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Bulletin of the British Ornithologists' Club

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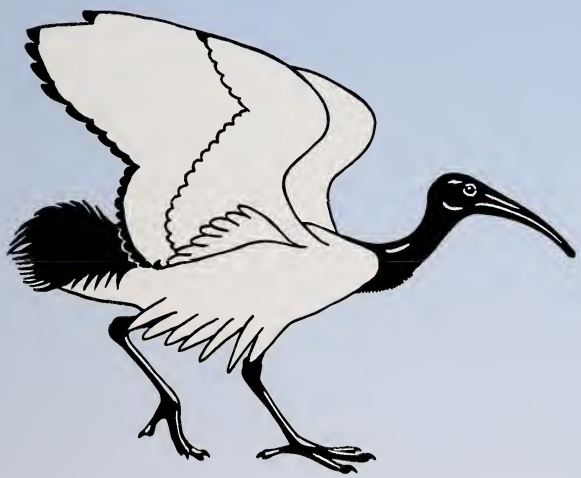

Volume 132 No. 3
September 2012

FORTHCOMING MEETINGS

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

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

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18 September 2012 at 6.00pm—Prof. Graham Martin—*Through birds' eyes: insights into avian sensory ecology*

Abstract: Sensory ecology investigates the information that underlies an animal's interactions with its environment. His talk will aim to illustrate how information from different sensory systems of birds may complement each other or how there may be trade-offs within a sensory modality in the achievement of particular tasks.

Biography: Emeritus Prof. Graham Martin's research has focused on the sensory worlds of birds. He undertook graduate work at the Univ. of Exeter into the sensory bases of nocturnal activity in owls, followed by post-doctoral studies at the Univ. of Sussex on the function of coloured oil droplets in the colour vision of pigeons. At the Univ. of Birmingham he established the Centre for Ornithology and established the M.Sc. programme in Ornithology, the only such programme in Europe. He has travelled and collaborated widely in his career, publishing comparative research on >60 diverse species of birds. In retirement he continues his research and has just stood down as editor of *Bird Study* after seven years. He is Vice-President of the BOU and Council member of the European Ornithologists' Union.

This meeting is in Tower Rooms, Section A, Sherfield Building, Imperial College, South Kensington, London, SW7 2AZ. The entrance is opposite the Queen's Tower in the main quadrangle. The nearest Tube station is at South Kensington. For maps, see: http://www3.imperial.ac.uk/campusinfo/southkensington

The meeting commences with the talk at 6.00 pm. After the talk the cash bar opens and at 7.30 pm there is a light buffet supper (sandwiches etc.) costing **£15 per person** which must be ordered in advance. Vegetarian and gluten-free options can be ordered.

Those wishing to order the buffet supper should apply to the Chairman (address below) as soon as possible. All orders must be received by ***Thursday 13 September 2012.***

Entry is free but those wishing to attend must notify the Chairman no later than ***Monday 17 September 2012.***

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23 October 2012—Indian ornithology, British botany and Allan Octavian Hume (1829–1912): the scientific legacy of a founder of the Indian National Congress

A one-day meeting in the Flett Theatre, Natural History Museum (NHM), South Kensington, organised by the NHM and the South London Botanical Institute (SLBI), supported by the British Ornithologists' Club and the Linnean Society of London.

For more information about this event, including a list of the planned talks, see the June Club Announcements.

There is a registration fee of £25 (which includes buffet lunch, teas / coffee and post-conference reception) and there is an opportunity, when booking, to arrange to visit the SLBI on Monday 22 October and the Natural History Museum at Tring on Wednesday 24 October.

Please note that the SLBI is handling all the bookings which must be received before Monday 1 October. Full programme and booking details are available on the SLBI website http://www.slbi.org.uk/ and on the BOC website. Bookings by post can be made to: Hume Conference, South London Botanical Institute, 323 Norwood Road, London SE24 9AQ. (SLBI telephone: 020 8674 5787; e-mail: info@slbi.org.uk).

2013 Programme

Evening meetings will be held in an upstairs room at The Barley Mow, Horseferry Road, Westminster, London SW1P 2EE. Provisional dates are: 26 February, 21 May 24 September and 19 November. A bar will be available and, for those wanting it, the talk will be followed by a meal which can be chosen from a menu on arrival.

Saturday 6 April 2013—Joint meeting with the African Bird Club and the Natural History Museum.

A one-day meeting in the Flett Theatre, Natural History Museum, South Kensington, London SW7 5BD.

Please check the website for further details.

The Chairman: Helen Baker, 60 Townfield, Rickmansworth, Herts WD3 7DD UK. Tel. +44 (0)1923 772441. E-mail: helen.baker60@tiscali.co.uk

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Bulletin of the
BRITISH ORNITHOLOGISTS' CLUB

Vol. 132 No. 3 Published 1 September 2012

CLUB ANNOUNCEMENTS

Chairman's message

At the AGM on 12 June Keith Betton was elected to the Committee in place of Mike Walton whose term ended. A Special General Meeting, following the AGM, approved the new Club Rules and Bye-laws.

For some time Committee has been considering how best to make back numbers of the Bulletin available free online. We have now agreed with the Biodiversity Heritage Library (BHL) for our Bulletins to be placed on their website. BHL (www.biodiversitylibrary.org) is an international consortium of natural history libraries that cooperate to digitise and make freely accessible the legacy literature of biodiversity. Bulletins for the years up to and including 1922 were already available: www.biodiversitylibrary.org/bibliography/46639. Those covering the period 1923–2007 are now being added. Thereafter, one volume will be added p.a. so that only those from the latest five years will not be available online. Copies of volumes made available online will no longer be available in print form for sale, following a move to a smaller storage unit.

The evening meeting on 18 September will be the last at Imperial College. In 2013 we are moving to a new venue (see opposite). Full details will appear in the December Bulletin.

Helen Baker

ANNUAL GENERAL MEETING

The Annual General Meeting of the British Ornithologists' Club was held in Room SALC 3, Sherfield Building, Imperial College, London SW7 2AZ on Tuesday 12 June 2012 at 5.15pm with Miss H. Baker in the chair. Twelve members were present. Apologies were received from Mr K. F. Betton, Mr S. E. Chapman, Mr S. P. Dudley, Revd. T. W. Gladwin, Mr S. M. S. Gregory, Dr J. P. Hume, Mr G. M. Kirwan, Mr P. J. Oliver, Mr R. C. Price, Dr P. Rudge, Mr M. J. Walton and Mr P. J. Wilkinson.

1. **Minutes of the previous meeting.** The Minutes of the 2011 AGM held on 14 June 2011, which had been published (*Bull. Brit. Orn. Cl.* 131: 137–138) were approved and signed by the Chairman.

2. **Chairman's report.** The Chairman's review, the Trustees' Annual Report and the Annual Accounts were combined in one document and had been available in the room before the start of the meeting. The Chairman thanked Committee members for their contributions and support over the last year. She said that 2011 had seen a new venture, a Joint Meeting with the Neotropical Bird Club (NBC) and the Natural History Museum (NHM). She thanked Dr R. P. Prŷs-Jones and Mr D. J. Fisher for organising it. Further Joint Meetings were planned. The Chairman reminded members that more volunteers are needed to help run the Club.

3. **Trustees' Annual Report taken with item 4, the Bulletin.** The *Hon. Secretary*, referring to the Trustees' report, stated that there had been a small fall in membership again in 2011 but there was still a good geographical spread. In addition to the Joint Meeting with the NBC and NHM, which had been well received, there had been three evening meetings. Talks had been given by Dr Joe Tobias and Rachel Bristol and there was a social evening with a series of mini-talks. The Bulletin was going from strength to strength. Volume 131 contained many interesting, well-illustrated papers. Waiting time from submission to publication was short and the rejection rate low due largely to the willingness of the editor to assist authors. There had been more good reviews of *Systematic Notes on Asian Birds*, which the Club had published in 2010. There had not been any BOC–BOU Joint Publications in 2011 but several titles were in the pipeline.

The *Hon. Treasurer* drew attention to the income and expenditure details, which showed a surplus of £808 for the year. He explained that this was because no grants were paid during the year, while the Club had received a £1,000 legacy from the late Diana Bradley and had written back the provision of £3,334 originally set aside for the Reftax project which was currently dormant. There was a small improvement in investment income but a drop in sales of publications as there had been no new titles. Subscription income from members had fallen but there had been an increase from Institutional Subscribers. He considered that the Club was well placed to cope with the current financial uncertainties. Mr M. W. Woodcock asked whether some of the cash in hand should be invested. The *Hon. Treasurer* agreed to consider this but pointed out that it was very difficult at present to determine what to invest in and when. The *Hon Treasurer* proposed the adoption of the Report and Accounts and this was seconded by Dr C. F. Mann.

6. **Election of Officers.** The Chairman proposed that Dr R. P. Prŷs-Jones be re-elected as *Hon. Secretary*, Mr D. J. Montier be re-elected as *Hon. Treasurer* and Mr K. F. Betton be elected to serve on the Committee in place of Mr M. J. Walton whose term had ended. This was seconded by Mr K. Heron Jones. Ex-officio members are appointed by the Committee.

7. **Any Other Business.** There was none.

The meeting closed at 5.32 pm.

The Chairman's review, Trustees' Annual Report and the Accounts are available on the BOC website (www.boc-online.org) and hard copies can be obtained from the *Hon Treasurer*, D. J. Montier, Eyebrook, Oldfield Road, Bickley, Bromley, Kent BR1 2LF, UK, e-mail: djmontier@btinternet.com

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SPECIAL GENERAL MEETING 12 JUNE 2012

A Special General Meeting of the British Ornithologists' Club was held in Room SALC 3, Sherfield Building, Imperial College, London SW7 2AZ on Tuesday 12 June 2012 at 5.40pm with Miss H. Baker in the chair. Thirteen members were present. Apologies were received from Mr K. F. Betton, Mr S. E. Chapman, Mr S. P. Dudley, Revd. T. W. Gladwin, Mr S. M. S. Gregory, Dr J. P. Hume, Mr G. M. Kirwan, Mr P. J. Oliver, Mr R. C. Price, Dr P. Rudge and Mr P. J. Wilkinson.

Item 1. Special resolution to propose the adoption of the new Rules for the Club in accordance with the draft special resolution attached

The Chairman reminded members that the proposed Rules, the special resolution and the Agenda for the Special General Meeting had been published in *Bull. Brit. Orn. Cl.* 131: 225–232. All present had a copy. She explained that current Rules dating from 2000 needed to be amended as permitted under Rule 40. The proposed Rules were based on the latest model produced by the Charity Commission. During their preparation the Committee had been advised by a solicitor whose areas of expertise included charity law. He had drafted the special resolution. The Chairman referred to a table of destinations which provided guidance as to where provisions in the current rules could be found, highlighted substantive changes and explained why certain provisions had not been carried through.

The Chairman asked if there were any questions. Mr S. A H. Statham asked:

- whether Rule7(4), under which a list of members' names and addresses must be made available to a member on request, was compatible with data protection legislation. The Chairman said that this was taken directly from the Model Rules and the solicitor had confirmed that, bearing in mind the nature of the Club, it was appropriate.
- whether the Committee was now maintaining the official record electronically. The Chairman said that at present records for the Club archive were all on paper.
- why, if the Chair did not arrive, there was a waiting period of 15 minutes at a general meeting (Rule 12(3)) and just ten minutes at a meeting of Trustees (Rule 18(11)). The Chairman said that these were the times in the Model Rules.

Mr F. M. Gauntlett asked whether Rule 16(1)(a) would be problematic if for example a stockbroker was appointed as a Trustee. The *Hon. Treasurer* explained that this provision related to Trustees in their role as Trustees of the Club.

It was resolved unanimously by the members present:

1. That the Rules of the Club be amended and adopted in accordance with the draft annexed hereto pursuant to Rule 40 of current Rules of the Club and the new rules shall operate until further amendment.
2. That the Committee shall forthwith notify the Charity Commission of the changes in accordance with the current procedure set down by the Charity Commission.

No votes by post or e-mail had been received.

Item 2. Subject to the adoption of the new Rules the adoption of the Bye-Laws made under Rule 26 of the new Rules

The proposed Bye-laws had been published in *Bull. Brit. Orn. Cl.* 131: 230–231. The members present agreed unanimously to adopt the proposed Bye-laws made under Rule 26.

The meeting closed at 5.58 pm.

The 970th meeting of the Club was held on Tuesday 12 June 2012 in the Sherfield Building, Imperial College, South Kensington, London SW7 2AZ. Sixteen members and seven non-members were present.

Members attending were: Miss H. BAKER (*Chairman*), Cdr. M. B. CASEMENT, RN, D. J. FISHER, F. M. GAUNTLETT, A. GIBBS, K. HERON JONES, R. R. LANGLEY, Dr C. F. MANN, D. J. MONTIER, Dr R. P.

PRŶS-JONES, N. J. REDMAN, S. A. H. STATHAM, C. W. R. STOREY, M. J. WALTON, P. J. WILKINSON and M. W. WOODCOCK.

Non-members attending were: Mrs M. H. GAUNTLETT, H. VAN GROUW (*Speaker*), Mrs J. HERON JONES, P. LAMBERT, Mrs M. MONTIER, A. WILSON and Mrs B. WOODCOCK.

Hein van Grouw spoke on the topic of *What colour is that bird? How to recognise and name colour aberrations in birds*. He presented an overview of the six most common aberrations found, illustrated with many photographs of their appearance in an array of different species, and provided a simple identification key to help name the aberrations correctly. The talk, on a topic of considerable confusion to many, generated much discussion. Those interested in pursuing the subject further can consult his following papers: Not every white bird is an albino: Sense and nonsense about colour aberrations in birds. *Dutch Birding* 28: 79–89 (2006); How to recognize colour aberrations in birds (in museum collections). *J. Afrotrop. Zool.* Spec. Issue: 53–59 (2010); and What colour is that bird? The causes and recognition of common colour aberrations in birds. *Brit. Birds* (in press).

CORRIGENDA

A recent paper by Tennyson *et al.* (2012, *Notornis* 59: 39–48) has drawn attention to an error in Bretagnolle & Shirihai (2010, *Bull. Brit. Orn. Cl.* 130: 300), wherein the type material of *Pterodroma brevipes magnificens* is incorrectly listed in Appendix 1. The text should read: AMNH 215400 (paratype), 216919 (holotype), 216920 (paratype), 216921 (paratype), 216922 (paratype) and 222193 (paratype). Note that the paper's main text and figure legends are correct throughout.

Range extensions and other notes on the birds and conservation of the Serranía de San Lucas, an isolated mountain range in northern Colombia

by Thomas M. Donegan

Received 3 August 2011

Summary.—Bird inventories of the isolated Serranía de San Lucas, northern Colombia, yielded range extensions for several foothill or highland birds of the adjacent Central Andes: Pavonine Cuckoo *Dromococcyx pavoninus*, Lyre-tailed Nightjar *Uropsalis lyra*, White-tipped Sicklebill *Eutoxeres aquila*, Masked Trogon *Trogon personatus*, Golden-headed Quetzal *Pharomachrus auriceps*, Smoky-brown Woodpecker *Picoides fumigatus*, Crimson-mantled Woodpecker *Colaptes rivolii*, Red-faced Spinetail *Cranioleuca erythrops*, Western Woodhaunter *Hyloclistes virgatus*, Buff-fronted Foliage-gleaner *Philydor rufum*, Spotted Woodcreeper *Xiphorhynchus erythropygius*, Slaty Antwren *Myrmotherula schisticolor*, White-crowned Tapaculo *Scytalopus atratus*, Rufous-browed Tyrannulet *Phylloscartes superciliaris*, Ornate Flycatcher *Myiotriccus ornatus*, White-winged Becard *Pachyramphus polychopterus*, Brown-capped Vireo *Vireo leucophrys*, Orange-billed Nightingale-Thrush *Catharus aurantiirostris*, Black-billed Thrush *Turdus ignobilis*, Golden Tanager *Tangara arthus* and Yellow-throated Bush Tanager *Chlorospingus flavigularis*. *M. schisticolor* and *S. atratus* show small differences from Central Andes populations and require further research. Range extensions for lowland species (some based on older specimens) include Ornate Hawk-Eagle *Spizaetus ornatus*, Scaled Dove *Scardafella squammata*, Vermiculated Screech Owl *Megascops 'guatemalae' centralis*, Central American Pygmy Owl *Glaucidium griseiceps*, Spot-tailed Nightjar *Hydropsalis maculicaudus*, Green-and-rufous Kingfisher *Chloroceryle inda*, Sooty Grassquit *Tiaris fuliginosus* and Black-faced Grassquit *T. bicolor*. The threatened Chestnut-bellied Hummingbird *Amazilia castaneiventris* and Recurve-billed Bushbird *Clytoctantes alixii* (both last collected in the 1940s in the region) were recorded. Tens of new elevational records for typically lowland species were made. San Lucas woodnymphs are intermediate between *Thalurania fannyi* and *T. colombica*, raising questions as to whether two species are involved. Nominate Lineated Foliage-gleaner *Syndactyla subalaris* (of the West Andes) occurs in the northern Central Andes including San Lucas. Various highland species recorded at similar elevations in the Central Andes are apparently absent, perhaps due to lower humidity, island effects and ecological release of lowland species. The highest elevations of San Lucas remain unknown but occupy very small areas. Further work will doubtless yield additional new records, but is complicated by security issues and land-use conflicts. Anti-personnel landmines do not provide a viable 'defence' against deforestation in the long term due to habitat disturbance associated with their clearance.

For decades, the isolated Serranía de San Lucas has been one of the great enigmas of the northern Andes, a rare example of *tierra incognita*. The San Lucas range rises to *c*.2,300 m (Fig. 1) in southern dpto. Bolívar, to the north of Colombia's Central Andes, separated from the main range by a *c*.75-km foothill plateau with a mean elevation of 500 m. The range is also isolated by 65 km from the East Andes. Some collections of birds were made in the

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lowlands surrounding the massif and in the foothills to premontane elevations in Santa Rosa del Sur municipality, most significantly by M. A. Carriker in April–May 1947 (Paynter 1997). Hilty & Brown (1986) mapped 58 bird species above 1,000 m in Serranía de San Lucas. With the exception of 13 species typical of high elevation recorded by Carriker, most were assumed to occur based on their broad distribution (Salaman *et al.* 2002a).

No further studies were made until 1999–2001, when Salaman *et al.* (2002a) visited primary lowland sites and disturbed habitats at higher elevations (to 1,400 m), reporting a host of avian range extensions. However, field workers were detained and prevented from accessing other areas due to the security situation, being able to study only forest edge habitats higher up (Salaman & Donegan 2001). As a result, the interior of highland forests and higher elevations remained unknown.

Study sites and Methods

In 2008–09, with the improving security situation, local authorities indicated that surveys of some habitats not previously studied were now feasible. In January 2010, a small team visited localities at higher elevations and primary lower montane forest for the first time. This led to the description of a new subspecies of Immaculate Antbird *Myrmeciza immaculata* (Donegan 2012), and a host of range extensions and other notes, detailed here.

Details of all sites studied by the author and other localities referred to based on historic collections appear in Table 1. Coordinates for historical localities are based on Paynter (1997), while those for highland localities in Salaman & Donegan (2001) contain errors so they were geo-referenced again in 2010. Localities in southern dpto. Bolívar between the ríos Cauca and Magdalena, south of the northernmost extension of the San Lucas foothills are included in this paper. Data from sites west of the río Cauca in the Achí region or north of Montecristo and Rioviejo are not generally included.

Our major highland study site at Santa Cecilia lies on a C-shaped ridge that includes *c.*18 km^2 of land above 1,500 m, rising to a peak marked on maps as 'Troja' at 1,664 m. The ridgetop is characterised by primary forest, although the agricultural frontier is close. Immediately to the north, the mountains rise again to the 'Cerro de San Lucas', known locally as the 'Teta de San Lucas' and on maps as 'Dedal' (2,270–2,310 m). This region includes *c.*60–80 km^2 of land above 1,500 m, mostly at 1,500–1,700 m, encompassing San Pedro Frío, Alto Quebrada La Fría and forest above sites visited by Salaman *et al.* (2002a). The Teta de San Lucas and highest elevations of the massif hold generally intact forest, but there are numerous gold mines and a notable increase in agriculture at foothill to premontane elevations since 2001.

At Santa Cecilia, field work followed rapid assessment protocols employed by previous EBA Project expeditions (e.g. Salaman *et al.* 2002a,b, Donegan *et al.* 2007). Twenty mist-nets were operated 12 hours per day and sound-recordings were made with a mini-disc and small microphone. We mist-netted on a ridge rising to the local peak, at *c.*1,500–1,600 m and made field observations in second growth down to *c.*1,350 m and to the top of the transect. At San Pedro Frío and Alto Quebrada La Fría, more degraded forest and nearby scrub was investigated, with sound-recordings and some photographs and videos taken. Mist-netted birds were photographed and measured (wing, tail, tarsus, culmen and mass; data are available from the author or ProAves) and a ProAves metal ring applied. Almost all birds were released, but a handful of selectively taken specimens and mist-net mortalities were deposited at the Instituto de Ciencias Naturales, Universidad Nacional, Bogotá (ICN), marked †. Skins, skeletons and tissue samples were preserved. Sound-recordings are archived at the British Library National Sound Archive, London, and www.xeno-canto.org (XC herein).

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Table 1
Sites in Serranía de San Lucas studied by the author and others.

Study site	Elevation (m)	Slope	Coordinates	Municipality, Department	Study	Dates	Habitat
New study sites							
Río Magdalena (Gamarra, to Cerro de Burgos)	100 m	East	Broad area	Various, Bolívar and César	EBA 2010	2 Jan and 12 Jan 2010	Rivers, riparian scrub, disturbed habitats and marsh
Santa Rosa del Sur (urban and environs)	600–1,000 m	East	07°57′47″N, 74°03′08″W (coordinates of town centre)	Santa Rosa del Sur, Bolívar	EBA 2010; (also, M.A. Carriker, 1947)	2–3 Jan and 5 Jan 2010	Urban, scrub, farms, plantations
San Pedro Frío	1,550–1,650 m	East	08°09′22″N, 74°16′57″W	Santa Rosa del Sur, Bolívar	EBA 2010	3–4 Jan 2010	Lower montane forest border and scrub
Alto Quebrada La Fría	1,500 m	East	08°05′50″N, 74°11′12″W	Santa Rosa del Sur, Bolívar	EBA 2010	4 Jan 2010 (brief surveys in pm)	Lower montane forest border
Santa Cecilia	1,350–1,600 m (main transect at 1,550 m)	East	07°58′33″N, 74°12′55″W (entrance into forest)	Santa Rosa del Sur, Bolívar	EBA 2010	6–11 Jan 2010	Lower montane forest
Salaman *et al.* (2002a) localities							
San Pablo	50–250 m	East	07°59′00″N, 74°13′33″W	San Pablo, Bolívar	EBA 2001	5–6, 9–12 Mar 2001	Rivers, riparian scrub, disturbed habitats and marshland
La Punta	1,200–1,400 m	East	08°08′57″N, 74°13′09″W	Santa Rosa del Sur, Bolívar	EBA 2001	15–20 Mar 2001	Foothill forest border and scrub
'La Teta Resort'	1,280 m	East	08°08′45″N, 74°14′00″W	Santa Rosa del Sur, Bolívar	EBA 2001	22 Mar–3 Apr 2001	Foothill forest border and scrub
'Apollo 13'	300 m	West	07°21′14″N, 74°40′95″W	El Bagre / Puerto López, Antioquia	EBA 1999	3–8 Aug 1999	Disturbed lowland humid forest
Old collecting localities (Paynter (1997)							
Simití	85 m	East	07°58′N, 73°57′W	Simití, Bolívar	E. L. Kerr; M. A. Carriker	1909 (ELK); 2–8 Mar and 10–11 Apr 1947 (MAC)	Wetlands and lowland forest
Volador	750–1,150 m	East	07°58′N, 74°15′W	Santa Rosa del Sur, Bolívar	M. A. Carriker	5–10, 12–17, 19–20, 22–31 May, 1 Jun 1947	Foothill and premontane areas
Norosí	120 m	North	08°32′N, 74°02′W	Montecristo, Bolívar	M. A. Carriker	27–28 Feb, 1–15 Mar 1947	Wetlands and lowland forest
Río Viejo	100 m	North	08°35′N, 73°51′W	Montecristo, Bolívar	M. A. Carriker	16–24 Feb 1947	Wetlands and lowland forest

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This paper details the most significant new distributional records from field work in San Lucas. Overlooked specimens now databased by Biomap Alliance Participants (2012) at the following museums are also discussed: United States National Museum (Smithsonian Institution), Washington DC (USNM), Museum of Comparative Zoology, Cambridge, MA (MCZ) and American Museum of Natural History, New York (AMNH), with all specimen identifications cited herein verified, unless specified otherwise.

Details of various observations are presented below. Numbers in parentheses refer to number of birds mist-netted, excluding re-captures. Taxonomy, order and nomenclature generally follow Salaman *et al.* (2010). Subspecies are only mentioned when identified to this level. Almost all records were mapped (and the elevational data included) in McMullan *et al.* (2010, 2011) but no details have previously been published.

Species accounts

Range extensions from the northern Central Andes to San Lucas.—All of the following species are considered or confirmed to occur in the Central Andes, including northern dpto. Antioquia (*fide* Hilty & Brown 1986, Salaman *et al.* 2002a, SAO 2003, Restall *et al.* 2006, Castaño & Pastiño 2007, Cuervo *et al.* 2008a,b, Donegan *et al.* 2009a, McMullan *et al.* 2010, 2011) but none has previously been recorded in San Lucas (Hilty & Brown 1986, Salaman & Donegan 2001, Salaman *et al.* 2002a). Each record represents a *c.*100–130 km northwards range extension. Further notes are presented only if there is additional significance to the record.

PAVONINE CUCKOO *Dromococcyx pavoninus*
Sound-recordings (XC99423, 99504, 99534, 104192, 104204–206, 104209–210, 104243) and field observations at Santa Cecilia. A pair held territory near the transect and was observed foraging on the ground at close quarters. All recordings probably relate to this pair. They moved between mid-level branches of trees and shrubs and the ground, sometimes overflying the mist-nets. Until recently, known in Colombia only from a Bogotá skin (BMNH 1887.12.19.482) and a 1941 Carriker specimen (USNM 368717) from Tierra Nueva, Perijá, with a series of recent records at various localities in the northern Central Andes of Antioquia (Alvarez *et al.* 2007, Cuervo *et al.* 2008a) and Serranía de los Yariguíes (Fundación ProAves 2008, Donegan *et al.* 2010, Freeman *et al.* 2012). East Andes and northern Central Andes sound-recordings are indistinguishable from those from San Lucas. The rare Pheasant Cuckoo *D. phasianellus* is known from just five specimens in Colombia (Biomap Alliance Participants 2012), one of them collected by Carriker at nearby Santa Rosa (610 m) (USNM 392054). Although the latter has not been reported more recently in the region, the two species may replace one another elevationally in San Lucas.

LYRE-TAILED NIGHTJAR *Uropsalis lyra*
The distinctive falling cadence of this species' song was heard once at night at Santa Cecilia, but not sound-recorded.

WHITE-TIPPED SICKLEBILL *Eutoxeres aquila*
Mist-netted and photographed at Santa Cecilia (2: Fig. 4). Most recent records in the Magdalena Valley (e.g. Donegan *et al.* 2010, Cuervo *et al.* 2008b) are from the foothills and there are recent high-elevation records elsewhere in Colombia (e.g. Donegan & Dávalos 1999). In contrast, field guides (e.g. Hilty & Brown 1986, Restall *et al.* 2006, McMullan *et al.* 2010, 2011) generally hold *E. aquila* to be widespread in Colombia's lowlands. Whilst

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it occurs at low elevations in the Chocó, there are no specimen localities from the base (as opposed to the foothills) of the Magdalena Valley (Biomap Alliance Participants 2012).

MASKED TROGON *Trogon personatus*
Sound-recorded at Santa Cecilia (e.g. XC104321–323) and Alto Quebrada La Fria. Collared Trogon *T. collaris* (previously reported by Salaman *et al.* 2002a) was also present at Santa Cecilia (1).

GOLDEN-HEADED QUETZAL *Pharomachrus auriceps*
A single distant recording made at Santa Cecilia (XC99291), but not observed during field work.

SMOKY-BROWN WOODPECKER *Picoides fumigatus*
A pair trapped together at Santa Cecilia (2: Fig. 6), where observed several times in mixed-species flocks.

CRIMSON-MANTLED WOODPECKER *Colaptes rivolii*
Observed well in mixed-species flocks at Santa Cecilia.

RED-FACED SPINETAIL *Cranioleuca erythrops*
Trapped and photographed at Santa Cecilia (1: Fig. 7). Sound-recordings of a short and long version of the song (XC99537, 100016) are similar to those of other north Andean populations.

WESTERN WOODHAUNTER *Hyloclistes virgatus*
Mist-netted and photographed at Santa Cecilia (2: Fig. 9) and observed in mixed flocks.

BUFF-FRONTED FOLIAGE-GLEANER *Philydor rufum*
Trapped and photographed at Santa Cecilia (1: Fig. 10), where observed in mixed-species flocks, with foraging or contact calls (e.g. XC104264) and a presumed recording of its song (XC104475) sound-recorded. Occurs to unusually low elevations (800 m) near the plateau separating San Lucas from the northern Central Andes (Salaman & Donegan 2001) so these populations may be continuously distributed.

SPOTTED WOODCREEPER *Xiphorhynchus erythropygius*
Mist-netted and photographed at Santa Cecilia (1: Fig. 11); seemed similar in plumage to birds elsewhere in the north Colombian Andes, so presumably referable to *X. e. insolitus* of Panama to the foothills of the Magdalena and Cauca valleys (*cf.* Marantz *et al.* 2003).

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Figure 1. Teta de San Lucas peak, taken from San Pedro Frío, Colombia (Thomas M. Donegan)

Figure 2. Wattled Guan *Aburria aburri*, San Pedro Frío, Colombia, January 2010 (© B. Huertas)

Figure 3. Rufous-fronted Wood Quail *Odontophorus erythrops*, Santa Cecilia, Colombia, January 2010 (© B. Huertas)

Figure 4. White-tipped Sicklebill *Eutoxeres aquila*, Santa Cecilia, Colombia, January 2010 (Thomas M. Donegan)

Figure 5. Woodnymph *Thalurania* sp., Santa Cecilia, Colombia, January 2010; note both green and purple feathering in the crown (Thomas M. Donegan)

Figure 6. Male Smoky-brown Woodpecker *Picoides fumigatus*, Santa Cecilia, Colombia, January 2010 (© B. Huertas)

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SLATY ANTWREN *Myrmotherula schisticolor*

Two females, an immature male and adult male trapped at Santa Cecilia (4, 3†). Sound-recordings of call notes of birds in the hand and on release (XC93256, 104126, 104218, 104230) are similar to natural recordings of contact calls elsewhere in the Andes. The female specimen is essentially identical to those from Anorí, Antioquia, and elsewhere in the north Central Andes at ICN, which are generally considered to pertain to the wide-ranging nominate subspecies. However, the male has notably paler grey posterior underparts than most Central Andes specimens and more marked speckling on face and moustachial due to rather pale grey basal plumage (Fig. 12), and is closer to East Andes birds, which are generally considered as *M. s. sanctaemartae* or *interior*. Chapman (1914) diagnosed currently recognised Colombian subspecies based only on female plumages, due to individual variation in males. However, Zimmer & Isler (2003) noted that male *sanctaemartae* is paler grey than the nominate (as is *interior*). Other geographical variation exists in Colombia and further work is needed to determine subspecies limits. Southern West Andes birds (Nariño to Cauca) are on average shorter tailed (30.8 mm ± 2.59, n = 5 specimens; 29.5 mm ± 2.00, n = 9 mist-net data from P. Salaman) than those in the Central Andes (37.67 mm ± 0.58; n = 3 specimens), San Lucas (36.25 mm ± 3.40; n = 4 mist-net data) and East Andes (37.81 mm ± 0.98, n = 11 specimens; 35.88 mm ± 1.72; n = 8 mist-net data from Yariguíes). In contrast, there are few discernible differences in plumage between those on the east and west slopes of the East Andes, which have been treated as different subspecies (*interior* and *sanctaemartae*). The possibility that *sanctaemartae* is restricted to Santa Marta or that some other populations, e.g. San Lucas and southern / Ecuadorian west slope, may represent '75% rule' or better subspecies requires investigation. Moreover, differences between Andean and Central American populations (type locality of *M. s. schisticolor* is in Costa Rica) also require study. A detailed molecular and vocal study appears necessary, given molecular structure in other wide-ranging species occupying similar-elevation forests in Colombia (e.g. Chaves & Smith 2011, Gutiérrez-Pinto *et al.* 2012).

