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Advertise with NBC in Cotinga

Black-and-white advertising rates:

Full page	\$190	£110	14.5	x	20.5	cm
Half page	\$120	£70	14.5	x	10	cm
Quarter page	\$90	£50	7	x	10	cm



Colour advertising is also available in conjunction with fully acknowledged colour sponsorship. Rates on request from the Advertising Officer. Space is also available for short classified advertisements at \$5 (£3) per line (average six words) with boxed entries (minimum 2 cm²) at \$16 (£10) per cm², \$2 (£1) extra per insertion. The copy deadline is 1 June. Please post early to avoid disappointment.

All advertisements must be sent prepaid (cheques made payable to the Neotropical Bird Club) on disk (in either Macintosh or PC format) to:

Advertising Officer, The Neotropical Bird Club,
c/o The Lodge, Sandy, Bedfordshire, SG19 2DL, UK
E-mail: secretary@neotropicalbirdclub.org

Club News



Changes to NBC Council

David Fisher has resigned as the Club's chairman and Chris Balchin took over the position from August 2010. David is now concentrating on his position as Meetings Organiser, and is currently working on an exciting joint meeting with the British Ornithologists' Club at the Natural History Museum, Kensington, on 29 October 2011.

New editor of *Neotropical Birding*

Juan Ignacio (Nacho) Areta has resigned as editor of *Neotropical Birding* and Guy Kirwan has taken over the position on a temporary basis until a permanent replacement is found. Council thanks Nacho for his fantastic work on the last two issues.

Back issues of *Neotropical Birding*

Issues of *Neotropical Birding* dated 2008 or earlier are on sale separately at UK£9 each. The price of back issues of *Cotinga* has risen due to increased postage costs; prices are now UK£5 for UK mailings and UK£7 elsewhere.

New US postal address

Megan Crewe is now handling the bulk of our US and Canada mailings and subscriptions, with the result that the Club has a new mailing address in the USA. If you live in the USA or Canada, please send your subscriptions to Neotropical Bird Club, PO Box 55, Cape May Point, NJ 08212-0055, USA.

E-mail addresses

With ever-increasing postal costs in the UK, the Club is looking to communicate with members by e-mail whenever possible. Please consider providing an e-mail address on your renewal form to assist us.

Website

Council is aware of problems experienced by members at times when trying to renew online etc., and has formed a working group to completely review the website.

Adverts

Would members please mention NBC when replying to adverts in *Cotinga* or *Neotropical Birding*.

Payments by credit card

Members who wish to pay their subscription by credit card are requested to use the online service available on the Club's website, which considerably reduces both administration and the Club's bank charges. When paying by credit card, please allow up to 28 days for your order to be processed.

Please consider helping NBC

We are always keen to welcome new members onto NBC Council. Meetings take place 3–4 times p.a., and are generally held a 20-minute train journey from central London. Current Council members come from a wide range of backgrounds (being a professional ornithologist is certainly not a prerequisite!). So if you share our fascination with Neotropical birds and would be willing to help the Club, please contact one of the officers either by e-mail or the Club's UK mailing address.

The Club is always interested to hear from members who might be able to help in other ways, for example:

Speakers—the Club is always looking for speakers for future AGMs and the May meeting in Norfolk; volunteers would be greatly appreciated.

Rutland—the Birdfair is one of the Club's most important fundraising events and Council would be grateful for assistance

running the stand—please contact the Secretary if you can help.

Annual raffle—the Club would particularly welcome help with filling envelopes, etc., for the annual raffle.

Payments in US dollars

Due to increased bank charges, the Club can only accept US\$ cheques drawn on banks with a US address. If payments are made by international money order, Canadian dollar cheques or US\$ cheques drawn on a Canadian bank, please add the equivalent of UK£5 to cover bank charges.

Donations

We would like to acknowledge the following members who have made donations recently: R. Andrew, J. Caddick, R. Cannon, I. Cox, Prof. D. Cyrus, M. Dennis, J. Dick, H. H. Eggenkamp, S. Enright, D. Evans, K. Fisher, Miss E. Forbes, J. Fritzhand, C. Gooddie, R. Hardcastle, J. Harvey, S. Healey, A. Hands, U. Jacob, G. Klebaukas, M. R. Rissopatron de Locke, C. Lynn, R. Maier, D. McWhirter, A. R. Miles, S. Newman, P. Nickless, N. Osborne, S. O'Malley, M. Overton, S. Pryor, G. Rees, D. Sargeant, P. Scott, J. L. R. Williams and E. M. Wilson.

Period of membership

The period of membership is for one calendar year starting 1 January. Members always receive both copies of *Neotropical Birding* and the copy of *Cotinga* for that year regardless of when they join. Your membership status can be obtained from the address label, the number after the membership type is the year the membership runs from, i.e. 11 for 2011. Unless stated all memberships are single year, multiple years are designated by Xyr, i.e. 2yr for two-year membership. GA appears on the label if you are registered for Gift Aid. Please consider

registering for Gift Aid if you have not already done so. Paying by Standing Order greatly assists the Club—please e-mail the Secretary for details. When renewing please provide an up-to-date e-mail address in case the Club needs to contact you.

Club Constitution

Any member wishing to obtain a copy of the Constitution should send an A5-sized stamped and addressed envelope to the Secretary.

UK Data Protection Act 1998

Members should note that the Club is subject to the Data Protection Act 1998. NBC informs its members that it holds certain information about them on the Club's mailing database. This information—name and address details—is deemed 'personal data' under the Act and may, in limited circumstances, be disclosed to others for the benefit of the Club.

Club administration

Please note that the Club's UK address is for mail forwarding only and no Club officers are based at the address. Although NBC shares the same address as OSME in the UK, members are requested to refrain from sending mail addressed to

both organisations in the same envelope as this causes administrative difficulties. NBC records its grateful thanks to the Royal Society for the Protection of Birds for their continued and much-valued assistance in this respect.

Promoting the Club

A membership flyer is available and the Club is seeking members to distribute it. Anyone able to help the Club recruit new members in this way should contact the Secretary.

Sponsored Members

The Sponsoring Member scheme permits members to sponsor the membership of a Neotropical national. The Sponsoring Member can nominate a recipient of their choice to receive the membership, or they can let the Club choose a suitable one. Members sponsoring specified members are asked to inform the Secretary if they wish to terminate the sponsorship, and it would be helpful if Sponsoring Members could inform the recipient if they intend to sponsor them during the following year.

Change of address

All members are requested to ensure that they inform the Club if they change their address. Due

to the costs involved, the Club is unable to supply replacement copies of *Cotinga* or *Neotropical Birding* if we are not notified of a change of address. In such cases the member will have to purchase the missing issue(s) and pay the postage.

Edward Grey Institute

Club members have been granted permission to use the library of the Edward Grey Institute, Oxford, UK, which has one of the largest collections of ornithological literature in the world.

Corporate Members

NBC wishes to thank the following Corporate Members for 2011: Birdquest, Canopy Tower Family (Panama), Geodyssey, Lynx Edicions, Manu Expeditions, Rockjumper Tours, Serra dos Tucanos, Sunbird, Swarovski Optik, and Ultimate Voyages.

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Birds of South and Middle America—recent advances in knowledge



BOC

Joint British Ornithologists' Club / Neotropical Bird Club /
Natural History Museum one-day symposium,
29 October 2011 at the Flett Theatre,
Natural History Museum, London SW7 5BD



NBC

10.30–11.00 Coffee / tea

11.00–11.45 **Why birds sing at dawn** *Nathalie Seddon*
(Edward Grey Institute, Oxford University)

Communal displays of acoustically and visually signalling animals include some of the great spectacles of the living world. Many of these spectacles involve large communities of different species signalling in concert, often just before sunrise. Though perhaps best documented in birds, dawn choruses occur in a wide diversity of other animals, from primates and frogs, to lizards and insects. These signalling events have long fascinated humans, but despite a century of speculation, there is little consensus as to their adaptive significance. Drawing on a recent study of the largest dawn chorus of all, that of the singing birds of upper Amazonia, I will discuss how ecology, social interactions and evolutionary history drive birds to synchronise their songs at daybreak.

11.45–12.30 **Conservation of high-Andean forest birds in Peru** *Huw Lloyd* (Manchester Metropolitan University)

The loss and degradation of high-Andean *Polylepis* woodland is of particular international concern because of its highly fragmented distribution, the inadequacy of its protection within national reserves, and the high levels of habitat-restricted endemism among its threatened bird communities. I will discuss some of the recent ornithological findings from southern Peru, which could lead to the development of realistic habitat restoration strategies for populations of these severely threatened bird species.

12.30–13.15 **Wildlife of the Pantanal, South America's Serengeti** *James Lowen* (Bradt Travel Guides)

The world's largest wetland and the aquatic heart of South America showcases some of the most breathtaking gatherings of birds, mammals and reptiles you could ever hope to see. The author of a recently published book to Pantanal wildlife and travel treats us to a visual celebration of the region's wildlife spectacles, with a particular focus on its avian specialities and their conservation.

13.15–14.15 Lunch

14.15–15.00 **The Mexican Bird Atlas : a collaborative approach for the study of biodiversity** *Adolfo Navarro* (Universidad Nacional Autónoma de México)

Bird specimens and their associated data are essential tools in the study of many biological disciplines. I will present an overview of an effort lasting almost 20 years to compile information on Mexican bird specimens in natural history museums worldwide, and the diverse ways in which this 'Atlas' project has helped advance ornithological knowledge in such diverse areas as taxonomy, biogeography, conservation biology and biodiversity informatics.

15.00–15.45 **Project BioMap: documenting the global museum resource of Colombian birds for research and conservation** *Robert Prŷs-Jones* (Natural History Museum)

Project BioMap, a tri-national initiative between British, Colombian and US institutions, began in late 2001. The project aim was to digitise and verify all Colombian bird specimens deposited in natural history museums around the world. A total of 217,802 Colombian bird specimens in 88 museums were databased and georeferenced (whenever possible) and made available online (<http://biomap.net>). I will present a temporal and spatial breakdown of the information available, highlighting strengths and weaknesses, and discuss its use in research and conservation.

15.45–16.15 Coffee / tea

16.15–17.00 **Exploring, studying and protecting the world's most diverse national avifauna** *Thomas Donegan* (ProAves)

The publication in 2010 of a new field guide for Colombia offers a good point to take stock of recent advances in knowledge in the world's most diverse country for birds. Explorations and discoveries facilitated by the improving security situation and the increasing capacity of national researchers and institutions have resulted in significant recent findings (new species, splits, lumps, new records, etc.), many of which will be discussed. An illustrated discussion of some of the steps being taken to conserve Colombia's birds and their habitats will also be presented.

