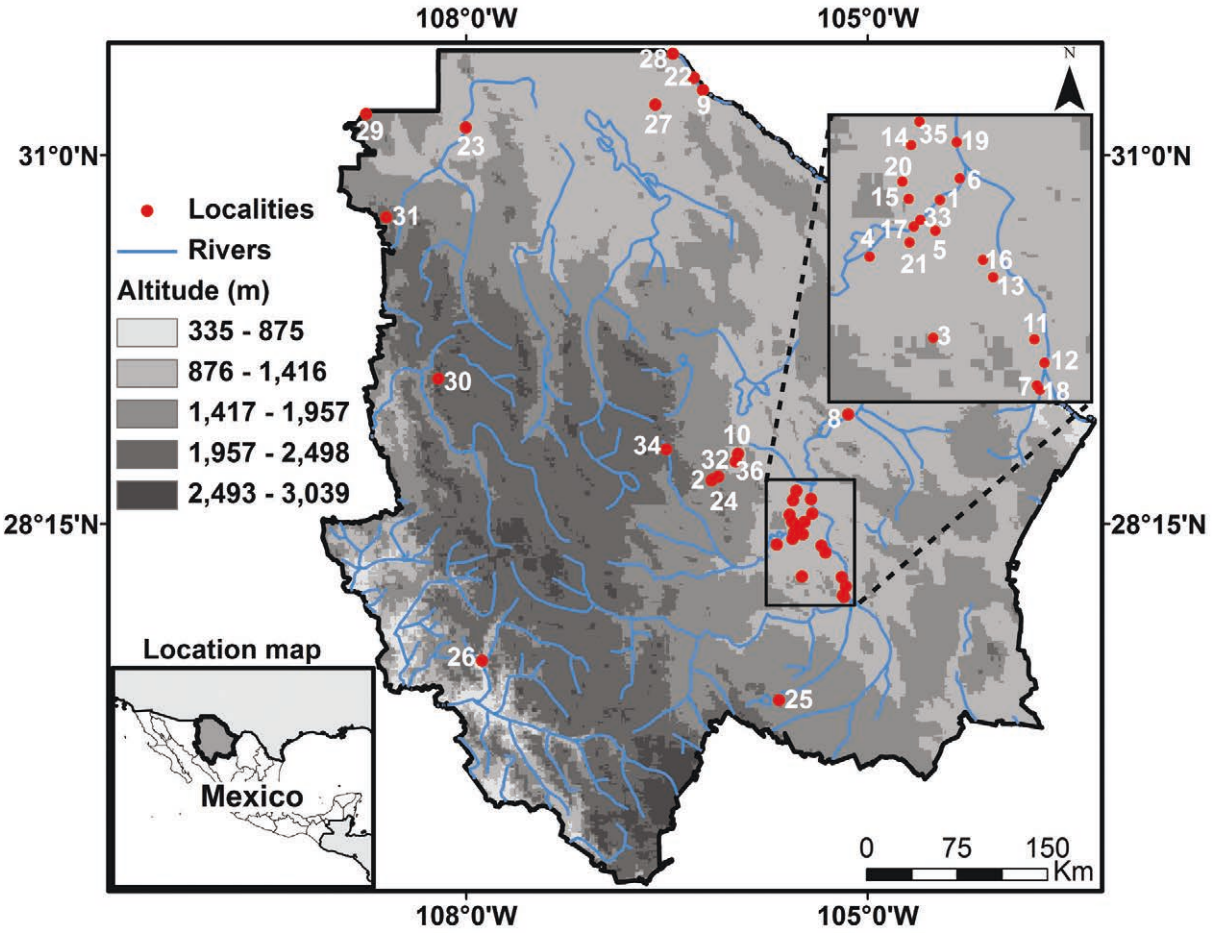

Figure 1. Map showing localities surveyed in Chihuahua, Mexico. Localities numbered following the sequence in Table 1.

the IUCN Red List (IUCN 2016). Distributional data have been deposited at the Unidad de Cartografía Digital, Instituto de Ciencias Biomédicas, Ciudad Juárez, Chihuahua, Mexico.

We determined records of interest following the criteria recommended by Sánchez-González (2013), i.e. (1) the species was not previously reported in the state, (2) the species was not previously mapped in the relevant ecoregion, biome or biogeographic province, and (3) a new locality within a continuum of suitable habitat from where there were no previous records confirming the species' presence there.

To analyse our data geographically, we obtained primary occurrence localities for the relevant species from several sources; by searching the 'Atlas of Mexican bird distributions' (Navarro-Sigüenza *et al*. 2003) and two principal online sources in May 2016 (http://portal.vertnet.org/search; www.ebird.org), as well as by reviewing relevant literature. We only selected those records properly supported by evidence such as specimens in scientific collections, photographs showing diagnostic characteristics or detailed field observations of species that could, according to published data, occur in the relevant region of Chihuahua. We discuss new additions to the list of bird species recorded in Chihuahua in light of these geographic data and by cross-referencing published information for adjoining states (Peterson & Zimmer 1998, Russell & Monson 1998, Lockwood & Freeman 2014).

Species accounts

BLACK-BELLIED WHISTLING DUCK *Dendrocygna autumnalis*
Five at Vado de Meoqui from 25 December 2015 (MJ) to 27 May 2016 (IM-C, FM, MJ, JR-M; Fig. 2A). Although the species was not mapped in Chihuahua (Howell & Webb 1995), there are previous year-round reports from Vado de Meoqui and other inland waterbodies (i.e., Presa Francisco I. Madero) (M. Bujanda *in litt*. 2016). In Sonora, it is an uncommon summer resident (Russell & Monson 1998).

HOODED MERGANSER *Lophodytes cucullatus*
A pair at Presa Chuvíscar on 19 January 2016 (MJ; Fig. 2B). A regular winter visitor only to Juárez municipality, Chihuahua (Moreno-Contreras *et al*. 2015a); further south it is highly irregular and probably only a casual visitor to waterbodies such as Laguna Fierro (eBird 2016). To our knowledge, there are no records for the Sierra Madre Occidental of Chihuahua. Two records for Sonora, one at Río Mayo (24 March 1977), the other at Río Bavispe (6 February 1986) (Russell & Monson 1998).

MONTEZUMA QUAIL *Cyrtonyx montezumae*
One record in the Chihuahuan Desert ecoregion: a group of six near Naica on 18 October 2015, with one on 21 October 2015 (FM). An uncommon to fairly common resident at several localities in and around the Sierra Madre Occidental of western Chihuahua, including minor ranges to the east (Moreno-Contreras *et al*. 2015b). Occasionally disperses to drier habitats (e.g., desert scrub, desert grasslands), mainly during the wet season (IM-C pers. obs.). One historical record, at Hidalgo del Parral in late July 1976 (S. Williams *in litt*. 2014), was overlooked by Moreno-Contreras *et al*. (2015b). Special protection (SEMARNAT 2010).

BROWN PELICAN *Pelecanus occidentalis*
An adult was at Vado de Meoqui on 25 January 2015 (MJ). The only previous record for Chihuahua involved a juvenile at Presa Peñitas, 15 km north of Madera, on 9 July 2002 (Gómez de Silva 2002b). An irregular, uncommon to rare visitor inland in Mexico (Howell & Webb 1995), it is also a casual visitor inland throughout Texas, with records from virtually all areas of the state, being apparently almost annual in the El Paso area (Lockwood & Freeman 2014). In New Mexico, it is a rare visitor, now annual in occurrence, and most regular on the Rio Grande at Elephant Butte Reservoir, though it has occurred over much of the state (B. Howe *in litt*. 2015).

DOUBLE-CRESTED CORMORANT *Phalacrocorax auritus*
Recorded at two localities in south-central Chihuahua: five at Presa Francisco I. Madero on 19 February 2012 (FM), and singles at Vado de Meoqui on 22 February 2015 (JR-M) and 5 December 2015 (MJ), with 15 there on 25 and 27 February 2016 (IM-C, FM). Not mapped in Chihuahua (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007), but Moreno-Contreras *et al*. (2015a) considered it a common year-round resident in northern Chihuahua, with scattered records in central and southern Chihuahua (eBird 2016). Lockwood & Freeman (2014) mentioned it as an uncommon to abundant migrant throughout Texas. In New Mexico, it is an uncommon breeder on larger lakes and some rivers nearly statewide, being most numerous in the Rio Grande and Canadian River drainages; it is also a widespread migrant and common winter visitor to the lower Pecos Valley, with smaller numbers elsewhere (B. Howe *in litt*. 2015).

Figure 2A: Black-bellied Whistling Duck *Dendrocygna autumnalis*, Vado de Meoqui, Chihuahua, Mexico, 27 May 2016 (Jaime Robles-Morales), B: Hooded Merganser *Lophodytes cucullatus*, Presa Chuvíscar, Chihuahua, Mexico, 19 January 2016 (Manuel Jurado), C: American White Ibis *Eudocimus albus*, Vado de Meoqui, Chihuahua, Mexico, 13 November 2011 (Jaime Robles-Morales), D: Yellow-crowned Night Heron *Nyctanassa violacea*, Delicias, Chihuahua, Mexico, 11 July 2014 (Jaime Robles-Morales), E: Tricoloured Heron *Egretta tricolor*, Río Falomir, Maclovio Herrera, Chihuahua, Mexico, 21 August 2015 (Jaime Robles-Carrillo), F: Mississippi Kite *Ictinia mississippiensis*, Camargo, Chihuahua, Mexico, 6 June 2016 (Alonso Alvidrez)

AMERICAN WHITE IBIS *Eudocimus albus*
First record for Chihuahua. JR-M observed a juvenile at the San Pedro River (Vado de Meoqui) on 13 November 2011 (Fig. 2C). Apparently, the species was recently recorded in Nuevo Casas Grandes municipality, on 21 August 2012, by S. Whitebread (eBird 2016). A rare visitor to Sonora (Russell & Monson 1998) and an accidental visitor to western Texas (Lockwood & Freeman 2014) and New Mexico, with probably fewer than 20 records in the second-named state (B. Howe *in litt*. 2015).

YELLOW-CROWNED NIGHT HERON *Nyctanassa violacea*
Three locality records: FM observed an adult at Delicias on 13 May 2012, a pair at a nest there on 26 April 2016 and an adult on 11 July 2014 (JR-M; Fig. 2D). JR-C observed an adult and a juvenile at El Torreón on 8 June and 27 September 2015, with two adults at Río Conchos (I) on 26 February 2016 (IM-C, FM, AA). Perhaps a regular breeder in Chihuahua: three nests with nestlings and adults in tall cottonwoods west of Casas Grandes on 29 May 2003, seven adults at Colonia Juárez on 29 May 2003 (Gómez de Silva 2003), one at Río Conchos, Camargo municipality, on 13 April 2011, and several immatures at El Agate, Chihuahua municipality, on 5 September 2014 (eBird 2016). These records confirm its presence in Chihuahua, where it was not previously mapped (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). In south-west Texas, the species is considered a casual visitor in May–October, with most records in late summer (Peterson & Zimmer 1998, Lockwood & Freeman 2014). Formerly a very rare and irregular post-breeding visitor to New Mexico, but currently more numerous, with several reports annually and nesting has been documented in recent years at two localities (B. Howe *in litt*. 2015).

TRICOLOURED HERON *Egretta tricolor*
An immature at Río Falomir, Maclovio Herrera, on 21 August 2015 (JR-C; Fig. 2E). Second record for Chihuahua; the first was one near Hinojosa on 24 August 1962 (Vuilleumier & Williams 1964). Not mapped for Chihuahua (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Scattered inland records in Sonora (Russell & Monson 1998).