WHITE-CROWNED TAPACULO *Scytalopus atratus*

A '*Scytalopus* (*femoralis*) sp.' was reported by Salaman *et al.* (2002a) at La Teta Resort. At Santa Cecilia, sound-recordings (XC99283, 104290–291) of *S. atratus* were made. The species was also heard at Alto Quebrada La Fría. Recordings are marginally lower pitched than others from Colombia (loudest note peaking at <2.5 kHz) but otherwise similar. A *S. atratus* was collected by Carriker at Boca del Monte, Volador, at 1,128 m (USNM 398730). Observed down to *c.*2–3 m distance at Santa Cecilia, on playback of Álvarez *et al.* (2007) recordings. *S. atratus* is a highly terrestrial tapaculo that passed below mist-nets both in response to playback and without. All those observed and the specimen had a clear white crown spot and limited white streaking on the lower belly, being more similar to specimens from Anorí (sometimes assigned to *S. a. confusus*) than the more extensively white-streaked birds in the East Andes at Serranía de los Yariguíes (Donegan *et al.* 2007).

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Figure 7. Red-faced Spinetail *Cranioleuca erythrops*, Santa Cecilia, Colombia, January 2010 (© B. Huertas)

Figure 8. Lineated Foliage-gleaner *Syndactyla subalaris*, Santa Cecilia, Colombia, January 2010 (© B. Huertas)

Figure 9. Western Woodhaunter *Hyloclistes virgatus*, Santa Cecilia, Colombia, January 2010 (© B. Huertas)

Figure 10. Buff-fronted Foliage-gleaner *Philydor rufum*, Santa Cecilia, Colombia, January 2010 (© B. Huertas)

Figure 11. Spotted Woodcreeper *Xiphorhynchus erythropygius*, Santa Cecilia, Colombia, January 2010 (© B. Huertas)

Figure 12. Male Slaty Antwren *Myrmotherula schisticolor*, Santa Cecilia, Colombia, January 2010 (© B. Huertas)

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RUFOUS-BROWED TYRANNULET *Phylloscartes superciliaris*
Very few records in Colombia. Trapped and photographed at Santa Cecilia (3: Fig. 13), including a pair mist-netted together.

ORNATE FLYCATCHER *Myiotriccus ornatus*
Common at Santa Cecilia (1), particularly at our camp and forest borders where sound-recordings (XC99282, 99294–295, 99297–298) and many observations made. Given that it is such a common and conspicuous species, but neither Salaman *et al.* (2002a) nor Carriker recorded it, its elevational range in San Lucas probably starts at 1,400–1,500 m.

WHITE-WINGED BECARD *Pachyramphus polychopterus*
Sound-recorded at Santa Cecilia (XC104272).

BROWN-CAPPED VIREO *Vireo leucophrys*
Observed at San Pedro Frío and Alto Quebrada La Fría.

ORANGE-BILLED NIGHTINGALE-THRUSH *Catharus aurantiirostris*
Generally stated to occur only in the headwaters of the río Magdalena in dpto. Huila (Hilty & Brown 1986, Clement & Hathaway 2000), but there are also records from near Medellín, Antioquia (SAO 2003). One, similar in plumage to brown-headed birds from the east side of the Magdalena Valley and illustrated in SAO (2003), was trapped at Santa Cecilia (1).

BLACK-BILLED THRUSH *Turdus ignobilis*
Observed near Santa Rosa del Sur town, with a specimen, similar in plumage to Central Andes specimens from Antioquia, collected by Carriker at Volador (USNM 398755).

GOLDEN TANAGER *Tangara arthus*
Observed and a flight-call sound-recorded (XC104487) within a mixed-species flock at Santa Cecilia.

YELLOW-THROATED BUSH TANAGER *Chlorospingus flavigularis*
Observed in mixed-species flocks at Santa Cecilia and apparently this species also sound-recorded (XC104192, 104210, 104212, 104320). Given that the landbridge between Anorí and San Lucas encompasses suitable elevations for this species (Hilty & Brown 1986, Isler & Isler 1999), populations are presumably continuously distributed.

Other new distributional records

JABIRU *Jabiru mycteria*
Three overlooked Simití specimens collected by E. L. Kerr in 1909 (MCZ 67799, AMNH 102397–398). Only a handful of records from localities west of the Andes in Colombia, including at sites along the río Magdalena north and south of San Lucas (Hilty & Brown 1986), but the Simití records have been overlooked in the literature.

ORNATE HAWK-EAGLE *Spizaetus ornatus*
Generally not considered to occur in the Magdalena Valley or east of the Central Andes in Colombia (Hilty & Brown 1986), although once mapped east of San Lucas (Restall *et al.* 2006). There is an old Santa Rosa specimen (610 m) collected by Carriker (USNM 391867).

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SCALED DOVE *Scardafella squammata*
Although not (yet) recorded west of the río Magdalena in the San Lucas region, *S. squammata* is now common below San Lucas in farmland in adjacent southern dpto. César, where seen at Ayacucho (08°37′N, 73°35′W), San Bernardo (08°41′N, 73°42′W) and La Tapia (08°42′N, 73°47′W) (Donegan *et al.* 2003a,b). At each, birds were observed in pairs but no documentation obtained. These are the first records for the Magdalena Valley and the southernmost west of the Andes. Known previously from arid scrub and disturbed areas on the north coast of Colombia and lowlands around Sierra Nevada de Santa Marta and the Guajira Peninsula (Hilty & Brown 1986). As noted by Estela *et al.* (2005), the wider distribution accorded this species by Baptista *et al.* (1997) was erroneous. Nonetheless, by 1997 at least, it had spread along the coast to Santa Lucía, Bolívar (de la Zerda & Rosselli 2003) and thereafter west to Sucre and Córdoba, and south to Mompox, Bolívar, in the Sinú lowlands, *c.*80 km north-west of the César records (Estela *et al.* 2005). A specimen (ICN 30802) was collected by H. Zuñiga in 1989 in La Jagua de Ibiricó municipality, César (09°37′N, 73°36′W), *c.*100 km north of the observations reported here. Older specimens were collected only as far south and west as Valledupar municipality and the Sierra Nevada de Santa Marta foothills (Hilty & Brown 1986), *c.*200 km north of recent records. This dove is widespread in Colombia's *llanos* and broadly east of the Andes (Hilty & Brown 1986, Baptista *et al.* 1997). Given that the La Jagua de Ibiricó and other records are all recent, and that Carriker's 1940s visits to San Lucas and southern César did not yield specimens, this dry-land specialist has probably spread south relatively recently in response to deforestation.

VERMICULATED SCREECH OWL *Megascops 'guatemalae' centralis*
Sound-recorded at Santa Cecilia (XC104127, 104129). Until recently, known in Colombia only in the Chocó region near the Ecuador and Panama borders (Hilty & Brown 1986), but recently sound-recorded in Serranía de las Quinchas by N. Athanas *et al.* (XC10835; Freeman *et al.* 2012) with unconfirmed records from the lowlands below Serranía de los Yariguíes (Donegan *et al.* 2010). The San Lucas sound-recording is the first for the Central Andes and the highest-elevation record in Colombia for the *guatemalae* group, which generally occurs below 1,000 m (Hilty & Brown 1986) (here at 1,550 m). The song is similar to populations in the Chocó of Colombia and Ecuador, generally treated as subspecies *centralis* (and sometimes split as Chocó Screech Owl, e.g., Restall *et al.* 2006). These range extensions and recordings could shed some light on the taxonomy of this difficult genus, which requires thorough revision (Remsen *et al.* 2012) and includes an undescribed species in Colombia (American Bird Conservancy 2007).

CENTRAL AMERICAN PYGMY OWL *Glaucidium griseiceps*
Sound-recorded at Santa Cecilia (1,550 m) (XC104318). As noted by Donegan *et al.* (2007), this was probably the same species identified by Salaman *et al.* (2002a) as '*G.* (*brasilianum*) *ridgwayi*' in the San Lucas lowlands and the *Glaucidium* at Anorí. In Ecuador, generally at 200–400 m (Ridgely & Greenfield 2001) and to 600 m in Colombia (Hilty & Brown 1986), with recent records to 1,000 m (Donegan *et al.* 2007) and 1,300 m (Restall *et al.* 2006). There is another high-elevation sound-recording from Água de la Virgen, Ocaña, dpto. Norte de Santander, East Andes (08°13′N, 73°24′W; 1,600 m) (XC20548) and a specimen at the Los Angeles County Museum from the Magdalena Valley between San Lucas and Água de la Virgen, at San Alberto, César, labelled '*G. hardyi minutissimum*' (LACM 58183, taken by Carriker in 1962, not verified). With other recent records (Donegan *et al.* 2007, Moreno-Palacios & Rodríguez-Ortíz 2008), the species appears to occur throughout the remnant foothill to premontane forests of the middle to lower Magdalena and lower Cauca valleys.

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SPOT-TAILED NIGHTJAR *Hydropsalis* (*Caprimulgus*) *maculicaudus*
Apparently migrates between South and Central America (Cleere 2010) and small numbers probably occur across much of Colombia at appropriate seasons. However, it has only been recorded on the Caribbean coast and in the Cauca Valley (Hilty & Brown 1986, McMullan *et al.* 2010). A Volador specimen refers to a juvenile growing its tail that was previously misidentified as White-tailed Nightjar *Caprimulgus cayannensis albicauda* (USNM 392117). It was re-identified by N. Cleere in 2004, but the record's significance—apparently the only Magdalena Valley occurrence—seems to have been overlooked (e.g. Cleere 2010).

GREEN-AND-RUFOUS KINGFISHER *Chloroceryle inda*
Two specimens from Simití (USNM 392376–377, identified as *C. i. chocoensis*). Previously known only from coastal regions west of the Andes (Hilty & Brown 1986), *c.*250 km distant.

PALE-TIPPED TYRANNULET *Inezia caudata*
Zimmer & Whittaker (2000) considered that *I. caudata* does not occur south to the *ciénagas* bordering San Lucas, although others (e.g., Hilty & Brown 1986, McMullan *et al.* 2010) have mapped it there. Several specimens from below San Lucas and surrounding region collected by Carriker, including at Simití (2), Norosí (2) and río Viejo (3), with one sound-recorded (XC20533) and mist-netted at La Tapia, southern César, in forest abutting a *ciénaga* east of San Lucas (08°42′N, 73°47′W) (Donegan *et al.* 2003b). The supposed occurrence of Slender-billed Tyrannulet *I. tenuirostris* in *ciénagas* in dptos. Bolívar and César (Franco & Bravo 2005) appears to represent an erroneous transcription of these records.

SOOTY GRASSQUIT *Tiaris fuliginosus*
Rare in Colombia, with records from Santa Marta (Strewe & Navarro 2004) and two localities on the west slope of the East Andes in dpto. Santander, Cerro de la Paz and Portugal (Donegan *et al.* 2007). Several trapped at Santa Cecilia including a pair together (5: Fig. 14), apparently the first records for the Central Andes.

BLACK-FACED GRASSQUIT *Tiaris bicolor*
Widespread in the Magdalena Valley, mostly on the East Andes side and adjacent lowlands (Hilty & Brown 1986). Few records in the Central Andes north of the head of the Magdalena Valley, and not reported during recent surveys elsewhere (e.g. Verhelst *et al.* 2001, Cuervo *et al.* 2008b). Male observed singing in scrub was sound-recorded (XC97555, 97560, 97582–584) at San Pedro Frío, a range extension of *c.*400 km for the Central Andes population, or just a few tens of kilometres from the East Andes side of the lower Magdalena Valley.

Taxonomic notes

WOODNYMPHS *Thalurania* sp.
Trapped previously by Salaman *et al.* (2002a) at La Punta (5) and La Teta Resort (12) and others mist-netted at Santa Cecilia (11, 2†) where sound-recorded in the hand or on release (XC99512–513, 104416–417) and while foraging (XC104452). All males at Santa Cecilia had a spot of purple feathers slightly behind the centre of the otherwise green crown (Fig. 5). In this feature, they are intermediate between Purple-crowned Woodnymph *T. colombica* of the East Andes and Green-crowned Woodnymph *T. fannyi hypochlora* of the West Andes and adjacent lowlands, which were previously treated together as 'Crowned Woodnymph'. ICN specimens collected at Anorí similarly possess a small purple forehead spot. Escalante-Pliego & Peterson (1992) noted that 'One to several violet feathers at the rear edge of the

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forecrown are observed in most Panamanian specimens'. To this should now be added specimens from San Lucas and the northern Central Andes (F. G. Stiles *in* Remsen *et al.* 2012, proposal 137). *T. fannyi* and *T. colombica* were split largely on the basis of crown coloration in males (Escalante-Pliego & Peterson 1992). In the latter study, purple-crowned birds were considered restricted to the Santa Marta Mountains and Central Andes of Colombia, with green-crowned birds in the West Andes and adjacent lowlands. We now know that purple-crowned birds occur in the East Andes (Donegan *et al.* 2007), with green-crowned

Figure 13. Rufous-browed Tyrannulet *Phylloscartes superciliaris*, Santa Cecilia, Colombia, January 2010 (© B. Huertas)

Figure 14. Male (right) and female Sooty Grassquits *Tiaris fuliginosus*, Santa Cecilia, Colombia, January 2010 (© B. Huertas)

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birds in the West Andes and purple-and-green-crowned birds in the northern Central Andes and San Lucas. At río Samaná, Caldas (05°25′39″N, 75°01′07″W), purple-and-green-crowned males also occur, as do males with almost no purple in the crown (M. Slaymaker *in litt.* 2012). Green-and-purple-crowned males from Panama are generally assigned to *T. f. fannyi*, with pure green-crowned *hypochlora* in the Colombian Chocó and West Andes. Treatment of *T. colombica* and *T. fannyi* as separate species requires revision in light of the known distribution of morphotypes in Colombia, identical female plumages and similar vocalisations throughout the Colombian Andes.

RED-BILLED SCYTHEBILL *Campylorhamphus trochilirostris*
Observed in mixed-species flocks, mist-netted (1) and apparently sound-recorded (XC106503–504) at Santa Cecilia. The bird vocalising was not seen, meaning the recordings are unconfirmed, but they are broadly similar in note shape to other Colombian recordings, differing in their higher frequency and change in frequency. This vocally very variable 'species' requires further study.

LINEATED FOLIAGE-GLEANER *Syndactyla subalaris*
Several mist-netted at Santa Cecilia (3: Fig. 8). Its song (XC104309, 104319) and in-the-hand vocalisations (XC104237, 104280) were sound-recorded. Specimen taken by Salaman *et al.* (2002a) at La Punta. In plumage, San Lucas birds resemble West Andes populations usually assigned to nominate *S. s. subalaris* in having a relatively rufous crown and indistinct, restricted belly streaking. Specimens with similar plumage from Anorí (ICN 33521, 33982, 34577) and Frijolera, Antioquia (AMNH 133576). Remsen (2003) incorrectly assigned San Lucas birds to *striolata*, citing Salaman *et al.* (2002a) among others, although the latter did not identify *S. subalaris* in San Lucas to subspecies. Dickinson (2003) also restricted *S. s. subalaris* to the West Andes. As others have noted (e.g. Meyer de Schauensee 1964, Hilty & Brown 1986, Fjeldså & Krabbe 1990, Salaman *et al.* 2001, 2008, 2010, Restall *et al.* 2006), the ranges of Lineated Foliage-gleaner subspecies in Colombia are rather unusual. *S. s. subalaris* (='*striaticollis*') occurs in the West Andes and northern Central Andes, and western Ecuador. Disjunct populations of rufous-headed birds belonging to different subspecies also occur in Panama and north through Central America. Darker and more contrastingly streaked birds, generally assigned to *S. s. striolata* or *mentalis*, occur at the head of the Magdalena Valley and in the East Andes south to eastern Ecuador. Although Hilty & Brown (1986), Fjeldså & Krabbe (1990) and others map the species as widespread in the Central Andes, there are no specimen data from between dptos. Antioquia (*subalaris*) and Huila (*striolata*) in the Central Andes (Biomap Alliance Participants 2012). Verhelst *et al.* (2001) and Corpocaldas & Asociación Calidris (2010) reported the species in Caldas, but the subspecies concerned is unknown. Further research into the geographical limits in the Central Andes of these two subspecies is needed. The name '*striaticollis*', used by Meyer de Schauensee (1964), Hilty & Brown (1986) and other authors in place of *subalaris*, would appear to be a *nomen nudum*, arising perhaps due to confusion with *Anabacerthia* names.

SHARPBILL *Oxyruncus cristatus*
First recorded in Colombia in San Lucas by Salaman *et al.* (2002a) and subsequently collected in the adjacent northern Central Andes in Antioquia (Cuervo *et al.* 2008a). At Santa Cecilia (1†), observed twice in mixed-species flocks, acrobatically feeding in the subcanopy and making short, single-note contact calls. Sound-recordings of a bird in the hand prior to collection (XC104288, 104466) are similar to those, made in similar circumstances, in Álvarez *et al.* (2007). The adult male from San Lucas is similar to the female from Anorí,

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except that it has a red (not orange) crown, perhaps due to sex-related variation (Kirwan & Green 2011). Cuervo *et al.* (2008a) considered that the whitish breast and belly of their specimen recalled eastern races such as *hypoglauca*. However, USNM specimens attributed to *brooksi* of Panama also have pale underparts, consistent with the tentative subspecific identification in Álvarez *et al.* (2007). Chapman (1931) and Kirwan & Green (2011) drew attention to the similarity of all northern populations of this species. A new subspecies is perhaps involved (Donegan *et al.* 2009b), but any assessment of subspecific limits requires natural sound-recordings from both Colombia and Venezuela and direct comparison of the Colombian specimens with a series from Venezuela and Panama.

Threatened species

WATTLED GUAN *Aburria aburri*
Previously recorded in San Lucas (Donegan *et al.* 2001, Salaman *et al.* 2002a), but because it is Near Threatened, additional localities are of note. A bird raised from a chick was in semi-captivity—free-ranging but periodically returning to a farm for food—at San Pedro Frío (Fig. 2). Sound-recorded at Santa Cecilia (XC99272), where much less abundant than at La Teta Resort or La Punta, perhaps due to hunting pressure.

CHESTNUT-BELLIED HUMMINGBIRD *Amazilia castaneiventris*
Observed at a large flowering bush below Santa Cecilia (*c.*1,400 m) on 6 January 2010. However, none was mist-netted at the nearby forest site. Collected by Carriker at Norosí (Collar *et al.* 1992: USNM 392313) but Salaman *et al.* (2002a) did not find the species and BirdLife International has recently excluded San Lucas from its range data used in conservation assessments. The preference of *A. castaneiventris* for flowering vegetation in modified habitats and its absence from primary forest is consistent with observations in Serranía de los Yariguíes (Donegan *et al.* 2007) and elsewhere (e.g. Chaves-Portilla & Cortés-Herrera 2006).

RECURVE-BILLED BUSHBIRD *Clytoctantes alixii*
One responded to playback of recordings of *C. alixii* in Álvarez *et al.* (2007) in bamboo-dominated growth below Santa Cecilia (*c.*1,400 m), but was not observed or sound-recorded. None was heard or recorded at our forest site, despite extensive playback. Like *A. castaneiventris*, there had been no records in San Lucas since specimens (USNM 392828–837) were collected at Santa Rosa in the 1940s (Collar *et al.* 1992), although other populations have recently been found in the northern Colombian Andes (Laverde & Stiles 2007, Colorado 2008, Donegan *et al.* 2010).

Unusual elevational records.—None of the records here is claimed as 'new' due to the sporadic publication of elevational records and the substantial grey literature. For each species, its currently recognised elevational range is summarised, followed by details of San Lucas records.

GREAT TINAMOU *Tinamus major*
Generally to 1,000 m, including in Colombia (Hilty & Brown 1986, Parker *et al.* 1996), but once to 1,350 m in Ecuador (Ridgely & Greenfield 2001) and rarely to 1,500 m in Venezuela (Hilty 2003, Restall *et al.* 2006). Sound-recorded at Santa Cecilia (XC104125) at 1,550 m.

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CHESTNUT-WINGED CHACHALACA *Ortalis garrula*
Generally below 800 m (Parker *et al.* 1996). Sound-recorded distantly at Santa Cecilia (1,550 m) (XC99458) and observed below San Lucas at Apollo 13 and San Pablo (Salaman & Donegan 2001) and nearby La Tapia, César (*cf.* Scaled Dove, above) (XC20507–513).

RUFOUS-FRONTED WOOD QUAIL *Odontophorus erythrops*
Generally in foothills to 1,100 m in Colombia (Hilty & Brown 1986), but to 1,600 m in Ecuador (Parker *et al.* 1996, G. M. Kirwan *in* Madge & McGowan 2002) and previously to 1,400 m in San Lucas (Salaman *et al.* 2002a). Heard, photographed (Fig. 3) and video-recorded at Santa Cecilia (1,550 m). Sang at dawn on several days, but not sound-recorded.

SCALED PIGEON *Patagioenas speciosa*
Generally to 1,000 m in Colombia; rarely to 1,300 m in Santa Marta (Hilty & Brown 1986). In Ecuador mainly below 1,200 m, with occasional records to 1,700 m there (Ridgely & Greenfield 2001) and 1,400 m in Venezuela (Hilty 2003). Sang from canopy of forest borders where sound-recorded (XC92157, 99276, 99453, 100031, 104411, 104115, 104118, 104223, 104226–229, 104292–293, 104325–326, 104328, 104404–405) and observed daily at Santa Cecilia (1,550 m).

BLUE-HEADED PARROT *Pionus menstruus*
Generally to 1,500 m (Rodríguez-Mahecha & Hernández-Camacho 2002) or 1,400 m (Ridgely & Greenfield 2001, Restall *et al.* 2006). In Venezuela mainly below 1,000 m, once to 1,500 m. Observed and sound-recorded (XC97537) at 1,600 m at San Pedro Frío.

MEALY PARROT *Amazona farinosa*
Generally to 1,100 m in Colombia (Rodríguez-Mahecha & Hernández-Camacho 2002) but below 500 m in Venezuela (Hilty 2003) or 700 m in Ecuador, with records rarely to 900 m (Ridgely & Greenfield 2001), but it has been recorded to 1,500 m (Restall *et al.* 2006). Observed well and dusk vocalisations sound-recorded at Santa Cecilia (XC99457, 100026, 100028–030, 104410, 104412, 104414, 104416–417, 104119–123) at 1,600 m. This is presumably the *Amazona* sp. reported by Salaman & Donegan (2001) in the San Lucas highlands.

BARRED PUFFBIRD *Nystalus radiatus*
Considered by Restall *et al.* (2006) to be found mainly below 900 m, although locally to 1,500 m in Ecuador (Ridgely & Greenfield 2001). Sound-recorded at Santa Cecilia at 1,550 m (XC104222–226).

WHITE-FRONTED NUNBIRD *Monasa morphoeus*
Considered by Restall *et al.* (2006) to be found mostly below 300 m, but to 1,350 m in Ecuador (Ridgely & Greenfield 2001, Restall *et al.* 2006) and to 1,100 m in Colombia (Hilty & Brown 1986). Observed at Santa Cecilia to 1,500 m.

BEAUTIFUL WOODPECKER *Melanerpes pulcher*
This Near Threatened country endemic was recently recorded at 1,350 m in the East Andes (Donegan *et al.* 2007). Observed in degraded habitat and forest borders at Santa Cecilia (1,350 and 1,550 m).

SLATY-WINGED FOLIAGE-GLEANER *Philydor fuscipenne*
Generally to 1,200 m (Hilty & Brown 1986, Ridgely & Tudor 1994, 2009, Remsen 2003, Restall *et al.* 2006) or 1,400 m (Parker *et al.* 1996), and to the latter elevation in San Lucas

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(Salaman *et al.* 2002a). Mist-netted at 1,550 m Santa Cecilia (1), consistent with a recent record at 1,600 m in the East Andes (Donegan *et al.* 2007).

FASCIATED ANTSHRIKE *Cymbilaimus lineatus*
Generally below 900 m in Colombia (Hilty & Brown 1986), 1,000 m in Ecuador (Ridgely & Greenfield 2001), 1,300 m in Venezuela (Hilty 2003) but rarely to 1,600 m (Zimmer & Isler 2003, Restall *et al.* 2006) and previously to 1,400 m in San Lucas (Salaman *et al.* 2002a). To 1,550 m at Santa Cecilia, where sound-recorded (XC104325–326, 104328, 104409–412, 104414). Birds west of the Andes appear to differ slightly in speed and note shape of their loudsongs from those east of the Andes.

RUFOUS-WINGED ANTWREN *Herpsilochmus rufimarginatus*
Generally below 1,300 m (Hilty & Brown 1986) but sound-recorded near the top part of the transect at Santa Cecilia (at 1,600 m) (XC104477, 104558) and collected by Carriker near Santa Rosa del Sur (1).

BLACK-TAILED FLYCATCHER *Myiobius atricaudus*
Generally below 1,400 m (Hilty & Brown 1986, Restall *et al.* 2006). Ridgely & Tudor (1994) considered that the species attains its highest elevations (1,400 m) in dry valleys of Colombia, although found to 1,600 m on the humid Pacific slope in Cauca (Donegan & Dávalos 1999). Mist-netted at 1,550 m in Santa Cecilia (1).

RUFOUS PIHA *Lipaugus unirufus*
To 1,000 m in Colombia (Hilty & Brown 1986, Ridgely & Tudor 1994, Restall *et al.* 2006), but only to 700 m in Ecuador (Ridgely & Greenfield 2001). Observed and sound-recorded at 1,550 m at Santa Cecilia (XC99291, 99295, 104123, 104249, 104264, 104453–465). Notably, this is the same elevation as the type locality of the threatened Chestnut-capped Piha *L. weberi* in the adjacent northern Central Andes of Anorí, which does not occur at Santa Cecilia.

PURPLE-THROATED FRUITCROW *Querula purpurata*
To 1,200 m in western Colombia (Hilty & Brown 1986, Ridgely & Tudor 1994, Restall *et al.* 2006). Eastern populations in Ecuador and Venezuela mostly below 500 m with small numbers to 700 m in Ecuador (Ridgely & Greenfield 2001, Hilty 2003) and generally considered to occur below 500–700 m (Snow 2004, Kirwan & Green 2011). Found at 1,400 m below Santa Cecilia, where a small group was observed but not sound-recorded. It was absent from the higher elevation forest transect.

GOLDEN-HEADED MANAKIN *Pipra erythrocephala*
Previously considered to occur to 1,000 m in Colombia (Hilty & Brown 1986) or 1,100 m (Parker *et al.* 1996) and generally at lower elevations elsewhere (Restall *et al.* 2006). It has recently been recorded at higher elevations in the East Andes (1,400 m: Salaman *et al.* 2002b; 1,350 m: Donegan *et al.* 2007) and San Lucas (1,200 m: Salaman *et al.* 2002a) and to 2,000 m in Venezuela (Hilty 2003). A female was mist-netted at 1,550 m at Santa Cecilia (1).

SLENDER-BILLED SCHIFFORNIS *Schiffornis stenorhyncha*
Formerly part of the 'Thrush-like Schiffornis *S. turdina*' complex, this taxon is generally considered to occur to 1,400 m (Hilty & Brown 1986, Restall *et al.* 2006). Found at Santa Cecilia at 1,550 m (illustrated in Donegan *et al.* 2011), where sound-recorded (XC81205, 100022, 104205, 104212). These are apparently the first available sound-recordings from the Central Andes.

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SCALY-BREASTED WREN *Microcerculus marginatus*
Previously recorded to 1,400 m in Colombia (Salaman *et al.* 2002a) but mist-netted at 1,550 m at Santa Cecilia (4) where also sound-recorded (XC104467).

WHITE-BREASTED WOOD WREN *Henicorhina leucosticta*
Previously recorded to 1,400 m in Colombia (Salaman *et al.* 2002a) but to 1,550 m at Santa Cecilia (4) and Alto Quebrada La Fría, where sound-recorded (XC98898, 99278–281, 99454–456, 104241).

SOOTY ANT TANAGER *Habia gutturalis*
Considered Near Threatened due to habitat loss in the Magdalena Valley and Caribbean Colombia. Generally found below 1,100 m (Hilty & Brown 1986, Parker *et al.* 1996, Restall *et al.* 2006, Ridgely & Tudor 2009), although previously to 1,400 m in San Lucas (Salaman *et al.* 2002a). Mist-netted and sound-recorded (XC99286, 99536) at 1,550 m at Santa Cecilia (2). The species was not recorded above 1,350 m at similar latitude on the more humid west slope of the East Andes (Donegan *et al.* 2010).

GREYISH SALTATOR *Saltator coerulescens*
Generally to 1,200 m (Hilty & Brown 1986, Ridgely & Tudor 2009) or 1,300 m (Restall *et al.* 2006) with small numbers to 1,600 m in Ecuador (Ridgely & Greenfield 2001) and generally below 850 m in Venezuela (Hilty 2003). Observed at 1,600 m at San Pedro Frío, where canopy frugivores in tall second growth included several *Saltator* spp.

CHESTNUT-HEADED OROPENDOLA *Psarocolius wagleri*
Generally below 1,000 m in Colombia (Hilty & Brown 1986, Restall *et al.* 2006) and to 700 m in Ecuador (Ridgely & Greenfield 2001), although it has been recorded to 1,200 m (Parker *et al.* 1996, Jaramillo & Burke 1999) and to 1,300 m in San Lucas (Salaman *et al.* 2002a). This rare species was observed and sound-recorded (XC100024, 104316) singing in the canopy at Santa Cecilia (1,550 m).

Dubious records

COLOMBIAN CHACHALACA *Ortalis columbiana*
Records by Salaman *et al.* (2002a), based on reports by local people, are doubtful in light of the high-elevation Chestnut-winged Chachalaca record, detailed above.

ASHY-TAILED SWIFT *Chaetura andrei*
Reported by Salaman & Donegan (2001) and Salaman *et al.* (2002a) for San Lucas, but the identification appears erroneous. Based on modern taxonomy (Marín 1997), the record was probably of Chapman's Swift *C. chapmani*.

Avian assemblage of the San Lucas highlands

My observations provide insight into the highland forest birds of the San Lucas range. At Santa Cecilia, forest was characterised by tall trees (*c.*25–30 m) with some moss and arboreal bromeliads, but overall relatively sparse epiphytes for this elevation in Colombia. A dense undergrowth including bamboo was noted, with selective logging in the lower part of the transect. Forest of similar physiognomy was observed at the other two localities, extending to at least 1,900 m on the eastern slope and main ridge.

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Santa Cecilia is noteworthy for its highly diverse flocks involving 20–30 species dominated by Furnariidae / Dendrocolaptidae but also typically including 2–3 woodpeckers, various warblers, vireos, tyrant flycatchers, tanagers and Sharpbill. In some forest-dependent groups, especially Picidae, Furnariidae and Thamnophilidae, various expected lower montane bird species were confirmed in San Lucas, among them numerous range extensions. Birds in these groups generally show close affinities to populations in the Anorí region of the northern Central Andes, as did some other highland species recorded by Salaman *et al.* (2002a).