The birds of Reserva Ecológica Guapiaçu (REGUA), Rio de Janeiro, Brazil

Leonardo Pimentel and Fábio Olmos

Received 30 September 2009; final revision accepted 15 December 2010

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É apresentada uma lista da avifauna da Reserva Ecológica de Guapiaçu (REGUA), uma reserva privada de 6.500 ha localizada no município de Cachoeiras de Macacu, vizinha ao Parque Estadual dos Três Picos, Estação Ecológica do Paraíso e Parque Nacional da Serra dos Órgãos, parte de um dos maiores conjuntos protegidos do Estado do Rio de Janeiro. Foram registradas um total de 450 espécies de aves, das quais 63 consideradas de interesse para conservação, como *Leucopternis lacernulatus*, *Harpyhaliaetus coronatus*, *Triclaria malachitacea*, *Myrmotherula minor*, *Dacnis nigripes*, *Sporophila frontalis* e *S. falcirostris*. A reserva também está desenvolvendo um projeto de reintrodução dos localmente extintos *Crax blumembachii* e *Aburria jacutinga*, e de reforço das populações locais de *Tinamus solitarius*.

The Atlantic Forest of eastern Brazil and neighbouring Argentina and Paraguay is among the most imperilled biomes in the world. At least 188 bird species are endemic to it, and 70 globally threatened birds occur there, most of them endemics^{4,8}. The Atlantic Forest is not homogeneous and both latitudinal and longitudinal gradients account for diverse associations of discrete habitats and associated bird communities. Another factor accounting for the heterogeneity of the biome is the frequently steep altitudinal gradient found in parts of south-east Brazil, where the Serra do Mar and associated ranges rise steeply to over 1,000 m from the surrounding lowlands and coastal plain¹⁸. Forest at lower altitudes was the first to be impacted by humans and has been mostly cleared for agriculture and pasture, making it unsurprising that many threatened birds are associated with lowland habitats^{3,4,6,18}.

The Serra dos Órgãos is one of the ornithologically best-known areas in the Atlantic Forest¹⁴. Its foothills have been visited by naturalists since the early 19th century, and are the source of rarities such as Kinglet *Calyptura Calyptura cristata*^{10,14,15}. The foothills were largely cleared to make room for coffee plantations and to obtain timber and firewood, while most of the vast swamp forests covering the lowlands between the hills and Guanabara Bay are gone because of extensive drainage in the early 20th century, mostly as part of efforts to control mosquito-borne diseases^{5,19}. Nevertheless small patches of forest in the lowlands did survive and the steep terrain of higher elevations retains much larger forests, while the abandonment of former plantations has permitted forest regeneration at lower altitudes. In consequence, more forest perhaps remains today than at the peak of the coffee boom in the early 20th century.

Some information has been published on the birds of lower (90–500 m) elevations in the region^{10,13}, but few areas have been subject to long-term surveys. Here we present the cumulative list of a privately protected area, Reserva Ecológica Guapiaçu (REGUA), which includes both low-lying parts of the Serra dos Órgãos massif and nearby higher ground, now mostly incorporated within the recently decreed 46,350-ha Três Picos State Park^{12,13,19}. REGUA, the Três Picos park and Serra dos Órgãos National Park (11,800 ha) form a continuum of some 600 km², one of the most extensive protected patches of Atlantic Forest¹⁶. REGUA is renowned in the ornithological literature as the sole site where Rio de Janeiro Antwren *Myrmotherula fluminensis* has been recorded since its description³.

Study area and Methods

Reserva Ecológica de Guapiaçu (REGUA) is located near the village of Guapiaçu, Cachoeiras de Macacu, Rio de Janeiro. The reserve comprises 6,500 ha of forest, ranging from c.30 to 2,200 m, adjoining the 46,350-ha Três Picos State Park. The reserve is drained by the rio Macacu basin. Most areas of level ground, originally covered by swamp forest, have been drained and are now occupied by pastures with scattered huge fig trees *Ficus clusifolia* and *F. enormis* clad in bromeliads. In some parts (Fazenda São José) man-made wetlands with dense herbaceous cover and open water are used by waterbirds.

In the rolling terrain of the foothills to c.500 m, vegetation is mostly old (>25 years) second growth, with many legumes (*Piptadenia gonoacantha*, *Anadenathera colubrina*, *Schizolobium parahyba* and *Inga* spp.), figs and Myrsinaceae (*Rapanea* spp., mostly at edges), spiny palms *Astrocaryum aculeatissimum* and palmito palms *Euterpe edulis*

Table 1. Bird species recorded in Reserva Ecológica de Guapiaçu (REGUA), Rio de Janeiro, Brazil. Nomenclature follows CBRO (<http://www.ib.usp/cbro>).

Abundance: C = common (recorded in appropriate habitat >80% of field days); F = fairly common (50–80%); U = uncommon (20–50%); R = rare (>20%).

Evidence: S = sight; V = voice; T = tape-recorded; M = mist-netted; P = photographed.

Habitat: W = wetlands; O = pasture and agricultural areas; E = edges; L = old second growth at 90–500 / 600 m; H = forest above 600 m.

* = introduced or feral, ^m = probable migrant, absent during part of year or subject to obvious changes in numbers, + = not recorded by us.

Species	English name	Abundance	Evidence	Habitat
TINAMIDAE				
<i>Tinamus solitarius</i>	Solitary Tinamou	R	S,V,T	H
<i>Crypturellus obsoletus</i>	Brown Tinamou	C	S,V,T	L,H
<i>Crypturellus tataupa</i>	Tataupa Tinamou	C	S,V,T	E,L
ANATIDAE				
<i>Dendrocygna viduata</i>	White-faced Whistling Duck	C	S,V,T,P	W
<i>Dendrocygna autumnalis</i>	Black-bellied Whistling Duck	R	S,V,P	W
<i>Cairina moschata</i>	Muscovy Duck	F	S,P	W
<i>Amazonetta brasiliensis</i>	Brazilian Duck	C	S,V,T,P	W
<i>Nomonyx dominica</i>	Masked Duck	F	S,P	W
CRACIDAE				
<i>Penelope superciliosus</i>	Rusty-margined Guan	U	S,V	E,L
<i>Penelope obscura</i>	Dusky-legged Guan	F	S,V,T,P	H
ODONTOPHORIDAE				
<i>Odontophorus capueira</i>	Spot-winged Wood Quail	F	S,V,T	L,H
PODICIPEDIDAE				
<i>Tachybaptus dominicus</i>	Least Grebe	C	S,V,P	W
<i>Podilymbus podiceps</i>	Pied-billed Grebe	U	S,P	W
PHALACROCORACIDAE				
<i>Phalacrocorax brasilianus</i>	Neotropic Cormorant	R	S,P	W
ANHINGIDAE				
<i>Anhinga anhinga</i>	Anhinga	R	S	W
FREGATIDAE				
<i>Fregata magnificens</i>	Magnificent Frigatebird	R	S	W
ARDEIDAE				
<i>Tigrisoma lineatum</i>	Rufescent Tiger Heron	U	S,V,P	W
<i>Cochlearius cochlearius</i>	Boat-billed Heron	R	S	W
<i>Botaurus pinnatus</i>	Pinnated Bittern	R	S,P	W
<i>Ixobrychus exilis</i>	Least Bittern	R	S	W
<i>Ixobrychus involucris</i>	Stripe-backed Bittern	R	S,P	W
<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	C	S,V,T,P	W
<i>Butorides striata</i>	Striated Heron	C	S,V,T,P	W
<i>Bubulcus ibis</i>	Cattle Egret	C	S,V,T,P	W,O
<i>Ardea cocoi</i>	White-necked Heron	R	S,P	W
<i>Ardea alba</i>	Great Egret	F	S,P	W
<i>Syrigma sibilatrix</i> ^m	Whistling Heron	F	S,P	W
<i>Pilherodius pileatus</i>	Capped Heron	C	S,P	W
<i>Egretta thula</i>	Snowy Egret	C	S,V,T,P	W
<i>Egretta caerulea</i>	Little Blue Heron	R	S,P	W
THRESKIORNITHIDAE				
<i>Theristicus caudatus</i>	Buff-necked Ibis	R	S,V,P	O
<i>Platalea ajaja</i>	Roseate Spoonbill	R	S,P	O
PHOENICOPTERIDAE				
<i>Phoenicopterus chilensis</i> [*]	Chilean Flamingo	R	S,P	W
CATHARTIDAE				
<i>Cathartes aura</i>	Turkey Vulture	C	S,P	W,O,E,L
<i>Cathartes burrovianus</i>	Lesser Yellow-headed Vulture	F	S,P	W,O,E
<i>Coragyps atratus</i>	Black Vulture	C	S,P	W,O,E,L,H
PANDIONIDAE				