WHITE-TAILED KITE *Elanus leucurus*
Single adults at La Mesa on 7 October 2011 (JR-C) and in a mosaic of agricultural fields and desert scrub near Jesús Carranza on 21 December 2014 (IM-C). Noted as a 'fairly common to common permanent resident' in parts of northern Mexico (Howell & Webb 1995); the species is regular in the Janos area (Dieni *et al*. 2003; B. Howe *in litt*. 2015) north of its mapped range in Chihuahua (Howell & Webb 1995). It breeds regularly in the El Paso area, Texas (Peterson & Zimmer 1998, Lockwood & Freeman 2014). In New Mexico, the species is a rare but regular visitor primarily to the south-west of the state (where it probably breeds occasionally), but also a fairly regularly visitor to the Mesilla Valley near Las Cruces (B. Howe *in litt*. 2015). Wandering birds have occurred north along the Rio Grande Valley to Albuquerque, with an exceptional record at Las Vegas National Wildlife Refuge (B. Howe *in litt*. 2015).

MISSISSIPPI KITE *Ictinia mississippiensis*
Seven locality records from southern Chihuahua: one near Rancho El Refugio on 27 August 2011; three at Floreño on 26 May 2012; one at Colonia Vicente Guerrero on 12 May 2013; two juveniles at Colonia 10 de Mayo on 31 August 2014; two at Orinda on 14 March 2015; four at El Gato Negro on 2 August 2015 (all JR-M); and one nesting at Camargo on 6 June 2016 (AA; Fig. 2F). We believe that this species may be a very local breeder in riparian areas

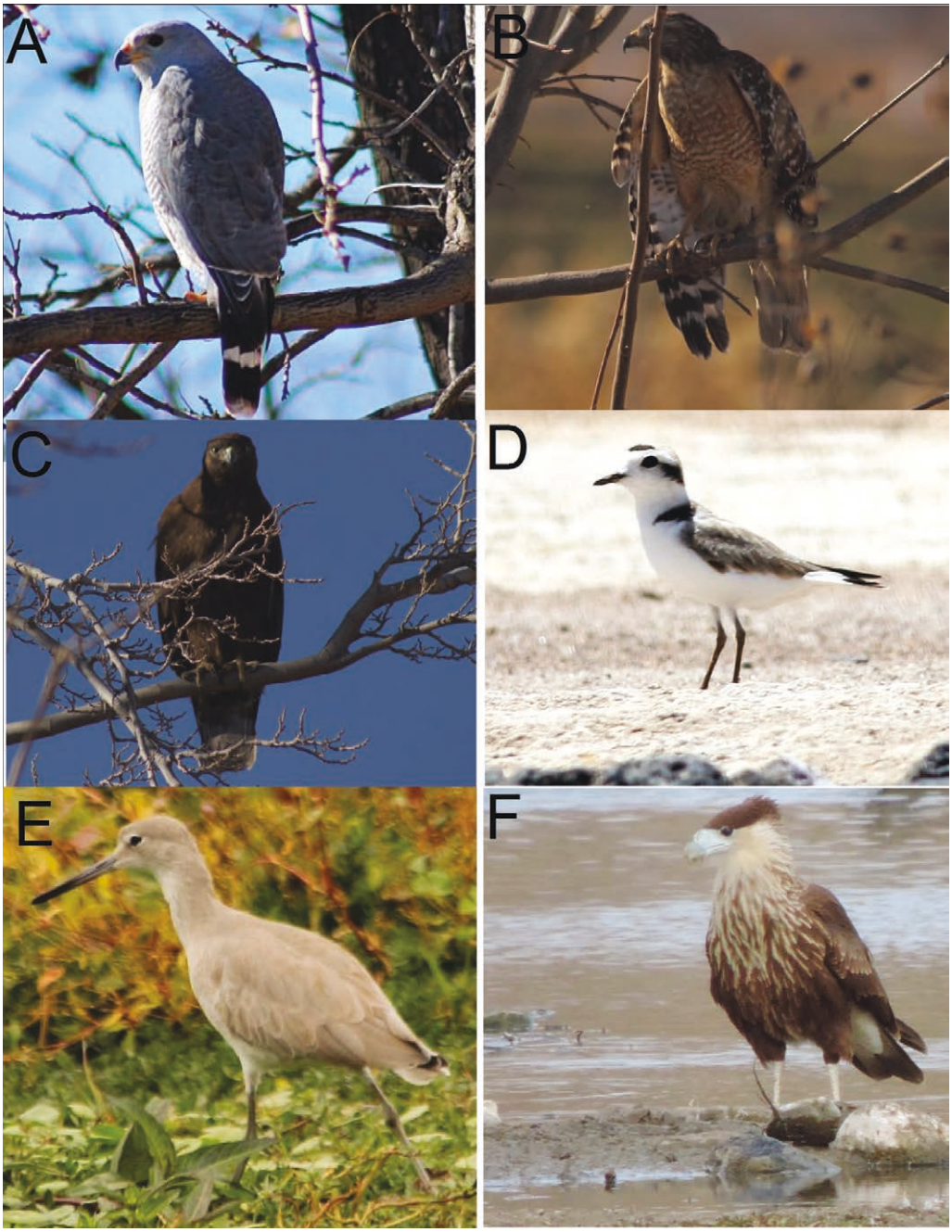

Figure 3A: Grey Hawk *Buteo plagiatus*, Presa Francisco I. Madero, Chihuahua, Mexico, 17 January 2016 (Jaime Robles-Carrillo); B: Red-shouldered Hawk *Buteo lineatus*, Estación Consuelo, Chihuahua, Mexico, 30 January 2016 (Jaime Robles-Morales); C: 'Harlan's' Red-tailed Hawk *Buteo jamaicensis harlani*, La Garita, Chihuahua, Mexico, 26 January 2014 (Jaime Robles-Morales); D: Snowy Plover *Charadrius nivosus*, Laguna San Juan, Chihuahua, Mexico, 30 May 2007 (Javier Cruz); E: Willet *Tringa semipalmata*, Vado de Meoqui, Chihuahua, Mexico, 8 November 2015 (Jaime Robles-Morales); F: Northern Crested Caracara *Caracara cheriway*, Vado de Meoqui, Chihuahua, Mexico, February 2014 (Manuel Jurado)

or other sites with many trees mixed with agricultural fields in the Chihuahuan Desert ecoregion. Formerly considered a fairly common to common transient in the lowlands of Mexico (Howell & Webb 1995). The first record in Chihuahua was at Batosárachi (Gómez de Silva 2002a) and the first breeding record for Mexico was at Río Casas Grandes, northern Chihuahua, on 2 June 1998 (Williams 1998). Since then, there have been numerous reports at Río Casas Grandes (eBird 2016) and in Juárez municipality (Moreno-Contreras *et al*. 2015a). A common to uncommon migrant in Texas (Lockwood & Freeman 2014), it is now an uncommon summer resident in the west of the state (Peterson & Zimmer 1998, Lockwood & Freeman 2014). A locally numerous breeder in cities and towns of easternmost New Mexico, but rarer further west, although small numbers breed in the Pecos Valley from Carlsbad County north to Santa Rosa County, and in the Rio Grande Valley from Socorro north at least to around Albuquerque, possibly as far north as Espanola (B. Howe *in litt*. 2015). Special protection (SEMARNAT 2010).

GREY HAWK *Buteo plagiatus*

Five locality records: singles at Delicias on 21 December 2014 (FM), Vado de Rosales on 25 December 2014 (MJ), Camargo on 9 September 2015 (AA), Presa Francisco I. Madero on 17 January 2016 (JR-C; Fig. 3A) and Río Conchos (I) on 26 February 2016 (IM-C, FM, AA). These records confirm its presence away from the Sierra Madre Occidental where not previously mapped (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Only a handful of previous records in Chihuahua: one sound-recorded near Casa de Janos on 31 May 2003 (Gómez de Silva 2003), a juvenile observed by B. Howe at Río San Pedro near Mesa de las Guacamayas on 30 May 2004, one seen by D. MacKay at Laguna Fierro, Nuevo Casas Grandes municipality on 19 August 2011, and another seen by R. Zamudio at Valle de Allende on 15 September 2013 (eBird 2016). The range expansion of Grey Hawk north and to higher elevations in the south-west USA and the interior of northern Mexico can be attributed to locally improved habitat conditions, including establishment of tall trees in riparian areas for nesting and brush encroachment in adjacent uplands for foraging, but might also reflect increasing temperatures, locally and regionally (Williams & Krueper 2008). Formerly a very rare visitor to New Mexico, but now breeds at two locations: Guadalupe Canyon in the south-west, and near Carlsbad in the south-east of the state (Williams & Krueper 2008; B. Howe *in litt*. 2015).

RED-SHOULDERED HAWK *Buteo lineatus*

First records for Chihuahua. Probably an uncommon but regular winter visitor to central and southern Chihuahua. Five records: singles at Vado de Rosales (Río San Pedro) on 26 January 2014 (MJ), near Río Conchos (II) on 16 February 2014 (JR-M), Naica on 10 December 2014 (FM), Camargo on 15 January 2015 (AA), and soaring over agricultural fields near Estación Consuelo on 30 January 2016 (JR-M; Fig. 3B). No Sonora records (Russell & Monson 1998). An uncommon to rare winter visitor to north-east and central Mexico (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). In Texas, Lockwood & Freeman (2014) considered it a common to uncommon resident throughout the eastern two-thirds of the state, and a rare to casual winter visitor further west. In New Mexico, a casual visitor primarily during migration and winter, with probably fewer than 20 records involving both the eastern (nominate) and western (*B. l. elegans*) subspecies (B. Howe *in litt*. 2015). Special protection (SEMARNAT 2010).

'HARLAN'S' RED-TAILED HAWK *Buteo jamaicensis harlani*
First records for Chihuahua. JR-M observed a dark-morph Harlan's Hawk near Rancho, El Refugio municipality on 22 January 2012, and another near La Garita on 26 January 2014 (Fig. 3C). On 5 and 20 February 2015, IM-C photographed a dark-morph adult in agricultural fields with scattered trees and irrigation channels at Loma Blanca along the Río Grande. Only a handful of previous records for Mexico, all in Baja California: one at Mexicali on 1–15 December 1994 (Patten *et al*. 2001), one in Baja California Sur on 24–31 January and 10 March 2003 (Mlodinow *et al*. 2005) and two well-documented records, in 2008 (specific date not mentioned: Erickson *et al*. 2013) and on 22 January 2012 (Erickson *et al*. 2013). Additionally, Mlodinow *et al*. (2005) suggested that it may occur in Tamaulipas, given several records from the Texas side of the lower Rio Grande Valley (Lockwood & Freeman 2014, eBird 2016). In south-west Texas, Peterson & Zimmer (1998) considered it a 'rare winter visitor' to the Trans-Pecos region. In New Mexico a regular winter visitor in small numbers, primarily from the Rio Grande Valley east, where it is usually found in areas with many trees and agricultural fields (B. Howe *in litt*. 2015).

AMERICAN AVOCET *Recurvirostra americana*
JR-M observed a pair exhibiting breeding behaviour at El Vado (28°15'13.3''N, 105°29'33.3''W) on 27 May 2016. Subsequently, a nest with one egg was discovered on 5 June 2016 (JR-M). Formerly, a transient in northern Chihuahua and winter visitor further south (Howell & Webb 1995), the species has since been recorded regularly as a summer resident at several localities in Chihuahua (Venegas-Holguín *et al*. 2015). Mostly a common winter visitor and transient in Sonora, although some non-breeders over-summer in some years (Russell & Monson 1998).