For several premontane to lower montane bird species, plumage and vocal data suggest that the range of low hills between San Lucas and the Central Andes may have facilitated relatively recent or ongoing contact. In other groups, different patterns are evident. For example, in Psittacidae, Columbidae, Troglodytidae and Icteridae, mostly lowland species have been recorded, many of them at unusually high elevations.

Salaman *et al.* (2002a) suggested that the avifauna of the higher part of San Lucas 'undoubtedly will be more unique', and anticipated 'high levels of endemism'. In a recent study of Three-striped Warblers *Basileuterus tristriatus*, San Lucas specimens which Salaman *et al.* (2002a) considered to represent a new subspecies were found to be phylogenetically basal to most other northern Andean populations (Gutiérrez *et al.* 2012). The status of this species, which was also trapped and sound-recorded at Santa Cecilia, will be discussed separately (Donegan submitted). Molecular work is required to confirm the relations of some populations, especially *Thalurania* sp., *Syndactyla subalaris*, *Myrmotherula schisticolor*, *Scytalopus atratus*, *Oxyruncus cristatus* and *Henicorhina leucophrys*, all of which are represented by specimens.

The premontane forest birds of Santa Cecilia and other San Lucas localities can be compared with those of ProAves' Reserva Natural de Aves (RNA) Arrierito Antioqueño, near Anorí, Antioquia (= 'La Forzosa'), which was subject to a rapid assessment at the same elevation as Santa Cecilia (1,550 m) by Salaman *et al.* (1999), with further study by Cuervo *et al.* (2008a,b) and is the closest locality of similar elevation in the adjacent Central Andes. Santa Cecilia is notably less humid with fewer arboreal epiphytes than RNA Arrierito Antioqueño (as are San Pedro Frío and Alto Quebrada La Fría). Perhaps as a result of the differing climatic and ecological conditions, various highland species found at 1,550 m in RNA Arrierito Antioqueño are (apparently) absent from Santa Cecilia, including Highland Tinamou *Nothocercus bonapartei*, Colombian Chachalaca *Ortalis columbiana* (vs. Chestnut-winged Chachalaca *O. garrula*), Chestnut-capped Piha *Lipaugus weberi* (vs. Rufous Piha *L. unirufus*), Greenish Puffleg *Haplophaedia aureliae*, Booted Racket-tail *Ocreatus underwoodii*, Olive-backed Woodcreeper *Xiphorhynchus triangularis* (vs. *X. erythropygius*), Brown-billed Scythebill *Camphylorhynchus pusillus* (vs. Red-billed Scythebill *C. trochilirostris*), Azara's Spinetail *Synallaxis azarae* (vs. Pale-breasted Spinetail *S. albescens*), Spotted Barbtail *Premnoplex brunnescens*, White-bellied Antpitta *Grallaria hypoleuca*, Uniform Antshrike *Thamnophilus unicolor*, Green Jay *Cyanocorax yncas*, Grey-breasted Wood Wren *Henicorhina leucophrys* (vs. *H. leucosticta*), Andean Solitaire *Myadestes ralloides* (vs. Orange-billed *Catharus aurantiirostris* and Spotted Nightingale Thrushes *C. dryas*), Great *Turdus fuscater* and Glossy-black Thrushes *T. serranus* (vs. Pale-vented Thrush *T. obsoletus*), Beryl-spangled Tanager *Tangara nigroviridis*, Purplish-mantled Tanager *Iridosornis porphyrocephala*, White-winged Tanager *Piranga leucoptera*, Oleaginous Hemispingus *Hemispingus frontalis*, Yellow-throated Brush Finch *Atlapetes albinucha* and Red-bellied Grackle *Hypopyrrhus hypopyrogaster*. Some of these might occur in more humid, higher elevation habitats at San Lucas but many probably are absent. In contrast, several typically lower elevation species not found at

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similar elevations in RNA Arrierito Antioqueño have been recorded above 1,500 m in San Lucas.

Two highland species collected by Carriker in the 1940s have not been found since, Chestnut-collared Swift *Streptoprocne rutila* and Grey-breasted Wood Wren *Henicorhina leucophrys*. Perhaps Carriker spent time at higher elevations at 'Volador' than is generally assumed (above 1,700 m) or climate change and deforestation have resulted in changes to elevational distributions. It is unusual for Carriker's specimens to bear incorrect locality data. The *H. leucoprhys* specimen from San Lucas will be treated separately.

Forests at 1,600–2,300 m in the Andes would typically support several species not found lower down. The steep slopes of Teta de San Lucas, which we observed from San Pedro Frío, possess more stunted vegetation (Fig. 1) and frequent ground-level mist, so may support additional species. However, the land area at the highest elevations of San Lucas is very small (just 1 km^2 exceeds 2,000 m elevation and only *c*.8 km^2 is above 1,800 m). As a result, island effects could restrict the persistence of high-elevation species, which in turn might influence the unusual number of typically low-elevation species in lower montane forest found by this study and Salaman *et al.* (2002a). The number of unusually high-elevation records for lowland species could result from competitive release (at least up to 1,600 m on the east slope and ridgeline).

Conservation and anthropogenic issues

In the 1990s, the San Lucas range was reportedly subject to significant coca-related deforestation and harboured several armed groups (Dávalos 2001, Álvarez 2001, 2002). That decade and the start of the millennium witnessed intense armed conflict and coca fumigation with glysophate (Dávalos 2001, Salaman & Donegan 2001). Dávalos *et al.* (2011) reported no sign of coca-driven deforestation in San Lucas during the period 2002–07 and we saw no evidence of this. However, there remain reports of armed groups deeper and higher in the mountains and in other municipalities, restricting opportunities for field work.

The recently improved security situation has led to noteworthy work on birds and other taxa (e.g. Krabbe *et al.* 2006, Donegan *et al.* 2007) and the development of birdwatching tourism in Colombia. However, various regions remain problematic (e.g. Regalado 2011), including parts of San Lucas. Great care, thorough research of security issues and the support of local communities are paramount when working in previously unstudied regions. Notably, it has taken *c*.10 years for a premontane forest locality in San Lucas (Santa Cecilia) to become accessible to scientists, although the highest elevations around the Teta de San Lucas were still inaccessible in 2010, with no immediate prospect of this changing. Communities in the highlands are concerned about two potentially conflicting government initiatives: (i) extraction concessions granted to multinationals over land presently occupied by artesanal gold-mining communities (largely unexploited to date due to security issues and property disputes); or (ii) the imposition of national protected areas. A more recent ornithological expedition to the San Lucas highlands was reportedly abandoned due to a security incident. Any research or conservation initiatives in the region must fully engage, and have the support of, local communities to succeed.

Some insights were made into the effects of anti-personnel landmines on conservation. Elsewhere in Colombia, it is rare to see forest so close to roads or settlements, and those who visited San Lucas in the 1990s to early 2000s remarked that forests may have been protected by landmining (Dávalos 2001, Salaman & Donegan 2001, Álvarez 2003). The same authors stressed the negative human and social consequences of this aspect of Colombia's conflict, although the press has sometimes drawn more controversial conclusions (e.g. Cooke 2010). Our study suggests instead that any positive conservation outcome of landmines

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is temporary and that it can be negative for forest conservation over the longer term. The previously landmined forests along the road to La Punta studied by Salaman *et al.* (2002a) had been almost entirely cleared for agriculture by 2010, whilst unmined forests further from the road at La Teta Resort were intact. This is because de-mining machines (similar to large bulldozers able to withstand explosions) have been used in San Lucas in the intervening years, in combination with manual mine and vegetation clearance.

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Notes on the birds of Laquipampa Wildlife Refuge, Lambayeque, Peru

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Summary.—Laquipampa was first designated a Reserved Zone, a temporary protected area category used by the Peruvian government until more complete studies permit a final designation, in 1982. The initial designation was based on the presence of the endemic and globally threatened White-winged Guan *Penelope albipennis*, but few other data on its other avifauna were available. We present the first comprehensive bird list (187 species) for this important reserve based on observations in 2001–10 and provide comments on several noteworthy records.

Laquipampa lies within the Incahuasi district of Ferreñafe province in Lambayeque. With the rediscovery of the presumed extinct White-winged Guan *Penelope albipennis* in Quebrada San Isidro in 1977 (see De Macedo 1979), further searches were initiated in Lambayeque and Piura. Ortiz (1980) found the species in two valleys at Laquipampa: Negrahuasi and Reloj. Based on this, a protected area was proposed and, in 1982, 11,346 ha were declared the Zona Reservada de Laquipampa to protect the guan (El Peruano 1982). However, apart from guan surveys (*cf.* Ortiz 1980, Ortiz & Díaz 1997), little was known of the area's avifauna and it received little government interest for almost two decades. In 1998 the Instituto Nacional de Recursos Naturales (INRENA, now the Servicio Nacional de Areas Naturales Protegidas, SERNANP) appointed the area's first refuge manager and in 2001 the first park ranger was assigned. In July 2006 the area was finally designated a Refugio de Vida Silvestre (El Peruano 2006) or wildlife refuge, covering 8,328 ha. Here we present the first comprehensive bird list for the conservation area, with notes on species of interest.

Study area and field work

Laquipampa Wildlife Refuge (LWR) is sited on a ridge on the north bank of the río La Leche (known as the Moyán above its confluence with the Sangana). Elevation in the refuge ranges from 200 m in the south-west (06°24′30″S, 79°33′45″W) to 2,600 m, the peak of 'La Punta' (06°15′55″S, 79°28′09″W), in the extreme north-east (Fig. 1).

According to CDC-UNALM (2006), the lower part of LWR belongs to the 'Piura and Tumbes Dry Forests' ecoregion and the upper part to the 'West Montane forests of the North Andes' ecoregion (Fig. 1). The dry forest is semi-deciduous and is found from 200 m to 1,300–1,400 m, and dominant species include *Loxopterygium huasango* (Anacardiaceae), *Bursera graveolens* (Burseraceae) and *Eriotheca ruizii* (Malvaceae). It has leaf cover in the wet season (December–May). Humidity and vegetation density increase with altitude. Montane forest is found in the upper LWR at 1,400–1,800 m, the vegetation does not shed its leaves in the dry season, and is considerably more humid than dry forest, reflected in the biomass of orchids, ferns and lichens. Another important floral community is *Sural* and scrub, which is dominated by *Suro* bamboo (*Chusquea* sp.: Poaceae) and many shrubs, with *Barnadesia* spp. (Asteraceae) dominant. This habitat occurs at 1,800–2,600 m and is characterised by low tree density, except on the sides of ravines. Agricultural areas also exist in the reserve including fields, mostly of corn, rice and sugarcane, near the ríos Moyán and La Leche, and formerly

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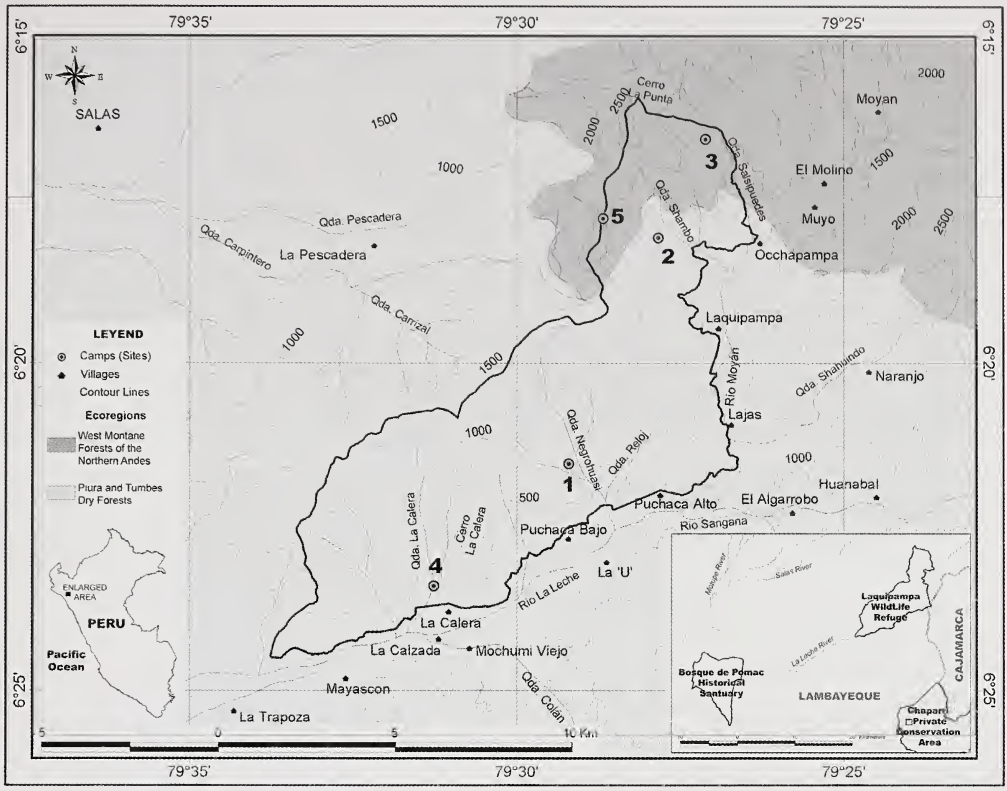

Figure 1. Map showing the location of the Laquipampa Wildlife Refuge in north-west Peru, its extent and the location of the five sites mentioned in the text. Site 1: Quebrada Negrahuasi, *c*.590 m. Site 2: Quebrada Shambo, *c*.1,360 m. Site 3: Corral Grande in Quebrada Salsipuedes, *c*.1,830 m. Site 4: lower reaches, *c*.350 m. Site 5: El Porongo, *c*.2,100 m.

used areas on level terrain dominated by *Acacia macracantha* (Fabaceae) at all elevations (established prior to the creation of the protected area).

On 21–31 August 2001, in the dry season, an expedition by ProAves Perú and Asociación Cracidae Perú produced the first bird list of 110 species (Flanagan & Angulo 2003). Two locations were visited: Quebrada Negrahuasi (22–24 August, 590 m, site 1) and Quebrada Shambo (25–29 August, *c*.1,000 m–1,400 m, site 2). In February 2006, a second expedition by Asociación Cracidae Perú explored the area in the wet season. Three camps were established, in Quebrada Negrahuasi (12–14 February, 590 m, site 1), Quebrada Shambo (15–19 February, *c*.1,360 m, site 2) and Corral Grande in Quebrada Salsipuedes (20–24 February, 1,830 m, site 3). A total of 130 species, 37 of them 'new' to the area (Angulo & Alemán de Lama 2006), was identified. Most records described here were made during these two visits. Other visits were in the dry season: on 11–13 July 2008 (at *c*.350 m, site 4) by FAP & JNMF, and 11–14 November 2010 (*c*.2,100 m, site 5, El Porongo) by FAP. An additional source is the records made during a two-year migrant bird project (September 2006–July 2008) conducted by ECOAN. Also included are records made around Moyán town, just outside LWR but with similar habitats and elevation, on the road to Incahuasi in February 2006. Finally, documented (with photographs) reports by local people are also included.

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Results

The Appendix presents an annotated species list for LWR totaling 187 species. Of these, seven are globally threatened—one Critically Endangered (CR) and six Vulnerable (VU) (BirdLife International 2012), 34 are restricted-range Tumbesian endemics and two are restricted-range Southern Central Andes endemics (Stattersfield *et al.* 1998). Sound-recordings have been archived at www.xeno-canto.org and are indicated by their catalogue number, e.g. XC66383. Noteworthy records not previously reported in the literature are detailed below.

COMB DUCK *Sarkidiornis melanotos*
Recorded twice in Laquipampa (5 June 2005 and 2 February 2006) at Puchaca (200–350 m), on both occasions singles in rice fields beside the río La Leche. The species is rather rare in north-west Peru, but was recorded during 1979–2010 at the Eten marshes near Chiclayo (Angulo *et al.* 2010). Approximately ten other records (usually of singles) in 2005–12 are available online (Cornell Laboratory of Ornithology & National Audubon Society 2011), from Rica Playa, in Tumbes, Laguna Ñapique (max. 25), Batanes and Puente Internacional, in Piura, and Olmos, Bosque de Pomac and Tinajones Reservoir (max. 55) in Lambayeque, the latter being the closest locality to Laquipampa. There is also a record from the río Tocto, Lambayeque (C. Hesse *in litt.* 2010).

BEARDED GUAN *Penelope barbata* VU
This restricted-range species was first reported at LWR in August 2001, in the Quebrada Shambo, where up to ten were seen at 1,300–1,700 m (Flanagan & Angulo 2002), and it was also heard in Quebrada Pescadera, a forested valley north of the refuge and above the village of Salas. In February 2006, *P. barbata* was found near the Shambo and Corral Grande camps, at 1,350–1,830 m. In November 2010 it was recorded to 2,150 m at El Porongo. On 17 February 2006, near Shambo camp at 1,400 m, a pair was found with a chick estimated on plumage to be *c.*2 weeks old (Delacour & Amadon 2004), suggesting that breeding here coincides with the wet season (December–February). The estimated population at LWR is 20–25 individuals based on available habitat.

WHITE-WINGED GUAN *Penelope albipennis* CR
First recorded at LWR in 1978 in Quebrada Negrahuasi, where 5–6 individuals were seen (Ortiz 1980). In 1987, 2–4 were recorded there (Ortiz & Díaz 1997). In 2000–01, FAP surveyed Quebrada Negrahuasi and two other sites—Lajas and Quebrada Shambo—on the advice of local people, finding six, 11 and two guans respectively (Angulo 2000, 2001). As of 2005, the refuge supported a min. population of 22 individuals (Angulo 2008). At LWR, White-winged Guan has been found at 600–1,400 m and also in the same quebrada, Shambo, as Bearded Guan, where they share a narrow altitudinal band at 1,300–1,400 m. The species is recorded regularly at Lajas, just below the village of Laquipampa (outside the refuge), and is also known to descend at dawn and dusk to a place *c.*500 m north of the village of Laquipampa, accessed via some fields. Moreover, ND noted that the species feeds in the village itself when a certain *Ficus* sp. (Moraceae) tree is fruiting. In 2007 eight captive-bred birds were reintroduced into Quebrada Negrahuasi (Angulo 2008) and had two chicks three months later. The estimated population in the refuge is 25–30 individuals.

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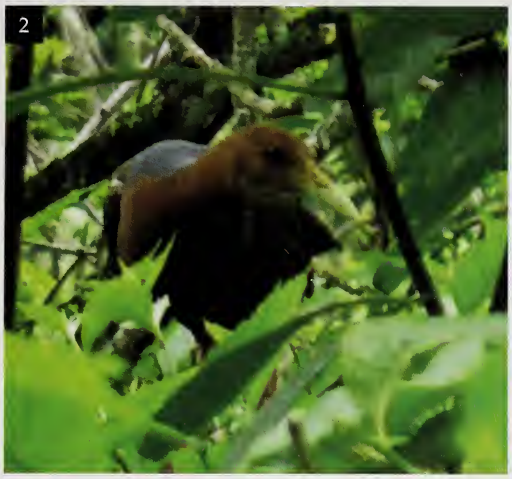

Figure 2. Rufous-necked Wood Rail *Aramides axillaris*, Quebrada Shambo, Laquipampa Wildlife Refuge, Peru, 15 February 2007 (Oscar Rodríguez)

Figure 3. Captive Ruddy Quail-Dove *Geotrygon montana*, claimed to have been trapped locally, Laquipampa, Peru, 3 October 2005 (Napoleon Durand)

Figure 4. Mouse-coloured Tyrannulet *Phaeomyias murina tumbezana*, Laquipampa Wildlife Refuge, Peru, 22 February 2006 (Willem-Pier Vellinga)

Figure 5. Male Blue Seedeater *Amaurospiza concolor*, Corral Grande, Laquipampa Wildlife Refuge, Peru, 24 February 2006 (Willem-Pier Vellinga)

RUFOUS-NECKED WOOD RAIL *Aramides axillaris*

Photographed by O. Rodríguez in Quebrada Shambo at 1,270 m on 15 February 2007 (Fig. 2). *A. axillaris* was first recorded in Peru in Tumbes Reserved Zone (now Cerros de Amotape National Park) in 1986 (Parker *et al.* 1995). In Tumbes it has been reported from mangroves (Valqui & Walker 2002) and dry forest near El Caucho and Pozo del Pato in the north of Cerros de Amotape National Park (Walker 2002). Our LWR record extends the species' distribution *c.*280 km south. According to (unconfirmed) information from the park rangers, the species is present at LWR year-round, but is more active and vocal in January–April.

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OCHRE-BELLIED DOVE *Leptotila ochraceiventris* VU
Heard at 550–2,100 m, with one poor sound-recording (XC38631) obtained at Quebrada Shambo in February 2006, and it was recorded again at El Porongo in November 2010. These records appear to be the southernmost published. Further north it has been reported at Palambla (Koepcke 1961).

[**RUDDY QUAIL-DOVE** *Geotrygon montana*
One kept as a 'pet' by a local person (Fig. 3), who claimed that the bird was captured in the valley. Its origin is of course unclear. In Amazonia (and possibly elsewhere), the species reportedly undertakes irruptive movements (Stouffer & Bierregaard 1993), so our record could be related to the closest known west-slope population (*c.*300 km to the north in Loja, Ecuador (Ridgely & Greenfield 2001), or perhaps to that in western Amazonia.]

KOEPCKE'S SCREECH OWL *Megascops koepckeae*
Sound-recorded near the Corral Grande camp in February 2006: during the night one was heard calling regularly and two birds, presumably male and female, were counter-singing just before dawn (XC5526, 8649). The species was also heard at night at 2,150 m at El Porongo. This is the northernmost record of the species on the west slope of the Andes. Several apparently well-documented records from the nearest localities further south (Sinsicap and Bosque Cachil) are unpublished (but see Cornell Laboratory of Ornithology & National Audubon Society 2011).

OILBIRD *Steatornis caripensis*
One observed on a tree was photographed by JNMF in Quebrada Shambo at *c.*1,400 m in August 2001. Schulenberg *et al.* (2007) stated 'very rarely is reported from coast'. It has been recorded in Pimentel and Chiclayo (FAP unpubl.). The closest-known caves are apparently near San Andrés de Cutervo (SERNANP 2010) on the east slope of the Andes 77 km east of LWR.

LITTLE WOODSTAR *Chaetocercus bombus* VU
One photographed by A. Gonzales de la Cruz in Quebrada Shambo at 1,317 m, in May 2008, matches the species' presumed habitat preference for humid and semi-deciduous forests. Little Woodstar was formerly considered threatened based on the paucity of late-20th century records (implying a decrease in numbers) and the destruction of humid forests (Collar *et al.* 1992). However, recent years have witnessed increasing records from the northern part of the historical range in Peru, especially the Marañón basin in Cajamarca, Piura, Amazonas and Lambayeque (Cornell Laboratory of Ornithology & National Audubon Society 2011). However, little is known of its ecology (Collar *et al.* 1992) and it would be interesting to clarify the species' status in LWR.

RUFOUS-NECKED FOLIAGE-GLEANER *Syndactyla ruficollis* VU
In Peru known from the west slope of the northern Andes and from the Amotape range at 600–2,650 m (Schulenberg *et al.* 2007). After Cerros de Amotape National Park and El Angolo Hunting Reserve, LWR becomes the third protected area known to harbour the species in Peru and the only one in the main Andean chain. It was found at 1,360–2,150 m.

HENNA-HEADED FOLIAGE-GLEANER *Hylocryptus erythrocephalus* VU
In Peru protected areas known to support this species are Cerros de Amotape National Park and El Angolo Hunting Reserve, making LWR the third conservation unit in the country

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and the first in the main Andean chain. In LWR it was encountered at Negrahuasi and Shambo, between *c*.550 and 2,100 m.

RUSTY-BREASTED ANTPITTA *Grallaricula ferrugineipectus leymebambae*
The song of *G. ferrugineipectus* was recorded at 2,150 m at El Porongo (XC66383). In recent years the species has been encountered at various locations on the west slope in Peru and Ecuador. In Ecuador, where it was previously unknown, the species has been found north to dpto. Pichincha, and in Peru it was initially found on the west slope near Canchaque (Schulenberg 1981) and subsequently near Ayabaca by P. Coopmans (Vellinga *et al.* 2004). Ours is the southernmost record (*c*.100 km south of Canchaque) and the first for Lambayeque.

MOUSE-COLOURED TYRANNULET *Phaeomyias murina*
A small confusing flycatcher that was trapped and observed several times in Quebrada Shambo (*c*.1,400 m) and Corral Grande (*c*.1,800 m) was identified as *P. m. tumbezana*. Our photographs compare well with specimens of *P. m. tumbezana* (Fig. 4) and the illustration in Schulenberg *et al.* (2007). In less-than-ideal field conditions the conspicuous wingbars and eyestripe, and the dark crown could cause confusion with Grey-breasted Flycatcher *Lathrotriccus griseipectus*, rather than with *P. m. inflava.* On current knowledge, *P. m. inflava* occurs from the lowlands of southern Piura south, whereas *P. m tumbezana* occurs in the lowlands of northern Piura north to Ecuador, but occurs south at least to the Olmos–Bagua highway, e.g. at 1,800 m at Limon de Porculla (D. F. Lane *in litt*. 2009). *P. m inflava* has not yet been found in LWR but is known from Bosque de Pomac Historical Sanctuary, lower down in the floodplain of the río La Leche (06°29′S 79°46′W; 100–200 m). It is unclear if *P. m. inflava* and *P. m. tumbezana* co-occur in LWR. For now, there are no records at 500–1,400 m. Vocally, *P. m. inflava* and *P. m. tumbezana* are apparently similar (Schulenberg *et al.* 2007), although one vocalisation of *P. m. tumbezana* (XC38632) is perhaps unique, as we have not heard it from *P. m. inflava.*

GREY-BREASTED FLYCATCHER *Lathotriccus griseipectus* VU
Found at all three 2006 camps. It was sound-recorded in Quebrada Shambo (XC5626). LWR is south of the presumed range of the species, but it has recently been encountered even further south in the Zaña Valley as well (FAP unpubl.).

PIURA CHAT-TYRANT *Ochthoeca piurae* NT
This Peruvian endemic is known from Palambla and Porculla (Piura), Samne and Sinsicap (La Libertad), and Colcabamba, Wiñapatun, Noqno and San Damian (Ancash) (Collar *et al.* 1992). LWR is the first known location for Lambayeque and the first protected area known to harbour the species, when one was mist-netted near Corral Grande on 23 February 2006. At a similar elevation on the road to Incahuasi, just outside LWR (Moyán), the species was also observed and sound-recorded (XC5228) on 12 February 2006.

BLUE SEEDEATER *Amaurospiza concolor*
A male was trapped on 24 February 2006 near Corral Grande, at *c*.1,840 m in a mist-net within *Chusquea* sp. (Fig. 5). A presumed female and a male were observed by WPV at the same place one day earlier. LWR represents only the third-known location for the species in Peru; it was found in the Zaña Valley in 1996 (Salinas *et al.* 1998) and in a scrubby area west of Porculla pass at *c*.1,800 m (B. Walker *in litt*. 2009).

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Discussion

The preliminary report on the 2001 expedition was instrumental in securing the present status of wildlife refuge, and the results presented here reinforce the importance of LWR for bird conservation in the Tumbesian Endemic Bird Area. The main importance of LWR remains the population of White-winged Guan; this is the only state-protected area known to date. Recently, two Regional Conservation Areas in which the species occurs have been created, in Piura and Lambayeque.

LWR also harbours a large number of Tumbesian endemics. Of the 55 range-restricted species of the Tumbesian region (*cf.* Stattersfield *et al.* 1998), 34 occur in LWR, making it meritorious of broader recognition as a key site in the protection of Tumbesian natural heritage. LWR is also crucial due to the altitudinal gradient of undisturbed forest protected therein, with species more associated with montane cloud forest present at higher altitudes, e.g. Bearded Guan. Such elevational transects of intact forest are increasingly scarce on the west slope of the northern Andes in Peru. Further field work could still discover other scarce species, e.g., Grey-headed Antbird *Myrmeciza griseiceps*, which is known both north and south of LWR in the main Andean chain. Such field work should focus on upper montane forests (2,000–2,600 m) and include seasons other than those during which we visited.

LWR lies immediately south of Comunidad Campesina Laquipampa and north of Salas. The economy of these communities mostly focuses on agriculture and cattle. Major threats to the refuge include its excessive use by cattle and land invasions by people.

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APPENDIX: birds of Laquipampa Wildlife Refuge

X = recorded in the season indicated. An empty box indicates a lack of records at the relevant season, and - = a degree of certainty that the species was not present. Evidence: C = mist-netted, photographed and released, P = photographed, R = sound-recorded, V = seen only, H = heard only, O = just outside LWR limits. Photographs include species photographed in the wild or birds photographed after being captured in the area by local people. Also shown are species indicative of Endemic Bird Areas; T = Tumbesian EBA, SCA = South Central Andes EBA, or country endemics (P) and threat status according to both IUCN (BirdLife International 2012) and the Peruvian government (El Peruano 2004).