Species	English name	Abundance	Evidence	Habitat
<i>Pandion haliaetus</i>	Osprey	R	S	W
ACCIPITRIDAE				
<i>Leptodon cayanensis</i>	Grey-headed Kite	R	S,T,P	L
<i>Chondrohierax uncinatus</i>	Hook-billed Kite	R	S	L
<i>Elanus leucurus</i>	White-tailed Kite	R	S,P	W,O
<i>Rostrhamus sociabilis</i>	Snail Kite	R	S	W
<i>Harpagus diodon</i>	Rufous-thighed Kite	R	S,P	L
<i>Ictinia plumbea</i> ^m	Plumbeous Kite	R	S,P	L
<i>Accipiter striatus</i> ⁺	Rufous-thighed Hawk	R	S	L
<i>Accipiter bicolor</i>	Bicoloured Hawk	R	S	L
<i>Geranospiza caerulescens</i>	Crane Hawk	U	S,P	L
<i>Leucopternis lacernulatus</i>	White-necked Hawk	R	S,P	L
<i>Leucopternis polionotus</i>	Mantled Hawk	U	S,T,P	L,H
<i>Buteogallus urubitinga</i>	Great Black Hawk	R	S	E
<i>Heterospizias meridionalis</i>	Savanna Hawk	C	S,T,P	W,O,E
<i>Harpyhaliaetus coronatus</i>	Crowned Eagle	R	S,V,T,P	L
<i>Parabuteo unicinctus</i>	Harris's Hawk	R	S	W
<i>Pernohierax leucorrhous</i>	White-rumped Hawk	R	S	L
<i>Rupornis magnirostris</i>	Roadside Hawk	C	S,M,T,P	W,O,E,L
<i>Buteo albicaudatus</i>	White-tailed Hawk	R	S,P	W,O
<i>Buteo nitidus</i> ⁺	Grey Hawk	R	S	L
<i>Buteo brachyurus</i>	Short-tailed Hawk	R	S,P	L,H
<i>Spizaetus tyrannus</i>	Black Hawk-Eagle	C	S,V,T,P	L,H
<i>Spizaetus melanoleucus</i>	Black-and-white Hawk-Eagle	U	S,V,T,P	L,H
<i>Spizaetus ornatus</i> ⁺	Ornate Hawk-Eagle	R	S	L
FALCONIDAE				
<i>Caracara plancus</i>	Southern Caracara	C	S,V,P	W,O,E
<i>Milvago chimachima</i>	Yellow-headed Caracara	C	S,V,T,P	W,O,E
<i>Milvago chimango</i> ⁺	Chimango Caracara	R	S	L
<i>Herpetotheres cachinnans</i>	Laughing Falcon	F	S,V,T,P	W,O,E
<i>Micrastur ruficollis</i>	Barred Forest Falcon	U	S,V,T,M,P	L,H
<i>Micrastur semitorquatus</i>	Collared Forest Falcon	R	S,V,T,P	E,L
<i>Falco sparverius</i>	American Kestrel	R	S,V,P	O
<i>Falco rufigularis</i>	Bat Falcon	R	S	W,O
<i>Falco femoralis</i>	Aplomado Falcon	U	S	W,O
ARAMIDAE				
<i>Aramus guarauna</i>	Limpkin	U	S,V,P	W
RALLIDAE				
<i>Aramides cajanea</i>	Grey-necked Wood Rail	R	S,V,T	W
<i>Aramides saracura</i>	Slaty-breasted Wood Rail	F	S,V,T	W
<i>Amaurolimnas concolor</i>	Uniform Crane	R	S,V,T	W
<i>Laterallus viridis</i>	Russet-crowned Crane	C	S,V,T	W
<i>Laterallus melanophaius</i>	Rufous-sided Crane	C	S,V,T,P	W
<i>Porzana albicollis</i>	Ash-throated Crane	C	S,V,T,P	W
<i>Pardirallus nigricans</i>	Blackish Rail	C	S,V,P	W
<i>Pardirallus sanguinolentus</i>	Plumbeous Rail	R	S,V,T,P	W
<i>Gallinula chloropus</i>	Moorhen	C	S,V,T,P	W
<i>Gallinula melanops</i>	Spot-flanked Gallinule	R	S,P	W
<i>Porphyrio martinica</i>	Purple Gallinule	C	S,V,T,P	W
HELIORNITHIDAE				
<i>Heliornis fulca</i>	Sungrebe	R	S,P	W
CARIAMIDAE				
<i>Cariama cristata</i>	Red-legged Seriema	R	S,V,P	O
CHARADRIIDAE				
<i>Vanellus chilensis</i>	Southern Lapwing	C	S,V,T,P	W,O
SCOLOPACIDAE				
<i>Gallinago paraguaiae</i>	South American Snipe	R	S,V,T	W
<i>Gallinago undulata</i>	Giant Snipe	C	S,V,T,P	W
<i>Actitis macularius</i> ⁺	Spotted Sandpiper	R	S	W
<i>Tringa solitaria</i> ^m	Solitary Sandpiper	R	S,V,P	W

Species	English name	Abundance	Evidence	Habitat
JACANIDAE				
<i>Jacana jacana</i>	Wattled Jacana	C	S,V,T,P	W
STERNIDAE				
<i>Sterna hirundinacea</i> ⁺	South American Tern	R	S,P	W
COLUMBIDAE				
<i>Columbina minuta</i>	Plain-breasted Ground Dove	R	S,V,T,P	O
<i>Columbina talpacoti</i>	Ruddy Ground Dove	C	S,V,T,M,P	O
<i>Columbina squamata</i>	Scaled Dove	R	S,V,P	W,E
<i>Claravis pretiosa</i>	Blue Ground Dove	R	S,V,P	E
<i>Columba livia</i>	Rock Pigeon	R	S	O
<i>Patagioenas picazuro</i>	Picazuro Pigeon	C	S,V,P	O
<i>Patagioenas cayennensis</i>	Pale-vented Pigeon	R	S,V	O,E
<i>Patagioenas plumbea</i>	Plumbeous Pigeon	R	S,V	L,H
<i>Leptotila verreauxi</i>	White-tipped Dove	C	S,V,T,M	L
<i>Leptotila rufaxilla</i>	Grey-fronted Dove	F	S,V,T	L,H
<i>Geotrygon montana</i>	Ruddy Quail-Dove	U	S,V,T,M	L
PSITTACIDAE				
<i>Primolius maracana</i>	Blue-winged Macaw	R	S,V	E
<i>Aratinga leucophthalma</i>	White-eyed Parakeet	R	S,V	E
<i>Aratinga aurea</i> *	Peach-fronted Parakeet	R	S,P	E
<i>Pyrrhura frontalis</i>	Maroon-bellied Parakeet	C	S,V,T,P	E,L,H
<i>Forpus xanthopterygius</i>	Blue-winged Parrotlet	C	S,V,T,P	E,L,H
<i>Brotogeris tirica</i>	Plain Parakeet	C	S,V,T,P	L,H
<i>Touit melanonotus</i>	Brown-backed Parrotlet	R	S,V	L,H
<i>Touit surdus</i>	Golden-tailed Parrotlet	F	S,V,T	L,H
<i>Pionopsitta pileata</i>	Pileated Parrot	F	S,V,T,P	L,H
<i>Pionus maximiliani</i>	Scaly-headed Parrot	C	S,V,T	L,H
<i>Amazona amazonica</i>	Orange-winged Parrot	U	S,V,P	W,O,E
<i>Amazona aestiva</i> *	Blue-fronted Amazon	R	S	L
<i>Triclaria malachitacea</i>	Blue-bellied Parrot	C	S,V,T,P	L,H
CUCULIDAE				
<i>Piaya cayana</i>	Squirrel Cuckoo	C	S,V,T,M,P	E,L,H
<i>Coccyzus melacoryphus</i>	Dark-billed Cuckoo	R	S,V,P	E
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	R	S,P	E
<i>Coccyzus euleri</i>	Pearly-breasted Cuckoo	R	S,P	E
<i>Crotophaga major</i>	Greater Ani	R	S,V,T,P	W,E
<i>Crotophaga ani</i>	Smooth-billed Ani	C	S,V,T,P	W,O
<i>Guira guira</i>	Guira Cuckoo	C	S,V,T,P	W,O
<i>Tapera naevia</i>	Striped Cuckoo	C	S,V,T,P	W,E
TYTONIDAE				
<i>Tyto alba</i>	Barn Owl	U	S,V,P	O
STRIGIDAE				
<i>Megascops choliba</i>	Tropical Screech Owl	F	S,V,P	E,L
<i>Megascops atricapilla</i>	Variable Screech Owl	U	S,V,T,P	L
<i>Pulsatrix koeniswaldiana</i>	Tawny-browed Owl	C	S,V,T,P	E,L
<i>Strix virgata</i>	Mottled Owl	R	S,V	E,L
<i>Strix huhula</i>	Black-banded Owl	R	S,P	L
<i>Glauclidium minutissimum</i>	Least Pygmy Owl	F	S,V,T,P	H
<i>Glauclidium brasilianum</i>	Ferruginous Pygmy Owl	C	S,V,T,M,P	E,L
<i>Athene cunicularia</i>	Burrowing Owl	C	S,V,T,P	O
<i>Asio clamator</i>	Striped Owl	F	S,V,P	E,L
NYCTIBIIDAE				
<i>Nyctibius aethereus</i>	Long-tailed Potoo	R	S,P	L
<i>Nyctibius griseus</i>	Common Potoo	F	S,V,P	W,E,L
CAPRIMULGIDAE				
<i>Lurocalis semitorquatus</i>	Short-tailed Nighthawk	R	S,V	L
<i>Nyctidromus albicollis</i>	Pauraque	C	S,V,P	E,L
<i>Caprimulgus longirostris</i>	Band-winged Nightjar	R	S,V	W,E
<i>Caprimulgus maculicaudus</i>	Spot-tailed Nightjar	R	S,V	W,O
<i>Hydropsalis torquata</i>	Scissor-tailed Nightjar	R	S,P	W,E