SNOWY PLOVER *Charadrius nivosus*
First breeding record in Chihuahua. On 30 May 2007, a pair was nesting at Laguna San Juan (JC; Fig. 3D). Previously, just one record: a single at a Pemex station on Highway 16 near General Trías, *c*.30 km west of Chihuahua city, on 30 July 2005 (Gómez de Silva 2005b). Not mapped for interior Chihuahua (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). A fairly common to common transient and winter visitor on the Pacific coast from Baja California and Sonora to Nayarit, and uncommon to common on the Atlantic coast from Tamaulipas to the Yucatán Peninsula (Howell & Webb 1995). Breeds mainly on the Mexican Plateau (Howell & Webb 1995). In the Trans-Pecos region of Texas, Snowy Plover is a regular breeder at Lake Balmorhea, Toyah Lake, Imperial Reservoir and Red Bluff Lake (Peterson & Zimmer 1998). In New Mexico it is a regular breeder in the lower Pecos Valley and an occasional visitor and rare breeder along the Rio Grande north to Bosque del Apache National Wildlife Refuge (B. Howe *in litt.* 2015). Listed as threatened nationally (SEMARNAT 2010) and Near Threatened globally (IUCN 2016).

WILLET *Tringa semipalmata*
A single at Vado de Meoqui on 8 November 2015 (FM, JR-M; Fig. 3E). Previously observed at Laguna Fierro, Nuevo Casas Grandes municipality, on 22 May 2008 (eBird 2016), and at Vado de Meoqui in March and October 2015 (eBird 2016). Not mapped for interior Chihuahua (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Russell & Monson (1998) listed five inland records for Sonora, all between 20 August and 15 September, except one on 30 April.

YELLOW-BILLED CUCKOO *Coccyzus americanus*
A pair copulating at El Herradero on 3 June 2016 (MJ). This record confirms its presence as a breeder in central Chihuahua, where well-documented breeding records are lacking. The species is perhaps a summer resident in Meoqui municipality, where there are a few early-summer records, mainly in riparian vegetation bordered by cottonwoods *Populus* (FM). Mapped as a summer resident only in western and northern Chihuahua by Howell & Webb (1995), but over the east and centre of the state by Navarro-Sigüenza & Peterson (2007).

NORTHERN CRESTED CARACARA *Caracara cheriway*
An adult in desert scrub near the settlement of Hidalgo del Parral on 13 March 2010 (JC); a juvenile at Vado de Meoqui on 3 February 2014 (MJ; Fig 3F); and a breeding record at Barrancas del Cobre (Sinaloan dry forests ecoregion) on 17 June 2014 (JC). Apparently the species has expanded its range in the Chihuahuan Desert ecoregion. Navarro-Sigüenza & Peterson (2007) mapped it only for south-west Chihuahua. In nearby Sonora, it is a fairly common to common resident below 1,000 m (Russell & Monson 1998). In adjacent Texas, the species is a 'casual visitor' throughout the year to the Trans-Pecos region (Peterson & Zimmer 1998, Lockwood & Freeman 2014). Casual visitor to southern New Mexico, with on average one report every five years (B. Howe *in litt*. 2015).

GREY FLYCATCHER *Empidonax wrightii*
A single was in mesquite-creosote scrub at Ojo de Enmedio on 7 February 2015 (IM-C), north of its winter range in Mexico (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). The species is a fairly common to uncommon migrant in northern Chihuahua (Moreno-Contreras *et al*. 2015a), with the Janos area perhaps representing the regular northern winter limit east of south-east Arizona (Dieni *et al*. 2003). Very rare winter visitor to El Paso County, Texas (Peterson & Zimmer 1998, Lockwood & Freeman 2014) and New Mexico (B. Howe *in litt*. 2015). A common transient from the coastal plain to the lower limits of pine–oak woodland, and common in winter at elevations below 1,000 m and rare in higher pine–oak woodland (Russell & Monson 1998).

PLUMBEOUS VIREO *Vireo plumbeus*
Three winter records for the Chihuahuan Desert: singles at Presa Francisco I. Madero on 4 January 2015 (M. Bujanda *in litt*. 2015), El Chamizal on 11 and 31 January 2015 (IM-C) and Vado de Meoqui on 27 February 2016 (IM-C, FM). A winter visitor to the Sierra Madre Occidental (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Our records confirm the species to be a regular winter visitor to the Chihuahuan Desert ecoregion. Rare but regular winter visitor to the Trans-Pecos region, Texas (Peterson & Zimmer 1998, Lockwood & Freeman 2014). Fairly common breeder in montane New Mexico and a very rare winter visitor mostly to the Rio Grande Valley from Elephant Butte Lake south (B. Howe *in litt*. 2015).

PINYON JAY *Gymnorhinus cyanocephalus*
An adult perched in an oak beside Highway 2 Janos–Agua Prieta, near Sierra San Luis, on 11 September 2015 (MJ). Formerly considered casual elsewhere in Chihuahua, with a record at Babícora Hills on 4 December 1936, and one collected at Rancho La Ciénega, *c*.27 km east La Junta, Guerrero municipality, on 10 June 1949 (Miller *et al*. 1957). Four records for Sonora, in April–May and October–November (Russell & Monson 1998). A detailed analysis of its status and distribution in Chihuahua will be published elsewhere. Considered Vulnerable globally (IUCN 2016).

Figure 4A: Clark's Nutcracker *Nucifraga columbiana*, Cinco Millas, Chihuahua, Mexico, 10 January 2015 (Javier Cruz); B: Northern Rough-winged Swallow *Stelgidopteryx serripennis*, Conchos (I), Chihuahua, Mexico, 26 February 2016 (Israel Moreno-Contreras); C: Black-and-white Warbler *Mniotilta varia*, Vado de Meoqui, Chihuahua, Mexico, 29 December 2015 (Jaime Robles-Morales); D: Wilson's Warbler *Cardellina pusilla*, Vado de Meoqui, Chihuahua, Mexico, 9 January 2016 (Manuel Jurado); E: Baltimore Oriole *Icterus galbula*, Camargo, Chihuahua, Mexico, 18 August 2015 (Alonso Alvidrez); F: 'White-winged' Dark-eyed Junco *Junco hyemalis aikeni*, El Chamizal, Chihuahua, Mexico, 22 February 2015 (Israel Moreno-Contreras)

CLARK'S NUTCRACKER *Nucifraga columbiana*
First records for Chihuahua. JC observed a flock of *c*.8 individuals in *Pseudotsuga menziesii*, *Pinus arizonica* and *Pinus ayacahuite* near Cinco Millas at 2,600 m on 30 April 2008, and a group of four at the same locality on 10 January 2015 (Fig. 4A). There is a previous report at Mesa de las Guacamayas on an unknown date in May 2009 (J. Olivo *in litt*. 2015). The species' potential distribution was considered to reach slightly into north-west Chihuahua (Navarro-Sigüenza & Peterson 2007). Recorded twice in Sonora (Russell & Monson 1998), a very rare winter visitor to the Trans-Pecos region (Peterson & Zimmer 1998, Lockwood & Freeman 2014) and an uncommon resident in the higher mountains of New Mexico, primarily above 2,500 m, with casual records in the lowlands in autumn / winter (B. Howe *in litt.* 2015). Endangered (SEMARNAT 2010).

NORTHERN ROUGH-WINGED SWALLOW *Stelgidopteryx serripennis*
Three winter records: a single at Loma Blanca on 18 February 2016 (IM-C), four at Río Conchos (I) on 26 February 2016 (IM-C, FM, AA; Fig. 4B) and two at Vado de Meoqui on 25 and 27 February 2016 (IM-C, FM). Howell & Webb (1995) and Navarro-Sigüenza & Peterson (2007) mapped the species as wintering in Chihuahua only in the extreme south-west. A handful of winter records in Chihuahua: 2–20 individuals at the San Pedro River, Satevó municipality, on 20–21 February 1998, six at Valle de Zaragoza on 9 February 1998 (M. Iliff), and one at Batopilas on 27 January 1999 (R. Cannings; eBird 2016).

BLACK-AND-WHITE WARBLER *Mniotilta varia*
An adult male at Vado de Meoqui on 29 December 2015 and 9 January 2016 (JR-M) was outside its winter range (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007); the species' winter status in the Chihuahuan Desert ecoregion requires elucidation. Howell & Webb (1995) considered the species to be a transient elsewhere in Chihuahua.

NASHVILLE WARBLER *Leiothlypis ruficapilla*
Two at Vado de Meoqui on 24 January 2016 (JR-M; Fig. 4C). Not previously mapped as a winter visitor to the Chihuahuan Desert ecoregion (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007), although there is another winter record in the same region (Rancho El Gato, 14 January 2012: eBird 2016). Howell & Webb (1995) considered the species to be a transient elsewhere in Chihuahua, but a regular winter visitor in the Sierra Madre Occidental (Navarro-Sigüenza & Peterson 2007).

WILSON'S WARBLER *Cardellina pusilla*
Singles at Presa El Rejón on 13 December 2014, near Neder on 24 December 2014, and at Vado de Meoqui on 9 January (MJ; Fig. 4D) and 28 February 2016 (IM-C, FM). The species' winter range includes the Sierra Madre Occidental of Chihuahua (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Our records suggest it is a regular winter visitor to the Chihuahuan Desert ecoregion, where it was considered only a transient (Howell & Webb 1995). B. Howe & D. Hawksworth reported a male at the río Casas Grandes, just west of Nuevo Casas Grandes, northern Chihuahua, on 12 January 1997 (Leukering & Bradley 1997).

BALTIMORE ORIOLE *Icterus galbula*
The second record for Chihuahua: a female and male photographed at a ranch in Camargo on 18 August 2015 (Fig. 4E) and a male at the same site on 18 September 2015 (AA). The first record was a male collected at Camargo on 20 June 1949 (Navarro-Sigüenza *et al*. 2003).

In north-west Mexico, vagrants reported from Baja California (Erickson *et al*. 2013), Sonora (Russell & Monson 1998) and Durango (F. San Martín *in litt*. 2015). Considered a 'casual visitor' to western Texas (Lockwood & Freeman 2014) and New Mexico (eBird 2016).

'WHITE-WINGED' DARK-EYED JUNCO *Junco hyemalis aikeni*
Probably the second and third records for Mexico, and first and second for Chihuahua: IM-C observed a single under excellent conditions at El Chamizal on 22 February 2015 (Fig. 4F), with a flock including Ruby-crowned Kinglets *Regulus calendula*, Audubon's Warblers *Setophaga auduboni*, and Oregon *Junco hyemalis cismontanus* and Pink-sided Juncos *J. h. mearnsi*. Another was observed by FM and R. Valdés at Cumbres de Majalca National Park on 25 October 2015. Both had grey upperparts, head and breast, dusky lores, bluish bill and white belly. At close range, White-winged Junco shows a considerable amount of white in the rectrices, apparently larger size and a longer tail than other juncos. Ten records for Texas (only seven accepted by the Texas Bird Records Committee) and considered a casual to very rare visitor in the Panhandle region, but an 'accidental visitor' to the rest of the Tran-Pecos region with *c*.3 well-documented records (Lockwood & Freeman 2014; M. W. Lockwood *in litt*. 2015). Howell & Webb (1995) did not mention its occurrence in Mexico, but there is at least one previous record (Puerto Peñasco, Sonora, 17 December 2000; eBird 2016). It is possible that the subspecies occurs in northern Mexico during irruptive movements.