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		Elevation		Season		Evidence	Threat		Endemic		Remarks
		min.	max.	wet	dry		IUCN	Peru	EBA	Peru	
Ixobrychus exilis	Least Bittern	250	250	X	X	V					
Nycticorax nycticorax	Black-crowned Night Heron	550	550	X	X	V					
Butorides striata	Striated Heron	300	550	X	X	V					
Bubulculus ibis	Cattle Egret	300	800	X	X	V					
Ardea alba	Great Egret	300	550	X	X	P					
Egretta thula	Snowy Egret	300	1,100	X	X	P					
Egretta caerulea	Little Blue Heron	200	400	X	X	P					
Cathartes aura	Turkey Vulture	300	2,100	X	X	P					
Coragyps atratus	Black Vulture	300	1,830	X	X	V					
Sarcoramphus papa	King Vulture	300	1,700	X	X	V					
Vultur gryphus	Andean Condor	2,200	2,600	X	X	V		EN			
Gampsonyx swainsonii	Pearl Kite	550	550	X	X	P					
Accpiter striatus	Sharp-shinned Hawk	1,830	2,100	X	X	V					
Accipiter bicolor	Bicoloured Hawk	300	1,500	X	X	V					
Buteogallus urubitinga	Great Black Hawk	590	1,400	X	X	V					
Buteogallus meridionalis	Savanna Hawk	200	400	X	X	P					
Harpyhaliaetus solitarius	Solitary Eagle	800	800	X	X	V					
Geranoaetus melanoleucus	Black-chested Buzzard-Eagle	300	2,100	X	X	V					
Parabuteo unicinctus	Harris's Hawk	550	700	X	X	V					
Buteo leucorrhous	White-rumped Hawk	2,000	2,100		X	V					
Buteo polyosoma	Red-backed Hawk	550	700	X	X	V					
Caracara cheriway	Crested Caracara	300	700	X	X	V					
Falco sparverius	American Kestrel	300	800	X	X	P					
Falco peregrinus	Peregrine Falcon	300	1,400	X	X	V					
Aramides axillaris	Rufous-necked Wood Rail	1,360	1,360	X		P					
Charadrius vociferus	Killdeer	300	550	X	X	V					
Burhinus superciliaris	Peruvian Thick-knee	300	300	X	X	V					
Actitis macularius	Spotted Sandpiper	550	550	X	X	V					
Columbina cruziana	Croaking Ground Dove	300	1,500	X	X	P, R					XC21773
Columba livia	Rock Pigeon	300	800	X	X	V					
Patagioena fasciata	Band-tailed Pigeon	1,360	2,150	X	X	P, R					XC69831
Zenaida meloda	West Peruvian Dove	300	1,500	X	X	P, R					XC8661, 16719, 21777, 21779
Zenaida auriculata	Eared Dove	300	2,150	X	X	P					
Leptotila verreauxi	White-tipped Dove	300	2,150	X	X	P, R					XC16720, 21594
Leptotila ochraceiventris	Ochre-bellied Dove	550	2,100	X	X	R	VU		T		XC38632
Aratinga wagleri	Scarlet-fronted Parakeet	590	1,830		X	V					
Aratinga erythrogenys	Red-masked Parakeet	300	2,100	X	X	P, R			T		XC16721, 16724

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		Elevation		Season		Evidence	Threat		Endemic		Remarks
		min.	max.	wet	dry		IUCN	Peru	EBA	Peru	
Forpus coelestis	Pacific Parrotlet	300	1,800	X	X	P			T		
Coccyzus erythropthalmus	Black-billed Cuckoo	700	700	X		P					
Crotophaga sulcirostris	Groove-billed Ani	300	1,800	X	X	R					XC21774
Tapera naevia	Striped Cuckoo	300	300	X	X	H					
Tyto alba	Barn Owl	800	800	X	X	P					
Megascops roboratus	West Peruvian Screech Owl	590	2,100	X	X	R					XC5627, 8660
Megascops koepckeae	Koepcke's Screech Owl	1,830	2,150	X	X	R				P	XC5526, 8649
Pulsatrix perspicillata	Spectacled Owl	600	700		X	H					
Ciccaba albitarsis	Rufous-banded Owl	1,400	1,400		X	R					XC29018
Glaucidium peruanum	Peruvian Pygmy Owl	300	1,800	X	X	R					XC5609, 8644, 21592
Athene cunicularia	Burrowing Owl	300	800	X	X	P					
Steatornis caripensis	Oilbird	1,400	1,400		X	P					
Nyctibius griseus	Common Potoo	590	1,360	X	X	P, R					
Chordeiles acutipennis	Lesser Nighthawk	300	1,400	X	X	P					
Nyctidroma albicollis	Pauraque	1,360	1,800	X	X	R					XC29018, 8645
Caprimulgus anthonyi	Scrub Nightjar	550	550		X	H			T		
Streptoprocne rutila	Chestnut-collared Swift	590	1,360	X	X	P					
Streptoprocne zonaris	White-collared Swift	1,400	1,400	X	X	V					
Chaetura brachyura	Short-tailed Swift	1,830	1,830	X	X	V					
Aeronautes montivagus	White-tipped Swift	590	2,100	X	X	R					XC5180
Phaethornis griseogularis	Grey-chinned Hermit	550	2,100	X	X	V					
Colibri coruscans	Sparkling Violetear	1,400	1,800	X	X	V					
Adelomyia melanogenys	Speckled Hummingbird	550	2,150	X	X	R					XC5590
Lesbia nuna	Green-tailed Trainbearer	1,830	2,100	X	X	C					
Aglaeactis cupripennis	Shining Sunbeam	2,100	2,150		X	V					
Coeligena iris	Rainbow Starfrontlet	1,500	2,100	X	X	V			SCA		
Patagona gigas	Giant Hummingbird	1,800	1,800	X	X	V					
Heliomaster longirostris	Long-billed Starthroat	590	800	X	X	V					
Myrtis fanny	Purple-collared Woodstar	1,800	1,830	X	X	V			T		
Chaetocercus bombus	Little Woodstar	1,300	1,300		X	P	VU	VU			
Myrmia micrura	Short-tailed Woodstar	300	1,050	X	X	V			T		
Leucippus sp.	Tumbes / Spot-throated Hummingbird	590	590	X	X	V			T		
Amazilia amazilia	Amazilia Hummingbird	300	1,830	X	X	C, R					XC5608
Trogon mesurus	Ecuadorian Trogon	550	1,800	X	X	P, R					XC5255–56
Megaceryle torquata	Ringed Kingfisher	300	700	X	X	P					
Chloroceryle americana	Green Kingfisher	300	700	X	X	V					
Momotus momota	Blue-crowned Motmot	590	590	X	X	P, R					XC5237

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		Elevation		Season		Evidence	Threat		Endemic		Remarks
		min.	max.	wet	dry		IUCN	Peru	EBA	Peru	
Picumnus sclateri	Ecuadorian Piculet	1,360	1,830	X	X	C, R			T		XC8633
Picoides fumigatus	Smoky-brown Woodpecker	1,830	1,920	X	X	C					
Verniliornis callonotus	Scarlet-backed Woodpecker	300	1,360	X	X	V					
Colaptes rubiginosus	Golden-olive Woodpecker	300	1,700	X	X	P, R					XC5244
Dryocopus lineatus	Lineated Woodpecker	590	1,360	X	X	V					
Campephilus gayaquilensis	Guayaquil Woodpecker	550	700	X	X	P					
Furnarius leucopus	Pale-legged Hornero	300	1,830	X	X	P					
Synallaxis azarae	Azara's Spinetail	1,400	2,100	X	X	R					XC44728, 44730, 44732
Cranioleuca antisiensis	Line-cheeked Spinetail	1,800	2,150	X	X	C, R					XC5597
Syndactyla ruficollis	Rufous-necked Foliage-gleaner	1,360	2,150	X	X	C, R	VU	VU	T		XC5177, 8750
Hylocryptus erythrocephalus	Henna-headed Foliage-gleaner	550	2,100	X	X	R	VU	VU	T		XC8727
Lepidocolaptes souleyetti	Streak-headed Woodcreeper	300	1,400	X	X	P, R					XC8699
Thamnophilus zarumae	Chapman's Antshrike	1,400	2,150	X	X	P, R			T		XC5181
Thamnophilus bernardi	Collared Antshrike	300	1,650	X	X	P, R			T		XC5566, 21586
Grallaria guatimalensis	Scaled Antpitta	1,400	1,830	X		C, R					XC8747
Grallaria ruficapilla	Chestnut-crowned Antpitta	1,400	2,150	X	X	R					many, e.g., XC8603
Grallaria watkinsi	Scrub Antpitta	700	1,200	X	X	V			T		
Grallaricula ferrugineipectus	Rusty-breasted Antpitta	2,100	2,150		X	R					XC66383, 69835
Scytalopus latrans subcinereus	Blackish Tapaculo	1,400	2,150	X	X	R					XC41723, 44728, 44732
Melanopareia elegans	Elegant Crescentchest	300	1,830	X	X	C, R			T		XC5595, 8579
Myiopagis subplacens	Pacific Elaenia	700	1,350	X	X	R			T		XC5263
Camptostoma obsoletum	Southern Beardless Tyrannulet	300	2,150	X	X	R					e.g. XC5179
Mecocerculus calopterus	Rufous-winged Tyrannulet	1,830	1,830	X	X	C, R					XC8603
Phaeomyias murina tumbezana	Mouse-coloured Tyrannulet	1,400	2,150	X	X	C, R					XC38632
Euscarthmus meloryphus	Tawny-crowned Pygmy Tyrant	300	2,150	X	X	R					XC5615, 16726
Pseudelaenia leucospodia	Grey-and-white Tyrannulet	300	700	X	X	V			T		
Mionectes striaticollis	Streak-necked Flycatcher	1,830	1,830	X	X	C					
Todirostrum cinereum	Common Tody-Flycatcher	550	1,400	X	X	V					
Myiophobus fasciatus	Bran-coloured Flycatcher	550	1,350	X	X	R					XC5614
Lathotriccus griseipectus	Grey-breasted Flycatcher	1,350	1,830	X	X	R	VU	VU	T		XC5626
Contopus cinereus	Tropical Pewee	590	1,830	X	X	P, R					XC5584
Contopus fumigatus	Smoke-coloured Pewee	1,360	1,830	X	X	R					XC8731
Sayornis nigricans	Black Phoebe	550	1,500	X	X	P					
Pyrocephalus rubinus	Vermilion Flycatcher	300	1,830	X	X	P					
Myiotheretes striaticollis	Streak-throated Bush Tyrant	1,800	2,150	X	X	V					
Tumbezia salvini	Tumbes Tyrant	590	590	X	X	P			T		
Ochthoeca piurae	Piura Chat-Tyrant	1,800	1,830	X	X	C, R		EN	T	P	XC5228

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		Elevation		Season		Evidence	Threat		Endemic		Remarks
		min.	max.	wet	dry		IUCN	Peru	EBA	Peru	
Muscigralla brevicauda	Short-tailed Field Tyrant	300	590	X	X	V					
Myiodynastes bairdii	Baird's Flycatcher	300	1,400	X	X	P, R			T		XC5236
Myiodynastes maculatus	Streaked Flycatcher	590	590	X		V					
Tyrannus niveigularis	Snowy-throated Kingbird	300	300		X	P					
Tyrannus melancholicus	Tropical Kingbird	300	1,830	X	X	R					XC5238
Myiarchus tuberculifer	Dusky-capped Flycatcher	550	2,100	X	X	V,R					e.g. XC8731
Myiarchus phaeocephalus	Sooty-crowned Flycatcher	1,700	1,700	X	X	V			T		
Pachyramphus albogriseus	Black-and-white Becard	1,360	1,360	X		C					
Cyclarhis gujanensis	Rufous-browed Peppershrike	300	2,150	X	X	P, R					XC5619
Cyanocorax mystacalis	White-tailed Jay	300	1,830	X	X	P, R, C			T		XC5183, 5185
Pygochelidon cyanoleuca	Blue-and-white Swallow	300	2,100	X	X	V					
Stelgidopteryx ruficollis	Southern Rough-winged Swallow	590	590	X	X	V					
Progne chalybea	Grey-breasted Martin	300	1,400	X	X	V					
Hirundo rustica	Barn Swallow	550	550		X	V					
Petrochelidon rufocollaris	Chestnut-collared Swallow	1,050	1,360	X	X	V					
Troglodytes aedon	House Wren	300	1,900	X	X	C, R					XC5599
Campylorynchus fasciatus	Fasciated Wren	300	1,830	X	X	R					XC8581
Pheugopedius sclateri	Speckle-breasted Wren	1,150	1,700	X	X	V					
Cantorchilus superciliaris	Superciliated Wren	300	1,830	X	X	R			T		XC5589, 21775
Polioptila plumbea	Tropical Gnatcatcher	300	1,500	X	X	R					XC16725
Catharus fuscater	Slaty-backed Nightingale-Thrush	1,700	2,100	X	X	R					XC41481
Turdus reevei	Plumbeous-backed Thrush	300	1,830	X	X	P, R, C			T		XC5567
Turdus nigriceps	Andean Slaty Thrush	1,400	1,830	X	-	P, R, C					XC5176, 8732
Turdus fuscater	Great Thrush	1,800	2,150	X	X	V,R					XC69842–43
Turdus chiguanco	Chiguanco Thrush	1,800	2,000	X		R, O					XC8700
Mimus longicaudatus	Long-tailed Mockingbird	300	1,830	X	X	P, R					XC5604
Anthus bogotensis	Páramo Pipit	1,800	1,800	X	X	V					
Conothraupis speculigera	Black-and-white Tanager	590	1,830	X	-	R					XC5603
Hemispingus melanotis piurae	Black-eared Hemispingus	1,900	2,150		X	R					XC6984–41
Thlypopsis ornata	Rufous-chested Tanager	1,830	1,830	X		R					XC5596
Thraupis episcopus	Blue-grey Tanager	300	1,800	X	X	R					XC5558
Thraupis bonariensis	Blue-and-yellow Tanager	1,800	1,800	X	X	V					
Pipraeidea melanonota	Fawn-breasted Tanager	1,830	1,830	X	X	V					
Tangara viridicollis	Silvery Tanager	1,360	1,830	X	X	V					
Conirostrum cinereum	Cinereous Conebill	1,800	1,800	X	X	V					
Diglossa sittoides	Rusty Flowerpiercer	1,800	1,830	X	X	C					
Catamblyrhynchus diadema	Plushcap	2,100	2,100		X	V					

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		Elevation		Season		Evidence	Threat		Endemic		Remarks
		min.	max.	wet	dry		IUCN	Peru	EBA	Peru	
Coereba flaveloa	Bananaquit	300	1,500	X	X	V					
Saltator nigriceps	Black-cowled Saltator	1,800	2,150	X	X	P, R, C			T		XC5184
Saltator striatipectus	Streaked Saltator	1,050	1,050		X	V					
Zonotrichia capensis	Rufous-collared Sparrow	1,400	2,100	X	X	V					
Rhynchospiza stolzmanni	Tumbes Sparrow	300	1,400	X	X	P, R			T		XC21781
Phrygilus plebejus	Ash-breasted Sierra Finch	1,800	2,100	X	X	V					
Piezorhina cinerea	Cinereous Finch	300	300	X	X	V			T	P	
Poospiza hispaniolensis	Collared Warbling Finch	300	300	X	X	R					XC33256
Sicalis flaveola	Saffron Finch	300	1,830	X	X	P					
Volatina jacarina	Blue-black Grassquit	300	1,830	X	X	R					XC5582
Sporophila peruviana	Parrot-billed Seedeater	300	700	X	X	V					
Sporophila telasco	Chestnut-throated Seedeater	300	590	X	X	V					
Arremon abellei	Black-capped Sparrow	590	1,500	X	X	P, C			T		
Arremon assimilis	Grey-browed Brush Finch	1,360	2,150	X	X	C, R					XC5169
Atlapetes leucopterus	White-winged Brush Finch	600	1,830	X	X	C, R					XC5173
Atlapetes albiceps	White-headed Brush Finch	300	2,150	X	X	V			T		
Atlapetes seebohmi	Bay-crowned Brush Finch	1,650	1,650		X	V			T		
Piranga flava	Hepatic Tanager	300	1,830	X	X	P, R					XC8580
Pheucticus chrysogaster	Golden-bellied Grosbeak	300	1,830	X	X	P, R, C					XC5182
Amaurospiza concolor	Blue Seedeater	1,830	1,830	X		C					
Parula pitiayumi	Tropical Parula	300	1,830	X	X	P, R					XC5174
Geothlypis aequinoctialis	Masked Yellowthroat	1,400	1,830	X	X	R					XC5581, 5583
Myioborus miniatus	Slate-throated Redstart	1,360	2,100	X	X	C					
Basileuterus fraseri	Grey-and-gold Warbler	550	1,700	X	X	C, R			T		XC5178
Basileuterus nigrocristatus	Black-crested Warbler	1,830	2,100	X	X	C, R					XC8764
Basileuterus trifasciatus	Three-banded Warbler	590	2,150	X	X	C, R			T		XC5187, 8648
Icterus graceannae	White-edged Oriole	300	1,800	X	X	P, R			T		XC16723
Icterus mesomelas	Yellow-tailed Oriole	590	1,360	X		P, R, C					XC8735
Dives warszewiczi	Scrub Blackbird	300	1,150	X	X	V					
Molothrus bonariensis	Shiny Cowbird	300	300	X	X	P					
Sturnella belicosa	Peruvian Meadowlark	300	1,500	X	X	R					XC21580
Carduelis magellanica	Hooded Siskin	1,800	2,100	X	X	R					XC5600
Carduelis psaltria	Lesser Goldfinch	1,800	1,800	X	X	V					
Euphonia laniirostris	Thick-billed Euphonia	300	2,100	X	X	P, R					XC5245

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Range extension for Buff-fronted Owl *Aegolius harrisii* in south-east Brazil

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Summary.—Buff-fronted Owl *Aegolius harrisii* is a poorly known species. Field records are rare and sparse, with large gaps throughout its distribution. We present five new records of *A. harrisii* in south-east Brazil, in the states of São Paulo and Minas Gerais, and the second ever nest description. In São Paulo, records from Franca are >300 km from previous records, while the new record in Minas Gerais is 600 km from the only previous state record. More nocturnal field work is required to better evaluate the true distribution of *A. harrisii*.

Little is known concerning the behaviour and precise range of the widely distributed Buff-fronted Owl *Aegolius harrisii* (König *et al.* 2009). Its main characters include: pale buff face and underparts, dark upperparts, black lines separating the neck and face and two dark bands connecting the eyes and crown, brown tail with two white-spotted bars, several large buffish-ochre spots on the scapulars, and wings with round whitish spots (Antas 2009, König *et al.* 2009). It inhabits open woodland including *cerrado* and *caatinga* (Girão & Albano 2010), stunted sandy-belt woodland in Minas Gerais, Bahia and Ceará (A. Whittaker pers. obs.) and forest edges (Sick 1997). There are reports from seasonally flooded forests near watercourses (Santos 2009) and human-altered landscapes, e.g. orchards (Marks *et al.* 1999) and pine plantations (Ribas & Santos 2007, Santos 2009). Although found from sea level to 3,800 m in the Andes (Marks *et al.* 1999), field records are scarce and fragmented, and the species is poorly represented in collections. Knowledge of its range and biology are hindered by its inconspicuous habits (Girão & Albano 2010).

Seven records of *A. harrisii* exist from south-east Brazil: one from Minas Gerais, in Januária municipality (Whittaker 2004) and six from São Paulo as follows. Two specimens at Museu Zoologia de Universidade de São Paulo are from the municipality of Osasco and an unknown locality (Willis & Oniki 2003, Ribas & Santos 2007), with two records (2001 and 2002) from Intervales State Park, Ribeirão Grande, one in 2006 at Mogi das Cruzes (Ribas & Santos 2007) and most recently at a privately owned reserve (Parque de Zizo) in the municipalities of Tapiraí / São Miguel Arcanjo (Lima & Salles 2008).

Buff-fronted Owl is not on the list of threatened species in Minas Gerais (Machado *et al.* 1998), which was published prior to the record by Whittaker (2004). For São Paulo, it is listed as Data Deficient (Silveira *et al.* 2009) due to the lack of available information on which to base a categorisation. Here, we report new locations for Buff-fronted Owl in south-east Brazil, including a nest description and habitat information.

Field work

Nocturnal bird surveys were conducted monthly between November 2007 and December 2009, with *c.*3 nights of sampling per month, in the municipalities of Lençóis Paulista, Avaré and Borebi, in São Paulo. Following this, each area and new localities were surveyed quarterly, including northern São Paulo and southern Minas Gerais. Sampling consisted of visits to main forest remnants at dusk/night, for *c.*3 three hours per night. We

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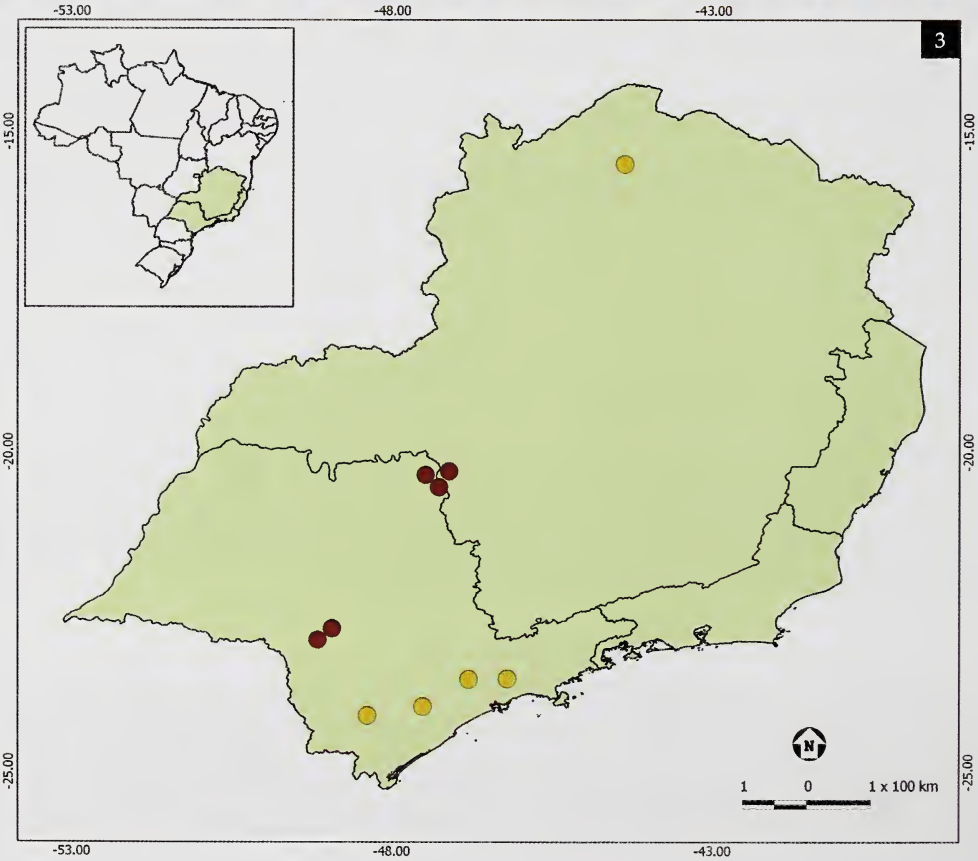
Figure 1. Riparian forest edge, rio Palmital, Avaré, São Paulo, Brazil (F. K. Ubaid)

Figure 2. Buff-fronted Owl *Aegolius harrisii*, Fazenda Rio Pardo II, Avaré, São Paulo, Brazil, 22 June 2011 (F. K. Ubaid)

Figure 3. Records of Buff-fronted Owl *Aegolius harrisii* in south-east Brazil: yellow circles = historical records; red circles = present study.



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used playback of the song to search for *A. harrisii*. Sound-recordings were made using a Marantz PMD-661 solid state recorder and Sennheiser ME-67 microphone. Areas sampled comprised a mosaic of *cerrado* and semi-deciduous and riparian forests, some being seasonally flooded.

New records

On 29 September 2008, the vocalisation of *A. harrisii* was recorded at a forest beside a watercourse at Fazenda Rio Claro, municipality of Lençóis Paulista (22°47′03″S, 48°54′09″W; 650 m). The bird vocalised twice, at *c*.23.00 h, but was not seen. A new record was obtained on 22 June 2011 at Fazenda Rio Pardo II, municipality of Avaré (22°50′47″S, 48°58′44″W; 640 m), on the left bank of the rio Palmital (Fig. 1), 6 km south-west of the previous site. Vocal activity from this individual (Fig. 2) commenced early evening (*c*.19.00 h) and continued regularly until the observers left at *c*.02.00 h. Recordings have been archived at the Macaulay Library of Natural Sounds (MLNS 165198) and Fonoteca Neotropical Jacques Vielliard (FNJV 12056). Two birds responded to playback. One, possibly a male by its smaller size, behaved aggressively, vocalising more frequently and for longer, and flying close to the sound source. We also discovered a nest, strongly defended by the same bird. It was in a hollow trunk of an unidentified dead palm, 9 m above ground and measured 40.5 cm deep, with an entrance hole 10.5 cm by 8.5 cm wide, 9 m above ground. The cavity's base was covered with wood chips, owl feathers and the carcass of a small headless rodent (*Oligoryzomys* sp.).

On 8 September 2011, the pair was recorded again, displaying the same aggressive behaviour to playback. Tropical Screech Owl *Megascops choliba* and Barn Owl *Tyto alba* were recorded nearby. Both sites are enclosed by *Eucalyptus* plantations (*c*.15 m tall) with no understorey and small patches of *cerrado* and *cerradão* connected by riparian forest corridors.

A. harrisii was recorded at two localities in Franca (20°31′S, 47°15′W; 20°32′S, 47°08′W), northern São Paulo, and in Ibiraci (20°16′S, 47°05′W), southern Minas Gerais (D. Fernando pers. comm.). At both localities, only sound-recordings (FNJV 12870: Franca, FNJV 12871: Ibiraci) are available as documentation due to the dense vegetation. A pair of Mottled Owls *Strix virgata* was also recorded at one of the Franca sites. Great Horned Owl *Bubo virginianus*, Ferruginous Pygmy Owl *Glaucidium brasilianum* and Tropical Screech Owl were present in the Ibiraci fragment.

Discussion

Our records fill a considerable gap in the known range of *A. harrisii* in south-east Brazil (Fig. 3). The records from inland São Paulo are *c*.155 km from the nearest locality (Ribeirão Grande), while those from Franca are >300 km away from any previous locality. Ibiraci lies *c*.600 km away from the record at Januária, Minas Gerais.

It appears that Buff-fronted Owl inhabits small *cerrado* fragments, with a mosaic of riparian forests, and plantations of pine and eucalyptus, suggesting that the species can tolerate some level of habitat change. In the Serra de Misiones, Argentina, decline has been associated with deforestation (König 1999) and Silveira *et al*. (2009) cited forest loss as the main threat to birdlife in São Paulo, although this is apparently not the main reason for the few records of *A. harrisii*. In Franca, the species was recorded in a very small fragment (20 ha) enclosed by pasture and coffee plantations. Conversely, Buff-fronted Owl has been recorded in a large, well-preserved Atlantic Forest remnant (Lima & Salles 2008).

Girão & Albano (2010) concluded that Buff-fronted Owl might be more inconspicuous than rare. As in our study, several hours of nocturnal observations at other known locations

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failed to produce further records. The few records might result from other factors, e.g. the activity of *A. h. dabbenei* (in north-west Argentina) was determined by that of certain bat species on which it feeds (Barrionuevo *et al.* 2008). Similarly, Girão & Albano (2010) argued that the sparse records of *A. harrisii* in Ceará, north-east Brazil, might be related to fluctuations in bat populations, although this requires confirmation. It is possible that the species has a preferred vocalisation period, as is the case for Boreal *A. funereus* and Northern Saw-whet Owls *A. acadicus* (Clark & Anderson 1997). The other Neotropical member of the genus, Unspotted Saw-whet Owl *A. ridgwayi* is also extremely poorly known and very infrequently heard (A. Whittaker pers. obs.), though like *A. harrisii* it sometimes vocalises by day (G. M. Kirwan *in litt.* 2012). Other explanations for the paucity of records include the possibility of altitudinal and / or seasonal movements (Barrionuevo *et al.* 2008), short periods of song activity, few vocalisations to avoid competition with more sedentary species (Girão & Albano 2010) and presence of large owls (e.g. *Pulsatrix*) that are potential predators, clumped spatial distributions (König 1999), and inaudible vocalisation at distance. The striking similarity of the voice of some species of toads to the owl's song must also be considered as another possible reason for the lack of records. These factors might also indicate that the species' population is under-estimated compared to other owls (Bodrati & Cockle 2006, Barrionuevo *et al.* 2008). Conversely, *A. harrisii* could be naturally rare. Future field work is required particularly during the supposed peak activity period of September–November (König 1999) and should focus on breeding biology, as the nest we found is only the second for the species.

The avifauna of south-east Brazil, the most developed region of the country, has suffered dramatically at human hands. Forests are now extremely fragmented, and different forms of land use have generally limited their area (Anjos 2001). Consequently, the few remnants of *cerrado* and riparian woodland should be preserved (Silveira *et al.* 2009), while efforts to protect, monitor (including via radio telemetry) and study rare species such as *A. harrisii* should be encouraged in existing conservation units. With better surveys, new data will fill gaps in the distribution of this and other poorly studied species. Moreover, compilation of all records will provide a substantial database to understand the various aspects of Buff-fronted Owl biology and habitat use.

Acknowledgements

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Reappraisal of Koepcke's Screech Owl *Megascops koepckeae* and description of a new subspecies

by Jon Fjeldså, Jan Baiker, Gunnar Engblom, Irma Franke, David Geale, Niels K. Krabbe, Daniel F. Lane, Miguel Lezama, Fabrice Schmitt, Robert S. R. Williams, Joaquín Ugarte-Núñez, Virgilio Yábar & Ramiro Yábar

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Summary.—Little empirical evidence has ever been presented to justify the taxonomic ranking of Koepcke's Screech Owl *Megascops koepckeae*. We summarise current knowledge of its distribution and ecology, and provide detailed information concerning its distinctive vocalisations. There is no evidence to support its asserted occurrence in Bolivia, but two distinctive populations can be recognised in Peru. A new subspecies is described here from the rainshadow valleys of south-central Peru.

Koepcke's Screech Owl *Megascops koepckeae* was described in 1982 (Hekstra 1982b) as a subspecies (*koepckei, sic*) of Tropical Screech Owl *Megascops* (*Otus*) *choliba*. Doubts were expressed regarding the assumed relationship with *M. choliba* (Marshall & King 1988, König & Straneck 1989, Marshall *et al.* 1991, König *et al.* 1999, 2008) and although little peer-reviewed empirical evidence has ever been presented, it has been treated as a species (e.g., Holt *et al.* 1999, Schulenberg *et al.* 2007).

Hekstra (1982b) based his description on 23 specimens from north-west Peru (Chachapoyas and Yanac and the type locality Quebrada Yanganuco in Cordillera Blanca, Ancash), south-central Peru (Ninabamba in Ayacucho) and La Paz (Chulumani, Irupana) and Cochabamba (Tin-tin), Bolivia. A description of this owl, with the proposed name *Otus roboratus alticola*, was drafted in 1969 by M. Koepcke, Peru's pre-eminent ornithologist, and this was forwarded via J. Weske to E. Eisenmann, who made Koepcke aware of Hekstra's ongoing project to revise the classification of New World screech owls (M. Koepcke *in litt.* 1969). Sadly, Koepcke was killed in a plane crash in 1971 and her text was never published, but Hekstra named the new taxon in her honour given that she was the first to recognise it as a distinct form.

In March 1987, JF & NKK encountered a road-kill *Megascops* near Abancay in Apurímac, south-central Peru, and immediately recognised it as being phenotypically distinct from specimens from north-west Peru examined few weeks earlier in Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos in Lima. Despite its poor condition, the bird was prepared as a specimen, but because of the lack of vocal data (of either population) nothing was concluded. In 1995 GE obtained another specimen near Abancay, and in 2001 a sound-recording. In January 2003 VY & RY obtained two additional specimens, the first video and additional sound-recordings from this area, documenting the distinctive vocalisations. Similar (but not identical) vocalisations were recorded from Lima in the 1990s (IFJ) and La Libertad in 2004 (DFL), south and north, respectively, of the type locality of *M. koepckeae* in Cordillera Blanca.

With several new specimens and sound-recordings available we are now able to describe more precisely how Koepcke's Screech Owl differs from other Andean screech owls, and to define differences between geographical populations within the species. Here we provide this new information and describe and name the population inhabiting the dry

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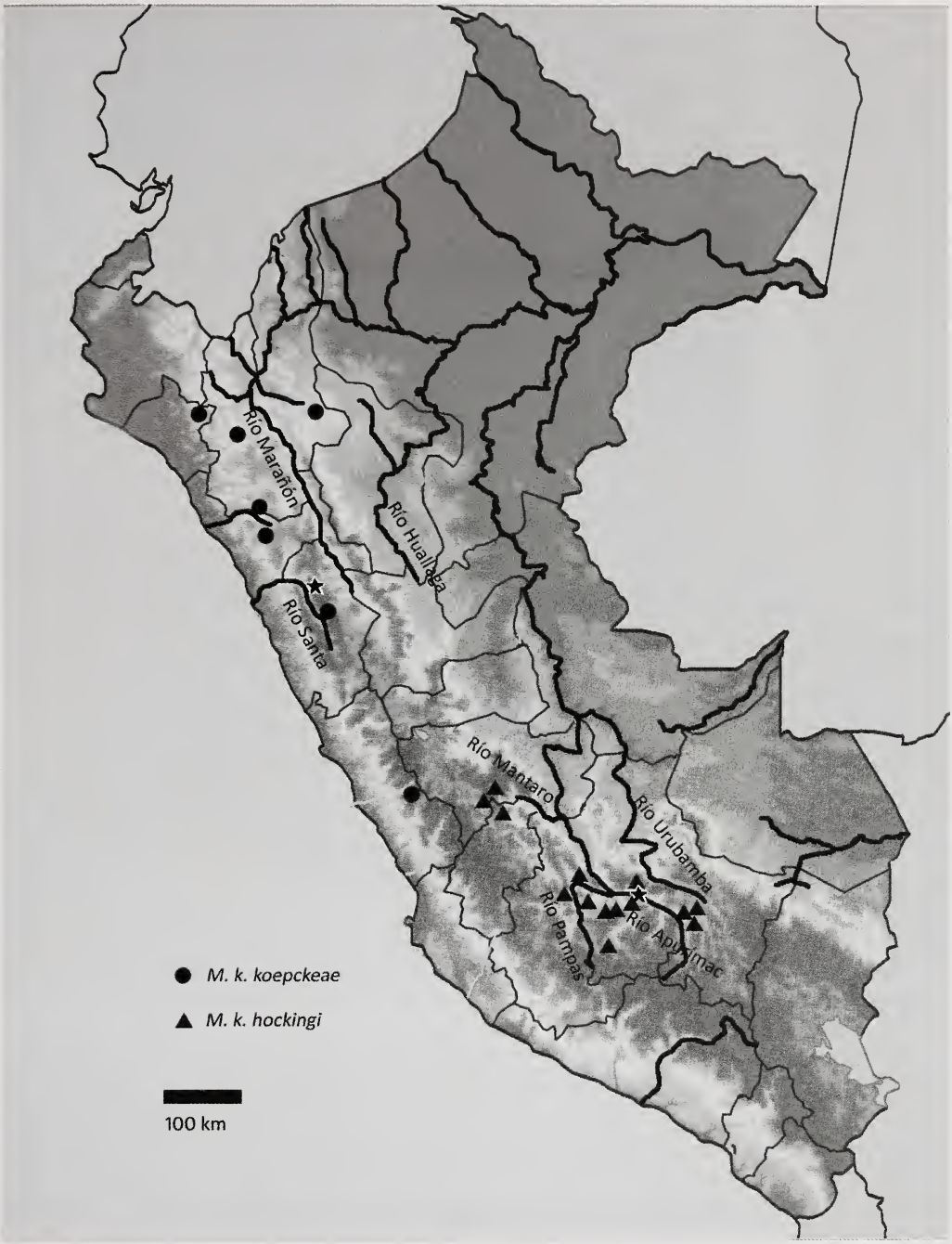

Figure 1. Records of the two subspecies of Koepcke's Screech Owl *Megascops koepckeae* in Peru. Bold lines mark major rivers and thin lines mark departmental borders. Stars mark the type localities of the two taxa (map prepared by Daniel F. Lane)

montane valleys of central Peru. However, it falls outside the scope of this paper to present molecular data that places the bird in a phylogenetic context.