Species	English name	Abundance	Evidence	Habitat
APODIDAE				
<i>Cypseloides fumigatus</i>	Sooty Swift	R	S	L
<i>Streptoprocne zonaris</i>	White-collared Swift	C	S,V,T,P	O,L,H
<i>Streptoprocne biscutata</i>	Biscutate Swift	R	S	L
<i>Chaetura cinereiventris</i>	Grey-rumped Swift	C	S,V,T	L,H
<i>Chaetura meridionalis</i> ^m	Ashy-tailed (Sick's) Swift	C	S,V	E,L
<i>Panyptila cayennensis</i>	Lesser Swallow-tailed Swift	R	S	L
TROCHILIDAE				
<i>Ramphodon naevius</i>	Saw-billed Hermit	C	S,V,T,M,P	L,H
<i>Glaucis hirsutus</i>	Rufous-breasted Hermit	C	S,V,T,M,P	E,L
<i>Phaethornis squalidus</i>	Dusky-throated Hermit	R	S,M,P	L,H
<i>Phaethornis idaliae</i> ⁺	Minute Hermit	R	S,M,P	L
<i>Phaethornis ruber</i>	Reddish Hermit	C	S,V,T,M,P	L,H
<i>Phaethornis pretrei</i>	Planalto Hermit	R	S	H
<i>Phaethornis eurynome</i>	Scale-throated Hermit	F	S,V,P	L,H
<i>Eupetomena macroura</i>	Swallow-tailed Hummingbird	C	S,V,M,P	E,L
<i>Aphantochroa cirrochloris</i>	Sombre Hummingbird	R	S	H
<i>Florisuga fusca</i> ^m	Black Jacobin	C	S,V,M,P	E,L,H
<i>Colibri serrirostris</i>	White-vented Violet-ear	R	S,P	E,L
<i>Anthracothorax nigricollis</i>	Black-throated Mango	R	S	E
<i>Stephanoxis lalandi</i>	Plovercrest			
<i>Lophornis magnificus</i>	Frilled Coquette	U	S,P	L
<i>Chlorostilbon lucidus</i>	Glittering-bellied Emerald	R	S	L
<i>Thalurania glaucopis</i>	Violet-capped Woodnymph	C	S,V,M,P	E,L,H
<i>Hylocharis cyanus</i>	White-chinned Sapphire	F	S,V,P	E
<i>Leucochloris albicollis</i>	White-throated Hummingbird	C	S,V,P	L,H
<i>Amazilia versicolor</i>	Versicoloured Emerald	U	S	L,H
<i>Amazilia fimbriata</i>	Glittering-throated Emerald	C	S,P	E,L
<i>Amazilia lactea</i>	Sapphire-spangled Emerald	F	S	L
<i>Clytolaema rubricauda</i>	Brazilian Ruby	U	S,V,T,P	L,H
<i>Calliphlox amethystina</i>	Amethyst Woodstar	R	S	L
TROGONIDAE				
<i>Trogon viridis</i>	White-tailed Trogon	R	S,V	L
<i>Trogon surrucura aurantius</i>	Surucua Trogon	C	S,V,T,P	L,H
<i>Trogon rufus</i>	Black-throated Trogon	F	S,V,T,P	L
ALCEDINIDAE				
<i>Megaceryle torquata</i>	Ringed Kingfisher	C	S,V,P	W
<i>Chloroceryle amazona</i>	Amazon Kingfisher	F	S,V,P	W
<i>Chloroceryle americana</i>	Green Kingfisher	U	S,V,P	W
MOMOTIDAE				
<i>Baryphthengus ruficapillus</i>	Rufous-capped Motmot	F	S,V,T	L
GALBULIDAE				
<i>Galbula ruficauda</i>	Rufous-tailed Jacamar	C	S,V,T,M,P	E,L
BUCCONIDAE				
<i>Notharchus swainsoni</i>	Buff-bellied Puffbird	R	S,V,T,P	L
<i>Nystalus chacuru</i>	White-eared Puffbird	R	S,V,T,P	O
<i>Malacoptila striata</i>	Crescent-chested Puffbird	C	S,V,T,P	E,L
RAMPHASTIDAE				
<i>Ramphastos toco</i>	Toco Toucan	R	S,V	W,E
<i>Ramphastos vitellinus</i>	Channel-billed Toucan	C	S,V,M,T,P	L,H
<i>Ramphastos dicolorus</i>	Red-breasted Toucan	R	S	L,H
<i>Selenidera maculirostris</i>	Spot-billed Toucanet	C	S,V,T,P	L,H
<i>Pteroglossus bailloni</i>	Saffron Toucanet	U	S,V,T,P	L,H
<i>Pteroglossus aracari</i>	Black-necked Aracari	R	S,V	E
PICIDAE				
<i>Picumnus cirratus</i>	White-barred Piculet	C	S,V,T,P	E,L,H
<i>Melanerpes candidus</i>	White Woodpecker	U	S,V,T	W,O,E
<i>Melanerpes flavifrons</i>	Yellow-fronted Woodpecker	C	S,V,T	L,H
<i>Veniliornis maculifrons</i>	Yellow-eared Woodpecker	C	S,V,T,P	L,H
<i>Picus flavigula</i>	Yellow-throated Woodpecker	C	S,V,T,P	L

Species	English name	Abundance	Evidence	Habitat
<i>Picus aurulentus</i>	Yellow-browed Woodpecker	U	S,V,T,P	H
<i>Colaptes melanochloros</i>	Green-barred Woodpecker	R	S,V,T	W,L,H
<i>Colaptes campestris</i>	Campo Flicker	C	S,V,T,P	O
<i>Ceelus flavescens</i>	Blond-crested Woodpecker	C	S,V,M,P	E,L
<i>Dryocopus lineatus</i>	Lineated Woodpecker	R	S,V,T,P	L,H
THAMNOPHILIDAE				
<i>Hypodaedalus guttatus</i>	Spot-backed Antshrike	C	S,V,T,P	L,H
<i>Batara cinerea</i>	Giant Antshrike	R	S,V,T	L,H
<i>Mackenziaena severa</i>	Tufted Antshrike	C	S,V,T,P	L,H
<i>Biatas nigropectus</i>	White-bearded Antshrike	R	S,V,T	H
<i>Thamnophilus ruficapillus</i>	Rufous-capped Antshrike	R	S,V	E
<i>Thamnophilus palliatus</i>	Chestnut-backed Antshrike	C	S,V,T,P	E
<i>Thamnophilus ambiguus</i>	Sooretama Slaty Antshrike	C	S,V,T,P	E,L
<i>Thamnophilus caerulescens</i>	Variable Antshrike	U	S,V,T,P	H
<i>Dysithamnus stictothorax</i>	Spot-breasted Antwreio	C	S,V,T,P	L
<i>Dysithamnus mentalis</i>	Plain Antwreio	C	S,V,T,P	L,H
<i>Dysithamnus xanthopterus</i>	Rufous-backed Antwreio	R	S,V	H
<i>Thammomanes caesioides</i>	Cinereous Antshrike	R	V	L
<i>Myrmotherula gularis</i>	Star-throated Antwren	C	S,V,T,M,P	L,H
<i>Myrmotherula axillaris</i>	White-flanked Antwren	C	S,V,T,M,P	E,L
<i>Myrmotherula minor</i>	Salvadori's Antwren	U	S,V,T,P	L,H
<i>Myrmotherula unicolor</i>	Unicoloured Antwren	C	S,V,T,M,P	L
<i>Herpilochmus rufimarginatus</i>	Rufous-winged Antwren	C	S,V,T	L
<i>Drymophila ferruginea</i>	Ferruginous Antbird	C	S,V,T,P	L,H
<i>Drymophila rubricollis</i>	Bertoni's Antbird	C	S,V,T,P	H
<i>Drymophila genei</i>	Rufous-tailed Antbird	R	S,P	H
<i>Drymophila ochropyga</i>	Ochre-rumped Antbird	F	S,V,T,P	L,H
<i>Drymophila malura</i>	Dusky-tailed Antbird	C	S,V,T,P	H
<i>Drymophila squamata</i>	Scaled Antbird	C	S,V,T,M,P	L
<i>Terenura maculata</i>	Streak-capped Antwren	C	S,V,T	L,H
<i>Pyrgilena leucoptera</i>	White-shouldered Fire-eye	C	S,V,T,M,P	L,H
<i>Myrmeciza loricata</i>	White-bibbed Antbird	C	S,V,T,M,P	L,H
CONOPOPHAGIDAE				
<i>Conopophaga lineata</i>	Rufous Gnateater	F	S,V,T,P	L,H
<i>Conopophaga melanops</i>	Black-cheeked Gnateater	C	S,V,T,M,P	L
GRALLARIIDAE				
<i>Grallaria varia</i>	Variegated Antpitta	C	S,V,T	L,H
RHYNOCRYPTIDAE				
<i>Psilorhamphus guttatus</i>	Spotted Bamboo-wren	F	S,V,T	H
<i>Merulaxis ater</i>	Slaty Bristlefront	C	S,V,T,P	L,H
<i>Scytalopus notorius</i>	Mouse-coloured Tapaculo	R	S,V	H
FORMICARIIDAE				
<i>Formicarius colma</i>	Rufous-capped Antthrush	C	S,V,T,P	L
<i>Chamaeza campanisoma</i>	Short-tailed Antthrush	F	S,V,T	L,H
<i>Chamaeza meruloides</i>	Cryptic Antthrush	F	S,V,T	H
<i>Chamaeza ruficauda</i>	Rufous-tailed Antthrush	R	S,V,T	H
SCLERURIDAE				
<i>Sclerurus scansor</i>	Rufous-breasted Leaf-tosser	C	S,V, T,M,P	L,H
DENDROCOLAPTIDAE				
<i>Dendrocincla turdina</i>	Thrush-like Woodcreeper	C	S,V,T,M,P	L,H
<i>Sittasomus griseicapillus</i>	Olivaceous Woodcreeper	C	S,V,T,M,P	L,H
<i>Xiphocolaptes albicollis</i>	White-throated Woodcreeper	F	S,V,T	L,H
<i>Dendrocolaptes platyrostris</i>	Planalto Woodcreeper	U	S,V,P	L,H
<i>Xiphorhynchus fuscus</i>	Lesser Woodcreeper	C	S,V,T,M,P	L,H
<i>Lepidocolaptes squamatus</i>	Scaled Woodcreeper	F	S,V,T,P	H
<i>Campylorhamphus falcularius</i>	Black-billed Scythebill	U	S,V,T,P	L,H
FURNARIIDAE				
<i>Furnarius figulus</i>	Wing-banded (Band-tailed) Hornero	C	S,V,T,P	W,O
<i>Furnarius rufus</i>	Rufous Hornero	C	S,V,T,P	W,O
<i>Synallaxis ruficapilla</i>	Rufous-capped Spinetail	F	S,V,T	L,H