INDIGO BUNTING *Passerina cyanea*
One near Río Sacramento on 2 June 2014 and two near El Jaral on 17 May 2015 (JC). Three previous records for Chihuahua: an adult male and second-year male at Río San Pedro on 29 May–1 June 2005 (Gómez de Silva 2005a), and nine and three individuals in Chihuahua municipality on 7 May 2011 and 19 May 2012, respectively (D. Venegas *in litt*. 2015). These records suggest that it is an uncommon but regular transient in western Chihuahua, where it is regular in the east and centre of the state (Howell & Webb 1995). Occasionally nests in riparian habitats in the Trans-Pecos region (Lockwood & Freeman 2014). Breeds over much of New Mexico in river valleys at lower and middle elevations, but not found in higher mountains (B. Howe *in litt*. 2015).

Discussion

The new records reported herein increase the Chihuahuan avifauna to 482 species, with the addition of American White Ibis *Eudocimus albus*, Red-shouldered Hawk *Buteo lineatus* and Clark's Nutcracker *Nucifraga columbiana*. We also added two new subspecies to the state list: 'Harlan's' Red-tailed Hawk *Buteo jamaicensis harlani* and 'White-winged' Dark-eyed Junco *Junco hyemalis aikeni* (the latter known from just one previous Mexican record).

Detailed and up-to-date knowledge of species' ranges and seasonal status is essential for conservation biology (Koleff & Urquiza-Haas 2011, Cantú-Salazar & Gaston 2013). The range maps in Howell & Webb (1995) and Navarro-Sigüenza & Peterson (2007) show that many migrant species were considered 'transients' in Chihuahua (at least outside the Sierra Madre Occidental). We provide evidence here and in Moreno-Contreras *et al*. (2015a) that at least some of these are probably regular winter visitors (e.g., Orange-crowned Warbler *Leiothlypis celata*). We noted a similar pattern for the central Chihuahua portion of the Mexican Plateau, with other records (e.g., Yellow-crowned Night Heron *Nyctanassa violacea*, Grey Hawk *Buteo plagiatus*) revealing year-round resident populations in the Chihuahuan Desert ecoregion of species that were formerly considered accidental in Chihuahua, at least outside the Sierra Madre Occidental (Howell & Webb 1995, Navarro-Sigüenza & Peterson 2007). Leukering & Bradley (1997) also reported several new records of species that formerly

were unknown as winter visitors or residents on the Mexican Plateau, indicating that there is still much to learn concerning the distribution and seasonal status of birds in Chihuahua.

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References:

Cantú-Salazar, L. & Gaston, K. J. 2013. Species richness and representation in protected areas of the Western Hemisphere: discrepancies between checklists and range maps. *Divers. & Distrib*. 19: 782–793.

CONABIO (Comisión Nacional para el Conocimiento y Uso de la Biodiversidad). 2014. Localidades rurales y urbanas 2, 2010, escala 1:1. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. Datos estadísticos del 2010, del Instituto Nacional de Estadística y Geografía (INEGI). México D.F.

Dieni, J. S., Howe, W. H., Jones, S. L., Manzano-Fischer, P. & Melcher, C. P. 2003. New information on wintering birds of northwestern Chihuahua. *Amer. Birds* 103: 26–31.

eBird. 2016. eBird: an online database of bird distribution and abundance. Cornell Lab of Ornithology, Ithaca, NY. www.ebird.org (accessed 28 May 2016).

Erickson, R. A., Carmona, R., Ruiz-Campo, G., Iliff, M. J. & Billings, M. J. 2013. Annotated checklist of the birds of Baja California and Baja California Sur, second edition. *N. Amer. Birds* 66: 582–613.

Flesch, A. D., González, S. C. & Valenzuela, A. J. 2016. Abundance and habitat relationships of breeding birds in the Sky Islands and adjacent Sierra Madre Occidental of northwest Mexico. *J. Field. Orn*. 87: 176–195.

Gill, F. & Donsker. D. 2016. IOC world bird list (v. 6.2). www.worldbirdnames.org (accessed 10 May 2016).

Gómez de Silva, H. 2002a. New distribution and temporal records of Mexican birds. *Cotinga* 18: 89–92.

Gómez de Silva, H. 2002b. The nesting season: Mexico region. *N. Amer. Birds* 56: 491–493.

Gómez de Silva, H. 2003. The spring migration: Mexico region. *N. Amer. Birds* 57: 408–413.

Gómez de Silva, H. 2005a. The spring migration: Mexico region. *N. Amer. Birds* 59: 500–505.

Gómez de Silva, H. 2005b. The nesting season: Mexico region. *N. Amer. Birds* 59: 659–661.

Howell, S. N. G. & Webb, S. 1995. *A guide to the birds of Mexico and northern Central America*. Oxford Univ. Press, New York.

IUCN. 2016. The IUCN Red List of threatened species. Version 2015-4. www.iucnredlist.org (accessed 9 May 2016).

Koleff, P. & Urquiza-Haas, T. (eds.) 2011. *Planeación para la conservación de la biodiversidad terrestre en México: retos en un país megadiverso*. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad & Comisión Nacional de Áreas Naturales Protegidas, México D.F.

Leukering, T. & Bradley, J. 1997. Some observations of birds on the central Mexican Plateau. *West. Birds* 28: 177–180.

Lockwood, M. W. & Freeman, B. 2014. *The Texas Ornithological Society handbook of Texas birds*. Second edn. Texas A&M University Press, College Station.

Miller, A. H., Friedmann, H., Griscom, L. & Moore, R. T. 1957. Distributional check-list of the birds of Mexico, pt. 2. *Pacific Coast Avifauna* 33: 1–436.

Mlodinow, S. G., Carmona, R., Sauma, L. & Brabata, G. 2005. First Harlan's Hawk (*Buteo jamaicensis harlani*) for Baja California Sur. *N. Amer. Birds* 59: 348–349.

Mondaca-Fernández, F. & Moreno-Contreras, I. 2014. Presence of the Neotropic Cormorant in Chihuahua, Mexico. *West. Birds* 45: 324–325.

Moreno-Contreras, I., Gómez de Silva, H., Torres-Vivanco, A., Villalpando-Navarrete, N. & Botello, A. 2015a. Avifauna of Juárez municipality, Chihuahua, Mexico. *West. Birds* 46: 190–215.

Moreno-Contreras, I., Gatica-Colima, A. & Venegas, D. 2015b. New Montezuma Quail records from Chihuahua, Mexico. *West. Birds* 46: 339–342.

Navarro-Sigüenza, A. G. & Peterson, A. T. 2007. Mapas de las aves de México basados en WWW. Informe final SNIB-CONABIO proyecto no. CE015. México D.F. www.conabio.gob.mx/informacion/gis/ (accessed 20 September 2015).

Navarro-Sigüenza, A. G., Peterson, A. T. & Gordillo-Martínez, A. 2003. Museums working together: the atlas of the birds of Mexico. *Bull. Brit. Orn. Cl*. 123A: 207–225.

Navarro-Sigüenza A. G., Rebón-Gallardo, M. F., Gordillo-Martínez, A., Peterson, A. T., Berlanga-García, H. & Sánchez-González, L. A. 2014. Biodiversidad de aves en México. *Rev. Mex. Biodivers*. 85: 476–495.

Patten, M. A., Mellink, E., Gómez de Silva, H. & Wurster, T. E. 2001. Status and taxonomy of the Colorado Desert avifauna of Baja California. *Monogr. Field Orn*. 3: 29–63.

Peterson, J. & Zimmer, B. R. 1998. *Birds of the Trans-Pecos*. Univ. of Texas Press, Austin.

Russell, S. M. & Monson, G. 1998. *The birds of Sonora*. Univ. of Arizona Press, Tucson.
Sánchez-González, L. A. 2013. Cuando un "nuevo registro" es realmente un nuevo registro: consideraciones para su publicación. *Huitzil* 14: 17–21.
Stager, K. E. 1954. Birds of the Barranca de Cobre region of southwestern Chihuahua, Mexico. *Condor* 56: 21–32.
Torres-Vivanco, A., Vital-García, C. & Moreno-Contreras, I. 2015. A new record of Lewis's Woodpecker, *Melanerpes lewis* (Gray, 1849) (Aves, Picidae) from Chihuahua, with comments on its status in Mexico. *Check List* 11(6): 1792.
Venegas-Holguín, D., Díaz-Tengler, M. E. & Cruz-Nieto, J. 2015. Avoceta Americana (*Recurvirostra americana*): primeros registros reproductivos en Chihuahua, México. *Huitzil* 16: 28–32.
Vuilleumier, F. & Williams, J. E. 1964. Notes on some birds from Río Conchos, Chihuahua, México. *Condor* 66: 515–516.
Webb, R. G. 1984. Terrestrial vertebrates of the Cerro Mohinora region, Chihuahua, Mexico. *Southwest. Natur*. 29: 243–246.
Williams, S. O. 1998. The nesting season: New Mexico region. *Field Notes* 52: 487–490.
Williams, S. O. & Krueper, D. J. 2008. The changing status of the Gray Hawk in New Mexico and adjacent states. *West. Birds* 39: 202–208.

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Neglected type specimens of Western Meadowlark *Sturnella neglecta* from Audubon's last expedition

by Matthew R. Halley

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Summary.—The 'original specimen' of Western Meadowlark *Sturnella neglecta*, collected by John James Audubon in 1843 on his only western expedition, was deposited at the Academy of Natural Sciences of Philadelphia by his companion Edward Harris in 1849. But the specimen was mysteriously lost during the following decades, prompting Stone in 1899 to designate a lectotype from one of two other surviving skins from the original series. After 150 years, I rediscovered the lost type, which bears an unsigned original tag in Audubon's own hand, and a second tag in an unknown hand incorrectly attributing the skin to a collection donated to the museum in 1857, by W. A. Hammond and J. G. Bell. Notwithstanding, Stone's lectotype is considered 'original' material despite that it was collected 500 km from the locality of the original specimens, and therefore retains its name-bearing status. The rediscovered type and two other specimens from the 1843 expedition, including one that was discovered in a New Jersey barn in the 1930s, are herein designated as paralectotypes.

In the spring of 1843, John James Audubon (1785–1851) journeyed north-west to the confluence of the Missouri and Yellowstone rivers, along the modern border of North Dakota and Montana, in the company of Edward Harris (1799–1863), Isaac Sprague (1811–95) and John Graham Bell (1812–99). While traveling through what is now south-eastern South Dakota, Audubon wrote in his journal, 'May 22 ... we saw Meadow Larks whose songs and single notes are quite different from those of the Eastern states; we have not yet been able to kill one to decide if new or not.' In his own journal, Harris concurred, 'We have seen a Meadowlark to-day which must prove a new one, its note so entirely different from ours.' The next day, Audubon wrote, 'Bell and Sprague saw several Meadow-larks, which I trust will prove new, as these birds have quite different notes and songs from those of our eastern birds.'

In fact, Audubon and his companions were not the first to notice the peculiar meadowlarks. A passage in the field journal of Meriwether Lewis (1774–1809) reveals that one was collected nearly 40 years earlier, in Great Falls, Montana. On 22 June 1805, Lewis wrote: 'there is a kind of larke here that … differs from ours in the form of the tail which is pointed, being formed of feathers of unequal length; the beak is somewhat longer and more curved and the note differs considerably; however in size, action, and colours there is no perceptible difference; or at least none that strikes my eye.' But Lewis did not publish a description of the bird, nor did he return to Philadelphia with a specimen. That task was accomplished by Audubon (1844).