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Materials and Methods

Morphological evidence has been assembled over a long period of time, mainly by JF, through visits to various museums: American Museum of Natural History, New York (AMNH), Academy of Natural Sciences of Philadelphia (ANSP), the Natural History Museum, Tring (BMNH; specimen loan); Field Museum of Natural History, Chicago (FMNH), Louisiana State University Museum of Zoology, Baton Rouge (LSUMZ; JF & DFL), Museo Nacional de Historia Natural de la Universidad Nacional Mayor de San Marcos, Lima (MUSM; JF, DFL & RW), Swedish Museum of Natural History, Stockholm (SMNH), the United States National Museum of Natural History, Smithsonian Institution, Washington DC (USNM), Museo de la Universidad Nacional de San Antonio Abad, Cuzco (MUSAAC; DFL), Museo de Historia Natural de la Universidad Nacional de San Agustín de Arequipa (MUSA) and Centro de Ornitología y Biodiversidad, Lima (CORBIDI; JF, JB & DFL). However, because of heterogeneous measurement protocol, we used below only the measurements taken by JF: bill length (to skull), tarsus, wing (flattened against the ruler) and tail (from base of central rectrices). Total length, wingspan and mass were in some cases noted from specimen labels.

For defining plumage characteristics, comparison was made with Andean screech owls with yellow eyes, firstly the widespread *Megascops choliba*, West Peruvian Screech Owl *M. roboratus* of the drier forests of north-west Peru and adjacent Ecuador, Montane Forest Screech Owl *M. hoyi* of the Boliviano-Tucumano forest zone, and to a lesser extent the very dark White-throated Screech Owl *M. albogularis*. Colour terminology is from Ridgway (1912). Sound-recordings were obtained by us over many years of field surveys and from published or online sound archives (Krabbe & Nilsson 2003, Coopmans *et al.* 2004, Lysinger *et al.* 2005, Boesman 2006, Jahn *et al.* 2008; Macaulay Library of Natural Sounds and xeno-canto); altogether 11 recordings of 13–14 *M. koepckeae* individuals from north-west Peru and 41 recordings of 23–24 individuals from south-central Peru (recorded by DFL, JB, RW & RY). These were compared with 76 recordings of *M. choliba* (of seven subspecies), 13 *M. roboratus pacificus*, seven *M. r. roboratus*, nine *M. hoyi*, 11 *M.* (*guatemalae*) *napensis*, six *M.* (*guatemalae*) *centralis* and 28 *M. albogularis*.

Results

Geographical distribution of M. koepckeae.—*M. koepckeae* occurs in two separate areas of Peru (*contra* the distribution map in König *et al.* 1999, 2008), in north-west Peru and in the east-draining valley systems of south-central Peru.

In northern Peru it is found in evergreen forests of the western Andes from Lambayeque (Bosque de Chiñama, at 2,250 m and Corral Grande in Laquipampa reserve, 1,840 m) to La Libertad (Sinsicap, *c.*2,500 m) and Cajamarca (La Granja, 2,200 m and Bosque Cachíl, 2,470 m) and around the Utcubamba Valley in Amazonas (San Pedro Chachapoyas, 2,620–2,870 m and ACP San Antonio-Chachapoyas; F. León photo). Other populations occur at high elevation in Cordillera Blanca, Ancash (río Santa valley, Yanac and Quebrada Yanganuco above Yungay, 2,458–4,500 m) and on the Pacific slope of Lima (Bosque Zarate, 2,850 m; Bosque Linday, 2,730 m). In general, the habitats are oligothermic and often mist-dependent forests and evergreen high-elevation *Polylepis* forests. Thus, the species could potentially occur at many additional sites in the Cordillera Blanca to adjacent northern Lima, as well as more widely along the upper slopes of the Marañón Valley, and perhaps into the drier upper Huallaga Valley.

In northern Peru *M. koepckeae* is broadly sympatric with *M. roboratus*, which has been recorded south to San Damien on Peru's Pacific slope (GE), usually in dry forest at

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Figure 2. *Megascops koepckei hockingi*, two birds showing different facial expressions (Jon Fjeldså)

lower elevation than *M. koepckeae*. The altitude of the replacement zone may vary locally. In Laquipampa reserve on the Pacific slope in Lambayeque the two species have been found only 2 km apart, *roboratus* at 1,400 m (sound-recording XC41268), *koepckeae* at 1,840 m (XC8649). In Ancash *roboratus* has been recorded to 2,100 m (Schulenberg *et al*. 2007), *koepckeae* not below 2,458 m. East of the continental divide their distributions are less well known, the two closest records >100 km apart, the highest *roboratus* record at 1,340 m, the lowest *koepckeae* at 2,200 m. On the most humid cloud-forest ridges, *M. koepckeae* is replaced by *M. albogularis*.

In south-central Peru, *M. koepckeae* was first collected in 1939 at Ninabamba in Ayacucho (Morrison 1948; identified by him as *Otus choliba crucigerus*) and recently at several other sites, especially in Apurímac (see Fig. 1 and below). Unlike in north-west Peru, it frequents rainshadow valleys with dry woodland, primarily *Prosopis*, but often with many large deciduous *Eriotheca vargasii* ('pati') trees (*Bombax sensu lato*, Malvaceae) with many epiphytic bromeliads (*Tillandsia*), mainly around 2,000 m (Baiker 2011). In the Mantaro, it appears not

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TABLE 1
Some characteristics of typical songs of selected taxa of *Megascops*. Values for pitch are for first harmonic although sometimes the loudest pitch is on second harmonic.

Taxon	*n*	Length of song mean ± SD (range) (s)	Pace at start of song mean ± SD (range) (notes/s)	Change in pace	Average pitch mean ± SD (range) (Hz)	Special characteristics
M. koepckeae (north-west Peru)	6	2.0 ± 0.2 (1.6–2.2)	7.6 ± 1.0 (5.8–8.6)	Slowing, especially towards end	968 ± 112 (850–1,160)	Second last 1–2 notes accentuated
M. koepckeae (south-central Peru)	5	2.6 ± 0.5 (2.0–3.1)	6.9 ± 0.9 (5.5–7.7)	Slowing, especially towards end	1,246 ± 111 (1,070–1,360)	Second last 1–2 notes accentuated
M. choliba	59	1.2 ± 0.2 (0.9–1.7)	14.5 ± 1.5 (12–17)	Constant except for pauses between last 1–2 notes	711 ± 75 (460–870)	Last 1–2 notes accentuated and higher pitched
M. roboratus roboratus	5	2.6 ± 0.3 (2.3–3.1)	25.0 ± 2.4 (21–27)	Constant	602 ± 13 (580–610)	
M. r. pacificus	12	2.6 ± 0.9 (2.3–3.1)	21.8 ± 2.1 (19–25)	Constant	564 ± 60 (510–670)	

to reach above 2,000 m and is found down to 1,400 m, but in Apurímac it can occasionally be found to 3,400 m. Thus, habitat selection here seems more similar to that of *M. roboratus* in the middle Marañón Valley in north-west Peru. The species should be looked for also in other arid intermontane valleys.

Characteristics and plumage variation.—*M. koepckeae* resembles *M. roboratus* in having small gracile feet, similar plumage and golden-buff under-down visible through the body plumage. However, *M. koepckeae* is apparently monomorphic, but varies from chocolate-brown in northern Peru to more greyish brown in south-central Peru. *M. roboratus* has, on the other hand, distinct greyish and rufous-brown colour morphs. Both species have a distinct black border to the pale facial disk, the 'herringbone' pattern on the underparts is often broken, as missing bars cause large white patches, and the shaft stripes are often expanded or bifurcate near the feather tip (as in *M. hoyi*). *M. koepckeae* has a very poorly developed or missing collar of whitish mottles on the hindneck, unlike *M. roboratus*, in which a whitish collar separating the dark cap from a paler nape is well visible in the field. Furthermore, *M. roboratus* has more uniform dark distal inner webs to the outer primaries and more vermiculated underparts, as the 'herringbone' marks are dominated by double bars, which are often irregular or disintegrated as stippled lines (see Johnson & Jones 1990, Fjeldså & Krabbe 1990: Pl. XXV 5b, Schulenberg *et al.* 2007: Pl. 80). In *M. koepckeae* the transverse bars on the underparts are usually prominent, with four per feather, or two bars below the breast, and little tendency towards vermiculation. *M. koepckeae* further differs by being less vermiculated dorsally, with narrower black streaks on the forehead and crown. Unlike *M. roboratus* (Johnson & Jones 1990), all known populations of *M. koepckeae* are fairly uniform in size (110–130 g, see Table 2).

Whereas birds from north-west Peru are quite brown above (warm sepia-brown with darker chocolate-brown or blackish markings) with a significant ochre-brown to cinnamon wash over the neck-sides and breast, and some ochre on the legs and vent (Schulenberg *et al.* 2007: Pl. 80), those of the east-draining valleys of south-central Peru are the greyest of all *Megascops* populations in Peru. They have very little brown in the plumage (except for mostly hidden ochraceous bars in the wings), and generally much whiter underparts below the breast. Thus, the underparts show a marked contrast between a mottled breast and white lower parts with a well-spaced grid of vertical and horizontal black lines (Fig. 2).

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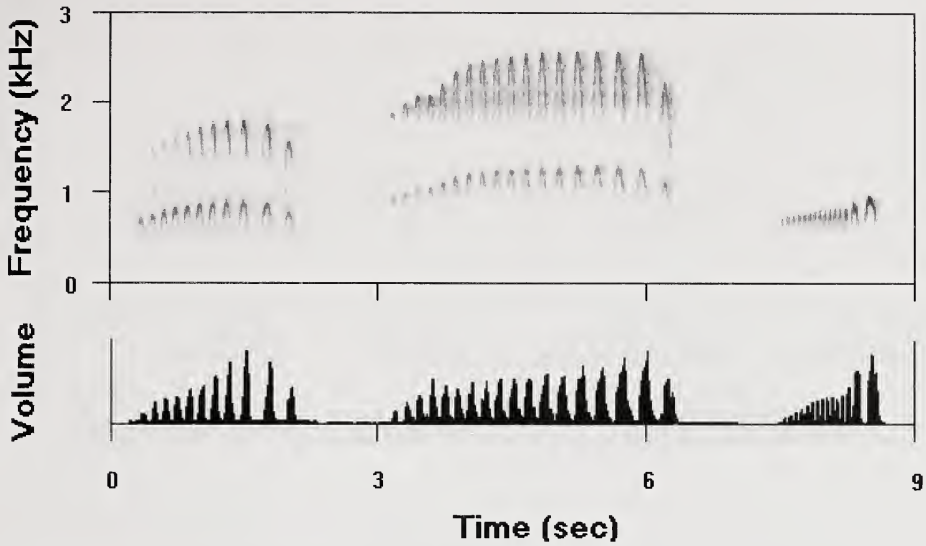

Figure 3. Songs of *Megascops koekckeae* (left, from La Libertad, middle, from Apurímac) and *M. choliba* (right, from Tucumán). Notice the lower pitch and the constant, fast pace of *M. choliba*, and differences in accentuation and change of pitch.

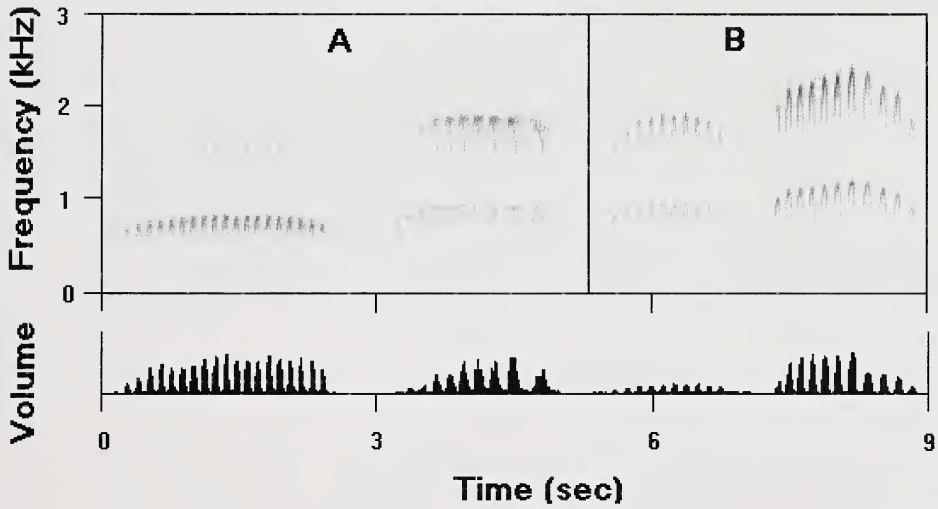

Figure 4. Duets of *Megascops koepckeae*. A: La Libertad, B: Apurímac. The lower pitched birds are males. In A the male gives an aggressive song rather than typical song.

Hekstra (1982a,b) referred 13 specimens from La Paz and Cochabamba to his *Otus choliba koepckei*, although he noted that they averaged smaller and more rufous, intermediate with his *O. c. alilicuco* of the Andean foothills of northern Argentina. JF found that specimens collected in the Andean valleys of Bolivia, below 2,500 m, varied much by plumage, some of them being very dark and heavily streaked, generally with 4–5 bars per 'herringbone' mark and a rather ochraceous appearance (Fjeldså & Krabbe 1990, and photographs and notes on specimens in AMNH, ANSP and SMNH). Although some

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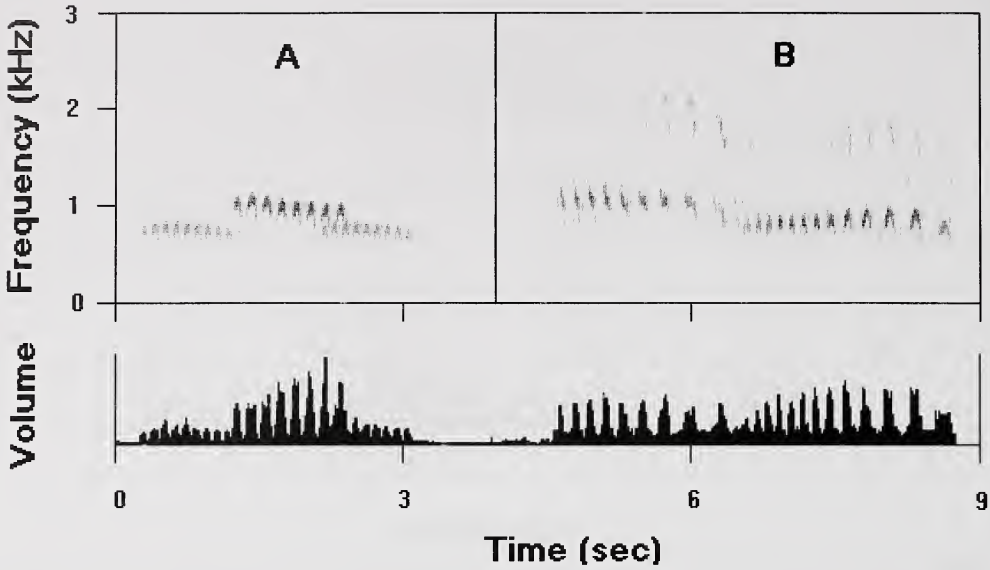

Figure 5. Duets of *Megascops albogularis* (A; Mérida, Venezuela) and *M. koepckeae* (B; Lambayeque, Peru). Note that the pace slows down in *M. koepckeae*.

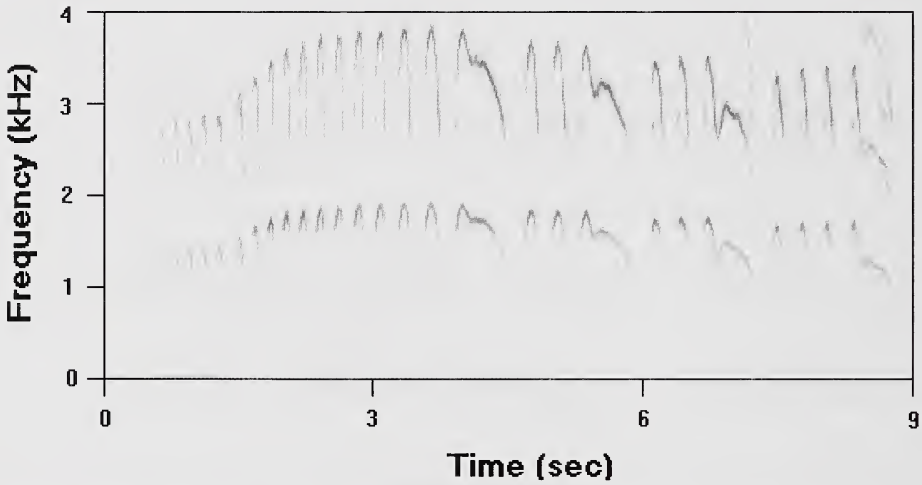

Figure 6. Long high-pitched call given by female *Megascops koepckeae* after repeated playback.

resemble *M. koepckeae* specimens from north-west Peru in plumage, no specimen could be referred to that taxon with any confidence. More noteworthy, all screech owls (except *M. albogularis* and *marshalli*) in the Andean valleys of La Paz and Cochabamba are vocally typical of *O. choliba* and voices corresponding to those of *M. koepckeae* have never been heard in Bolivia (JF pers. obs., S. Arias pers. comm., S. K. Herzog *in litt*. 2009; Mayer 1996). The semi-evergreen Boliviano-Tucumano forests further south are inhabited by the vocally distinct *M. hoyi* (Fjeldså & Mayer 1996). This species, overlooked by Hekstra (1982a,b), has distinct colour morphs, including grey birds resembling *M. koepckeae* in south-central Peru. We conclude that Hekstra was probably confused by the significant phenotypic variation

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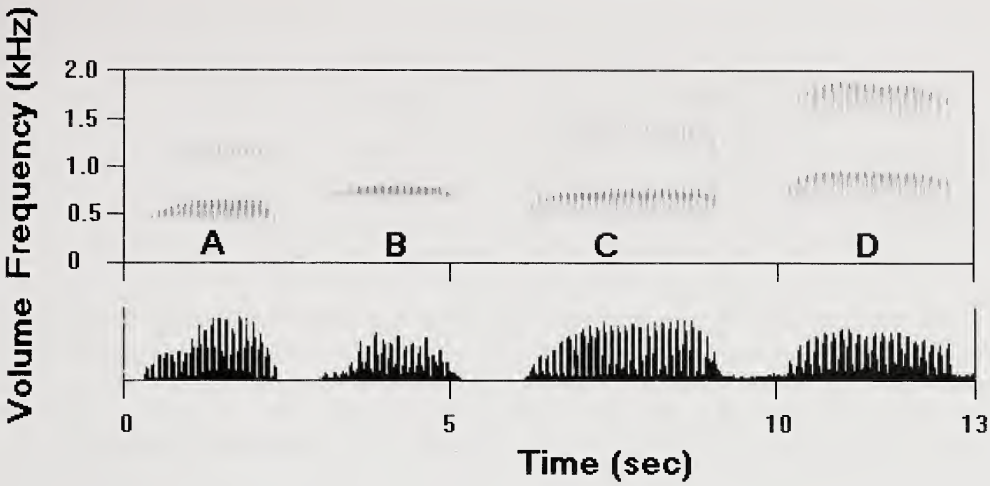

Figure 7. Aggressive songs of *Megascops* spp. A: *M. choliba* (Norte de Santander, Colombia). B: *M. hoyi* (Jujuy, Argentina). C–D: *M. koepckeae* (La Libertad and Apurímac, Peru). Note the similarity.

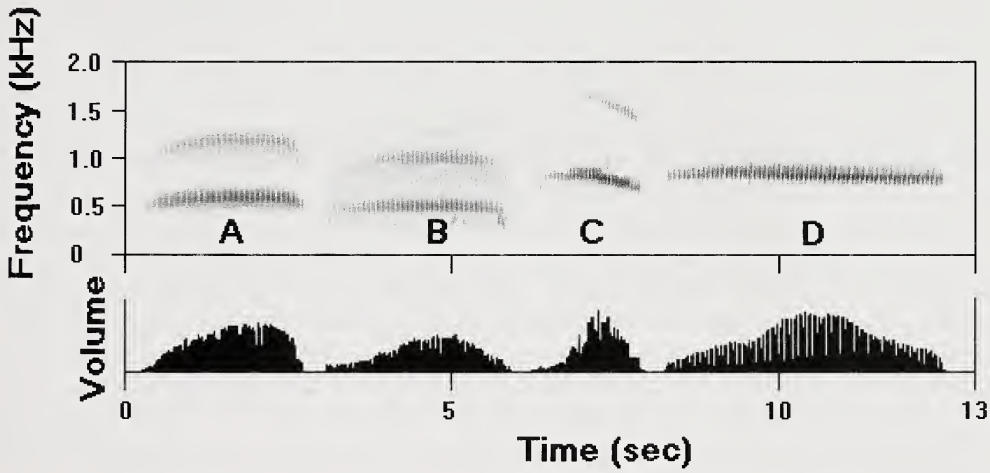

Figure 8. Male songs of some species of *Megascops*. A: *M. r. roboratus* (Zamora-Chinchipe, Ecuador). B: *M. r. pacificus* (Lambayeque, Peru). C: *M.* [*guatemalae*] *centralis* (El Oro, Ecuador). D: *M.* [*g.*] napensis (Napo, Ecuador). Notice that *pacificus* is lower pitched than *roboratus* despite its significantly smaller body size (70–90 g vs. 144–162 g: Marks *et al.* 1999). In D only the first harmonic shows in this example.

among Bolivian specimens of *M. choliba* and *hoyi*, and erroneously referred some of them to his *Otus choliba koepckei*.

Vocalisations of M. koepckeae.—The song of *M. koepckeae* consists of a loud, rising and falling series of 'hysterical' shrill notes that slows down, especially at the end, with accentuated second or third to last notes: *ko-ko-ko-ko-ko-ko-ka Ká Ka Kah* or *ko-ko-ko-ko-ko-ko-ka Ká Kah* (Fig. 2). This is quite unlike any other *Megascops*. Thus, *M. roboratus*, including *pacificus*, produces very fast, low-pitched trills, like many other congeners (Fig. 5), but well outside the range of variation documented for *M. koepckae*.

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TABLE 2
Measurements of specimens per subspecies.

Population	*n*	Bill length to skull (mm)	Tarsus (mm)	Flattened wing (mm)	Tail (mm)	Mass (g)
M. koepckeae, north-west Peru	6	21.7 ± 0.73 (20.8–22.3)	28.7 ± 0.70 (28–30)	177.2 ± 4.29 (173–185)	99.3 ± 1.71 (98–102)	119.9 ± 4.8 (112–127)
M. koepckeae, south-central Peru	8	21.5 ± 1.73 (19.0–23.7)	30.7 ± 2.63 (25.3–37.0?)	172.3 ± 2.45 (169–174)	94.6 ± 5.16 (86–103)	121, 122, 130

Most similar to the song of *M. koepckeae*, perhaps, *M. choliba* also gives trills at lower pitch, slightly rising at constant pace and succeeded by one or two (rarely three) higher pitched and accentuated notes: *popopopopopopopopo-pú*, *popopopopopo-pú-pú* (Fig. 3, Table 1). Songs from throughout the vast geographical range of *M. choliba* (59 recordings) are remarkably uniform. Songs of five individuals from eastern Peru are no different from the rest, showing no intermediacy towards *M. koepckeae*, just as none of the songs of 11 presumed males of *M. koepckeae* shows any tendency towards that of *M. choliba*. The two differ consistently from each other in pace, change of pace, pitch, change of pitch and accentuation. Additionally, *M. choliba* does not normally duet, whereas *M. koepckeae* apparently does so commonly. Very few (at most two of 59) recordings of *M. choliba* are duets, vs. nine of 23 (39%) of *M. koepckeae* recordings. Among South American screech owls, duetting is most frequent in *M. albogularis*, with 19 of 28 songs (68%) (Fig. 2b), but is also common in *M. roboratus* (11 of 20 songs, 55%) and *M. sanctaecatarinae* (four of nine songs, 44%).

During duets of *M. koepckeae*, the presumed male song is answered by a similar, but slightly shorter and slower paced, 5–40% higher pitched song, presumably the female (Fig. 2). In response to playback, songs of both sexes become slightly higher pitched and longer (pitch of an excited presumed male is thus much like a relaxed presumed female), or sometimes more dissonant ('hoarse'). Following repeated playback, the female (alone?) may give a high-pitched long series, up to 1,700 Hz and nine seconds long (Fig. 3). Some presumed male songs may be incomplete, given with notes at constant pace and without accentuation. The 'aggressive song' (*sensu* Schulengerg *et al.* 2007; 'type B song' of many authors), an alternate type often given by more agitated birds, is similar but slightly longer and faster paced, approaching the 'aggressive songs' of *M. choliba* and *M. hoyi* (Fig. 4), but with a slower pace than in *M. robotatus*, *centralis* and *napensis* (Fig. 5). Other vocalisations of *M. koepckeae* include a hiss (female only?) given in response to male song (Schulenberg *et al.* 2007).

There are constant differences between songs of the two geographical populations of *M. koepckeae*. Those from the Marañón and Pacific drainages (Cajamarca, Lambayeque, La Libertad) are shorter and lower pitched than those from central Peru (Junín, Apurímac, Cuzco), with little overlap (Fig. 1, Table 1).

New taxon.—Plumage colours are, in general, of little use in screech owl systematics, but differences in vocalisations and habitat are usually more reliable (Holt *et al.* 1999, König *et al.* 2008). The differences in song and habitat choice between *M. koepckeae* populations of north-west and south-central Peru may suggest their long isolation. This would make sense biogeographically, as the north-western and central Peruvian Andes possess separate aggregates of endemic species (Fjeldså 1992, García-Moreno & Fjeldså 1999, García-Moreno *et al.* 1999, Fjeldså & Irestedt 2009). However, we adopt here the conservative approach that species rank should not be proposed unless thorough molecular studies, with adequate sampling and modeling of coalescence and gene flow, confirm the existence of separate

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evolutionary lineages. Lacking such data, we propose to recognise the central Peruvian population as a subspecies, which we formally name:

Megascops koepckeae hockingi, subsp. nov.

Holotype.—Museo Nacional de Historia Natural de la Universidad Nacional Mayor de San Marcos, Lima, no. 24278. Adult male collected 8 May 2002 by J. Mattos, preparatory no. 400, at 1,925 m, C'onoq [=Cconoc] at río Apurímac, Apurímac, Peru.

Description of the holotype.—Upperparts from forehead to rump Drab (Ridgway 1912 for colours) with 2–3 mm-wide fuscous streaks, somewhat irregular and often expanded near feather tips, the lateral parts of feathers finely mottled and often with roundish spots of pale ochre to whitish, and only faint indication of a pale ochraceous nuchal collar. Humerals with large white patch on outer webs, on most feathers separated by black line from pale ochraceous base. Wing-coverts like back but outer greater coverts with large white subterminal spots; greater coverts black with ochraceous notches and white border on outer web; carpal joint white and wing linings mostly pale ochraceous; remiges and rectrices Dusky Drab with indistinct ochraceous to pale pinkish-buff bars and mottles including on terminal parts. Facial disk Pallid Mouse Grey with faint Drab mottles, partly as concentric rings, and whitish border towards forehead and bill, and black lateral border continuing on side of throat, which is white with Dark Mouse Grey herringbone marks. Breast greyish white with some Cinnamon-buff and Fuscous-black herringbone marks of variable structure: shaft stripes mostly 1–2 mm but up to 5 mm wide; most feathers with 4–5 bars, but often asymmetrical with many gaps creating white spots; belly and sides white with distinctive black lines (shaft stripe and generally two transverse bars) creating distinctive 'grid' pattern; vent white, most feathers with small black arrow-shaped mark; feathered tarsi buff with small fuscous streaks. Label data: irides yellow, bill greyish green, and feet greyish brown; 'regular' fat; no moult; left testis 6 × 4 mm.

Measurements of the type.—Bill (to skull) 22.3 mm, tarsus 28.0 mm, flattened wing 174 mm, tail 97.5 mm.

Other specimens examined.—*M. k. hockingi*: ZMUC 103.504–505; BMNH 1946.49.130 from Ninabamba, Ayacucho; MUSA (JUN10-100) from Patibamba, Ayacucho, and MUSA 2150 from Apurímac; MUSAAC TO-01 from Alfapata south-west of Abancay, 2,500 m, Apurímac; MUSM 24279, 24293 and 25300; LSUMZ 179642–643; CORBIDI AV-08618–619. Specimens of *M. k. koepckeae*: MUSM 2202, 7298–99, 8428–29, 8824, 12790–791, 15462, 16798, 19433–435, 20020, 25058; LSUMZ 179540 (and examined by JF in 1980s: AMNH 235429, 235431–432, 476729, 802425 [holotype]; Paris CJ1903 u.87). Several photos and videos of live birds of both subspecies also examined see http://www.youtube.com/watch?v=xArRBU02Pys and http://www.youtube.com/watch?v=9J8IRkztFnQ.

Diagnosis.—Differs from *M. k. koepckeae* by generally more drab grey (rather than Chocolate- to Snuff Brown) appearance and more sparsely marked rear underparts, contrasting with densely barred breast and throat. Very little brown in plumage, except ochraceous hue to greater primary-coverts, and only a little ochraceous underdown or tinge on legs and vent, as seen in nominate subspecies. Feathers of underparts below breast white, typically with 1.0–1.5 mm-broad shaft-streaks that extend laterally into bars, occasionally with an expanded bifurcation near tip of feather, and only two transverse bars, affording general impression of white rear underparts with 'grid' of black lines (Fig. 2). Generally some distinct short black shaft-streaks or arrow-shaped marks on feathered tarsi. *M. k. koepckeae*, in contrast, is more richly hued, with ochre-brown to cinnamon patches in plumage, and more gradual transition between densely barred breast and whiter belly, which often has some stippled bars and several narrow bars spaced 1.5 mm apart.

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Individual variation.—All specimens of *M. k. hockingi* very greyish but some variation in pattern, as certain individuals have dense pale speckles and spots, and conspicuous dark streaks dorsally, while others are more uniform dark brownish grey with indistinct mottling; some have virtually no indication of nuchal collar. Similarly, boldness of shaft-streaks on ventral side varies, as in females some dark stripes on breast up to 6 mm broad, thus much heavier than those illustrated in Fig. 2, with white parts of feathers rather peppered with small dark spots or indications of double bars. Some specimens have more ochraceous down on upper flanks and some pinkish cinnamon on the feathered tarsi. Measurements overlap with northern populations, albeit with slightly lower mean values, except the tarsus (Table 2).