Species	English name	Abundance	Evidence	Habitat
<i>Synallaxis cinerascens</i>	Grey-bellied Spinetail	U	S,V,T,P	L
<i>Synallaxis albescens</i>	Pale-breasted Spinetail	R	S,V,T,P	W
<i>Synallaxis spixi</i>	Spix's Spinetail	U	S,V,T	E,L
<i>Cranioleuca pallida</i>	Pallid Spinetail	F	S,V,T	H
<i>Certhiaxis cinnamomeus</i>	Yellow-chinned Spinetail	C	S,V,T,P	W
<i>Phacelodorus rufifrons</i>	Rufous-fronted Thornbird	C	S,V,T	O
<i>Phacelodorus erythrophthalmus</i>	Red-eyed Thornbird	C	S,V,P	H
<i>Anabacethia amaroitis</i>	White-browed Foliage-gleaner	F	S,V,T	H
<i>Syndactyla rufosuperciliata</i>	Buff-browed Foliage-gleaner	F	S,V,T	H
<i>Philydor lichtensteini</i>	Ochre-breasted Foliage-gleaner	F	S,V,P	L,H
<i>Philydor atricapillus</i>	Black-capped Foliage-gleaner	C	S,V,M,P	L,H
<i>Philydor rufum</i>	Buff-fronted Foliage-gleaner	C	S,V,T	L,H
<i>Anabazensops fuscus</i>	White-collared Foliage-gleaner	C	S,V,T	H
<i>Cichlocolaptes leucophrus</i>	Pale-browed Treehunter	F	S,V,T,P	L,H
<i>Automolus leucophthalmus</i>	White-eyed Foliage-gleaner	C	S,V,T,M,P	L,H
<i>Lochmias nematura</i>	Sharp-tailed Streamcreeper	U	S,V,T,M,P	L,H
<i>Heliobletus contaminatus</i>	Sharp-billed Treehunter	F	S,V,P	H
<i>Xenops minutus</i>	Plain Xenops	C	S,V,T,P	L,H
<i>Xenops rutilans</i>	Streaked Xenops	C	S,V,P	L,H
TYRANNIDAE				
<i>Mionectes oleagineus</i>	Ochre-bellied Flycatcher	C	S,V,T,M,P	E,L
<i>Mionectes rufiventris</i>	Grey-hooded Flycatcher	C	S,V,T,M,P	L,H
<i>Leptopogon amaurocephalus</i>	Sepia-capped Flycatcher	C	S,V,T,M,P	L,H
<i>Corythopis delalandi</i>	Southern Antpipit	C	S,V,T,M,P	L
<i>Hemitriccus diops</i>	Drab-breasted Bamboo Tyrant	C	S,V,T,P	H
<i>Hemitriccus orbitatus</i>	Eye-ringed Tody-Tyrant	C	S,V,T,M,P	L
<i>Hemitriccus nidipendulus</i>	Hangnest Tody-Tyrant	R	S,V,P	E,L
<i>Myiornis auricularis</i>	Eared Pygmy Tyrant	F	S,V,T,P	E,L
<i>Poecilotriccus plumbeiceps</i>	Ochre-faced Tody-Tyrant	F	S,V,T,P	L,H
<i>Todirostrum poliocephalum</i>	Yellow-lored Tody-Flycatcher	C	S,V,T,P	E
<i>Todirostrum cinereum</i>	Common Tody-Flycatcher	C	S,V,T,P	W,E
<i>Phyllomyias burmeisteri</i>	Rough-legged Tyrannulet	F	S,V,T,P	L,H
<i>Phyllomyias virescens</i>	Greenish Tyrannulet	U	S,V,P	H
<i>Phyllomyias fasciatus</i> ^m	Planalto Tyrannulet	C	S,V,T,P	L,H
<i>Phyllomyias griseocapilla</i>	Grey-capped Tyrannulet	R	S,V,T,P	L,H
<i>Myiopagis viridicata</i>	Greenish Elaenia	R	S,V,T,P	E
<i>Elaenia flavogaster</i>	Yellow-bellied Elaenia	C	S,V,T,P	W,O,E
<i>Elaenia parvirostris</i> ^m	Small-billed Elaenia	R	S,V,P	E
<i>Elaenia mesoleuca</i> ^m	Olivaceous Elaenia	R	V	H
<i>Ornithion inerne</i>	White-lored Tyrannulet	R	S,V	L
<i>Camptostoma obsoletum</i>	Southern Beardless Tyrannulet	C	S,V,T,P	E,L
<i>Serpophaga nigricans</i>	Sooty Tyrannulet	R	S,P	W
<i>Serpophaga subcristata</i>	White-crested Tyrannulet	R	S	E
<i>Capsiempis flaveola</i>	Yellow Tyrannulet	C	S,V,T,P	E,L,H
<i>Phylloscartes ventralis</i>	Mottled-cheeked Tyrannulet	C	S,V,T	H
<i>Phylloscartes paulista</i>	São Paulo Tyrannulet	R	S	L
<i>Phylloscartes oustaleti</i>	Oustalet's Tyrannulet	F	S,V,T,P	H
<i>Phylloscartes difficilis</i>	Serra do Mar Tyrannulet	R	S,V,P	H
<i>Tolmomyias sulphurescens</i>	Yellow-olive Flycatcher	C	S,V,T,P	L,H
<i>Tolmomyias flaviventris</i>	Yellow-breasted Flycatcher	F	S,V,T,P	E
<i>Platyrinchus mystaceus</i>	White-throated Spadebill	C	S,V,T,P	L,H
<i>Platyrinchus leucoryphus</i>	Russet-winged Spadebill	U	S,V,T,P	L,H
<i>Myiophobus fasciatus</i>	Bran-coloured Flycatcher	F	S,V,T,P	W,O
<i>Myiobius barbatus</i>	Sulphur-rumped Flycatcher	F	S,V,M,P	L,H
<i>Myiobius atricaudus</i>	Black-tailed Flycatcher	U	S,P	H
<i>Hirundinea ferruginea</i>	Cliff Flycatcher	U	S,V,T,P	L,H
<i>Lathrotriccus eulerei</i>	Euler's Flycatcher	C	S,V,T,M,P	L,H
<i>Cnemotriccus fuscatus</i>	Fuscous Flycatcher	U	S,V,T,P	E
<i>Contopus cooperi</i>	Olive-sided Flycatcher	R	S	L
<i>Contopus cinereus</i>	Tropical Pewee	F	S,V,T,P	L,H

Species	English name	Abundance	Evidence	Habitat
<i>Pyrocephalus rubinus</i>	Vermilion Flycatcher	R	S,P	W,O
<i>Knipolegus cyanirostris</i>	Blue-billed Black Tyrant	R	S,P	L,H
<i>Knipolegus lophotes</i>	Crested Black Tyrant	R	S	O
<i>Knipolegus nigerrimus</i>	Velvety Black Tyrant	R	S	H
<i>Satrapa icterophrys</i>	Yellow-browed Tyrant	U	S,P	W,O
<i>Xolmis cinereus</i>	Grey Monjita	U	S,P	O
<i>Xolmis velatus</i>	White-rumped Monjita	U	S,P	O
<i>Gubernetes yetapa</i>	Streamer-tailed Tyrant	R	S,V,P	W
<i>Muscipipra vetula</i>	Shear-tailed Grey Tyrant	F	S,V,T,P	H
<i>Fluvicola nengeta</i>	Masked Water Tyrant	C	S,V,T,P	W
<i>Arundinicola leucocephala</i>	White-headed Marsh Tyrant	C	S,V,T,P	W
<i>Colonia colonus</i>	Long-tailed Tyrant	U	S,V,T,P	L,H
<i>Machetornis rixosa</i>	Cattle Tyrant	C	S,V,T,P	O
<i>Legatus leucophaeus</i> ^m	Piratic Flycatcher	C	S,V,T	L
<i>Myiozetetes cayanensis</i>	Rusty-margined Flycatcher	R	S,V,T,P	W,E
<i>Myiozetetes similis</i>	Social Flycatcher	C	S,V,T,P	W,E,L
<i>Pitangus sulphuratus</i>	Great Kiskadee	C	S,V,T,P	W,O,E
<i>Conopias trivirgatus</i>	Three-striped Flycatcher	R	S	L
<i>Myiodynastes maculatus</i>	Streaked Flycatcher	C	S,V,T,P	L,H
<i>Megarhynchus pitangua</i>	Boat-billed Flycatcher	C	S,V,T,P	E,L,H
<i>Empidonomus varius</i> ^m	Variegated Flycatcher	F	S,V,P	W,E,L
<i>Tyrannus melancholicus</i> ^m	Tropical Kingbird	C	S,V,T,P	W,O,E
<i>Tyrannus savana</i> ^m	Fork-tailed Flycatcher	F	S,V,P	W,O
<i>Rhytipterna simplex</i>	Greyish Mourner	F	S,V,T,M,P	L
<i>Sirystes sibilator</i> ^m	Sirystes	R	S,V,P	L,H
<i>Myiarchus tuberculifer</i>	Dusky-capped Flycatcher	R	S,V,T	L
<i>Myiarchus swainsoni</i>	Swainson's Flycatcher	R	S,V	L
<i>Myiarchus ferox</i>	Short-crested Flycatcher	C	S,V,T,P	W,E
<i>Ramphotrigon megacephalum</i>	Large-headed Flatbill	R	S,V,T,P	L,H
<i>Attila rufus</i>	Grey-hooded Attila	C	S,V,T,P	L,H
COTINGIDAE				
<i>Phibalura flavirostris</i> ^m	Swallow-tailed Cotinga	R	S,P	L,H
<i>Carpornis cucullata</i>	Hooded Berryeater	U	S,V,T,P	L,H
<i>Procnias nudicollis</i> ^m	Bare-throated Bellbird	C	S,V,T,P	L,H
<i>Tijuca atra</i>	Black-and-gold Cotinga	U	S,V,T	H
<i>Pyroderus scutatus</i>	Red-ruffed Fruitcrow	R	S,P	L
PIPRIDAE				
<i>Piprites chloris</i>	Wing-barred Piprites	R	S,V,T	L
<i>Ilicura militaris</i>	Pin-tailed Manakin	C	S,V,T,M,P	L,H
<i>Machaeropterus regulus</i>	Eastern Striped Manakin	U	S,V,T,P	L
<i>Manacus manacus</i>	White-bearded Manakin	C	S,V,T,M,P	E,L
<i>Chiroxiphia caudata</i>	Swallow-tailed (Blue) Manakin	C	S,V,T,M,P	E,L,H
TITYRIDAE				
<i>Oxyruncus cristatus</i>	Sharpbill	F	S,V,T	L,H
<i>Schiffornis virescens</i>	Greenish Schiffornis	F	S,V,T,P	L,H
<i>Schiffornis turdina</i>	Thrush-like Schiffornis	R	S,V,T	L
<i>Lanius elegans</i>	Elegant Mourner	F	S,V,T,P	L,H
<i>Tityra inquisitor</i>	Black-crowned Tityra	R	S	L
<i>Tityra cayana</i>	Black-tailed Tityra	R	S,V,P	L
<i>Pachyramphus viridis</i>	Green-backed Becard	R	S,V,P	L
<i>Pachyramphus castaneus</i>	Chestnut-crowned Becard	C	S,V,T,P	L,H
<i>Pachyramphus polychopterus</i>	White-winged Becard	C	S,V,T,P	E,L
<i>Pachyramphus marginatus</i>	Black-capped Becard	C	S,V,T,P	L
<i>Pachyramphus validus</i>	Crested Becard	F	S,V,P	E,L
VIREONIDAE				
<i>Cydarhis gujanensis</i>	Rufous-browed Peppershrike	C	S,V,T,P	L,H
<i>Vireo olivaceus</i>	Red-eyed Vireo	C	S,V,T,M,P	L,H
<i>Hylophilus poicilotis</i>	Rufous-crowned Greenlet	F	S,V,P	H
<i>Hylophilus thoracicus</i>	Lemon-chested Greenlet	C	S,V,T,P	E