The first specimens were collected on 24 May 1843, but Audubon and his companions were discouraged to find that the strange meadowlarks were difficult to distinguish visually from Eastern Meadowlark *S. magna*. There is one extant *S. magna* skin from their passage through Illinois in April 1843 in the Academy of Natural Sciences of Philadelphia collection (ANSP 162536), indicating that this conclusion was reached after comparing the new material to *S. magna* skins in the field. Audubon lamented, 'May 24 ... we shot four Meadow-

larks that have, as I said, other songs and notes than ours, but could not establish them as new.' But Harris remained adamant: 'May 24. We killed ... several of the new Meadow Larks, for new I will insist it is notwithstanding that we cannot from the books establish any specific difference, yet it is totally different. But as we cannot set down these notes on paper, and the world will not take our words for it if we do, we must be content to refrain from publishing this good species unless we can on our return find a something [*sic*] about the bird more than we can now discover to establish a specific difference: Mais nous verrons.'

Despite his initial reservations, Audubon (1844) included the new meadowlark, which he named *S. neglecta*, in the 'Octavo Edition' (1839–44) of *The birds of America* (VII, 339, pl. 489). The species is still considered valid and Audubon's name has priority (Davis & Lanyon 2008). Cassin (1850) confirmed that Harris deposited an 'original specimen' of *S. neglecta* at ANSP in 1849, but strangely made no mention of it when he reviewed the taxonomy of the Icteridae several years later (Cassin 1866). By that time, Cassin's physical and mental health was rapidly deteriorating due to long-term exposure to arsenic, which was used in specimen preparation during his time, an affliction that resulted in his death in 1869. During these final years, Cassin was systematically cataloging the ANSP collection, each day increasing his exposure and exacerbating his condition. The type of *S. neglecta* was evidently stored together with a conspecific series donated by W. A. Hammond and John Bell in 1857, when someone, perhaps Cassin himself, attached a second label (undated) that misattributed Audubon's type to 'Kansas. W. A. Hammond', after which it was mistaken by Stone (1899), Street (1948), and others, for one of Hammond's skins. Audubon's diminutive original tag bore a date, but not his name, and was easily overlooked as one of Hammond's skins, especially when juxtaposed with the confident words on the erroneous second tag.

After Cassin's death, the bird collection had no curator for more than 20 years. Witmer Stone (1866–1939), who helped to restore the collection in the 1890s, had no reason to doubt the veracity of the second label, and apparently did not recognise Audubon's handwriting on the original tag. On the back of the second label is written, in what appears to be Stone's penmanship, 'May 29, 1863 or 1843? Nipouri River' [*sic*]—a humorous misreading of Audubon's archaic double-*s* in 'Missouri'. Having failed to identify the error, Stone (1899) concluded that the *S. neglecta* type 'cannot now be found' and designated a lectotype: a skin from the same expedition that Audubon had given to Spencer Baird (1823–1927), who deposited it at the United States National Museum, Washington DC (USNM 1939; Baird 1860: 539). That skin had been collected on 30 June 1843, at the Fort Union trading post on the modern border of North Dakota and Montana, the westernmost point reached by the expedition party, almost 500 km from the locality of the type deposited at ANSP by Harris.

In July 2016, I discovered the error and identified specimen ANSP 3543 as the lost *S. neglecta* type deposited by Harris in 1849. The skin was collected in South Dakota, just five days after the party first noticed the strange meadowlark, as per Audubon's and Harris' journals (Audubon 1897). Audubon's handwriting on the original label includes the name '*Sturnella neglecta*', which he would not have written in the field, so this appears to be a tag that was attached after the expedition, in anticipation of the specimen being deposited at ANSP. Unfortunately, the measurements provided in Audubon's (1844) description are of almost no use for comparison today. First, he was not clear as to whether his measurements came from a freshly killed (unskinned) specimen, from a fresh skin or a dried skin. Indeed, his measurement of 'alar extent' (i.e., wingspan) can only have been taken from a freshly killed bird, before it was prepared. This uncertainty, compounded by the deteriorated state of the 173-year-old specimen, and probable differences in measuring technique and instrument accuracy, preclude any meaningful morphometric comparison between the rediscovered type and Audubon's description. The tail of the type specimen is now worn

and frayed, and the tip of its bill missing. The only measurement that is perhaps useful to compare is the length of the 'wing from flexure' (i.e. distance from the radiale to the wingtip), which is relatively unambiguous to measure and unlikely to change with time except as a result of wear. The wingtips of the type specimen are in relatively good condition and this measurement matches Audubon's (1844) description, both being 124 mm.

However, Audubon's (1844) illustration of *S. neglecta* was certainly not 'drawn from nature by J. J. Audubon', as stated below the image. Unlike the illustrations in *The birds of America* (1827–38), which had been drawn life size and engraved in copper, 'The Octavo Edition' (1839–44) featured hand-coloured lithographs of reduced copies of the originals, many of which were completed by the ornithologist's son, John Woodhouse Audubon (1812–62). The illustration that accompanied the description of *S. neglecta* (Audubon 1844, pl. 489) appears to be a crude rendering of the juvenile *S. magna* depicted in the Havell edition of *The birds of America* (pl. 136), but with some structural details and the plumage coloration altered to better resemble *S. neglecta*. The reduction drawing, a scan of which was published by Boehme (2000), was drawn onto a lithographic stone and the final print hand-coloured by J. T. Bowen in Philadelphia, presumably with the type(s) available for colour reference. Thus, the illustration that accompanied the description of *S. neglecta* was in fact an amalgamation of two different species!

In the late 1930s, an incredible collection of skins that had belonged to Harris was discovered in a wooden chest in a barn in New Jersey, and subsequently donated to ANSP (Street 1948). Apparently, Harris had retained some skins for personal use, and did not donate his 'entire collection' in 1849 as reported by Cassin (1850). Many specimens were in poor condition, but among those that were salvaged was a single *S. neglecta* skin with a label written by Audubon, 'Missouri River 1843' (ANSP 162537)—the same locality given on the tag of the rediscovered type that Harris deposited in 1849 and was subsequently lost. Having now examined a large number of skins from the 1843 expedition, it appears to me that Audubon was in the habit of writing 'Missouri River' in May and early June, when the party was in transit through South Dakota, whereas specimens collected between 10 June and 16 August, when the expedition party was at Fort Union, North Dakota, were accordingly labelled 'Fort Union' by Audubon. On the day the rediscovered type was collected—29 May 1843—Audubon and his companions were camped near Fort George, a historic trading post located *c*.32 km south of Fort Pierre, South Dakota.

Audubon (1844) gave measurements for one male specimen from 'Upper Missouri', and Harris deposited a type at ANSP (Cassin 1850, Stone 1899), but Audubon's description was not explicit in stating that the name *neglecta* was fixed to a single specimen. For this reason, Stone's (1899) lectotype (USNM 1939), which was designated by inference because the original type was lost, retains its name-bearing status (ICZN 1999, Art. 74.5). The rediscovered type (ANSP 3543) is hereby designated as a paralectotype, as is the undated and unsexed skin from the Street (1948) acquisition, labelled 'Missouri River 1843' (ANSP 162537) and a male collected 29 June at Fort Union, presented to George N. Lawrence by Victor G. Audubon and now in the collection of the American Museum of Natural History, New York (AMNH 42244). Thus, the long-standing mystery of the missing *S. neglecta* type is now solved.

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References:
Audubon, J. J. 1844. *The birds of America, from drawings made in the United States and their territories*, vol. 7. E. G. Dorsey, Philadelphia.
Audubon, M. R. 1897. *Audubon and his journals*, vol. 1. Charles Scribner's Sons, New York.
Baird, S. F. 1860. *The birds of North America*. D. Appleton & Co., New York.
Boehme, S. E. 2000. *John James Audubon in the West*. Harry N. Abrams, Inc., New York.
Cassin, J. 1850. Special report on the state of the ornithological collection. *Proc. Acad. Nat. Sci. Phil*. 4: 256–260.
Cassin, J. 1866. A study of the Icteridae. *Proc. Acad. Nat. Sci. Phil*. 18: 10–25.
Davis, S. K. & Lanyon, W. E. 2008. Western Meadowlark (*Sturnella neglecta*). *In* Poole, A. (ed.) *The birds of North America online*. Cornell Lab of Ornithology, Ithaca, NY. http://bna.birds.cornell.edu/bna/species/104 doi:10.2173/bna.104
International Commission on Zoological Nomenclature (ICZN). 1999. *International code of zoological nomenclature*. Fourth edn. International Trust for Zoological Nomenclature, London.
Stone, W. 1899. A study of the type specimens of birds in the collection of the Academy of Natural Sciences of Philadelphia, with a brief history of the collection. *Proc. Acad. Nat. Sci. Phil*. 51: 5–62.
Street, P. B. 1948. The Edward Harris collection of birds. *Wilson Bull*. 60: 167–184.

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Molecular identification of a mystery rail from Panama results in the first country record of King Rail *Rallus elegans*

by James M. Maley, Tyng M. Liu, Whitney L. E. Tsai & John E. McCormack

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On 25 January 1985, a rail belonging to the King / Clapper *Rallus* spp. complex was observed by W. Martínez at the edge of a freshwater pond 37 km west of Chiriquí Grande, Bocas del Toro, Panama (Ridgely & Gwynne 1989). It was later caught using a mist-net and taken into captivity; the bird died shortly thereafter. The skin was prepared and deposited at the Academy of Natural Sciences, Philadelphia (ANSP 180686); unfortunately, the bird's sex was not recorded. It was identified as a Clapper Rail *R. longirostris sensu lato* but could not be identified to subspecies and was considered to possibly represent a new race (Ridgely & Gwynne 1989, Olson 1997). No other record of this form has been documented in Panama. The specimen is small relative to other members of the complex and has a bright rufous breast, a grey-and-rufous face, dark crown and boldly barred flanks. A mixture of worn and fresh feathers is present on the back; the fresh feathers are dark brown edged pale brown (Fig. 1).

We obtained a sample of a toepad from this specimen and extracted the DNA using a modified phenol-chloroform protocol to maximise yield (Blin & Stafford 1976). The DNA was heavily degraded and we were unable to amplify large fragments of mitochondrial DNA. We used internal primers to amplify and sequence eight small fragments of the mitochondrial gene ND2 following the methods of Maley & Brumfield (2013). We assembled the overlapping fragments using Geneious v. 8.1.8 (Biomatters Ltd., Newark) resulting in a total of 701 base pairs of ND2 sequence. We searched for similar sequences on GenBank using BLASTN 2.3.1 (Zhang *et al*. 2000).

We compared the sequence of the Panama specimen to sequences from 75 other specimens in the complex and found it was identical to that of a King Rail *R. elegans ramsdeni* specimen from Cuba, LSUMNS B-71232 (accession no. KP081567), at Louisiana State University Museum of Natural Sciences, Baton Rouge. This unique haplotype has been found nowhere else in the species' range (Maley & Brumfield 2013). It is not very divergent from King Rails from the eastern USA, but the haplotype was not found in birds from Florida, Illinois, Louisiana, Ohio and Oklahoma.