Eyes (based on label data supplemented with photos of live birds) deep yellow, darkest near pupil; cere greenish, bill greenish (or blue-grey) with greenish-yellow cere and distal part; feet greenish-grey (with variation, as specimens from La Libertad had pale tan feet with olive soles, and a photo from Cordillera Blanca, Ancash, suggests pink feet).

Distribution.—Dry intermontane valleys of Apurímac, Ayacucho, Huancavelica and southern Junín, in central Peru (Fig. 1). Localities in Junín: below Pariahuanca, 12°02′41″S, 74°50′31″W, 1,950 m (sound-recordings DFL, T. S. Schulenberg) and north-east of Pariahuanca, 12°01′26″S, 74°50′56″W, 2,150 m (sound-recordings DFL); Acobamba near Estancia Chillo, 11°46′22″S, 74°47′28″W, 2,320 m (tape-recordings by FS). Huancavelica: Mantaro Valley, right bank on Surcubamba–Huachucollpa road, 12°05′28″S, 74°41′56″W, 1,400 m (sound-recordings DFL). Ayacucho: Ninabamba in lower río Pampas Valley (BMNH); Patibamba on río Torobamba (near Río Pampas), 13°07′S, 73°54′W, 2,253 m; near Huanta on río Huarpa (Mantaro Valley), 12°56′S, 73°07′W, 2,450 m; Chinchipata, 13°13′S, 73°52′W, 2,900 m, between Chilcas and Rosaspampa, and río Pampas Valley near Rosaspampa, 13°16′S, 73°49′W, 1,700 m (JB). Apurímac: Alfapata at 13°35′S, 73°07′W, between Andahuaylas and Abancay (collected, T. Aucca), Villa Los Loros Choquequirao lodge, near Huanipaca, beside río Tambobamba; Pachachaca Valley and ascent towards Abancay town, 1,550–2,100 m, 13°40′S, 72°55′W (two collected, many observations, Colcapata, Pachachaca, Pomachaca); Chalhuanca Valley south to Tampumayu 14°11′S, 73°19′W and Atunhuaijo north to Mutca, at 14°12′S, 73°17′W, 3,320 m; Apurímac Valley, including dpto. Cuzco (two collected at Tincocc, 13°50′S, 71°56′W at 2,626 m, Cocha, Pumachaca, San Ignacio, Cocamasana at 2,276 m, Baños de Cconoc [='C'onoq', type locality], Curahuasi, Huallpachaca, Colcapata, Huanipaca, Pachachaca, Tocto Huaylla and Río Yaurisque on río Molle Molle, and towards Choquequirao 13°25′55″S, 72°49′55″W, at 1,500–1,900 m, Ayusbamba 13°48′S, 71°57′W and Yaurisque 13°40′S, 71°55′W, at 3,400 m).

Etymology.—We name this owl for Pedro Hocking, in honour of his life-long efforts to document the Peruvian avifauna, notably the poorly explored forests of the central Peruvian Andes.

Ecology and biology.—The east-draining basins of the central Peruvian Andes are erroneously classified as humid montane forest by many ecological atlases (e.g., Dinerstein *et al.* 1995). In fact, these valleys are mostly a rainshadow area with dry forest and scrub, and relict patches of various types of evergreen mist vegetation only locally on the upper slopes towards the puna (*Podocarpus*, *Myrcianthes*, *Escallonia*, *Hesperomeles* etc., and *Polylepis* highest up). The only small owl reported from these evergreen forests is Andean Pygmy Owl *Glaucidium* (*jardinii*) *bolivianum*. In Lima and Ancash, however, the evergreen forests have *M. k. koepckeae*, whereas *G. peruanum* is mainly found in mist-dependent woodlots lower down, but in Apurímac, e.g., the latter occurs syntopically with *M. k. hockingi* (Baiker 2011). The rainshadow valleys of central Peru are mostly severely degraded, as deciduous forests have been turned into open land with spiny scrubs through most of Ayacucho, and

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few wooded patches are left, other than numerous *Eucalyptus* plantations. However, there are still large tracts of mature dry forest in the Mantaro, Pampas, Pachachaca, Apurímac and Chalhuanca valleys, at 1,400–2,000 m. *M. k. hockingi* is locally fairly common in woodland dominated by *Eriotheca vargasii*, *Ficus cuatrecasasiana* and *Schinus molle* along the río Apurímac. However, it also occurs in scrubby areas with groves of tall *Eucalyptus* trees at 3,400 m at Ayusbamba, Mutca and Yaurisque.

The owls appear in pairs, maintaining frequent vocal contact. They are noisy and audible at long distance, and respond readily to playback. The small feet suggest that the diet is mainly insects, as also noted on several specimen labels. Breeding is in February–March (rainy season), based on the gonadal state of specimens. Roosting may be in holes in trees or cavities in large masses of epiphytic bromeliads. On 3 March 2010 DG, with J. Ccahuana & H. Clyman, observed a pair of *M. k. hockingi*, in a cultivated landscape with rows of trees and scrubs below Abancay, of which one bird flew into an apparently naturally eroded hole in a 4 m-high north-facing roadcut. On 29 March the site was visited again by DG & ML, and an adult and two nestlings were photographed in the hole. The hole was *c*.3 m above ground, oval-shaped, *c*.30 cm high, 70 cm wide and 1 m deep, tapering to *c*.20 cm high and 40 cm wide at its end, where the nest chamber was placed. The nestlings, probably a few days old, had pale grey down, the eyes closed, bill bluish grey.

This taxon is common in many places, even in rather degraded habitat. Provided some trees remain for roosting and perching, and holes in trees or banks for nesting, it seems to survive well. Thus, no particular conservation concern should exist for this owl. Yet, further work is much needed to clarify the apparent geographical variation in environmental requirements of Koepcke's Screech Owl, and there is also a need for genetic sampling to model the history of gene flow between its populations.

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Appendix 1: sound-recordings examined

LNS = Macaulay Library of Natural Sounds (http://macaulaylibrary.org), XC = Xeno-Canto (http://www.xeno-canto.org).

Megascops choliba: *M. c. margaritae* song 7 (LNS 59303, 59305–306, 59308–311, 105908, 59307, XC 45400), alarm 3 (LNS 59304, 105908, XC 45400), calls 3 (LNS 59300, 59304, 59308). *M. c. crucigerus* song 27 (LNS 4476–77, 59301, 59312, 59314–316, 59318–319, 59321, 89811, 90479, 95027, 134790, XC 6577, 7877, 8389, 10844, 12931–932, 12934, 13530, 14643, 27842, 28142, 30811–812), alarm 8 (LNS 4476–77, 59312, 59314, 59316–317, 87585, XC 12933), calls 3 (LNS 59302, 59313, 59321). *M. c. decussatus* song 8 (LNS 113387, XC 1225, 4369, 6604, 6890, 7416, 18921, 24732), calls 2 (XC 6420, 16809). *M. c. choliba* song 5 (XC 10240, 15944, 23848, 30363, 33444), alarm 1 (XC 8109). *M. c. uruguaiensis* song 5 (LNS 59320, XC 16289, 22566, 24378, 30450), alarm 1 (XC 22565). *M. c. suturutus* song 7 (LNS 110727, 120858, 120992, XC 2162, 2824, 3016, 4378), alarm 2 (LNS 120992, XC 3017), call 2 (LNS 120993, XC 3016). *M. c. wetmorei* song 3 (LNS 116068, 139170, XC 45228).

Megascops koepckeae: **North-west Peru** (11 recordings of 13–14 individuals): **Cajamarca** ('La Granja', 06°21′S, 79°07′W, 2,200 m) duet 1 (DFL), **Lambayeque** ('Corral Grande', 06°17′S, 79°27′W, 1,840 m) songs of two birds (females?) 1 (XC 8649), duet 1 (XC 5526), **La Libertad** (Sinsicap, 07°51′S, 78°45′W, 2,500–2,550 m) song 3 (GE, DFL), duet 3 (XC 14127, LNS 129552, DFL). **South-central Peru** (41 recordings of 23–24 individuals): **Junín** (Acobamba, 11°46′S, 74°47′W, 2,318 m) song 1 and alarm 1 (XC 23646–647), (below Pariahuanca, 12°03′S, 74°50′W, 1,950 m) song 2 and duet 1 (DFL) (north-east of Pariahuanca, 2,150 m) duet 1 (DFL), **Apurímac** ('San Ignacio', 13°25′S, 72°52′W, 1,784 m) song 1 (JB), (Cocamasana, 13°26′S, 72°50′W, 2,276 m) song 1 (JB), (Cconoc, 13°33′S, 72°35′W, 1,850–1,900 m) song 2, duet and call 2 (RY, JB), (Pacchani, 13°34′S, 73°04′W, 2,457 m) song 1 (JB), (3.5 km south-west of Abancay, 13°39′S, 72°56, 2,000 m) song 1 (DFL), (Pachachaca bridge, 13°40′S, 72°56′W, 1,775 m) song 1, call 1 (RY, RW), (6 km south-west of Abancay, 13°41′S, 72°57′W, 2,200 m) duet 1 (DFL), (Huallpachaca, 13°41′S, 72°20′W, 2,100 m) song 1 (RY), **Cuzco** (Molle Molle, 13°41′S, 71°57′W, 3,000 m) call and song 1 (RY), (Tocto Huaylla, 13°44′S, 71°59, 2,750 m) call 1 (RY), (Colcapata, 13°47′S, 71°58′W, 2,900 m), (Cocha, 13°50′S, 71°56′W, 2,626 m) duet 1 (RY).

Also analysed were the following recordings deposited in Macaulay Library, xeno-canto.org, or published by Hardy *et al.* (1989), Jahn *et al.* (2002), Krabbe & Nilsson 2003, Coopmans *et al.* (2004), Lysinger *et al.* (2005) and Boesman (2006); also an unpublished recording of *pacificus* from Loja by Anonymous (© Ginkgo) and two unpublished recordings of *roboratus* and three of *albogularis* by NKK: ***Megascops roboratus pacificus***: songs from 13 individuals or pairs, calls from five, from Ecuador and Peru. ***M. r. roboratus***: songs from seven individuals, calls from two, from Ecuador and Peru. ***M. hoyi***: songs from 16 individuals from Bolivia and Argentina. ***M.* [*guatemalae*] *napensis***: songs from 13 individuals from Ecuador and Peru. ***M.* [*g.*] *centralis***: songs from nine individuals from Panama, Colombia and Ecuador. ***M. albogularis***: songs or duets from 28 individuals or pairs from Venezuela, Colombia, Ecuador, Peru and Bolivia. ***M. sanctaecatarinae***: songs or duets from nine individuals or pairs.

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Studies of Socotran birds VII. Forbes-Watson's Swift *Apus berliozi* in Arabia—the answer to the mystery of the 'Dhofar swift'

by Andrew Grieve & Guy M. Kirwan

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Summary.—Analysis of specimens of *Apus* swifts held in the Bonn, Tring and Washington museums, previously identified as Common Swift *A. apus pekinensis* or Pallid Swift *A. pallidus*, and collected in southern Arabia, revealed all of them to be Forbes-Watson's Swifts *A. berliozi*, and probably of the doubtful subspecies *bensoni*, previously known only from coastal Somalia (where it breeds) and winter-collected specimens in south-east coastal Kenya. The Arabian specimens, all taken in south-west Oman or southern Yemen, were confidently identified as *A. berliozi* based on a combination of plumage, especially vocal, and biometric characters, which eliminate all other possible species. These specimens and the evidence of recent sight records demonstrate that *A. berliozi* is a locally common summer visitor to parts of the southern Arabian coast and the immediate hinterland, as well as a handful of offshore islands. The migrant or partially migratory *A. b. bensoni* is separable only on its marginally longer wing from nominate *A. berliozi*, which is apparently confined to Socotra, where it is resident or largely so.

Originally described as a subspecies of Pallid Swift *A. pallidus* Shelley, 1870, Forbes-Watson's Swift *Apus berliozi*, Ripley 1966, is usually considered to be restricted, as a breeder, to Socotra (*A. b. berliozi*) and coastal (perhaps also inland) Somalia (*A. b. bensoni*, Brooke, 1969), some of which move south to coastal Kenya in the non-breeding season (Brooke 1969, Fry 1988, Chantler & Driessens 2000). It is worth remarking that the date of authorship of *A. berliozi* has usually been ascribed to 1965 (Dickinson 2003), but is correctly assigned to 1966 (GMK pers. obs. 2006; Dickinson *et al.* 2011). Taxonomy of the Pallid Swift superspecies is especially complex. In addition to the two species already mentioned, the group also includes African (Black) Swift *A. barbatus* (P. L. Sclater, 1865), which occurs disjunctly through sub-Saharan Africa, principally in the south and east, and Bradfield's Swift *A. bradfieldi* (Roberts, 1926) of south-west Africa, with some authorities (e.g., Sibley & Monroe 1990, Gill & Wright 2006) also recognising *A. barbatus balstoni* (E. Bartlett, 1880), of Madagascar, and *A. b. mayottensis* (Nicoll, 1906), of the Comoros, at the specific level, as Malagasy Black Swift *A. balstoni*.

In recent years, various authors (e.g., Evans 1994, Jennings 1995, Chantler & Driessens 2000, Tibbett 2006) have promulgated that the range of *Apus berliozi* is rather wider than hitherto realised, encompassing parts of southern Arabia, between the Dhofar region of south-west Oman in the east to the environs of Aden (Yemen) in the west. Records of 'mystery' swifts in Arabia span more than 50 years, since Smith (1956) reported some unusual swifts, perhaps breeding, in southern Yemen in June 1954, with further reports of unidentified *Apus* in the same country in November 1985 and January 1986 (Brooks *et al.* 1987). Reports from Jeddah and Jizan, as well as the Eastern Province (all in Saudi Arabia) of Plain Swift *A. unicolor* (a species endemic as a breeder to Macaronesia) were rejected understandably by Jennings (1981) and Stagg (1984). Gallagher & Woodcock (1980) mentioned the presence of apparent Common Swifts *A. apus pekinensis* in Dhofar in July and

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October, which statement was based on two specimens obtained by M. D. Gallagher in 1977 (Gallagher & Rogers 1980), both at the Natural History Museum, Tring. Shortly thereafter, Bundy (1986) reported coastal colonies of what he considered to be probably Nyansa Swift *A. niansae*, although the Oman Bird Records Committee did not accept the identification.

It seems probable that not all of the above reports relate to the same (unidentified) species of swift, but what is clear is that since Bundy's observations quite some interest and attention has been paid to what has come to be known as the 'Dhofar swift'. This bird appears to be a common breeding summer visitor to coastal cliffs in south-west Oman, and many observers have noted the apparent close resemblance of these birds to *Apus berliozi*, though presumably relatively few of these had field experience with the latter. In May 1993, J. S. Ash and G. Nikolaus acquired three specimens (now held in The Natural History Museum, Tring, the National Museum of Natural History, Washington DC, and the Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn) of the mystery *Apus* but failed to resolve their identity, although *A. berliozi* was apparently ruled out as a possibility at this time (Eriksen *et al.* 2003). Given Ash's familiarity with *A. berliozi* in Somalia, to some extent this finding appeared to quell interest in the issue. However, further field observations by ourselves of swifts feeding over Salalah in southern Oman in April 2005, which GMK immediately identified as Forbes-Watson's Swifts based on his Socotran field work, prompted a new investigation into the identity of the 'Dhofar swift'. Simultaneously, other colleagues have also tended to assign some populations of swifts breeding in extreme southern Arabia to *A. berliozi*, including Porter & Aspinall (2010) and this course was also adopted by Kirwan (2010).

Material and Methods

Specimens.—All *Apus* specimens, except Alpine Swift *A. melba* and Little Swift *A. affinis* from Arabia and Socotra held in The Natural History Museum, Tring (BMNH), and the National Museum of Natural History, Smithsonian Institution, Washington DC (NMNH), were examined and descriptions for all taxa compiled. Morphometric data were acquired according to standard procedures (see below and Table 2). In addition, a description was compiled and morphometric data collected for a further taxon, *A. p. bensoni*, to compare with those swifts occurring and breeding in Arabia and Socotra. Data were also collected for a sample of *A. a. pekensis* from their breeding range, for comparison, given that the Dhofar swifts had previously been ascribed to this taxon. Our analyses included the types of *A. b. berliozi* (NMNH 518025) and *A. b. bensoni* (NMNH 519515), as well as a few specimens of *A. apus* from coastal East Africa.

The following data were obtained from each specimen: wing (flattened) and tail length, using a standard metal wing-rule with a perpendicular stop at zero (precision 0.5 mm), and using digital callipers (precision 0.01 mm) for the following: the distance between the tip of the longest and the tip of the shortest tail feather, which procedure has previously been used to measure the tail fork (e.g., Brooke 1969), the maximum width of the longest and second longest tail feather, and the depth and width of the pale throat patch. Wherever possible, we excluded specimens known to be non-adult from our statistical analyses, as younger birds could have differently shaped rectrices and smaller and paler throat patches.

The three specimens collected in Dhofar, Oman, by J. S. Ash and G. Nikolaus, in May 1993 were re-examined. These specimens (one male and two females) are separately housed in the National Museum of Natural History, Washington DC (NMNH 609005), Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn (ZFMK-Orn. 95.008), and the Natural History Museum, Tring (BMNH 1994.2.1). That in the Natural History Museum, Tring, was formerly housed with the *A. a. pekinensis* specimens from Iran, India and

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China. The two specimens (one male, the other unsexed) obtained by S. M. Brogan, M. D. Gallagher and T. D. Rogers in Dhofar were also examined at the Natural History Museum, Tring (BMNH 1977.21.16 and BMNH 1977.21.17). This gave a total of five so-called 'Dhofar' swifts available for general analysis, all of which were labeled as *A. a. pekinensis*; however, BMNH 1977.21.17 was not subject to statistical analysis as it is a juvenile (see above). In addition, a further six swifts (four males, two females) obtained by H. L. Powell from Aden in March–April 1922, and also housed in the Natural History Museum, Tring, were critically examined; hereafter referred to as the 'Aden' swifts, these were all labeled and originally identified as *A. pallidus brehmorum* (Meinertzhagen 1924; BMNH 1965.M.5539–5544).

Vocal analysis.—Sound-recordings of 'Dhofar' swifts were made at Tawi Atir, near Salalah, Oman, on 17 September 2007, by AG, using a Sony D5 recorder and parabolic reflector with Telinga PRO4 microphone. The same parabolic reflector and microphone were used to make recordings of Common Swifts *A. apus pekinensis* at Bukhara, Uzbekistan, on 11 May 2009, using an Edirol R05 digital recorder, for comparison with the 'Dhofar' swift recordings. Data for *pekinensis* was used in this analysis as it is this subspecies that is considered most likely to occur on passage in southern Arabia, and all specimens of the 'Dhofar swift' were ascribed to this taxon. Additionally, a sound-recording of Pallid Swift *A. pallidus brehmorum* was accessed on www.xeno-canto.org, recorded at Uludağ, in north-west Turkey, in May by S. Fisher (XC25820) to provide further comparisons with the 'Dhofar swift' recordings. Finally, a sound-recording of Forbes-Watson's Swift made on Socotra Island in February was provided by R. F. Porter.

Analysis of the sound-recordings was undertaken using WaveSurfer software (Sjölander & Beskow 2000) from which maximum, minimum and mean peak frequencies within each burst of 'screaming' were measured using a Hamming window and a fast Fourier transformation of 2,048 points at a sampling rate of 44,100 kHz. Sonograms were produced in the software Raven using a FFT-length of 256 points in a Hamming window.

Photographs and field work.—Field photographs by AG were taken of 'Dhofar swifts' in April and May 2005 (Fig. 2) and September 2007, and were compared to photographs of a Forbes-Watson Swift trapped on Socotra Island in spring 1993 (see Porter & Martins 1996: plates 25–26). For another field image from southern Oman, see Jennings (2010: 99). GMK studied *A. berliozi* on Socotra during one week in April 1993, and has broad field experience with relevant *Apus* taxa from other field work in most areas of the Middle East and south Asia since 1990, while AG has even broader experience, also encompassing Central Asia, especially Kazakhstan and Uzbekistan.

Results

Table 1 summarises the main plumage features of the five specimens of the 'Dhofar' swifts and the six 'Aden' swifts, their affinities to *A. berliozi* and *A. b. bensoni* and the differences from *A. a. pekinesis* specimens from Iran, India and China, and *A. pallidus* from Oman. As is evident from this, in morphology the southern Arabian birds are closest to *A. berliozi* from Socotra and Africa, and distinguished clearly from *A. a. pekinensis* in underwing pattern, the pale throat patch's size, tail feather width, and to a lesser extent the colour of the primaries. Porter *et al.* (1996) suggested, on the basis of field observations on Socotra, that the differences between *A. berliozi* and *A. a. pekinensis* centred on the former's pale-fringed upperparts feathers, larger white throat patch, slight dark 'saddle' effect on the mantle, overall paler coloration, p10 longest (vs. p9), voice, and an oily sheen to the median and secondary coverts of the upperwing. Our own analysis of specimens suggests that the wingtip character is variable and therefore unreliable. Brooke (1969) too did not find p10 to be longest in *A. berliozi*. Throat patch size does appear to be a consistent and useful

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TABLE 1

Plumage characters of the 'Dhofar' and 'Aden' swifts compared to Forbes-Watson's Swift *Apus berliozi* from Socotra and continental Africa (including *A. b. bensoni*), Common Swift *A. apus pekinensis* and Pallid Swift *A. pallidus*. See also Figs. 3–7.

	'Dhofar' birds	**'Aden' birds**	***A. berliozi***	***A. apus pekinensis***	***A. pallidus***
Upperparts	Blackish to dark brown, darkest on mantle and more dark brown on rump.	Blackish to dark brown, being darkest on mantle.	Blackish to dark brown, darkest on mantle and upper back, some with slight 'saddle' effect contrasting with dark brown rump.	Blackish to dark brown, darkest on mantle / upper back, browner on lower back / rump creating blackish 'saddle' effect.	Dark brown, little contrast between mantle and back.
Underparts	Blackish underparts with extensive blacker-centred feathers and broad white fringes (reduced with wear).	Blackish underparts with extensive blacker-centred feathers and broad white fringes (reduced with wear).	Blackish underparts with extensive blacker-centred feathers and broad white fringes (reduced with wear).	Mixed blackish / dark brownish underparts with less extensive blacker-centred feathers and fewer and narrower white fringes (further reduced with wear).	Dark brown underparts with darker brown-centred feathers and narrow pale or white-fringed feathers (reduced with wear).
Primaries	Blacker and strongly contrasting with rest of wing and upperparts, while some outer primaries have glossy greenish or purplish-black sheen.	Blackish brown (slightly faded in appearance) but strongly contrasting with rest of wing and upperparts.	Blacker and strongly contrasting with rest of wing and upperparts, with glossy greenish or purplish-black sheen over several outer primaries.	Blacker and strongly contrasting with rest of wing and upperparts, with blackish sheen to outer primaries largely restricted to the feather shaft.	Darker brown and less contrasting with rest of wing and upperparts, with dark brown sheen to outer primaries.
Underparts	Blackish with even blacker-centred feathers and broad white fringes (reduced with wear).	Blackish brown (appearing faded) with darker-centred feathers and broad pale fringes.	Blackish with even blacker-centred feathers and broad white fringes (reduced with wear).	Blackish with even blacker-centred feathers and narrow white fringes (reduced with wear).	Dark brown underparts with darker-centred feathers and broad white or pale fringes (reduced with wear).
Underwing	Blackish / dark brown (some paler than others) and has broad white tips and fringes to underwing-coverts.	Blackish / dark brown underwing with broad white tips and fringes to underwing-coverts.	Blackish / dark brown (some paler than others) and has broad white tips and fringes to underwing-coverts.	Mainly dark brown to blackish underwing (some paler) with narrow white fringes to some underwing-coverts (further reduced with wear).	Greyer underwing-coverts with broad white or pale fringes (reduced with wear).
Throat	Broad, deep whitish or pale throat patch extends almost to upper breast though slightly less extensive on some (see biometrics). Centres of throat feathers possess dark, fine, vertical streaking (which wears off).	Broad, deep pale throat patch extends almost to upper breast (see biometrics). Centres of throat feathers possess dark, fine, vertical streaking (which wears off).	Broad and deep whitish or pale throat patch extends almost to upper breast though slightly less extensive on some (see biometrics). Centres of throat feathers possess dark, fine, vertical streaking (which wears off).	Narrower and less deep whitish or pale throat patch, extending to just over 50% down throat or even less extensive on some birds (see biometrics). Throat lacks fine streaking.	Broad whitish or pale throat patch extends almost to upper breast, though smaller on some birds (see biometrics). Throat lacks any fine streaking.
Tail	Tail has broad feathers (see biometrics).	Tail has broad feathers (see biometrics).	Tail has broad feathers (see biometrics).	Tail feathers narrow (see biometrics).	Tail feathers narrow (see biometrics).

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TABLE 2
Biometrics of four taxa of adult *Apus* swifts and the 'Dhofar' / 'Aden' swifts (two juveniles (BMNH 1977.21.16 and BMNH 1977.21.17) obtained by S. M. Brogan, M. D. Gallagher and T. D. Rogers in Dhofar were excluded from the analysis). For data collation protocols see Material and Methods. * = small sample size. NS = not significant.

Character	Taxon	Sample (*n*)	Mean	SD (±)	Min.	Max.	Comparison *t*-test with Dhofar / Aden birds
Wing	*A. b. bensoni* ((females)	4	171.75	6.85	162.0	177.0	NS
	A. b. bensoni (males)	11	172.18	3.84	167.0	178.0	NS
	A. b. berliozi (females)	10	164.85	4.07	157.0	170.0	*P* = 0.003
	A. b. berliozi (males)	18	168.19	3.08	164.0	173.0	*P* = <0.001
	Dhofar / Aden (females)	3	173.00	2.00	171.0	175.0	-
	Dhofar / Aden (males)	6	175.50	3.15	171.0	180.0	-
	A. pallidus (females)	2	163.50	0.707	163.0	164.0	NS *
	A. pallidus (males)	5	173.40	3.36	169.0	177.0	NS
	A. a. pekinensis (females)	10	171.80	3.55	166.0	177.0	NS
	A. a. pekinensis (males)	11	173.36	3.53	167.0	178.0	NS
Tail	*A. b. bensoni* (females)	4	76.75	4.92	73.0	84.0	NS
	A. b. bensoni (males)	11	77.45	2.266	73.5	80.0	*P* = 0.005
	A. b. berliozi (females)	10	71.85	1.248	70.0	74.0	*P* = <0.001
	A. b. berliozi (males)	18	75.05	2.849	69.0	79.0	NS
	Dhofar / Aden (females)	3	72.67	2.89	71.0	76.0	-
	Dhofar / Aden (males)	6	72.67	3.78	70.0	80.0	-
	A. pallidus (females)	2	67.00	2.83	65.0	69.0	NS *
	A. pallidus (males)	5	71.50	0.577	71.0	72.0	NS
	A. a. pekinensis (females)	10	71.77	1.922	69.0	75.0	*P* = 0.002
	A. a. pekinensis (males)	11	74.61	3.35	70.0	80.0	NS
R4 width	*A. b. bensoni* (females)	4	10.66	0.577	10.0	11.0	NS
	A. b. bensoni (males)	11	10.25	0.890	9.0	12.0	NS
	A. b. berliozi (females)	10	10.35	0.669	9.0	11.0	NS
	A. b. berliozi (males)	18	10.52	0.795	9.0	12.0	NS
	Dhofar / Aden (females)	3	10.50	0.361	10.2	10.9	-
	Dhofar / Aden (males)	6	10.66	0.635	9.9	11.8	-
	A. pallidus (females)	2	9.10	0.141	9.0	9.2	*P* = 0.008 *
	A. pallidus (males)	5	9.26	1.108	8.2	10.1	*P* = 0.001
	A. a. pekinensis (females)	10	9.17	0.559	8.0	9.9	*P* = 0.003
	A. a. pekinensis (males)	11	9.45	0.425	8.5	9.9	*P* = <0.001
Throat depth	*A. b. bensoni* (females)	4	25.73	3.26	21.63	28.53	NS
	A. b. bensoni (males)	11	25.21	2.318	22.25	29.82	NS
	A. b. berliozi (females)	10	22.58	1.703	20.05	25.84	NS
	A. b. berliozi (males)	18	23.32	2.132	20.26	27.82	*P* = <0.001
	Dhofar / Aden (females)	3	24.50	2.80	22.5	27.7	-
	Dhofar / Aden (males)	6	28.16	1.728	26.1	30.3	-
	A. pallidus (females)	2	28.65	2.62	26.8	30.5	NS
	A. pallidus (males)	5	30.80	3.22	27.5	34.3	NS
	A. a. pekinensis (females)	10	22.29	3.28	16.6	26.5	*P* = <0.001
	A. a. pekinensis (males)	11	21.91	2.986	15.6	25.6	*P* = <0.001

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Throat width	*A. b. bensoni* (females)	4	22.07	2.79	19.47	24.84	NS
	A. b. bensoni (males)	11	21.52	3.146	15.7	25.15	NS
	A. b. berliozi (females)	10	23.76	1.482	21.44	27.19	NS
	A. b. berliozi (males)	18	23.56	1.501	20.94	26.13	$P = 0.004$
	Dhofar / Aden (females)	3	21.31	1.629	19.43	22.30	-
	Dhofar / Aden (males)	6	20.82	2.63	18.70	24.60	-
	A. pallidus (females)	2	17.25	0.212	17.1	17.4	NS
	A. pallidus (males)	5	19.25	1.848	17.3	21.2	NS
	A. a. pekinensis (females)	10	16.24	2.193	12.1	20.7	$P = 0.004$
	A. a. pekinensis (males)	11	15.70	1.393	13.9	18.5	$P = <0.001$

TABLE 3
Vocal characters of 'Dhofar' swifts compared to Forbes-Watson Swift *A. berliozi*, Common Swift *A. apus* and Pallid Swift *A. pallidus*. Frequencies in Hz.

	Sample (*n*)	Mean peak frequency	Min. peak frequency	Max. peak frequency	Standard deviation	Comparison *t*-test with Dhofar birds
'Dhofar swift' (Oman)	15	3,944.3	3,516	4,493	239.6	
Forbes-Watson Swift (Socotra)	15	3,949.9	3,516	4,354	284.9	NS
Common Swift (Bukhara, Uzbekistan)	15	5,901.9	5,051	6,252	287.5	$P = <0.001$
Pallid Swift (Uludağ, Turkey)	12	5,898.3	5,396	6,391	317.1	$P = <0.001$

distinguishing character, although the preparator's style can influence this in specimens. The overall paler coloration of *berliozi* and the 'saddle' effect are of much more marginal utility. However, with experience, voice is a very useful character for identification (see Table 3 and below). Our biometric analysis, see Table 2, further confirmed that the specimens from Aden and Dhofar possess the characters of *A. berliozi* and not those of *A. a. pekinensis* or *A. pallidus*.

As evidenced in Table 3, there is no significant difference between the mean peak frequencies of the 'Dhofar swifts' and Forbes-Watson's Swift, and their calls appear identical to the human ear, whilst both Common and Pallid Swifts vocalise at significantly higher frequencies.

Sonograms (Fig. 1) also show the differences between Pallid / Common Swifts and the 'Dhofar' / Forbes-Watson Swifts. The latter maintain a steady, lower frequency around the mean (4,000 Hz) throughout their 'scream', compared to the rising, higher frequency of *c*.6,000 Hz in both Pallid and Common Swifts, a frequency not achieved by Forbes-Watson's or the 'Dhofar' swifts.