Species	English name	Abundance	Evidence	Habitat
CORVIDAE				
<i>Cyanocorax cristatellus</i>	Curl-crested Jay	R	S,V,P	W,O
HIRUNDINIDAE				
<i>Pygochelidon cyanoleuca</i>	Blue-and-white Swallow	C	S,V,P	O,E
<i>Atticora tibialis</i>	White-thighed Swallow	U	S,V	L
<i>Stelgidopteryx ruficollis</i>	Southern Rough-winged Swallow	C	S,V,P	W,O,E
<i>Progne tapera</i>	Brown-chested Martin	C	S,V,T,P	W,O
<i>Progne chalybea</i> ^m	Grey-breasted Martin	C	S,P	O
<i>Tachycineta leucorrhoa</i> ^m	White-rumped Swallow	F	S,V,T,P	W,O
<i>Hirundo rustica</i> ^m	Barn Swallow	R	S	O
TROGLODYTIDAE				
<i>Troglodytes musculus</i>	House Wren	C	S,V,T,P	W,O,E
<i>Pheugopedius genibarbis</i>	Moustached Wren	F	S,V,T,P	E
<i>Cantorchilus longirostris</i>	Long-billed Wren	C	S,V,T,M,P	E,L
DONACOBIIDAE				
<i>Donacobius atricapilla</i>	Black-capped Donacobius	F	S,V,T,P	W
POLIOPTILIDAE				
<i>Ramphocaenus melanurus</i>	Long-billed Gnatwren	R	S,V	H
TURDIDAE				
<i>Turdus flavipes</i> ^m	Yellow-legged Thrush	C	S,V,T,P	L,H
<i>Turdus rufigentris</i>	Rufous-bellied Thrush	C	S,V,T,M,P	E,L
<i>Turdus leucomelas</i>	Pale-breasted Thrush	C	S,V,T,P	L,H
<i>Turdus amaurochalinus</i> ^m	Creamy-bellied Thrush	C	S,V,T,M,P	E
<i>Turdus subalaris</i> ^m	Eastern Slaty Thrush	R	S,V,P	L
<i>Turdus albicollis</i> ^m	White-necked Thrush	C	S,V,T,M,P	L,H
MIMIDAE				
<i>Mimus saturninus</i>	Chalk-browed Mockingbird	C	S,V,T,P	W,O,E
MOTACILLIDAE				
<i>Anthus lutescens</i>	Yellowish Pipit	C	S,V,T,P	O
<i>Anthus hellmayri</i>	Hellmayr's Pipit	F	S,V,T,P	H
COEREBIDAE				
<i>Coereba flaveola</i>	Bananaquit	C	S,V,T,P	E,L,H
THRAUPIDAE				
<i>Saltator fuliginosus</i>	Black-throated Grosbeak	C	S,V,T,P	L,H
<i>Saltator maximus</i>	Buff-throated Saltator	C	S,V,T,P	E,L
<i>Saltator similis</i>	Green-winged Saltator	F	S,V,T,P	L,H
<i>Orchesticus abeillei</i>	Brown Tanager	F	S,V,T,P	H
<i>Schistochlamys ruficapillus</i>	Cinnamon Tanager	R	S,V	H
<i>Cissopis leverianus</i>	Magpie Tanager	R	S,V,P	H
<i>Nemosia pileata</i>	Hooded Tanager	C	S,V,T,P	E
<i>Orthogonys chloricterus</i>	Olive-green Tanager	F	S,V,T,P	L,H
<i>Pyrrhocomma ruficeps</i>	Chestnut-headed Tanager	R	S	L,H
<i>Trichothraupis melanops</i>	Black-goggled Tanager	C	S,V,T,P	L,H
<i>Tachyphonus cristatus</i>	Flame-crested Tanager	C	S,V,T,M,P	L
<i>Tachyphonus coronatus</i>	Ruby-crowned Tanager	F	S,V,T,M,P	L,H
<i>Ramphocelus bresilius</i>	Brazilian Tanager	C	S,V,T,M,P	E,L
<i>Thraupis sayaca</i>	Sayaca Tanager	C	S,V,T,P	E
<i>Thraupis cyanoptera</i>	Azure-shouldered Tanager	F	S,V,T,P	L,H
<i>Thraupis ornata</i>	Golden-chevroned Tanager	C	S,V,T,P	L,H
<i>Thraupis palmarum</i>	Palm Tanager	C	S,V,T,P	E,L
<i>Pipraeidea melanonota</i>	Fawn-breasted Tanager	R	S,V,P	E,L
<i>Tangara brasiliensis</i>	White-bellied Tanager	C	S,V,T,P	E,L
<i>Tangara seledon</i>	Green-headed Tanager	C	S,T,M,P	L
<i>Tangara cyanocephala</i>	Red-necked Tanager	F	S,V,T,M,P	L,H
<i>Tangara desmaresti</i>	Brassy-breasted Tanager	F	S,V,T,P	L,H
<i>Tangara cyanoventris</i>	Gilt-edged Tanager	R	S	L
<i>Tangara cayana</i>	Burnished-buff Tanager	C	S,V,P	E
<i>Tangara peruviana</i> [†]	Black-backed Tanager	R	S	E,L
<i>Tersina viridis</i> ^m	Swallow Tanager	F	S,V,T,P	E,L
<i>Dacnis nigripes</i> ^m	Black-legged Dacnis	U	S,V,T,P	E,L

Species	English name	Abundance	Evidence	Habitat
<i>Dacnis cayana</i>	Blue Dacnis	C	S,V,T,P	E,L,H
<i>Cyanerpes cyaneus</i>	Red-legged Honeycreeper	R	S,V,T,P	E,L
<i>Hemithraupis ruficapilla</i>	Rufous-headed Tanager	C	S,V,T,P	L,H
<i>Hemithraupis flavicollis</i>	Yellow-backed Tanager	C	S,V,T,P	E,L
<i>Conirostrum speciosum</i>	Chestnut-vented Conebill	C	S,V,T,P	E,L
EMBERIZIDAE				
<i>Zonotrichia capensis</i>	Rufous-collared Sparrow	R	S,V,T,P	O,E
<i>Ammodramus humeralis</i>	Grassland Sparrow	C	S,V,T,P	O,E
<i>Haplospiza unicolor</i> ^m	Uniform Finch	F	S,V,T,M,P	L,H
<i>Sicalis flaveola</i>	Saffron Finch	C	S,V,T,P	O,E
<i>Emberizoides herbicola</i>	Wedge-tailed Grass Finch	F	S,V,T,P	O,E
<i>Volatinia jacarina</i>	Blue-black Grassquit	C	S,V,T,P	O
<i>Sporophila frontalis</i> ^m	Buffy-fronted Seedeater	U	S,V,T,P	L,H
<i>Sporophila falcirostris</i> ^m	Temminck's Seedeater	U	S,V,T	L,H
<i>Sporophila lineola</i> ^m	Lined Seedeater	C	S,V,T,P	O,E
<i>Sporophila nigricollis</i>	Yellow-bellied Seedeater	U	S,P	O
<i>Sporophila caeruleascens</i> ^m	Double-collared Seedeater	C	S,V,T,P	O
<i>Sporophila leucoptera</i>	White-bellied Seedeater	F	S,V,T,P	O,E
<i>Sporophila angolensis</i>	Chestnut-bellied Seed Finch	R	S,V,T	W,O,E
<i>Tiaris fuliginosus</i>	Sooty Grassquit	U	S,V,T,P	L,H
<i>Arremon semitorquatus</i>	Half-collared Sparrow	R	S,V,T	H
<i>Coryphospingus pileatus</i>	Pileated Finch	F	S,V,T,P	W,O,E
<i>Paroaria dominicana</i> [*]	Red-cowled Cardinal	R	S,V,P	O
CARDINALIDAE				
<i>Habia rubica</i>	Red-crowned Ant Tanager	C	S,V,T,M,P	L,H
<i>Caryothraustes canadensis</i>	Yellow-green Grosbeak	C	S,V,T,P	L
PARULIDAE				
<i>Parula pitiayumi</i>	Tropical Parula	C	S,V,T,P	L
<i>Dendroica striata</i> ^m	Blackpoll Warbler	R	S,P	E
<i>Geothlypis aequinoctialis</i>	Masked Yellowthroat	U	S,V,T,P	W,E
<i>Basileuterus culicivorus</i>	Golden-crowned Warbler	C	S,V,T,P	L,H
<i>Basileuterus leucoblepharus</i>	White-browed Warbler	F	S,V,T,P	H
<i>Phaeothlypis rivularis</i>	Neotropical River Warbler	R	S,V	L
ICTERIDAE				
<i>Psarocolius decumanus</i>	Crested Oropendola	R	S,V,P	L,H
<i>Cacicus haemorrhous</i>	Red-rumped Cacique	C	S,V,T,P	L,H
<i>Gnorimopsar chopi</i>	Chopi Blackbird	F	S,V,T,P	W,O
<i>Chrysomus ruficapillus</i>	Chestnut-capped Blackbird	C	S,V,T,P	W
<i>Molothrus oryzivorus</i>	Giant Cowbird	R	S,V,T,P	O,E
<i>Molothrus bonariensis</i>	Shiny Cowbird	R	S,V,P	O
<i>Sturnella supercilialis</i> ^m	White-browed Blackbird	C	S,V,P	O
FRINGILLIDAE				
<i>Sporaga magellanica</i> ^m	Hooded Siskin	R	S,V,T,P	O
<i>Euphonia chlorotica</i>	Purple-throated Euphonia	C	S,V,T,P	E
<i>Euphonia violacea</i>	Violaceous Euphonia	C	S,V,T,M,P	E,L
<i>Euphonia chalybea</i>	Green-chinned Euphonia	U	S,V,T,P	H
<i>Euphonia cyanocephala</i>	Golden-rumped Euphonia	R	S,V,P	L,H
<i>Euphonia xanthogaster</i>	Orange-bellied Euphonia	C	S,V,T,M,P	E,L
<i>Euphonia pectoralis</i>	Chestnut-bellied Euphonia	C	S,V,T,P	L,H
<i>Chlorophonia cyanea</i>	Blue-naped Chlorophonia	F	S,V,T,P	E,L,H
ESTRILDIDAE				
<i>Estrilda astrild</i>	Common Waxbill	F	S,V,P	O
PASSERIDAE				
<i>Passer domesticus</i>	House Sparrow	U	S,V	O

but comparatively few epiphytes. Patches of old banana groves and scattered jackfruit *Artocarpus jaca* are testimony to recent cultivation. Damp areas along creeks and in low-lying bowls possess dense Maranthaceae and banana-like *Heliconia* that attract hummingbirds. Higher, forest epiphytes, especially bromeliads, become much more common and there are more Myrtaceae, Sapotaceae and Lauraceae, indicative of more mature forest, as well as scattered very large *Cariniana estrellensis* trees. Above 600 m the forest is much like mature Atlantic Forest elsewhere. Bamboo thickets (especially a large *Guadua* sp.) are common only above 600 m, with only scattered plants in lower areas.