We examined the specimen alongside those of members of this complex from Cuba, the Yucatán Peninsula (Mexico), Honduras, Venezuela, Colombia and Ecuador. Of the specimens examined, the plumage pattern and colour is most similar to MCZ 89303 (Fig. 1). We also measured 52 specimens from the complex, including 12 of Cuban King Rails and found that the bird from Panama matched most closely with female Cuban King Rails. Measurements (in mm) of the Panama specimen with mean, range and sample size of female Cuban King Rails: wing chord = 144.9 (mean = 142.8, range 139.7–149.4, n = 8), exposed culmen = 49.6 (mean = 51.6, range 48.9–54.7, n = 8) and tarsus length = 46.2 (mean = 46.6, range 44.9–48.4, n = 7). The Panama specimen did not overlap in size for any measurement with male Cuban King Rails, which are considerably larger.

It seems odd that a bird would disperse more than 1,000 km across the Caribbean Sea from a sedentary population, but rails are well known for their extraordinary dispersal abilities (Remsen & Parker 1990). We believe the confusion over the identity of this

Figure 1. Dorsal and ventral photographs of three rail specimens at the Museum of Comparative Zoology, Cambridge, MA, for comparison: the bird on the left in both photographs is MCZ 80748 *Rallus crepitans leucophaeus* from the Isle of Pines, Cuba; that in the middle is ANSP 180686 from Panama; and that on the right is MCZ 89303 *Rallus elegans ramsdeni* from Ariguanabo Lagoon, Cuba (James M. Maley, © President and Fellows of Harvard College)

specimen can be attributed to the bird differing considerably in appearance from the nearest Caribbean populations in Colombia or the Yucatán Peninsula. This represents the only known record of a King Rail in Panama.

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References:

Blin, N. & D. W. Stafford. 1976. A general method for isolation of high molecular weight DNA from eukaryotes. *Nucleic Acids Res*. 3: 2303–2308.

Maley, J. M. & Brumfield, R. T. 2013. Mitochondrial and next-generation sequence data used to infer phylogenetic relationships and species limits in the Clapper/King rail complex. *Condor* 115: 316–329.

Olson, S. L. 1997. Towards a less imperfect understanding of the systematics and biogeography of the Clapper and King rail complex (*Rallus longirostris* and *R. elegans*). Pp. 93–111 *in* Dickerman, R. W. (ed.) *The era of Allan R. Phillips*. Horizon Communications, Albuquerque, NM.

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.
Ridgely, R. S. & Gwynne, J. A. 1989. *A guide to the birds of Panama, with Costa Rica, Nicaragua, and Honduras*. Second edn. Princeton Univ. Press.
Zhang, Z., Schwartz, S., Wagner, L. & Miller, W. 2000. A greedy algorithm for aligning DNA sequences. *J. Computation Biol*. 7: 203–214.

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The nest of Serra do Mar Tyrant-Manakin *Neopelma chrysolophum* with a brief review of nest architecture in the genera *Neopelma* and *Tyranneutes*

by Guy M. Kirwan

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The genus *Neopelma*, P. L. Sclater, 1861, comprises a quintet of unprepossessing, dull-plumaged 'manakin' species of uncertain affinities, but whose closest relatives are generally considered to be the *Tyranneutes* 'manakins'. Rêgo *et al*. (2007), Tello *et al*. (2009) and McKay *et al*. (2010), in their molecular analyses of the Pipridae, found evidence to suggest that *Tyranneutes* and *Neopelma* lie outwith the true manakins, but together they are sister taxa to the latter group. The same arrangement was proposed by Lanyon (1985), Prum *et al*. (2000) and Chesser (2004), but rejected by Prum & Lanyon's (1989) study of syringeal morphology, nest architecture and plumage. To emphasise their unique position, Gill & Wright (2006) elected to use the genus' scientific name as the English group name too, and Tello *et al*. (2009) erected a new subfamily, the Neopelminae, for these two genera, which arrangement was followed by Dickinson & Christidis (2014).

The five species with their largely allopatric ranges are: Saffron-crested Tyrant-Manakin *Neopelma chrysocephalum* (von Pelzeln, 1868) in north-east South America (south of the Orinoco River and north and east of the rio Negro), with an isolated and comparatively recently discovered population in north-east Peru; Sulphur-bellied Tyrant-Manakin *N. sulphureiventer* (Hellmayr, 1903) in south-west Amazonia; Pale-bellied Tyrant-Manakin *N. pallescens* (Lafresnaye, 1853) in eastern, central and southern Brazil, with small extensions into Bolivia, Guyana and Surinam; Wied's Tyrant-Manakin *N. aurifrons* (zu Wied, 1831) in eastern Brazil, from southern Bahia to central Rio de Janeiro; and Serra do Mar Tyrant-Manakin *N. chrysolophum* Pinto, 1944, also in eastern Brazil, but generally at higher elevations and south of the range occupied by the previous species, from east-central Minas Gerais to southern São Paulo (Ridgely & Tudor 1994, Whitney *et al*. 1995, Robbins *et al*. 2004, Snow 2004, Kirwan & Green 2011).

Breeding data for the genus *Neopelma* are almost non-existent. Whitney *et al*. (1995) reported that Euler (1900: 44) had described the nest of what these authors assumed was probably *N. aurifrons* as being bag-shaped, like that of many tyrant flycatchers (Tyrannidae), and suspended below the overhang of a bank, from near Cantagalo, Rio de Janeiro state, south-east Brazil, in the mid 1860s. Based on the translation of Euler's description presented by Whitney *et al*. (1995), under the system for describing the nests of Neotropical birds proposed by Simon & Pacheco (2005), the nest was of the closed / long / pensile type. However, it is unclear as to whether Euler really did collect *N. aurifrons* at this

locality, as reported by Ihering (1900) and repeated by Whitney *et al*. (1995). Certainly, no specimen that is currently identified as this species is held at the Berlin museum (Museum für Naturkunde, Zentralinstitut der Humboldt-Universität; S. Frahnert *in litt*. 2008) and none of the specimens held in that institution that was collected by Euler at Cantagalo appears likely to have been misidentified as another species. S. Frahnert (*in litt*. 2008) is unaware of any Euler specimens being sent to other museums from Berlin. Consequently, without stronger evidence, it seems best to discard this description, especially as it is quite unlike that of other nests of *Neopelma* (or *Tyranneutes*) that have been found subsequently (see below).

More recently, Lebbin *et al*. (2007) reported discovering a nest of Sulphur-bellied Tyrant-Manakin under construction, at Oceania, along the río Tahuamanu, in dpto. Madre de Dios, south-east Peru. They observed one bird (presumably a female) building a nest on 16 October within a patch of *Guadua* bamboo, but they were unable to follow it to completion. The partially completed nest was a thin, shallow cup of woven bamboo fibres, slung between two branches, 10–11 m up in the bamboo. The nests of *N. pallescens* and *N. chrysocephalum* are unknown (Kirwan & Green 2011).

I discovered a nest of Serra do Mar Tyrant-Manakin beside the Agulhas Negras road, in the upper part of Itatiaia National Park (22º37.35'S, 44º75.41'W; *c*.1,750 m), at the boundary between Minas Gerais and Rio de Janeiro states (with my observation made in the latter), south-east Brazil. According to the classification system proposed by Simon & Pacheco (2005), the nest described here can be categorised as low cup / fork.

The nest of *N. chrysolophum* was found on 19 September 2007, in the initial stages of construction. It was sited within 3 m of a dirt road and *c*.1 m above ground in an unidentified understorey shrub (*c*.2 m in overall height) shaded by taller trees with a canopy height of *c*.15 m. The nest (diameter *c*.5 cm) was placed *c*.50 cm from the main trunk of the tree, and was slung between the fork formed by two very narrow, horizontal branches, attached in two places to each branch, mainly using heavily bound spider's web, with the rest of the construction involving both live and dead black rootlets, with some moss and dead leaves for camouflage. Only one bird, presumably the female attended the nest, occasionally appearing to test it for size (by sitting on the nest and slowly moving the rear part of the body from side to side), and regularly bringing fresh material to it at intervals of 1–5 minutes over a period of *c*.30 minutes. The nearest singing male was at least 150 m distant. Another nest of this species was found by A. Whittaker & K. J. Zimmer (*in litt*. 2007), while leading a birdwatching group. Unfortunately, full details can no longer located, but it was apparently similar in structure and location to this one.

The nest described here, and that of *N. sulphureiventer* described by Lebbin *et al*. (2007), recall the structure of the only nests to be reported to date for the genus *Tyranneutes*, that of a Dwarf Tyrant-Manakin *T. stolzmanni* discovered, with a single nestling, at Sacha Lodge Research Station, in eastern Ecuador, in mid-April 2001 (Greeney *et al*. 2004) and a Tiny Tyrant-Manakin *T. virescens* nest found in Guyana in late March or early April (Beebe & Beebe 1910, Kirwan & Green 2011).

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References:

Beebe, M. & Beebe, W. 1910. *Our search for a wilderness*. Henry Holt & Co., New York.

Chesser, R. T. 2004. Molecular systematics of New World suboscine birds. *Mol. Phyl. & Evol*. 32: 11–24.

Dickinson, E. C. & Christidis, L. (eds.) 2014. *The Howard and Moore complete checklist of the birds of the world*, vol. 2. Fourth edn. Aves Press, Eastbourne.
Gill, F. & Wright, M. 2006. *Birds of the world: recommended English names*. Christopher Helm, London.
Greeney, H. F., Gelis, R. A. & White, R. 2004. Notes on breeding birds from an Ecuadorian lowland forest. *Bull. Brit. Orn. Cl.* 124: 28–37.
Ihering, H. von. 1900. Aves observadas em Cantagallo e Nova Friburgo. *Rev. Mus. Paulista* 4: 149–164.
Kirwan, G. M. & Green, G. 2011. *Cotingas and manakins*. Christopher Helm, London.
Lanyon, W. E. 1985. A phylogeny of the myiarchine flycatchers. Pp. 361–380 *in* Buckley, P. A., Foster, M. S., Morton, E. S., Ridgely, R. S. & Buckley, F. G. (eds.) *Neotropical ornithology*. Orn. Monogr. 36.
Lebbin, D. J., Hosner, P. A., Andersen, M. J., Valdez, U. & Tori, W. P. 2007. First description of nest and eggs of the White-lined Antbird (*Percnostola lophotes*), and breeding observations of poorly known birds inhabiting *Guadua* bamboo in southeastern Peru. *Bol. Soc. Antioqueña Orn.* 17: 119–132.
McKay, B. D., Barker, F. K., Mays, H. L., Doucet, S. M. & Hill, G. E. 2010. A molecular phylogenetic hypothesis for the manakins (Aves; Pipridae). *Mol. Phyl. & Evol.* 55: 733–737.
Prum, R. O. & Lanyon, W. E. 1989. Monophyly and phylogeny of the *Schiffornis* group (Tyrannoidea). *Condor* 91: 444–461.
Prum, R. O., Rice, N. H., Mobley, J. A. & Dimmick, W. W. 2000. A preliminary phylogenetic hypothesis for the cotingas (Cotingidae) based on mitochondrial DNA. *Auk* 117: 236–241.
Rêgo, P. S., Araripe, J., Marceliano, M. L. V., Sampaio, I. R. & Schneider, H. 2007. Phylogenetic analyses of the genera *Pipra, Lepidothrix* and *Dixiphia* (Pipridae, Passeriformes) using partial Cytochrome b and 16S mtDNA genes. *Zool. Scripta* 36: 565–575.
Ridgely, R. S. & Tudor, G. 1994. *The birds of South America*, vol. 2. Univ. of Texas Press, Austin.
Robbins, M. B., Braun, M. J. & Finch, D. W. 2004. Avifauna of the Guyana southern Rupununi, with comparisons to other savannas of northern South America. *Orn. Neotrop.* 15: 173–200.
Simon, J. E. & Pacheco, S. 2005. On the standardization of nest descriptions of Neotropical birds. *Rev. Bras. Orn.* 13: 143–154.
Snow, D. W. 2004. Family Pipridae (manakins). Pp. 110–169 *in* del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, vol. 9. Lynx Edicions, Barcelona.
Tello, J. G., Moyle, R. G., Marchese, D. J. & Cracraft, J. 2009. Phylogeny and phylogenetic classification of the tyrant flycatchers, cotingas, manakins, and their allies (Aves: Tyrannidae). *Cladistics* 25: 429–467.
Whitney, B. M., Pacheco, J. F. & Parrini, R. 1995. Two species of *Neopelma* in southeastern Brazil and diversification within the *Neopelma/Tyranneutes* complex: implications of the subspecies concept for conservation (Passeriformes: Tyrannidae). *Ararajuba* 3: 43–53.