Discussion

The sound-recordings of the 'Dhofar swifts' were made in September, post-breeding, with less duetting than in recordings of Forbes-Watson's Swift made in February on Socotra, i.e. in the early breeding season (Kirwan 2010). Despite this, the recordings are remarkably similar and analysis showed that they were almost identical (Table 3, Fig. 1). The only obvious difference between them was the slightly shorter duration of the 'Dhofar birds', which might merely reflect less intensive calling in the post-breeding season (Fig. 1). Recordings of Forbes-Watson's Swift and the 'Dhofar swift' lack the rising and falling

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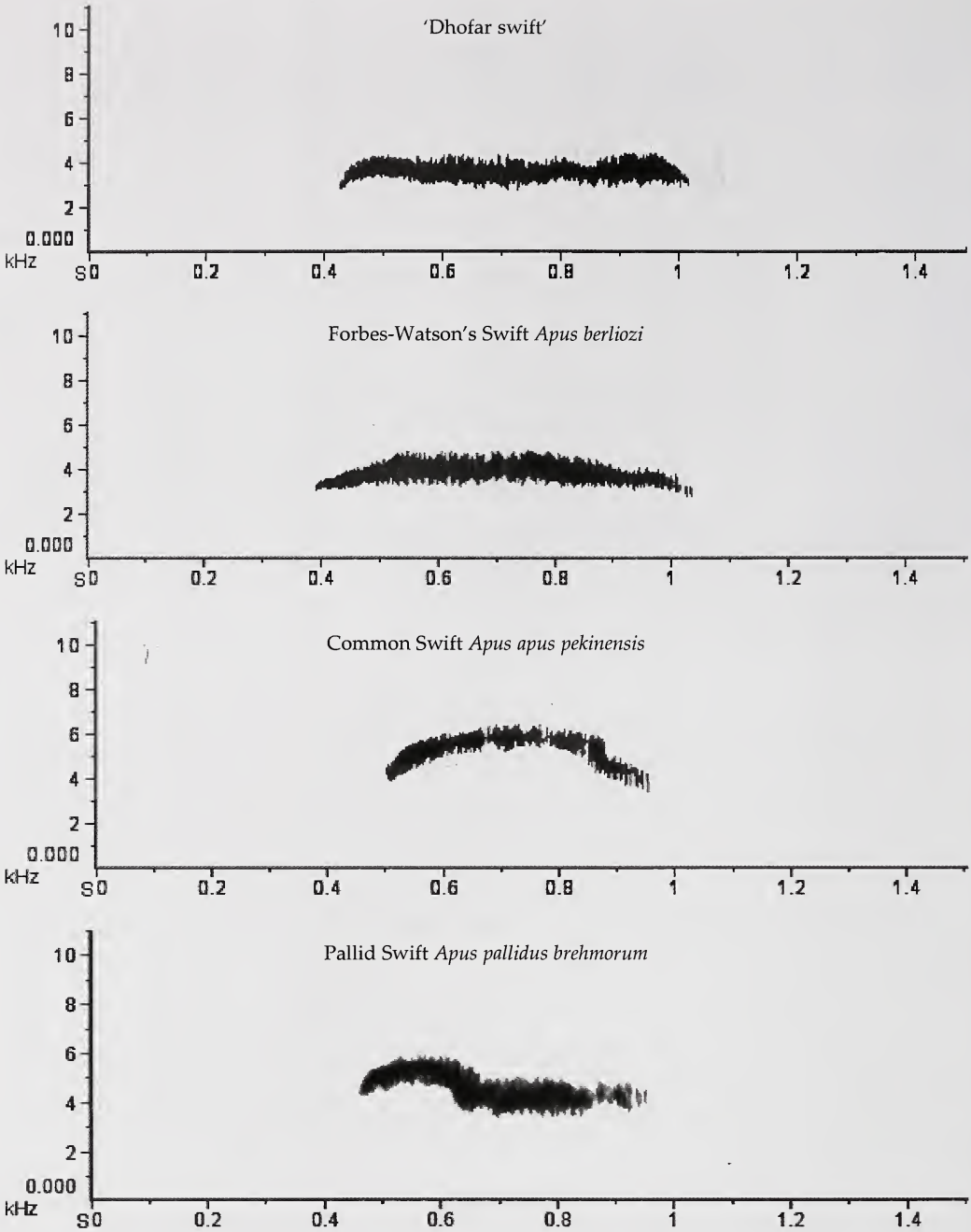

Figure 1. Sonograms of the 'Dhofar swift', Forbes-Watson's Swift *Apus berliozi*, Common Swift *A. apus pekinensis* and Pallid Swift *A. pallidus brehmorum* (see text for recording localities).

component during the main part of the 'scream' of both Pallid Swift and *pekinensis* Common Swift (Fig. 1).

Comparing morphometrics, 'Dhofar', 'Aden' and Forbes-Watson's Swift have similar wing and tail lengths, and the size of the throat patch is as in *A. pallidus*, but all three have

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Figure 2. Forbes-Watson's Swift *Apus berliozi*, Jarziz Farm, Salalah, Dhofar, Oman, May 2005; note broad tail feathers, extent of throat patch, white-tipped fringes to underparts and white edges to underwing-coverts forming distinct bars (Andrew Grieve)

significantly broader tail feathers than the latter, when comparing the fourth rectrix of each (Table 2). They also possess much darker plumage than Pallid Swift (Table 1). There were more significant differences compared to *pekinensis*, with the width of the fourth rectrix again being wider, but more noticeable was the throat patch, which was considerably more extensive on the 'Dhofar', 'Aden' and Forbes-Watson's Swifts (Tables 1–2). All of the latter three also had slightly blacker plumage, but this would be generally very difficult to discern in the field, except perhaps in comparative views. The biometric data also revealed that the 'Dhofar' and 'Aden' swifts had closer affinities to *A. b. bensoni*, rather than *A. b. berliozi*, with their similarly longer wings being statistically significant (Table 2). The 'Dhofar swifts' are summer visitors to Oman (and neighbouring eastern Yemen) mainly between April and September, with some probably remaining into October (Eriksen *et al.* 2003, Kirwan 2010). However, it almost certainly is the case that occasional November records of swifts in this region reflect confusion with Pallid Swift (a photograph of one such misidentified bird appears at http://mikewatsonsdiary.blogspot.co.uk/2009/11/oman-bahrain-2009-with-birdquest-south.html). The slight difference in wing lengths between *A. b. berliozi* (on Socotra) and the southern Arabian swifts is easily explained because the latter is a migratory population, which presumably winters in continental Africa, whereas the population on Socotra is apparently wholly, or at least, principally resident (Kirwan 2010, Porter & Aspinall 2010). *A. b. bensoni* was described from specimens taken in the boreal midwinter (December–January) in south-east coastal Kenya (Brooke 1969), which in terms of their morphometrics (and plumage) are very similar to those collected in Dhofar (Chantler & Driessens 2000; pers. obs.). Subsequently, additional specimens of *A. b. bensoni* (also at NMNH) were collected by J. S. Ash in coastal Somalia, between April and August in 1979–80. Fry (1988) and Ash & Miskell (1998) noted that this population is also resident or perhaps partially migratory, and breeding has been recorded in most months between March and December. Those in southern Somalia have been considered to be intermediate

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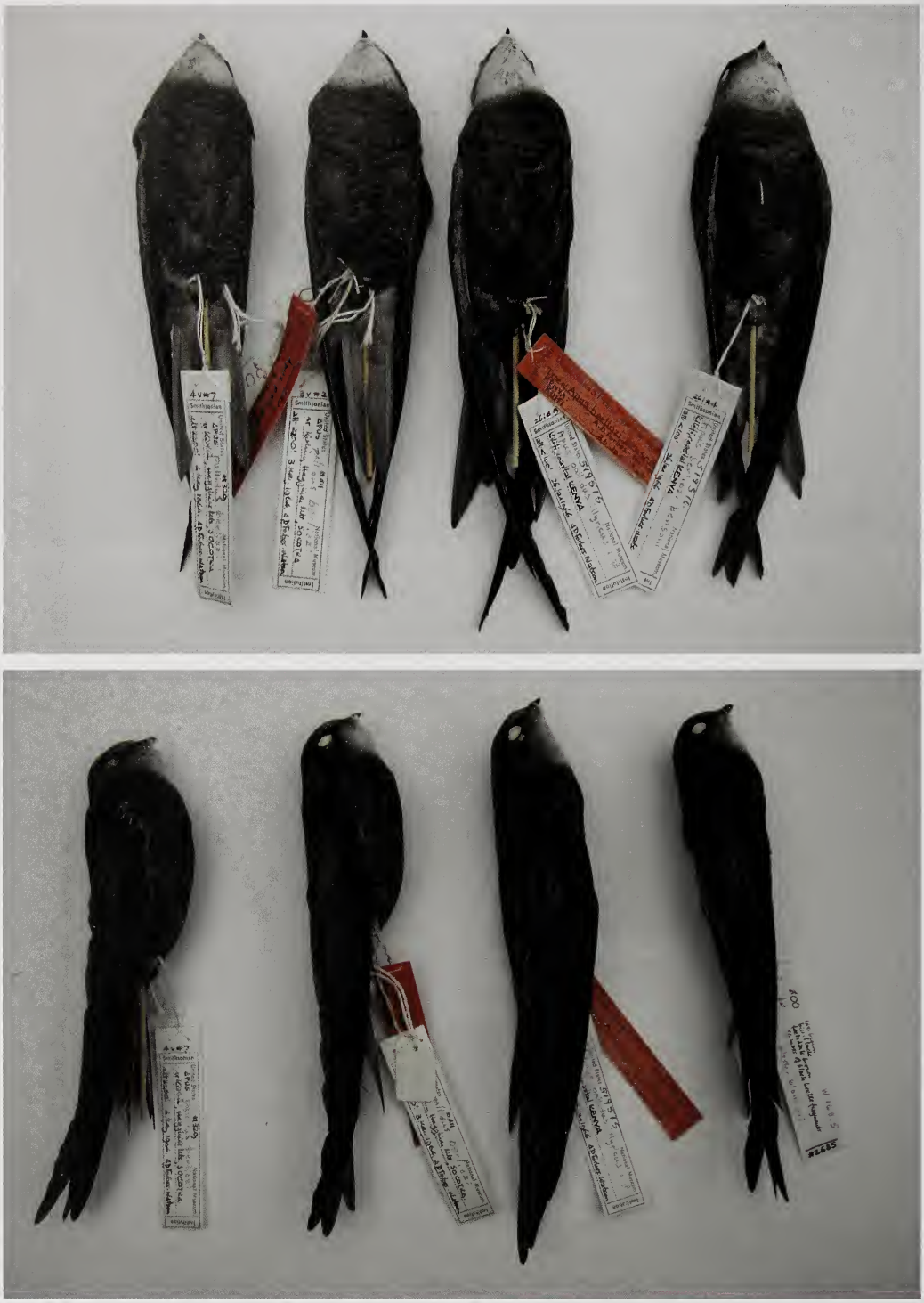

Figures 3–4. Forbes-Watson's Swift *Apus berliozi* specimens held in the Smithsonian Institution, National Museum of Natural History (NMNH), Washington DC, left to right: female *A. b. berliozi*, Socotra Island, May 1964; male *A. b. berliozi*, Socotra Island, May 1964 (holotype); female *A. b. bensoni*, coastal Kenya, January 1966 (holotype); and male *A. b. bensoni*, coastal Kenya, January 1966 (Guy M. Kirwan / © NMNH)

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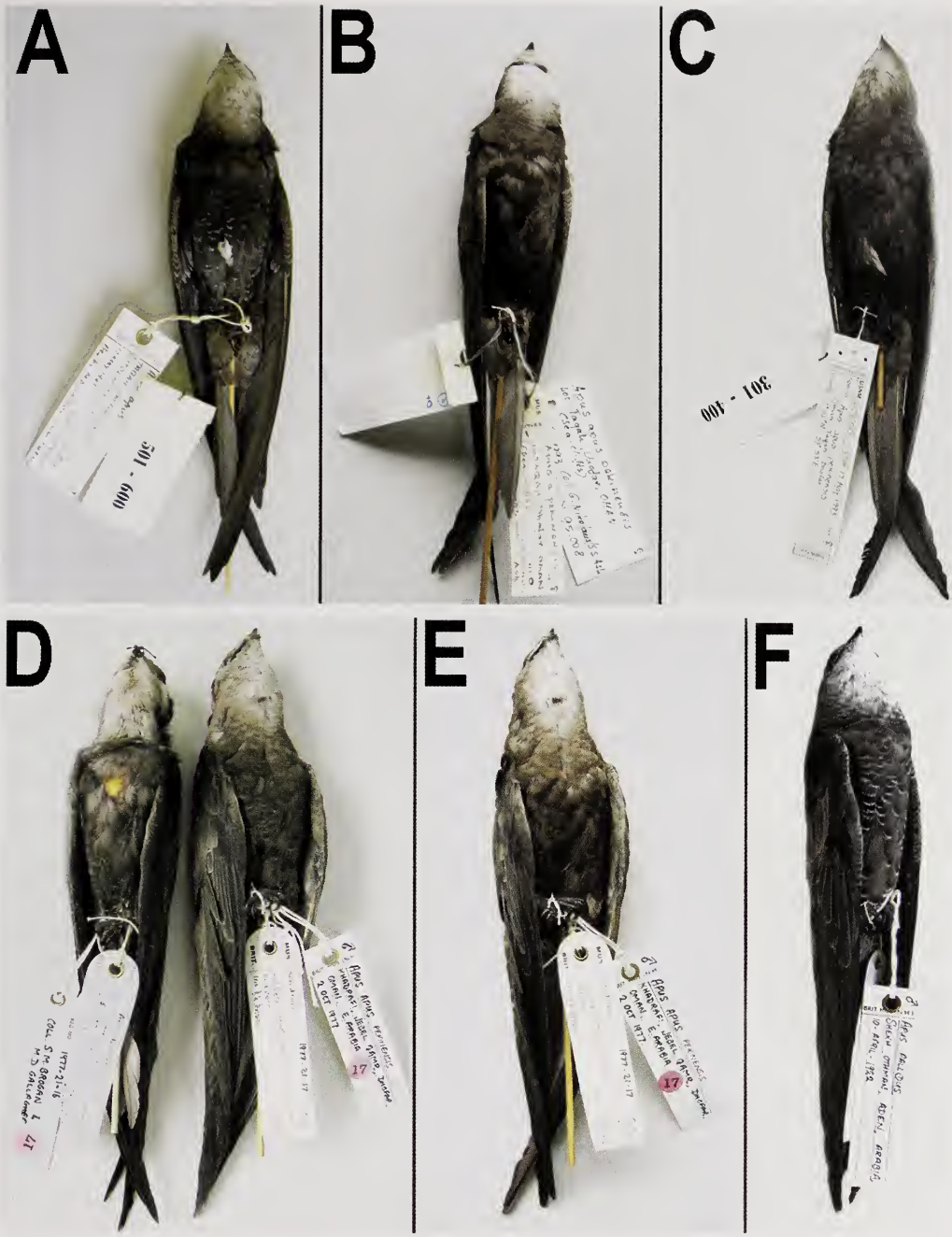

Figure 5. The six specimens of 'Dhofar' swifts and one of the six 'Aden' swifts. 'Dhofar' swift (A) collected by J. S. Ash & G. Nikolaus (Andrew Grieve © Natural History Museum, Tring). 'Dhofar' swift (B) collected by J. S. Ash & G. Nikolaus (Andrew Grieve © Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn). 'Dhofar' swift (C) collected by J. S. Ash & G. Nikolaus (Guy M. Kirwan © National Museum of Natural History, Washington DC). Two 'Dhofar' swifts (D) collected by M. D. Gallagher (Andrew Grieve © Natural History Museum, Tring). Juvenile 'Dhofar' swift (E) collected by M. D. Gallagher (excluded from biometric analysis) (Andrew Grieve © Natural History Museum, Tring). One of six 'Aden' swifts (F) collected by R. Meinertzhagen (Andrew Grieve © Natural History Museum, Tring). Note general darkness of underparts, extent of the pale throat patch, fine dark streaking on throat and typically some white-tipped feathers on underparts.

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Figure 6. Forbes-Watson's Swift *Apus berliozi* specimens held in the Smithsonian Institution, National Museum of Natural History (NMNH), Washington DC, left to right: male *A. b. berliozi*, Socotra Island, May 1964 (holotype); female *A. b. bensoni*, coastal Kenya, January 1966 (holotype); female *A. b. berliozi*, Socotra Island, May 1964; and female *A. b. bensoni* (?), south-west Oman, May 1993 (Guy M. Kirwan / © NMNH)

in size between *A. b. berliozi* and *A. b. bensoni* collected in Kenya (Fry 1988) and as a result Ash & Miskell (1998) suggested that their racial separation is only doubtfully valid.

Brooke (1969) stated that *A. b. bensoni* differs from nominate *berliozi* 'in being darker and browner throughout, in being somewhat larger … and with faint dark shafts to the white throat feathers'. However, as Figs. 3–4 and 6–7 demonstrate, colour differences between the two subspecies are practically undetectable, while both taxa can show dark shaft-streaks to the white throat feathers. Thus, with the exception of the slight increase in wing length between *A. b. berliozi* from Socotra vs. those specimens from southern Arabia ascribed to Forbes-Watson's Swift and the *A. b. bensoni* specimens from Kenya and Somalia, there are no differences in morphology that cannot be accounted for by wear and moult state. Consequently, we suggest that *A. b. bensoni* can be upheld, marginally, solely on the basis of its slightly longer wing than *A. b. berliozi*, but that some authorities might prefer to regard Forbes-Watson's Swift as a monotypic species.

Our reinvestigation of the problem posed by the 'Dhofar swift' (Fig. 5), which was previously considered to represent either Pallid Swift or Common Swift of the subspecies *pekinensis*, reveals that these birds can be confidently identified as Forbes-Watson's Swift. The same is true of the Aden specimens (Fig. 5) 'discovered' in the Tring collection during the course of this work. These latter specimens from the Meinertzhagen (1924) collection, like all of his material, require closer verification. M. C. Jennings has drawn our attention to the fact that in the same work Meinertzhagen (1924) reported an Arabian Accentor *Prunella fagani* from an unusually low elevation, but this specimen (and another in the Meinertzhagen collection) prove to have been stolen from G. W. Bury (Rasmussen & Prŷs-Jones MS). In the

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Figure 7. *Apus* specimens held in the Smithsonian Institution, National Museum of Natural History (NMNH), Washington DC, left to right: female *A. berliozi bensoni* (?), south-west Oman, May 1993; female *A. a. apus*, coastal Kenya, February 1966; female *A. b. berliozi*, Socotra Island, May 1964; and male *A. a. apus*, coastal Kenya, February 1966 (Guy M. Kirwan / © NMNH)

case of the 'Aden' swifts, it appears that we can be sure of their provenance. The birds' original labels are annotated as being collected by H. L. Powell and the preparation can be matched to his rather unusual style (the incision is made under the right wing), while close reading of Meinertzhagen's text makes it obvious that they could only have been taken by Powell. Furthermore, the only south-west Arabian collection available in the early 1920s from which Meinertzhagen could have readily stolen other specimens was Bury's. Neither Sclater (1917) nor Hartert (1917) mentioned that Bury collected any Apodidae other than Little Swift *Apus affinis*.

The field and museum work reported here formed the substantiative basis for much of the relevant species account in the recently published Arabian bird atlas (Kirwan 2010). On current knowledge, Forbes-Watson's Swift appears to be a migrant breeder at coastal sites in Dhofar, Oman, as well as discontinuously westwards along the southern Yemeni coast, and on some offshore islands, as far west as Aden (Jennings 2003, Kirwan 2010).

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We are grateful to staff members at the Natural History Museum, Tring (Robert Prŷs-Jones and Mark Adams) and National Museum of Natural History, Washington DC (James P. Dean, Christina Gebhardt, Chris Milensky and Brian Schmidt) for their assistance at these institutions. In particular, Robert Prŷs-Jones assisted in establishing the provenance of the 'Aden' swifts. Renate van den Elzen is thanked for expediting the loan of the specimen of *A. berliozi* held at the Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, to the Tring museum. Richard Porter provided a sound-recording of *A. berliozi* from Socotra. Our referees, Mike Jennings and Richard Porter, contributed variously to the final manuscript.

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Rainbow Starfrontlet *Coeligena iris* in Huascarán National Park, Ancash, Peru

by C. Steven Sevillano Ríos

Received 23 September 2010; final revision accepted 23 May 2012

On 14 June 2007 two Rainbow Starfrontlets *Coeligena iris* were mist-netted in *Polylepis weberbauri* forest at Quebrada Aquillpo (09°20′48.66″S, 77°28′48.90″W; 4,016 m), Huascarán National Park, Ancash, Peru. Both were caught at *c*.18.00 h while the mist-nets were being closed. One was dead in the net, and the other was weighed, measured and released. Individual 1 (Fig. 1): collected, total length 139 mm, bill 34 mm, wing 80 mm, rectrix 1 36.5 mm, rectrix 5 48.0 mm; individual 2: released, total length 141 mm, bill 34.45 mm, wing 77.35 mm, tarsus 9.06 mm. Comparing these morphometrics with those in Sánchez (2003), both were probably subadult males (C. Sánchez pers. comm.). On 21 November 2008, another *C. iris* was observed in *P. weberbaueri* forest at Quebrada Llanganuco (09°04′50.12″S, 77°39′13.96″W; 3,750 m), and on 8 May 2010, two were photographed at Quebrada Aquillpo.

These are the first documented records of *C. iris* in Huascarán National Park to be published, and come from much higher elevations than were previously reported for the species (1,300–3,300 m: Schulenberg *et al.* 2010). Birdwatchers have regularly recorded the species at Llanganuco since the late 1990s, but none published their observations or ascertained which subspecies was involved.

C. iris has a fragmented distribution, from southern Ecuador to the northern Peruvian Andes (Sánchez 2003; Fig. 2). The geographically proximate subspecies is *C. i. eva*, whose diagnostic characters such as the absence of black on the neck and upper back, the lack of a violet throat patch, and well-developed olive tips to the rectrices (Sánchez 2003) were evident in the birds at Huascarán.

Why has this hummingbird been largely overlooked in Huascarán National Park by previous surveys? I speculate that Rainbow Starfrontlet is present at low densities and only patchily distributed in the Cordillera Blanca. During 2007–09, I surveyed ten different localities and only recorded *C. i. eva* at Aquillpo and Llanganuco (Sevillano *et al.* 2011). Aquillpo has *c*.110 ha of *P. weberbaueri* and *P. sericea* forest (with trees up to 16 m tall). Other dominant flora includes *Buddleja incana*, *Gynoxys* sp., *Oreocallis grandiflora* and the

Figure 1. Rainbow Starfrontlet *Coeligena iris*, Aquillpo, Huascarán National Park, Ancash, Peru, June 2007 (C. Steven Sevillano Ríos)

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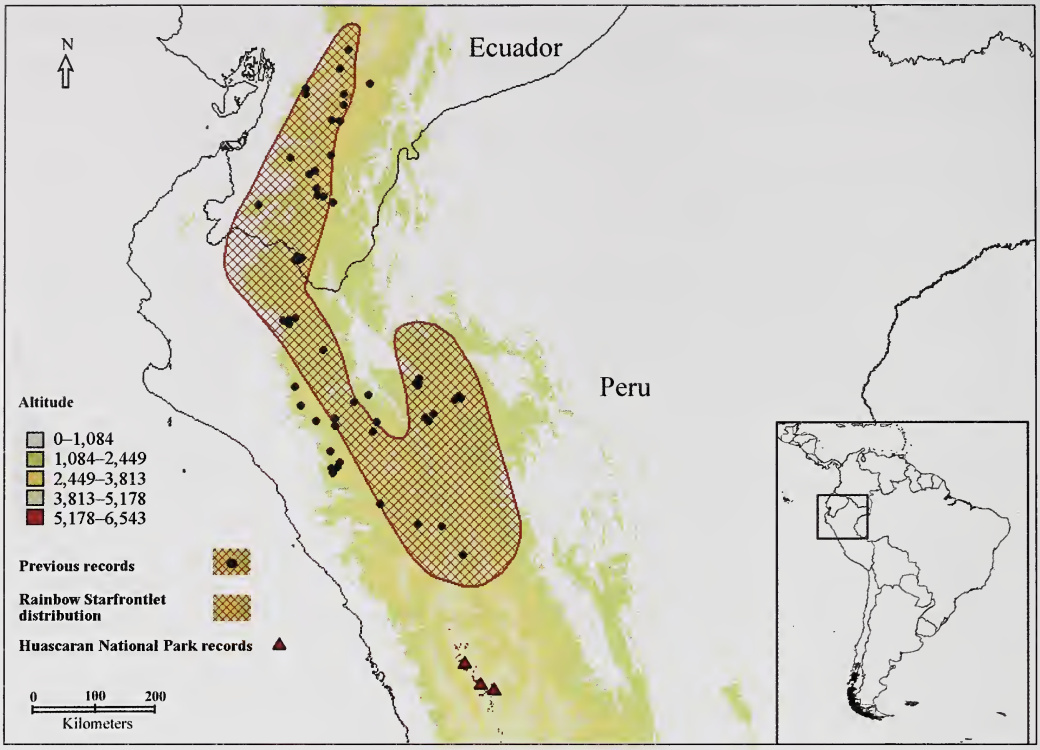

Figure 2. Map showing current Rainbow Starfrontlet *Coeligena iris* distribution, with previous records mainly from Sánchez (2003). The three triangular points correspond to the records from Llanganuco (northernmost) and Aquillpo and Rurichinchay (southernmost), in Huascarán National Park, Ancash.

parasite *Tristerix longibracteatus*. *P. weberbaueri* is also abundant at Llanganuco and the forest extensive as well; other trees and woody plants in the same area include *Alnus* spp., *Passiflora* spp., *Puya angusta*, *Berberis* spp. and abundant bromeliads (*Tillandsia* spp.).

C. iris is currently known from Ancash (Schulenberg *et al.* 2010) based on an unpublished specimen collected by M. Koepcke at Llanganuco on 7 August 1960 (T. S. Schulenberg pers. comm.). Frimer & Nielsen (1989) mentioned one of the few published reports of the species in the region, a single individual at Rurichinchay in 1988; consequently, Fjeldså & Krabbe (1990) stated that *C. iris* might occur in Huascarán National Park, but questioned whether it was a vagrant. Fjeldså (1987) and Barrio (2002) failed to find it too.

The records presented here indicate that *C. i. eva* is resident at a few localities in the Cordillera Blanca. These represent the highest elevational records and the southernmost limit of the species' distribution. Further study of the Huascarán population could yield important insights into the taxonomy of the *C. iris* complex (Sánchez 2003).

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First Uruguayan records of Great-winged Petrel *Pterodroma macroptera*

by Sebastián Jiménez, José S. Abente, Adrián B. Azpiroz, Christian Savigny & Martin Abreu

Received 22 November 2011

Great-winged Petrel *Pterodroma macroptera* comprises two subspecies, of which *P. m. gouldi* (Grey-faced Petrel) is endemic to New Zealand. The near-circumpolar *P. m. macroptera* breeds in the Southern Hemisphere, including the Atlantic (on Tristan da Cunha and Gough), Indian (Prince Edward, Marion, the Crozets and Kerguelen) and Pacific Oceans (southern Australia and northern New Zealand). Post-breeding, it disperses widely in the temperate south-east Atlantic and Indian Oceans, mainly at 30–50°S (Brooke 2004, Camphuysen 2007, Onley & Scofield 2007) with some reaching Antarctic waters (Montalti *et al*. 1999). The main pelagic distribution in the Atlantic is around southern Africa, where it typically occurs in oceanic waters and over the shelf edge (Camphuysen & van der Meer 2000, Camphuysen 2007). It is rare in the south-west Atlantic (Tickell & Woods 1972, Brown *et al*. 1975, Thurston 1982, Brooke 2004, Bugoni 2006, Onley & Scofield 2007).

Data on the species' occurrence in the south-west Atlantic are scarce, with scattered records for southern Brazil (Harris & Hansen 1974, Bugoni 2006), Argentine waters, the Falklands and South Georgia (Tickell & Wood 1972, Brown *et al*. 1975, Thurston 1982, Curtis 1994, Mazar Barnett & Pearman 2001, White *et al*. 2002, Chebez 2009). Some authors have highlighted the difficulties of identifying *P. macroptera*, especially vs. Kerguelen Petrel *Lugensa brevirostris*, so undocumented records should be treated cautiously, especially south of the polar front (cf. Mazar Barnett & Pearman 2001, Chebez 2009). Favero & Silva Rodríguez (2005) erroneously quoted Veit (1995) as mentioning *P. macroptera* as being a recurrent species at pelagic seabird assemblages in Argentine waters. However, the species mentioned by Veit was Great Shearwater *Puffinus gravis* and he found *P. macroptera* to be rare (R. Veit pers. comm.). Confusion probably originated through use of the Spanish name 'Petrel Pardo', which is applied to several species, including *Puffinus gravis* and *Pterodroma macroptera*.

P. macroptera was included in the Uruguayan avifauna by Cuello (1975) based on a specimen from La Floresta, dpto. Canelones, in July 1973, which Escalante (1980) reidentified as *Lugensa brevirostris*. Here we report the first documented records of *P. macroptera* in

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Uruguay. On 24 May 2003 a specimen was collected by JSA at Solymar (34°50′S, 55°56′W), in coastal dpto. Canelones, southern Uruguay. The specimen (Museo Nacional de Historia Natural, Montevideo, MNHN 6235) was a female in excellent condition, found alive the previous day by Javier Abente. Initially identified as *L. brevirostris*, careful examination by J. P. Cuello revealed that it was *P. m. macroptera* (Figs. 1–2). *P. m. macroptera* is a mid-sized,

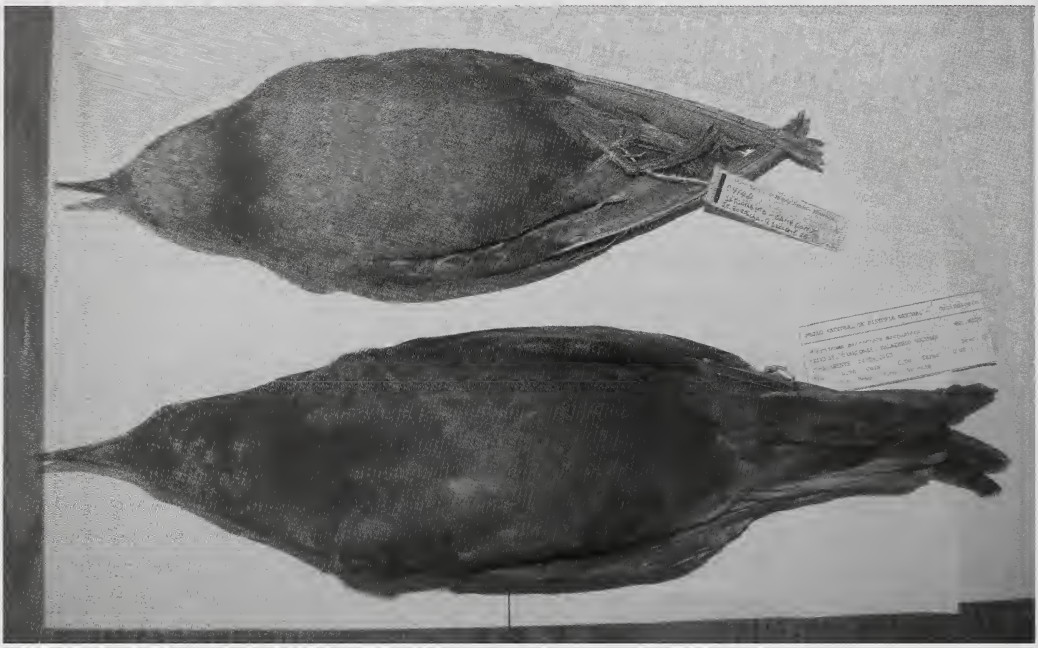

Figure 1. Ventral view of specimens of Kerguelen Petrel *Lugensa brevirostris*, La Floresta, dpto. Canelones, Uruguay, July 1973 (Museo Nacional de Historia Natural, Montevideo, MNHN 4142; above) and Great-winged Petrel *Pterodroma m. macroptera*, Solymar, dpto. Canelones, Uruguay, May 2003 (MNHN 6235; below) (Adrián B. Azpiroz)

Figure 2 (left). Head of Great-winged Petrel *Pterodroma m. macroptera* (above), Solymar, Uruguay, May 2003 (MNHN 6235) and Kerguelen Petrel *Lugensa brevirostris*, La Floresta, dpto. Canelones, Uruguay, July 1973 (MNHN 4142; below) (Adrián B. Azpiroz)

Figure 3 (right). Great-winged Petrel *Pterodroma m. macroptera*, Uruguayan waters, 1 March 2007 (Sebastián Jiménez)

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long-winged, all-dark petrel with dark underwings and black feet (Brooke 2004, Onley & Scofield 2007) separable from most other dark petrels (*Pterodroma, Bulweria* and *Procellaria* spp.) by size, absence of pale underwing areas, and bare-parts coloration. This applies to all potential confusion species in the south-west Atlantic (*L. brevirostris,* dark-morph Trindade Petrel *Pterodroma arminjoniana* and Atlantic Petrel *P. incerta*). The specimen lacks the pale face (including forehead, chin and base of bill) characteristic of *P. m. gouldi*. Measurements (mm) are: bill length (exposed culmen) 36.7, bill depth at base 15.0 and bill depth at nail 15.2.