Higher elevation areas (above 900 m) are accessed from the northern edge of the Serra dos Órgãos massif, via Nova Friburgo and Teresópolis and local properties like Fazenda Campestre (22°21'42.50"S 42°40'30.77"E), and from there walking to REGUA through the forest. This area is the source of most high-elevation species. Another higher elevation site, recently incorporated into REGUA, is Casa do Waldenoor (22°25'14.22"S 42°49'00.30"W), near Teresópolis.

The main study sites were the trails leading to and around the research quarters (22°25'14.5"S 42°44'19.3"W; 90 m), Casa do Aníbal (22°24'47.8"S 42°45'17.6"W; 60–355 m), the Green Trail (22°22'52.8"S 42°43'34.7"W; 170–1,300 m), Red Trail (22°23'27.7"S 42°44'22.8"W; 400–950 m), Orange Trail (22°23'03.8"S 42°43'47.7"W), Blue Trail (22°24'22.8"S 42°44'37.8"W; 80–615 m) and the wetlands near the lodge of Vila São José (22°26'52"S 42°46'14"W). A brief description of these follows.

Green Trail: one of the most important and frequently covered, with a length of 4.8 km, starting at the Casa de Pesquisa and cutting a transect from 130 to 1,300 m. Up to 500 m the forest is old second growth with few palms and epiphytes. Above 500 m older, primary-looking forest appears, especially at 600–800 m. There are pockets with large trees >30 m, many *Euterpe edulis* palms, epiphytes and giant bamboos *Guadua* spp.

Red Trail: this cuts through some of the best forest in the reserve, and is a branch of the Green Trail. With a length of 3.3 km at elevations of 400–900 m, the lower montane forest along the trail has many trees >25 m laden with epiphytes, and many palms. Above 700 m the understorey is rich in *Guadua* bamboos, and at 800–900 m to the hilltops there is elfin forest clad in epiphytes such as orchids.

Blue Trail: a branch of the Green Trail, with a length of 4.2 km and a gradient of 80–615 m. Below 500 m the second-growth forest is dominated by legumes, has few palms and epiphytes but many old banana orchards. Higher, the forest is much

better, with trees >25 m, some quite large. *Euterpe* palms are common as well as epiphytes. The highest stretch, at c.600 m, cuts through *Chusquea* bamboo thickets.

Casa do Aníbal: one of the best areas for lowland species. The trail cuts a transect of 2.8 km at 60–350 m, with second-growth forest <80 years old but very few epiphytes and *Euterpe* palms.

Wetland: in 2004 a project aiming to restore the wetlands commenced and this site was created. It is located in the lowest part of the reserve, at c.30 m, and is surrounded by pasture being planted with native trees or secondary forest edge.

Part of the survey was undertaken along the Red Trail, at 600–900 m, during a period when the common giant bamboos (*Guadua* spp.) were seeding, attracting the specialist Buffy-fronted *Sporophila frontalis* and Temminck's Seedeaters *S. falcirostris*. Another area of special attention was the wetland, where monitoring was deemed important, as was the 'antwren trail', near the Casa de Pesquisa, where Rio de Janeiro Antwrens were reportedly recorded. Other sites around the headquarters (younger forest and edge) were also surveyed.

The first bird list for REGUA was compiled during the 1990s by S. Knapp and A. Foster, who made extensive observations and mist-netted over the entire altitudinal gradient, and observed or photographed species not reported since, e.g. Chilean Flamingo *Phoenicopterus chilensis* and Minute Hermit *Phaethornis idaliae*. Subsequently, FO surveyed birds on 5–10 October (Casa de Pesquisa and Casa de Maria) and 9–16 November 2003 (the same), and on 31 May–8 June 2004 (all sites). LP has made observations in the area since November 2005, this paper presenting his results prior to May 2008. His total effort sums c.1,620 field hours.

Surveys were undertaken from dawn to about noon, and in late afternoon before sunset. Bird vocalisations were documented using a Sony TCM-EV5000 tape-recorder and a Sennheiser ME67 microphone. Reference recordings were used to locate selected species through playback. Whenever possible birds were documented with photographs and sound-recordings, the latter being available at <http://www.xeno-canto.org> (cited as XC hereafter).

During October–November 2003 mist-nets were placed along the trail near the Casa de Pesquisa where Rio de Janeiro Antwrens² had been reportedly seen, in an attempt to document the species. Fifteen 10-m nets were placed for two days in October and thirty on two days in November. Another ten mist-nets were used on one day near Casa de Maria in November. Trapped birds were photographed and released.



Figure 1. Black Hawk-Eagle *Spizaetus tyrannus*, Reserva Ecológica Guapiaçu, Rio de Janeiro, south-east Brazil, August 2007 (Leonardo Pimentel)

Figure 2. Male White-bearded Antshrike *Biatas nigropectus*, Reserva Ecológica Guapiaçu, Rio de Janeiro, south-east Brazil, August 2010 (Leonardo Pimentel)



Figure 3. Male Salvadori's Antwren *Myrmotherula minor*, Reserva Ecológica Guapiaçu, Rio de Janeiro, south-east Brazil, May 2008 (Leonardo Pimentel)

Figure 4. Female Slaty Bristlefront *Merulaxis ater*, Reserva Ecológica Guapiaçu, Rio de Janeiro, south-east Brazil, September 2009 (Leonardo Pimentel)

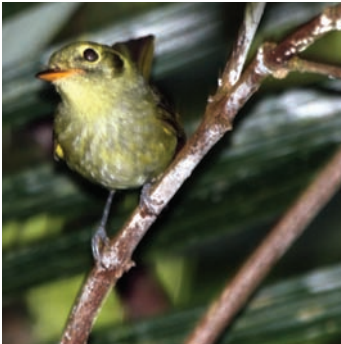


Figure 5. Oustalet's Tyrannulet *Phylloscartes oustaleti*, Reserva Ecológica Guapiaçu, Rio de Janeiro, south-east Brazil, August 2007 (Leonardo Pimentel)

Figure 6. Russet-winged Spadebill *Platyrinchus leucoryphus*, Reserva Ecológica Guapiaçu, Rio de Janeiro, south-east Brazil, October 2007 (Leonardo Pimentel)

Figure 7. Elegant Mourner *Laniisoma elegans*, Reserva Ecológica Guapiaçu, Rio de Janeiro, south-east Brazil, October 2007 (Leonardo Pimentel)

Results and Discussion

A total of 453 bird species has been recorded at REGUA, 443 by us. The cumulative list for REGUA includes birds documented by other observers, such as Minute Hermit *Phaethornis idaliae* and

Rufous-tailed Antbird *Drymophila genei* (both photographed) but not recently. This remarkable total owes much to the dramatic altitudinal gradient and habitat diversity of the area, and the large forest in the adjoining Três Picos State Park.

The presence of wetlands surrounded by young second growth adds to species richness. Some 114 species use the wetlands, most of them restricted to that habitat. Some (Wing-banded Hornero *Furnarius figulus* and Masked Water Tyrant *Fluvicola nengeta*) are recent colonisers that appeared only during the most recent decades^{15,21}. The same appears true of a few open-country species such as Whistling Heron *Syrigma sibilatrix* and Rufous-fronted Thornbird *Phacelodomus rufifrons*. Deforestation has permitted species such as Toco Toucan *Ramphastos toco*, Curl-crested Jay *Cyanocorax cristatellus* and Pale-breasted Spinetail *Synallaxis albenscens* to invade the environs of the reserve. The record of a pair of Blue-fronted Amazon *Amazona aestiva* certainly refers to escapees, but this species has become established and nests in other parts of south-east Brazil (even in São Paulo city¹¹).

Other species such as Magnificent Frigatebird *Fregata magnificens*, Black-bellied Whistling Duck *Dendrocygna autumnalis*, *Phoenicopterus chilensis* and South American Tern *Sterna hirundinacea* are stragglers from Guanabara Bay, where the first two and last-named are common (A. Aroeira *in litt.* 2009), while the flamingo has been recorded several times²⁰.

The results show an obvious bias to lower elevation areas where most effort was expended. It is probable that many species recorded to date only in the lowlands will be found higher (especially raptors), while more time spent in montane forest and bamboo thickets will produce additional species.

REGUA lies at the southernmost tip of the range of several species of Amazonian affinity that occur in the northern Atlantic Forest lowlands¹⁷. These include White-flanked Antwren *Myrmotherula axillaris luctuosa*, Sooretama Slaty Antshrike *Thamnophilus ambiguus*, Cinereous Antshrike *Thamnomanes caesi*, White-lored Tyrannulet *Ornithion inerme*, Ochre-bellied Flycatcher *Mionectes oleagineus*, Dusky-capped Flycatcher *Myiarchus tuberculifer*, Eastern Striped Manakin *Machaeropterus regulus*, White-bellied Tanager *Tangara brasiliensis*, Yellow-green Grosbeak *Caryothraustes canadensis* and Orange-bellied Euphonia *Euphonia xanthogaster*. Other lowland species include Orange-winged Parrot *Amazona amazonica*, which is common around Rio de Janeiro city and at Poços das Antas Biological Reserve.

REGUA harbours several species of conservation concern, mostly Near Threatened taxa or birds considered threatened in the state of Rio de Janeiro. It should be noted that the populations of some species found at REGUA and elsewhere around the Serra dos Órgãos (e.g. Unicoloured Antwren *Myrmotherula unicolor*, Spot-breasted Antwren *Dysithamnus stictothorax* and Eye-ringed

Tody-Tyrant *Hemitriccus orbitatus*) contributed to their being downlisted by BirdLife International⁴.

As might be expected, following prolonged human impact, several species appear to be locally extinct and others no longer breed. Among the latter, we recorded a single Crested Oropendola *Psarocolius decumanus*, which species has been occasionally recorded along the rio Macacu, near REGUA¹⁴, and may be recolonising the region.

Locally extinct species include Red-billed Curassow *Crax blumenbachii*, Black-fronted Piping Guan *Aburria jacutinga* (all but extinct in Rio de Janeiro except, perhaps, near the border with São Paulo¹⁷), Yellow-legged Tinamou *Crypturellus noctivagus* (considered extinct in Rio de Janeiro¹), Little Tinamou *C. soui* (another lowland bird still found at União and Poço das Antas biological reserves; J. F. Pacheco *in litt.* 2009), Variegated Tinamou *C. variegatus* (apparently extinct in Rio de Janeiro but recorded from lower areas around Cachoeiras de Macacu in the late 1960s^{11,17}) and Blue-headed Parrot *Pionus menstruus reichenowi* (probably extinct in Rio de Janeiro¹). Solitary Tinamou *Tinamus solitarius* is still present above 600 m, but is apparently unknown in the lowlands¹⁴. REGUA is promoting the reintroduction of Red-billed Curassow and Black-fronted Piping Guan^{1,2}, and plans to do likewise with the extinct tinamou and to augment the depleted population of Solitary Tinamou.