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First record of Lapland Longspur *Calcarius lapponicus* in the Caribbean

by Orestes Martínez, Lazaro Cotayo, Arturo Kirkconnell & James W. Wiley

Received 2 August 2016

On 26 May 2016, J. Lezcano, a fishing guide from La Salina, Cuba, observed an unknown bird at Laguna de las Salinas ('Las Salinas', 22°07′42″N, 81°16′04″W; Fig. 1), *c*.3 km north-east of La Salina, Parque Nacional de Ciénaga de Zapata, Matanzas province, Cuba. Lezcano told F. Rodríguez about the bird, whereupon Rodríguez visited the site, and observed and photographed it for an extended period. Later the same day, Rodríguez told OM of the bird, and at 09.00 h, on 27 May 2016, OM was able to photograph and video it, an adult male Lapland Longspur *Calcarius lapponicus* in breeding plumage (Fig. 2). It was in the same area as the previous day, on the causeway dividing aquatic habitat and mangrove forest on either side. The substrate used by the longspur included sand, pebbles, rocks and grassy habitat adjacent to red *Rhizophora mangle* and black *Avicennia germinans* mangroves extending into the wetlands.

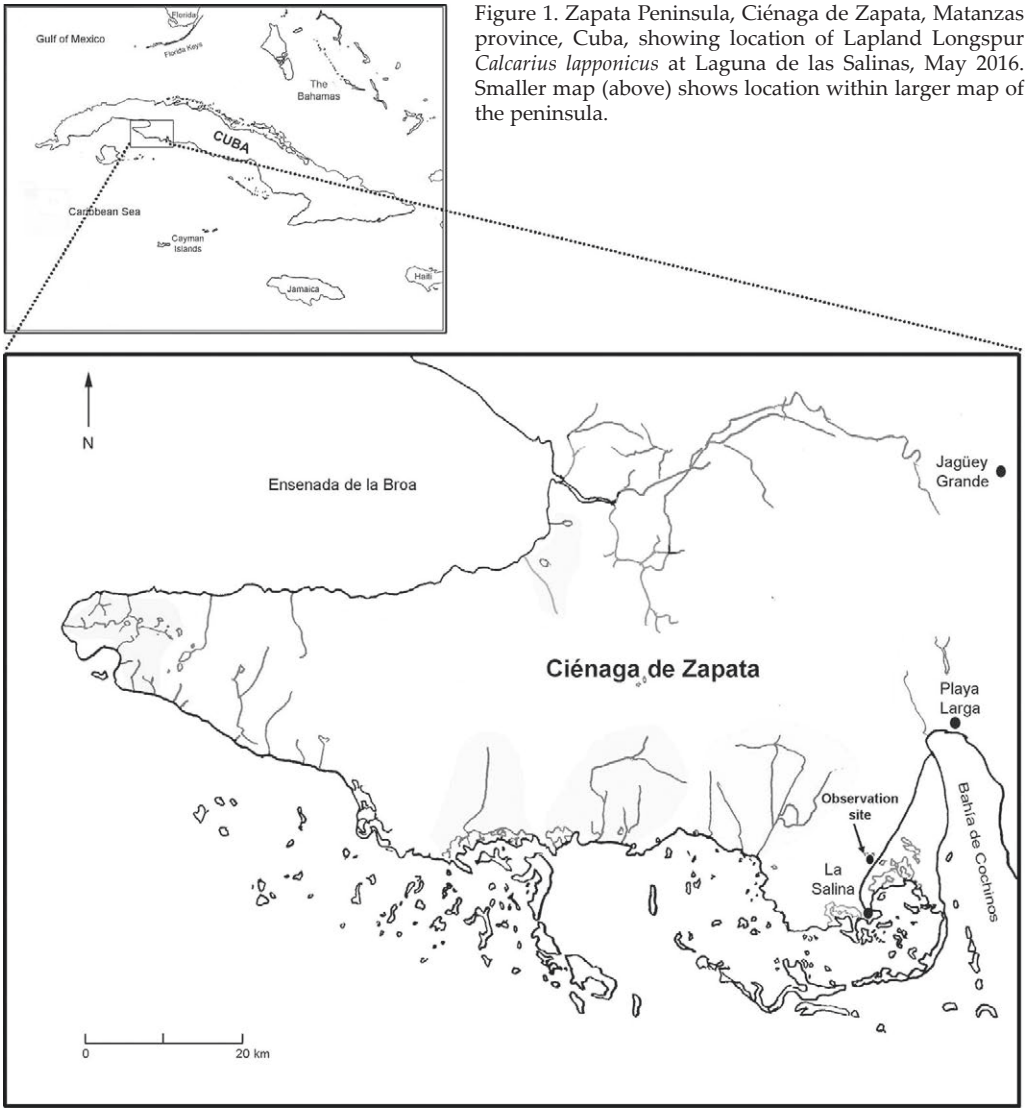

Figure 1. Zapata Peninsula, Ciénaga de Zapata, Matanzas province, Cuba, showing location of Lapland Longspur *Calcarius lapponicus* at Laguna de las Salinas, May 2016. Smaller map (above) shows location within larger map of the peninsula.

OM watched the longspur for *c.*90 minutes, during which time it was constantly foraging on sand among Virginia glasswort *Salicornia depressa*, between pebbles, and probing pock holes in larger rocks, apparently taking seeds and small invertebrates. The bird foraged alone, although a group of Ruddy Turnstones *Arenaria interpres* fed 6 m away. The longspur exhibited no evidence of exhaustion and was in complete plumage (Fig. 2). It did not vocalise.

Lapland Longspur breeds over an extensive Holarctic range across northern Eurasia and North America (Hussell & Montgomerie 2002). In North America, it winters at high densities west of the Great Lakes and across the Great Plains from southern Canada to northern Texas, but is generally uncommon west of the Rockies and in eastern North America south to northern (casually southern) Florida (Root 1988, Sauer *et al*. 1996, AOU 1998, Hussell & Montgomerie 2002). Southward migration of North American populations occurs between mid August and mid November (mainly early September to

Figure 2. Male Lapland Longspur *Calcarius lapponicus* in breeding plumage, Laguna de las Salinas, Zapata Peninsula, Matanzas province, Cuba, 27 May 2016 (Orestes Martínez)

Figure 3. Lapland Longspur *Calcarius lapponicus*, foraging in two substrates at Laguna de las Salinas, Cuba, 27 May 2016, (A) rubble and pebble surface on sand, (B) probing pock-holes in rocks over sand among Virginia glasswort *Salicornia depressa* and sea grape *Coccoloba uvifera* leaf litter (Orestes Martínez)

early November). On northbound migration, Lapland Longspur leaves its North American wintering range from early February to early March, moving through the northern USA and southern Canada during late March to early May, arriving on the breeding grounds in late May and early June (Hussell & Montgomerie 2002, Rising 2011). Peak arrival is 14–22 May (Madsen 1982).

Lapland Longspur is considered a vagrant to Mexico (Howell & Webb 1995) and casual on Bermuda (AOU 1998). Our search of eBird (2016) revealed no specific record for the Bahamas or West Indies, thus the observation reported here apparently is the first record of Lapland Longspur for the Caribbean.

The southernmost report of the species is from central Veracruz, Mexico, in February 1985 (Howell & Webb 1995), *c*.1,580 km west of the Cuban record. On 6 November 1974, Lee (1978) found a recently dead adult male in winter plumage 5.3 km east of Celestún, Yucatán (20°52′N, 90°24′W), *c*.940 km west of Las Salinas. The nearest reports we found of Lapland Longspur to Las Salinas are three from south Florida: (1) a single 'probable female' photographed on 13 March 2014 at Virginia Key Ecosystem Restoration Area, Miami-Dade County, by R. Diaz (eBird 2016; checklist S17533765); (2) R. Diaz (eBird 2016; checklist S17533765) noted that S. Pimm and S. Bass observed a female on Garden Key (*c*.24°37′42″N, 82°52′23″W), Dry Tortugas, Monroe County, on 11 March 2014; and (3) a male photographed on Garden Key by J. Roth (*in litt*. 2016) on 28 May 2016; i.e., one day after the male at Las Salinas was last seen. Judging by its plumage characteristics, the male on Garden Key on 28 May was not the same individual as at Las Salinas (J. Roth *in litt*. 2016; pers. obs.). Las Salinas is *c*.415 km south-west of Virginia Key and 300 km south-east of Garden Key.

During spring and autumn migration, Lapland Longspur shuns forest and uses ploughed fields, stubble and open grassland (AOU 1998, Hussell & Montgomerie 2002). In forested regions, it tends to concentrate along coasts, shores of lakes and rivers, roadsides and other open ground away from trees (Hussell & Montgomerie 2002), i.e., similar to the habitat used by the Cuban bird. Gabrielson (1924) reported that Lapland Longspur feeds mainly on seeds of grasses and other plants during late autumn to spring, but during summer and early autumn it feeds on a mix of seeds and invertebrates, similar to the Las Salinas bird.

Calcarius lapponicus has four or five recognised, but not well-differentiated, subspecies (Rising 2011, Dickinson & Christidis 2014). The Cuban bird cannot be identified subspecifically with certainty, although it appears closest to *C. l. subcalcaratus*, which is not always recognised (Rising 2011). We are unable to suggest any special conditions that would have influenced the Lapland Longspur's reaching Cuba. The country was not affected by any substantial weather front forming to the north and pushing south into the Antilles in the week before the bird was observed at Las Salinas. The only important weather system that affected Cuba in the weeks before was Tropical Depression Bonnie, which formed in the Atlantic, brushed past south-east Cuba and continued offshore towards the eastern USA coast during the week of 23 May 2016.

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References:

American Ornithologists' Union (AOU). 1998. *Check-list of North American birds*. Seventh edn. American Ornithologists' Union, Washington DC.

Dickinson, E. C. & Christidis, L. (eds.) 2014. *The Howard and Moore complete checklist of the birds of the world*, vol. 2. Fourth edn. Aves Press, Eastbourne.

eBird. 2016. eBird: an online database for bird distribution and abundance. eBird, Cornell Lab of Ornithology, Ithaca, NY. www.ebird.org (accessed 17 October 2016).

Gabrielson, I. N. 1924. Food habits of some winter bird visitants. *US Dept. Agric. Bull*. 1249: 1–32.

Howell, S. N. G. & Webb, S. 1995. *A guide to the birds of Mexico and northern Central America*. Oxford Univ. Press.

Hussell, D. J. & Montgomerie, R. 2002. Lapland Longspur (*Calcarius lapponicus*). *In* Poole, A. (ed.) *The birds of North America online*. Cornell Lab of Ornithology, Ithaca, NY. http://bna.birds.cornell.edu/bna/species/656 (accessed 10 June 2016).