On 1 March 2007 a *Pterodroma* sp. was observed by SJ (Fig. 3) from a Uruguayan pelagic longline fishing vessel targeting swordfish *Xiphias gladius*, during a 30-minute count commencing at 08.10 h, at 36°04'S, 51°00'W, in Uruguayan waters (sea surface temperature 24.32°C, northerly wind and sky completely cloudy, rain during final part of count). Other species present were *c*.60 Spectacled Petrels *Procellaria conspicillata* and *c*.15 *P. incerta*. The single *Pterodroma* was observed at the onset of rain and followed the vessel for 30 minutes. At *c*.09.00 h the number of *P. incerta* doubled and photographs of the all-dark *Pterodroma* were taken (Fig. 3). A small patch of paler feathers at the base of the black bill, characteristic of *P. m. macroptera* (Brooke 2004, Onley & Scofield 2007), distinguishes it from dark-morph *P. arminjoniana* from Trindade, which has dark lores and a pale throat (Onley & Scofield 2007). Onley & Scofield (2007) stated that dark-morph *P. arminjoniana* has a reduced pale patch on the outer underwing, but has a narrow white line on the inner forewing. These features were not detected on the Uruguayan bird, which appeared similar in size or smaller than the *P. incerta* present, thereby excluding the much smaller *L. brevirostris*. It was concluded that the petrel was *P. m. macroptera*.

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Missiemuseum, Steijl, the Netherlands—the history of a little-known collection

by Justin J. F. J. Jansen

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The Missiemuseum at Steijl, which contains *c*.1,200 ornithological mounts / skins, is not mentioned by Roselaar (2003) but deserves a place among his 'B-list' collections. On 8 September 1875, Father Arnold Janssen (1837–1909) inaugurated the Societas Verbi Divini (SVD) in response to the anti-Catholic *Kulturkampf* policy pursued by the Prime Minister of Prussia, Otto von Bismarck, in 1871–78. The first foreign mission was established at Hong Kong (1879), followed in 1882 by China's Shandong Province, or Qingdao (leased from China by Germany in 1897–1914) and in 1884 by Kaiser-Wilhelmsland, part of German New Guinea, a protectorate of the German Empire. Further missions followed in Italy (1888), Argentina (1889), Austria (1892), Togo (1892), Ecuador (1893), Brazil (1895), USA (1895) and Papua New Guinea (1896). No fewer than 47 other countries followed up until 1993.

One of the aims of the SVD was to found a museum, to provide the public with knowledge of the countries and cultures in which the Societas worked. The collection's nucleus dates from 1884 when Janssen started the Missiemuseum, financed by Monsieur von Anzen, with anthropological and natural history items from China, among them birds. It was housed in two small rooms by the mission's printing shop. The last new material was purchased in 1937. Unfortunately, specimens were neither registered nor labelled. Information concerning them has been kept in numerous papers, held in storage in the museum's attic, thus with some effort many could be adequately labelled, thereby meeting the criterion set by Roselaar (2003) of 100 well-labelled specimens for 'B-list' inclusion.

Initially, Janssen was responsible for the collections, then P. Schaaf (fl. 1885–94), but when in February 1894 the museum was enlarged Schaaf resigned. He was succeeded by Hermann auf der Heide (1865–1930) and taxidermist Philo Maier (fl. 1894–1901); Maier resigned in 1901. Thereafter, Johannes Giessen (1868–1935), known as Father Berchmans, was appointed collection manager, collaborating with auf der Heide. After the latter died, P. Schmitz (fl. 1935) and then P. Balkenhol (fl. 1935–37) became the museum's taxidermists. On 1 February 1931 the museum moved to its present location, with Berchmans responsible for furnishing the new museum. At present (2012) the Missiemuseum is administrated by Missiehuis St. Michaël, but has not expanded its natural history collections. Since Berchmans' death in 1934 very little concerning the displays has changed. The museum can

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be visited daily; all mounted specimens are on display, with a few skins held elsewhere in the building.

Material at the museum came from foreign-based missionaries or via purchases and exchanges. From papers held at the museum, it is clear that natural history items were acquired not only for the museum, but more especially for trade purposes, to expand and finance foreign missions. Material was received in exchange or by purchases from companies like that of Wilhelm Schlüter (1828–1919) at Halle an der Saale (Germany) and from captive-held birds at Allwetter Zoo, Münster (Germany) and Castle Broekhuizen (Arcen, the Netherlands). Private collectors included Franz Werner (1867–1939) from Vienna, who sent specimens from Brazil and Togo in 1925. An important purchase was (part of) the Merkelbeek collection (the Netherlands), at public auction in December 1937. Merkelbeek's collection contained material from the monastery of the Benedictine Confederation of the Order of Saint Benedict at Merkelbeek, which in 1923 was moved to the Sint Benedictusberg abbey at Mamelis, Vaals. In 1910 the collection of Johannes Renier Joseph van der Harten (1852–1925) was purchased; it contained material collected by Willem de Greef (b. 1863), Cornelus Notten (1847–1911) and Willem Lodewijk Joost Spoor (1827–93). The collection of D. W. Jansen (fl. 1900–12) from Arnhem was purchased in December 1906 and those of Carolus Roncken (1871–1944) and J. L. Wielders (fl. 1920–21) before 1931. Specimens were also traded with German missionaries, e.g., in Drieburg, Geilenkirchen, Neuenkirchen and Wengerohr, and exchanges also occurred with the Rijksmuseum van Natuurlijke Historie, Leiden (176 specimens) and Zoölogisch Museum Amsterdam (unknown). Among active missionaries were Franz Bartels (1889–1928) and Ludwig Klapheck (1868–1931) at Qingdao, Friedrich Girards (1875–1935), Hermann auf der Heide (1865–1930), Franz Kirschbaum (1882–1930) and Andreas Puff (1879–1939) in Kaiser-Wilhelmsland, and P. A. Müller (fl. 1907–08) and Wilhelm Schmidt (1868–1954) in Brazil. Unknown at present is how much of each collection remains, due to the lack of a register. However, most of the van der Harten collection is still present.

Plumes from birds-of-paradise, Dwarf *Casuarius bennetti* and Northern Cassowaries *C. unappendiculatus*, and Victoria Crowned Pigeon *Goura victoria* found their way via the missionaries to the Missiemuseum. For example, between October 1910 and June 1912 some 143 Victoria Crowned Pigeons and 626 birds-of-paradise passed via the museum to be sold. This is *c*.10% of all Paradisaeidae exported during this period from Kaiser-Wilhelmsland (Swadling 1996), although the Missiemuseum is not mentioned in the latter work.

My research provided additional information on some specimens (all of which still lack labels). The collection holds a number of rarities, and the main focus was on these and their data. Specimens of Slender-billed Curlew *Numenius tenuirostris*, Spix's Macaw *Cyanopsitta spixii* and Chinese Crested Tern *Sterna bernsteini* can be singled out. The Slender-billed Curlew was collected on 5 December 1888 at Zierikzee (51°38′59″N, 03°54′59″E) and was the second record for the Netherlands (de Graaf 1893). The Spix's Macaw was collected in Brazil but lacks collecting data. The Chinese Crested Tern is from Jiaozhou Bay (36°07′24.44″N, 120°14′44.3″E), and arrived on 24 July 1909 at Hamburg, Germany, in a collection of 131 bird skins formed by Franz Bartels and Josef Klapheck. Dutch rarities include a Greater Spotted Eagle *Aquila clanga* collected on 5 November 1892 at Weert (Vliet *et al*. 2005), a Middle Spotted Woodpecker *Dendrocopos medius* taken on 15 February 1922 at Blerick, a Great Bustard *Otis tarda* dated 10 February 1922 from Wijlre and two Pallas's Sandgrouse *Syrrhaptes paradoxus* (an adult female and young female) from Zeelst, near Eindhoven (the sole inland record during the 1888–89 invasion). For Germany, an Atlantic Puffin *Fratercula arctica* collected on 12 January 1907 on the Rhine near Emmerich represents one of the country's very few inland records.

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Bulwer's Petrel *Bulweria bulwerii* in Brazilian waters

by Samantha R. Klein, Nicholas W. Daudt & Leandro Bugoni

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Bulwer's Petrel *Bulweria bulwerii* has a pantropical distribution, breeding on islands in the North Atlantic, Indian and Pacific Oceans (Megysi & O'Daniel 1997, Onley & Scofield 2007). In the Atlantic it breeds on the Azores, Madeira, the Desertas, Selvagem Grande, the Canaries and Cape Verdes, with a total population estimated at >11,000 breeding pairs (Brooke 2004). Atlantic breeders spend much of the year at sea, moving south and south-west to tropical latitudes, reaching 40°S and even South Africa (Carboneras 1992, Bourne 1995, Megysi & O'Daniel 1997, Flood & Fisher 2011), and north to 40°N (Bourne 1995, Legrand *et al.* 1999). Limits in the North Atlantic are based on records off the eastern USA, Caribbean Sea and Netherlands Antilles (ffrench 1973, Haney & Wainright 1985, Legrand *et al.* 1999, Howell 2012), with vagrants off Ireland (Alibone 1980), continental Europe and in the Mediterranean (Flood & Fisher 2011). The species' distribution in the Atlantic was mapped in Flood & Fisher (2011), based on unpublished results from data loggers provided by J. González-Solís.

The at-sea distribution of Bulwer's Petrel in the South Atlantic potentially includes Brazilian waters. Van Oordt & Kruijt (1953) mentioned the species as 'rather common' and 'regular' off north-east Brazil between 31 December 1951 and 4 January 1952, and provided max. daily counts of six, nine, nine, five and 12 birds. They travelled from the Caribbean to South Africa and during this period crossed between Fernando de Noronha and São Pedro e São Paulo, within the Brazilian Exclusive Economic Zone (EEZ). Their southernmost record was one bird at 21°16'S, 09°30'W, midway between South America and Africa on 9 January (van Oordt & Kruijt 1954). Similar data were provided by Harris & Hansen (1974), who made a transect from north-east of São Pedro e São Paulo to south-west of Fernando de Noronha (while travelling from Europe to Uruguay) in October–November 1973. They recorded daily maxima of three, 15, 20 and 42 birds, the last just south-west of Fernando de Noronha. Bourne & Curtis (1985) mentioned 24 records in 1982–84, with up to eight birds in a day, all between 06°–39°S and 17°–37°W, in December–February. Bourne (1995) provided additional records, most between 10°N and 10°S and mentioned 'many records' in north-east Brazil during the boreal autumn, i.e. the post-breeding period. More recently, one was seen in Brazilian waters on 19 February 1999, 157 nautical miles (nm) south-west of São Pedro e São Paulo (Naves & Vooren 2000). These undocumented records suggest the

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Figure 1. Bulwer's Petrel *Bulweria bulwerii*, 176 nautical miles east of Cabo de São Tomé, Rio de Janeiro, Brazil, 22 December 2011 (Samantha R. Klein)

species is frequent in the tropical Brazilian Economic Exclusive Zone (EEZ), especially near São Pedro e São Paulo, Fernando de Noronha and the Atol das Rocas, as well as in adjacent international waters. Given the lack of pelagic work in Brazilian waters and off oceanic islands, the species has not been documented. Here we provide the first documented record of Bulwer's Petrel off Brazil.

The observation occurred aboard the R/V *Atlântico Sul*, at 14.57 h on 22 December 2011. A single bird (Fig. 1) was seen by SRK & NWD over waters 3,500 m deep (22°17′61″S, 37°52′51″W), <15 nm from the Almirante Saldanha seamount, the top of which is just 61 m below the surface. It is located east of Cabo de São Tomé, Rio de Janeiro state, which is 176 nm away, and thus well within the Brazilian EEZ. There was good light, sea state 4 on the Beaufort scale, and the wind was 22 knots from the north. The bird was first seen *c*.200 m away, was in view for *c*.2 minutes and at one point crossed the bow of the ship, permitting photographs (Fig. 1). The only other species seen nearby was a Great Shearwater *Puffinus gravis*.

The bird flew low over the surface, alternating between gliding zigzags (similar to a gadfly petrel) with fast circular bat-like flight comprising strong wingbeats (like a storm petrel). It foraged at the surface, dipping its head to partly immerse the bill in flight. Size was estimated at between Wilson's Storm Petrel *Oceanites oceanicus* and Manx Shearwater *Puffinus puffinus*, both of which we observed during the trip. The long wings and tail were notable. Plumage was all dark with a pale band on the upperwing-coverts, from the scapulars (where narrow) to the carpal region, where it broadened, typical of *B. bulwerii* and, according to Onley & Scofield (2007), visible up to 250 m away. Photographs reveal that the dark bill was less robust than those of *Pterodroma* petrels, but longer than in storm petrels. Plumage, flight action, structure and size made identification straightforward, eliminating any all-dark *Pterodroma* and smaller storm petrels. The marked pale band on the wing-coverts and pointed tail eliminated the similar, but larger, Jouanin's Petrel *Bulweria fallax* (Legrand *et al.* 1999, Onley & Scofield 2007), which is unknown in the Atlantic Ocean (Flood & Fisher 2011, Howell 2012).

Our record in December accords with Bourne (1995), who stated that the species migrates to the South Atlantic in the boreal autumn, reaching 20°S by November, and returns to the Northern Hemisphere by April. The only other at-sea study in the same region, in July–September 1984, did not record the species (Coelho *et al.* 1990). Our sighting close to a seamount might indicate the species was foraging in an upwelling area, which was suggested to explain previous records near Fernando de Noronha (van Oordt & Kruijt 1953, Harris & Hansen 1974, Bourne 1995, Megysi & O'Daniel 1997). Upwellings are productive areas, where Bulwer's Petrel could find its main prey, like zooplankton, small

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fish and squid (Zonfrillo 1986). Bulwer's Petrel generally forages alone or in pairs (Onley & Scofield 2007, Howell 2012), as noted also by van Oordt and Kruijt (1953).

Bulwer's Petrel was placed on the secondary list of Brazilian birds (CBRO 2011) due to a lack of tangible evidence (i.e., specimens, photographs etc.) (*sensu* Carlos *et al.* 2010). The present report provides the first documentation of the species' presence in Brazilian waters.

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The nest of Crescent-faced Antpitta *Grallaricula lineifrons* in north-east Ecuador

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The genus *Grallaricula* includes nine of the 51 species of antpittas (Grallariidae) and comprises small, semi-terrestrial species (Krabbe & Schulenberg 2003, Remsen *et al.* 2012). Thirty years ago Wiedenfeld (1982) reviewed published information on the nesting of antpittas, at which time the nest of only one species had been described (Schwartz 1957). Despite a recent flush of publications on their taxonomy, distribution, conservation and natural history (Andrade & Lozano 1997, Holley *et al.* 2001, Delgado-V. 2002, Greeney *et al.* 2004, Verea 2004, Greeney & Sornoza 2005, Donegan 2008, Niklison *et al.* 2008, Freile *et al.* 2010), the nests of fewer than half of the described species are known, and the breeding biology of most species is poorly documented (Greeney *et al.* 2008).

Crescent-faced Antpitta *G. lineifrons* is one of the most strikingly plumaged members of the genus and is considered Near Threatened (BirdLife International 2012). The type specimen was collected in 1923 (Chapman 1924) and remained unique for 49 years. In fact, Crescent-faced Antpitta was not reported in life until 1971 (Lehman *et al.* 1977) and even 70 years after being described its distribution and behaviour were virtually unknown (Fjeldså & Krabbe 1990, Robbins *et al.* 1994). Today it is known to be more widespread than was previously thought, in humid *Polylepis* woodlands and other treeline and elfin forests, often with small patches of bamboo, at elevations of 2,900–3,400 m, in the Central Andes of Colombia and the Eastern Andes of Ecuador south to northern prov. Loja (Ridgely & Tudor 1994, Ridgely & Greenfield 2001, Krabbe & Schulenberg 2003). Apart from a young bird collected in mid March in prov. Carchi, northern Ecuador (Robbins *et al.* 1994), nothing has been published on the species' reproduction. Here we provide the first description of the nest and brief observations on the nestling and parental care from north-east Ecuador.

Methods and Results

On 10 February 2012, we found a nest of Crescent-faced Antpitta just above the town of Papallacta, prov. Napo (00°19'S, 78°12'W), at *c.*3,300 m. At the time of discovery, it contained a single nestling, estimated to be no more than five days from fledging based on the experience of HFG with other species of *Grallaricula*. We photographed both adults arriving at the nest to provision the young (Fig. 1), but were unable to examine the nest and nestling more closely due to its precarious position (see below). Based on direct observation and from pictures taken on 10 February, the nestling was covered in a dense coat of rusty-brown downy plumage, and primary feathers were at least halfway emerged from their sheaths. The mouth lining was bright crimson-orange, mandible dusky orange, maxilla dark grey and rictal flanges yellow-white. We returned on 6 March, at which time the nest was empty but undisturbed, and we collected it for closer examination.

The open-cup nest was 3.6 m above ground and constructed within a loose tangle of three thin (*c.*1 cm diameter) vines hanging from a 10-cm diameter branch. The three vines hung *c.*1 m below the branch before becoming tangled, creating a loose 'basket' into which the nest was built. This 'basket' of vines was filled with a loose mixture of green moss, short sticks and leaf petioles creating a 10.5 cm-tall platform onto which the nest itself was built. This base was 13.5 cm in diameter at the narrowest point and 15 cm at the widest.

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The uniform mixture of sticks and moss, as well as the loose composition of the base strongly suggest that the material was brought there by the antpittas. The outer portion of the nest comprised similar materials to those used for the base, but the moss was more tightly packed, permitting the nest itself to be easily separated from the supporting base. This portion of the nest was symmetrical and measured 11 cm in diameter by 5.5 cm tall externally. The internal egg cup was neatly lined with a *c*.0.5-cm thick layer of crisscrossed dark rootlets and fibers, intermixed with only a few paler grass stems and flexible fibres. Internally, the egg cup was 6.5 cm wide and 3.5 cm deep. Additional photographs of the nest and nestling are available on the Colaboraciones Americans Sobre Aves project website (http://avesamericanas.lifedesks.org/pages/69356).

Habitat in the vicinity of the nest was typical of this elevation in northern Ecuador, with a 6–10 m-high canopied forest, dominated by *Polylepis* trees with a patchily vegetated understorey varying from dense *Chusquea* bamboo thickets to fairly open areas with only sparse vegetation. Most areas, however, were well covered in a dense layer of moss and epiphytes. The nest was at the edge of an area with little understorey vegetation, *c*.10 m from the edge of low, dense vegetation covering an old landslide. While we waited near the nest to take photographs, the adults foraged 15–30 m from the nest in the more open areas. On several occasions they visited areas disturbed by our passage, catching small arthropods by probing into displaced moss and soil, providing nominal support for the hypothesis that many antpittas facultatively follow large mammals while foraging (Greeney in press a).

Adults were silent while we were near the nest, except an occasional, soft, downslurred whistle as described for the species (Robbins *et al*. 1994), which is similar to that made by Ochre-breasted *G. flavirostris* and Peruvian Antpittas *G. peruviana* (Robbins & Ridgely 1990, Greeney *et al*. 2004). We also occasionally heard adults make this noise while foraging for food to bring to the nest, but during *c*.2 hours in the vicinity we did not hear any other

Figure 1. Adult Crescent-faced Antpitta *Grallaricula lineifrons* feeding nestling, Papallacta, prov. Napo, north-east Ecuador, 10 February 2012 (Harold F. Greeney)

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vocalisations by this pair. One member of a different pair, *c*.40 m from the nest, gave the more typical song of the species, a series of slightly ascending, closely spaced notes (Robbins *et al*. 1994, Ridgely & Greenfield 2001). This pair was seen carrying small pieces of moss and sticks, indicating they were in the process of nest construction, but we were unable to locate a nest.

Discussion

Although we are unable to offer a detailed description of the older nestling of Crescent-faced Antpitta, it is clearly similar to the older nestlings of other *Grallaricula*, all described as having dense, rusty-brown down and striking, orange mouth linings (Greeney *et al*. 2004, Greeney & Miller 2008, Niklison *et al*. 2008, Greeney *et al*. in press). It is now clear that in *Grallaricula* this downy coating is not natal down (which develops predominantly or entirely pre-hatching), but rather is formed by an early appearing semi-plume portion of the incoming juvenile plumage (Collins 2010). Thus, in all likelihood, nestling Crescent-faced Antpittas are naked at hatching and develop this downy plumage *c*.1 week after hatching (Greeney in press b).

The nest described here, being a relatively shallow, open-cup nest lined with dark fibres, matches descriptions of other *Grallaricula* nests. The predominance of moss in the external portion agrees with nests of Peruvian (Greeney *et al*. 2004) and Ochre-breasted Antpittas (Holley *et al*. 2001, Maillard & Vogel 2003, Greeney *et al*. in press), in contrast to the leaf, stick and petiole exterior to nests of Slate-crowned Antpitta *G. nana* (Greeney & Sornoza 2005, Greeney & Miller 2008, Greeney *et al*. 2010) and Rusty-breasted Antpitta *G. ferrugineipectus* (Schwartz 1957, Niklison *et al*. 2008). The large amount of extra material placed below the nest described here appears unusual for the genus, but is not inconsistent with the nest architecture of other species, all of which create a platform upon which to construct their nest cups (Greeney *et al*. 2008, in press). Few nests are known for most *Grallaricula* spp., but in general they are built below 2 m (but see Holley *et al*. 2001), making the nest described here unusually high. It remains to be seen if the placement and voluminous platform witnessed here are typical for Crescent-faced Antpitta. Our observation of one pair with an older nestling and one pair nest building in mid February suggest that the species' breeding season in this area may be at least January–April. This is the wetter season in the area, and contrasts with the dry-season nesting peak for most other species (Greeney *et al*. 2011).

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A new name for a buzzard from the Himalayas

by Edward C. Dickinson & Lars Svensson

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As pointed out by Penhallurick & Dickinson (2008) the name *Circus plumipes* 'Parbattiah' [= Hodgson], 1836, is preoccupied in the genus *Buteo* by *Falco plumipes* Daudin, 1800, a synonym of *Buteo lagopus lagopus*. They also observed that the name *Buteo burmanicus* Hume, 1875, was used by Rasmussen & Anderton (2005) for presumably the same species, the 'Himalayan Buzzard'. The latter authors depicted *B. burmanicus* on pl. 24 of their work, and we see the lower, perched figure as a good likeness of the type specimen. Penhallurick & Dickinson (2008) also mentioned molecular screening by Kruckenhauser *et al.* (2004) in which *Buteo refectus* Portenko, 1935, was sampled, and agreed with Rasmussen & Anderton (2005) that *refectus* should be considered a synonym of *burmanicus*. This section of Penhallurick & Dickinson's paper was inserted, at proof stage, by the senior author without consultation. We now possess photographs of the holotype and one paratype of *B. refectus* and photographs of a specimen in Berlin (ZMB 35.364) labelled *B. buteo japonicus* which Kruckenhauser *et al.* (2004) identified as *B. refectus* from its mtDNA profile. In addition, we examined many other specimens, among them BMNH 1949.Whi.1.472, a specimen also screened by Kruckenhauser *et al.* (2004) and listed by them as *B. refectus*.

At this stage, we wish to make clear our view that neither of the names *refectus* Portenko, and *burmanicus* Hume, applies to the dark-morph birds that Hodgson called *plumipes*. This conclusion is based on an examination of Hodgson's type, as well as the type of *burmanicus*, and photographs of the holotype of *refectus*. We are satisfied that *burmanicus* is a migrant from a northern breeding range including Manchuria. Our present impression is that dark-morph *plumipes* lacks characters that would be present if *refectus* and *plumipes* were conspecific.

As we have found no other name that applies to Hodgson's species, we propose:

Buteo (*buteo*) *hodgsoni* nom. nov.

as a replacement name for *Circus plumipes* Parbattiah [= Hodgson], 1836.

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We thank Vladimir Loskot, Zoological Institute, St. Petersburg, for providing photographs of the holotype and a paratype of *Buteo refectus*, Sylke Frahnert, Museum für Naturkunde, Berlin, for the photograph of ZMB 35.364, which is said to be *refectus* (although this requires confirmation as the original type material of *refectus* was not screened), and Robert Prŷs-Jones and Mark Adams, the Natural History Museum, Tring, for access to all relevant specimens in their care including the type of *Circus plumipes* Hodgson, the type specimens of *Buteo burmanicus* Hume and other types of Asian buzzards. David Pearson kindly assisted us in these examinations. Richard Schodde read a draft that helped us to improve this paper.

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Rediscovery of missing specimens once held at Vassar College, including the holotype of Baudó Guan *Penelope ortoni*

by Mary LeCroy, Jeremy J. Kirchman & Lois Horst

Received 11 June 2012

In early 1874, Osbert Salvin and his wife were ready to depart from Guatemala, intending to visit California and New York before returning to England. Frustrated by undependable schedules of ships calling at Central American ports, they sailed to Panama and thence directly to New York. Taking advantage of the five weeks until their ship departed for home, they visited both public and private bird collections in the eastern USA, and Salvin (1874) reported on the highlights of what he saw.

One of the collections visited was that of Vassar College in Poughkeepsie, New York. There Salvin was shown the collection by the newly appointed Professor of Natural History and Curator of the Natural History Museum, James Orton, who no doubt took pleasure in introducing the collection to such a famous visitor. Orton had recently led two expeditions to South America which yielded many specimens of new birds. By the time of Salvin's visit, Orton had already published a landmark book *The Andes and the Amazon* (1870) and an article on some of the Vassar rarities (Orton 1871a). Several new species were named by George Newbold Lawrence based on the specimens at Vassar. However, it was a large, dark guan taken on Orton's first trip that intrigued Salvin most.

On his return to England, Salvin (1874) named the large, dark bird *Penelope ortoni*. The name was based on a single specimen that Salvin found had been identified as *P. greeyi* (= *P. marail*). Orton told him that it had been collected near Mindo, on the west slope of Volcán Pichincha, Ecuador, at 6,000–7,000 feet elevation. It was the first species of *Penelope* found in western Ecuador. Salvin noted that 'the white markings of the feathers of the chest of this species are inconspicuous, are confined to the pectoral region and do not extend to the back of the neck as in the allied species, *P. marail* and *P. greeyi*.' On that first expedition

Figure 1. Holotype of Baudó Guan *Penelope ortoni*, New York State Museum, Albany (NYSM9991) (Jeremy J. Kirchman)

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Orton's group had crossed the Isthmus of Panama and reached the coastal tropical forest of Guayaquil, Ecuador, in July 1867, later spending 2.5 months in the Quito area, arriving in August and leaving at the end of October 1867. They visited many areas in the Quito valley, including Pichincha (Orton 1870: 133–142) and, although Mindo is not mentioned by Orton, they likely collected the new *Penelope* during this time. In fact, it probably was the species listed by Orton (1871b: 625) as *Ortalida Montagnii* (= *Penelope m. montagnii*) and only later reidentified as *P. greeyi*.

In 1877, Prof. Orton returned to South America but died during the expedition. After his death, the whereabouts of the holotype slipped into obscurity. In the 1920s, known types in the Vassar Collection were sent on long-term loan and later donated to the American Museum of Natural History (AMNH), but the holotype of *P. ortoni* was not among them. In 1942, Hellmayr & Conover (1942: 145–146) noted that the type was at Vassar College, did not say that they had examined it, but noted that the altitude mentioned by Orton for Mindo, the type locality of *P. ortoni*, was high for this low-altitude species. The altitude given by Paynter (1993) is 1,264 m, and there are specimens of *Penelope ortoni* in AMNH collected subsequently by the Olallas at Mindo.

In the late 1960s and early 1970s, when Dean Amadon was researching cracids for his book with Jean Delacour (Delacour & Amadon 1973: 124, pl. 10, upper right) and James C. Greenway (1973) was looking for types of the family Cracidae that might be in AMNH, the holotype of *P. ortoni* was not found despite considerable correspondence.

As a result of renewed research into the present whereabouts of Vassar specimens by ML & LH, contact was made with JJK, now Curator of Birds at the New York State Museum in Albany, NY (NYSM), which had adopted parts of the Vassar Collection in the 1950s when Dr Ralph Palmer was State Zoologist. During the years 1942–49, with time out for service in World War II, Palmer taught at Vassar and probably realised that valuable specimens were still present in the collection, which was being used for teaching. When he became Zoologist for NYSM in 1949, he arranged to have the more important specimens still at Vassar transferred to Albany. Over 1,100 skins, nearly all collected in New York, were accessioned at that time. It is probable that the holotype of *P. ortoni* found a new home at this time as well, but with no indication of its importance it was stored apart from the main series in a cabinet containing several tropical species that remained unidentified. In 2007, shortly after taking over as Curator, JJK identified and accessioned most of these specimens, including one skin of *P. ortoni* (Fig. 1), with a label only verifying that it had come from Vassar ('Advanced Ornithology 26, Vassar College'), but containing no further data.

So, now 138 years after its description, the holotype of *P. ortoni* has been rediscovered and safely included in the type collection of NYSM as NYSM 9991, a fitting tribute to James Orton, a largely unappreciated early explorer of South America.

In the same paper in which *P. ortoni* was named, Salvin (1874: 323) mentioned that Orton had presented him with the second known specimen of *Icterus graceannae*, collected at Machala, near Guayaquil. The species had been named by Cassin (1867: 52), and the type deposited in the Academy of Natural Sciences, Philadelphia. The type specimen had been included in a collection of birds mostly from Peru, but also some Ecuadorian and Bolivian birds, so its exact collecting locality could not be stated. Orton's specimen provided a known locality for the species.

I. graceannae had been on some of the lists of type specimens that were to have been sent to AMNH on extended loan, but on at least one of them someone had noted 'not a type'. The collection at AMNH has been searched more than once for this specimen, thinking that perhaps it had come to AMNH as a type, but when its non-type status was discovered, that it had been placed in the regular collection. Because the Salvin-Godman Collection was

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deposited in the British Museum (Natural History) (BMNH) bird collection, now housed at Tring, UK, we inquired of R. Prŷs-Jones whether this specimen had come to Tring with that collection. Prŷs-Jones (*in litt.* 2012) confirmed that it had and is now BMNH 1885.11.2.503 from Machala, Guayaquil, and is listed in Sclater (1886: 378).

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We thank Robert Prŷs-Jones for sending us the information on Salvin's specimen of *Icterus graceannae*, Thomas Trombone for his help in preparing the photographs for publication, and Robert Prŷs-Jones and Juan Freile for their helpful comments on the manuscript.

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