Lee, J. C. 1978. Lapland Longspur in southeastern Mexico. *Condor* 80: 452–453.

Madsen, J. 1982. Timing of breeding and reproductive success in a Lapland Bunting *Calcarius lapponicus* population in Eqalungmiut Nunaat, West Greenland. *Dansk Orn. Foren. Tidsskr*. 76: 137–145.
Rising, J. D. 2011. Family Emberizidae (buntings and New World sparrows). Pp. 428–683 *in* del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, vol. 16. Lynx Edicions, Barcelona.
Root, T. L. 1988. *Atlas of wintering North American birds: an analysis of Christmas Bird Count data*. Univ. of Chicago Press.
Sauer, J. R., Swartz, S. & Hoover, B. 1996. The Christmas Bird Count home page. Version 95.1. Patuxent Wildlife Research Center, Laurel, MD. www.mbr-pwrc.usgs.gov/bbs/cbc.html (accessed 12 June 2016).

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The valid name of the Slaty-backed Flycatcher (previously, *sordida* Godwin-Austen, 1874, and *hodgsonii* J. P. Verreaux, 1871), and the gender of *Caffrornis*: comments on Zuccon (2011)

by Normand David & Murray Bruce

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In their study of members and relatives of *Ficedula* flycatchers, Outlaw & Voelker (2006) considered that genus *Muscicapella* Bianchi, 1907, which had been subsumed in *Niltava* Hodgson, 1837, by Watson (1986), but retained by other authors (e.g. Dickinson 2003, Clement 2006), should be placed within a broad genus *Ficedula* Brisson, 1760. As a result, *Nemura hodgsoni* [not *hodgsonii*], introduced by Moore, 1854 (*in* Horsfield & Moore 1854: 300), and the only species in *Muscicapella*, competes for precedence in *Ficedula* with *Siphia hodgsonii* (Slaty-backed Flycatcher), introduced by Verreaux ('1870' = 1871: 34). Verreaux's name, which was subsequently often misspelled '*hodgsoni*', is therefore a junior homonym under Art. 58.14 of the *International code of zoological nomenclature* (ICZN 1999), hereafter the Code, and requires reconsideration.

As set out by Watson (1986: 340), alternatives are available, as two new names had been coined for precisely the above eventuality: *Muscicapa amabilis* Deignan, 1947, and *Muscicapa erwini* Wolters, 1950, both *nomina nova* for *Siphia hodgsonii* J. P. Verreaux. Watson (1986: 339) also listed *Siphia erithacus* Jerdon & Blyth, 1861, as an applicable name, prior to Verreaux's *hodgsonii*, but did not use it because he (p. 340) considered it to be preoccupied by *Siphia erythaca* Blyth, 1847. Outlaw & Voelker (2006), apparently seeing no clear homonymy between *erithacus* and *erythaca*, suggested that *erithacus* should be applied to the Slaty-backed Flycatcher. However, Zuccon (2011) stated that this did not appear to be correct.

Zuccon (2011) argued that *Siphia erithacus* Jerdon & Blyth, 1861 (*in* Blyth 1861: 201) is preoccupied by *Siphia erythaca* 'Jerdon' [= Blyth] (1847: 126), because they differ only in the use of *i* or *y* according to Art. 58.2 of the Code, and thus represent variant spellings. He added that the two names are primary homonyms (Art. 53.3.1) and that *Siphia erithacus* Jerdon & Blyth, 1861, is invalid and unavailable. Zuccon then indicated that *Erythrosterna sordida*, introduced by Godwin-Austen (1874: 158), is the next available and valid name for Slaty-backed Flycatcher.

Treatment of *sordida* Godwin-Austen, and of *hodgsonii* J. P. Verreaux, has been somewhat chaotic. Sharpe (1879: 156) listed *Muscicapa sordida* (Godwin-Austen) and *Poliomyias* '*hodgsoni*' (Verreaux) as separate species, whereas Oates (1883: 287), who thought *E. sordida* was probably the female of *P. hodgsoni* [*sic*], listed it under *Poliomyias* '*hodgsoni*' (Verreaux). Later, Oates (1890: 14) treated *sordida* as a synonym of *Cyornis* '*hodgsoni*' (Verreaux) whereas Sharpe (1901: 223), not 'Sharpe (1903)' as indicated by Zuccon (2011: 196), listed *sordida* as a synonym of *Poliomyias* '*hodgsoni*' (Verreaux). The name *sordida* was not recorded by Watson (1986) because it already had been synonymised by Sharpe (1901). However, it was adopted by Dickinson & Christidis (2014: 605), who mistakenly referred to Zuccon & Ericson (2010), instead of Zuccon (2011), as the authority for using *sordida*.

We have revisited the issue and we conclude that Outlaw & Voelker (2006) were correct in accepting use of *erithacus* Jerdon & Blyth, 1861, for Slaty-backed Flycatcher. Resolving the perceived homonymy is not straightforward. The key difference between *erithacus* Jerdon & Blyth, 1861, and *erythaca* Blyth, 1847, currently a junior synonym of *Muscicapa mugimaki* Temminck, 1836, is not between *i* and *y*, but that between *-us* and *-a*. This is because they are two different nouns, not two adjectival words. Lewis & Short (1891: 657) indicated that *erithacus* is the Latin noun *erithacus* [unknown bird], and Liddell & Scott (1996: Suppl., p. 134) listed the noun ερυθακος [unknown bird], which is Latinised with the *-a* ending (= *erythaca*). Just as adjectival species-group names such as *chinensis* and *sinensis* are not homonyms, neither are the nouns *erithacus* Jerdon & Blyth, 1861, and *erythaca* Blyth, 1847, and they therefore do not fall under Art. 58.2, just like the nouns *consobrina* and *consobrinus*. As a result, the combination *Ficedula erithacus* (Jerdon & Blyth, 1861) must be accepted as the valid name of Slaty-backed Flycatcher.[1]

We also take this opportunity to point out that Zuccon (2011: 197) erred in stating that the genus '*Caffrornis* Roberts, 1922 ... is masculine'. Genus-group names ending in the Greek noun ορυις, which is masculine as well as feminine (Liddell & Scott 1996), must be assigned gender according to Art. 30.1.4.2 of the Code: they are masculine unless combined with a feminine adjectival species-group name when originally established. According to Jobling (2010: 83), *caffer* is adjectival, with the feminine ending *-ra*. Because Roberts (1922: 232) used the combination *C*[*affrornis*] *caffra* in the original description of *Caffrornis* without specifying genus gender, as well as *Caffrornis caffra namaquensis* W. L. Sclater, 1911 (p. 233), *Caffrornis* Roberts is feminine.

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References:

Blyth, E. 1847. Notices and descriptions of various new or little known species of birds. *J. Asiatic Soc. Bengal* 16: 117–157.

Blyth, E. 1861. Notes on some birds collected by Dr. Jerdon in Sikkim. *Proc. Zool. Soc. Lond*. 29: 199–202.

Clement, P. 2006. Pygmy Blue Flycatcher *Muscicapella hodgsoni*. P. 162 *in* del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, vol. 11. Lynx Edicions, Barcelona.

Dickinson, E. C. (ed.) 2003. *The Howard and Moore complete checklist of the birds of the world*. Third edn. Christopher Helm, London.

Dickinson, E. C. & Christidis, L. (eds.) 2014. *The Howard and Moore complete checklist of the birds of the world*, vol. 2. Fourth edn. Aves Press, Eastbourne.

[1]*Siphia erithacus* Jerdon & Blyth, 1861, must not be confused with *Siphia erithacus*, introduced by Sharpe (1888: 199), but clearly unavailable. The latter was listed as *Cyornis erythaca* [*sic*] by Sharpe (1901: 217), but correctly by Watson (1986: 349) under *platenae* Blasius, 1888, which has priority.

Godwin-Austen, H. H. 1874. Fourth list of birds principally from the Naga Hills and Munipur, including others from the Khasi, Garo, and Tipperah Hills. *J. Asiatic Soc. Bengal* 43: 151–180.
Horsfield, T. & Moore, F. 1854. *A catalogue of the birds in the museum of the Hon. East-India Company*, vol. 1. W. H. Allen & Co., London.
International Commission on Zoological Nomenclature (ICZN). 1999. *International code of zoological nomenclature*. Fourth edn. International Trust for Zoological Nomenclature, London.
Jobling, J. A. 2010. *The Helm dictionary of scientific bird names*. Christopher Helm, London.
Lewis, C. T. & Short, C. 1891. *A new Latin dictionary*. Harper & Brothers, New York & Clarendon Press, Oxford.
Liddell, H. G. & Scott, R. 1996. *A Greek-English lexicon / with a revised supplement*. Oxford Univ. Press.
Oates, E. W. 1883. *A handbook to the birds of British Burmah*, vol. 1. R. H. Porter, London.
Oates, E. W. 1890. *The fauna of British India, including Ceylon and Burma*. Birds, vol. 2. Taylor & Francis, London.
Outlaw, D. C. & Voelker, G., 2006. Systematics of *Ficedula* flycatchers (Muscicapidae): a molecular reassessment of a taxonomic enigma. *Mol. Phyl. & Evol*. 41: 118–126.
Roberts, A. 1922. Review of the nomenclature of South African birds. *Ann. Transvaal Mus*. 8: 187–272.
Sharpe, R. B. 1879. *Catalogue of the birds in the British Museum*, vol. 4. Trustees of Brit. Mus. (Nat. Hist.), London.
Sharpe, R. B. 1888. On a collection of birds from the island of Palawan. *Ibis* (5)6: 193–204.
Sharpe, R. B. 1901. *A hand-list of the genera and species of birds*, vol. 3. Trustees of Brit. Mus. (Nat. Hist.), London.
Verreaux, J. [1870] = 1871. Note sur les espèces nouvelles d'oiseaux recueillis par M. l'abbé Armand David dans les montagnes du Thibet chinois. *Bull. nouv. Arch. Mus*. 6: 33–40 *in Nouvelles archives du Muséum d'histoire naturelle*, Tome 6. Paris,
Watson, G. E. 1986. Old World flycatchers. Pp. 295–375 *in* Mayr, E. & Cottrell, G. W. (eds.) *Check-list of birds of the world*. *A continuation of the work of James L. Peters*, vol. 11. Mus. Comp. Zool., Cambridge, MA.
Zuccon, D. 2011. Taxonomic notes on some Muscicapidae. *Bull. Brit. Orn. Cl*. 131: 196–199.
Zuccon, D. & Ericson, P. G. P. 2010. A multi-gene phylogeny disentangles the chat-flycatcher complex (Aves: Muscicapidae). *Zool. Scripta* 39: 213–224.

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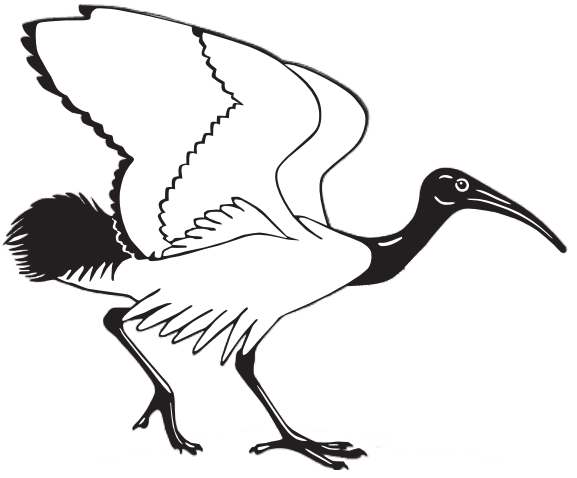

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