These 'missing' birds (and mammals such as Brazilian Tapir *Tapirus terrestris* and White-lipped Peccary *Tayassu pecari*) are poached, showing the impact this activity has on sensitive species, especially those restricted to low elevations. Human persecution may also account for the absence or extreme rarity of cagebirds such as Chestnut-bellied Seed Finch *Sporophila angolensis*, Rusty-collared Seedeater *S. collaris* and Ultramarine Grosbeak *Cyanocopsa brissonii*. Reintroductions and translocations could restore all of these species.

Continuous protection is needed to guarantee populations of species currently uncommon (such as guans and Solitary Tinamou) to increase and, eventually, to reintroduce some of the 'lost' species.

Selected species accounts

Solitary Tinamou *Tinamus solitarius* Uncommon throughout Rio de Janeiro, where considered threatened¹. In the reserve, found only above 500 m, where rare. On 10 October 2008 one observed on the Red Trail following playback, while a nest with four eggs found on 15 November 2007 was predated. Captive-bred birds have been released at lower elevations since early 2009. A globally Near Threatened species⁴.

Bicoloured Hawk *Accipiter bicolor* Not previously recorded in the Serra dos Órgãos¹⁴. Rare with only

two records: one seen perched at 15 m on a *Cecropia* near Casa do Aníbal, on 10 November 2006, and, more recently, one was seen on 15 October 2007, on the São José Trail.

White-necked Hawk *Leucopternis lacernulatus* Found only in the lower part of the reserve, with records year-round, sometimes following army ant swarms. One seen perched low (c.2 m) along the trail to Casa de Maria on 7 October 2003. A large half-eaten *Leptodactylus* frog found nearby was a potential prey. This globally Vulnerable species⁴ seems commonest at lower elevations but does occur higher such as in the outskirts of São Paulo city. A lone Mantled Hawk *L. polionotus* (Near Threatened) was recorded along the same trail on 8 June 2004.

Mantled Hawk *Leucopternis polionotus* Fairly common throughout the reserve, with most observations of soaring birds. Also seen following army ant swarms and catching large insects such as cockroaches. Considered Near Threatened in Rio de Janeiro¹ and globally³. Tape-recorded (XC13726).

Crowned Eagle *Harpyhaliaetus coronatus* Rare in the Serra dos Órgãos, where associated with montane grassland¹⁴. Recorded once, on 5 June 2007, when a pair was observed soaring low above forest until mobbed by a Black-and-white Hawk-Eagle *Spizaetus melanoleucus*. Tape-recorded (XC14006). The Museu de Zoologia da Universidade de São Paulo has two juveniles collected near Rio de Janeiro (Niterói) suggesting dispersal to lower areas. A globally threatened species⁴.

Black Hawk-Eagle *Spizaetus tyrannus* Perhaps the commonest large raptor in the reserve and over much of the southern Atlantic Forest. Detected by its conspicuous calls almost daily in higher areas of REGUA, and commonly seen soaring over lower parts (Fig. 1). Records of juveniles suggest breeding in the area. Considered probably threatened in Rio de Janeiro¹. Tape-recorded (XC14001, XC13981).

Black-and-white Hawk-Eagle *Spizaetus melanoleucus* Recorded throughout the reserve, most frequently in the second half of the year. A pair seen soaring with a Grey-headed Kite *Leptodon cayanensis* on 15 November 2003 at the start of the trail to Casa de Maria and three soaring low over forest in October 2007. Usually at low density and uncommon throughout the Atlantic Forest, it is considered Vulnerable in Rio de Janeiro¹.

Brown-backed Parrotlet *Touit melanonotus* A rare and globally threatened species³ with few records in the Serra dos Órgãos¹⁴. A flock of four heard calling in low flight over the Green Trail on 26 May 2008.

Golden-tailed Parrotlet *Touit surdus* This genus of small, inconspicuous parrots is notoriously difficult to identify to species. Two seen in flight near the Casa de Pesquisa on 7 October 2003 could have been either *T. surdus* or *T. melanonotus*. Calls tape-recorded (XC13972) on 3 June 2004 were identified as being of *T. surdus* (J. F. Pacheco *in litt.* 2009). Positive sightings of small groups have been made with some frequency at 200–700 m. On 5 May 2006 a group of six was observed feeding in the canopy of a Lauraceae. Considered globally Vulnerable⁴.

Blue-bellied Parrot *Triclaria malachitacea* Pairs or small groups (3–4) can be seen or heard daily (sometimes on the ground) above 500 m, especially along the Green, Red and Orange trails. REGUA appears to harbour a significant population of this species, and may be its stronghold in Rio de Janeiro¹². Considered globally Near Threatened⁴. Tape-recorded (XC12828).

Lesser Swallow-tailed Swift *Panyptila cayennensis* Rarely recorded in the Serra dos Órgãos¹⁴, there are several records by visiting birdwatchers, who sometimes misidentified it for the similar Neotropical Palm Swift *Tachornis squamata*, and one by FO of a single bird over the wetlands in 27 November 2006.

White-bearded Antshrike *Biatas nigropectus* A bamboo specialist with a patchy and local distribution, it is globally Vulnerable^{4,17}. Rare in the reserve, where occasionally recorded in *Guadua*-dominated areas above 700 m (Fig. 2).

Cinereous Antshrike *Thamnomanes caesius* One responded to playback (but did not approach), near the Casa de Pesquisa on 7 October 2003, but not recorded since. This species reaches the southern limit of its range in Rio de Janeiro, where it is known from very few sites^{10,14}.

Salvadori's Antwren *Myrmotherula minor* First recorded on 10 November 2003, the species is rare and has been recorded above 400 m along the Green, Red, Grey and Blue trails, always in pairs or small groups of up to five, sometimes with mixed-species flocks, moving c.3–4 m above ground (Fig. 3). Considered globally Vulnerable⁴ and not previously recorded in the Serra dos Órgãos¹⁴.

Rio de Janeiro Antwren *Myrmotherula fluminensis* Documenting this species was one of the main goals of the surveys in 2003–04. Observations along the 'antwren trail' produced only several records of *M. axillaris luctuosa* and *M. unicolor*, and one *M. minor*. Mist-nets covering the area where *M. fluminensis* was reported by other observers produced several *M. minor* and



Figure 8. Male Black-legged Dacnis *Dacnis nigripes*, Reserva Ecológica Guapiçu, Rio de Janeiro, south-east Brazil, August 2007 (Leonardo Pimentel)



Figure 9. Buffy-fronted Seedeater *Sporophila frontalis*, Reserva Ecológica Guapiçu, Rio de Janeiro, south-east Brazil, May 2008 (Leonardo Pimentel)

M. a. luctuosa. *M. a. luctuosa* does not show the conspicuous white flanks of other taxa in the *M. axillaris* group (especially Amazonian populations) and the elongated flank plumes are various shades of grey (pearly or bluish) rather than pure white, and some have quite dark plumes, as observed in specimens (L. F. Silveira *in litt.* 2008). For now, we prefer to consider the records of Rio de Janeiro Antwren at REGUA as involving *M. a. luctuosa*, especially as all available *M. fluminensis* sound-recordings are identical to contact calls of *M. a. luctuosa*¹⁰. The taxonomic status of *M. fluminensis* is controversial. That the type (a male) was collected with a female *M. a. luctuosa* suggests it is either a hybrid or even a melanistic *M. a. luctuosa* (L. F. Silveira *in litt.* 2008), something currently being investigated through genetic analysis (A. Aleixo *in litt.* 2009).

Unicoloured Antwren *Myrmotherula unicolor*
Recorded daily below 500 m, both in old second growth and in dense, tangled vegetation along creeks. Formerly considered Vulnerable, this Atlantic Forest endemic is now treated as Near Threatened⁴, and REGUA can be considered as a stronghold. Tape-recorded (XC11809).

Slaty Bristlefront *Merulaxis ater* Common >700 m, but lower only in two areas along the Green and Blue trails (Fig. 4). Globally Near Threatened⁴. Tape-recorded (XC15839).

Pale-breasted Spinetail *Synallaxis albescens*
One record, on 30 October 2007, when two birds called repeatedly from tangled vegetation in the wetland area. They readily approached to playback and were tape-recorded (XC15858).

Eye-ringed Tody-Tyrant *Hemitriccus orbitatus*
Fairly common in lower areas and was mist-netted several times. As in other areas near the Serra

dos Órgãos this species appears to be among the commonest forest insectivores⁷. Considered globally Near Threatened⁴, a designation it perhaps does not merit. Tape-recorded (XC13027).

Greenish Elaenia *Myiopagis viridicata* REGUA is the site of the first record for Rio de Janeiro¹⁵. One foraged at the edge of secondary forest by the reserve headquarters on 5 May 2008 and several times thereafter; also seen around the lodge's gardens in early morning. Tape-recorded (XC20642).

White-lored Tyrannulet *Ornithion inerme* One bird observed on 8 October 2004 by the 'antwren trail' while perched in the lower canopy. The species reaches the southern edge of its range in Rio de Janeiro, where it is considered Vulnerable¹. This appears to be the first record for the Serra dos Órgãos¹⁴.

São Paulo Tyrannulet *Phylloscartes paulista*
One seen in the midstorey on 8 June 2003 with a large mixed-species flock near Casa de Maria. Considered globally Near Threatened⁴, the species' distribution and taxonomy still pose problems (J. F. Pacheco pers. comm.). A globally Near Threatened species⁴, this appears to be the first record for the Serra dos Órgãos region¹⁴.

Oustalet's Tyrannulet *Phylloscartes oustaleti*
Records in the Serra dos Órgãos are based on old specimens and it was considered probably extinct there¹⁴. In 2006 it was rediscovered at Nova Friburgo within the Três Picos park¹². On 6 October 2003 a pair was present in a mixed-species canopy flock in mature forest at Base 1, one individual descending in response to playback. Several records since, always >500 m, especially along the Red, Green and Black trails (Fig. 5). Tape-recorded (XC13714).

Russet-winged Spadebill *Platyrynchus leucoryphus* First recorded by us on 5 June 2007 at c.500 m on the Red Trail. Since found regularly throughout the reserve, always singly in the lower understorey foraging for insects (Fig. 6). Regular in at least five places on the Green, Red and Grey trails. Globally Vulnerable¹⁴. Tape-recorded (XC13716).

Olive-sided Flycatcher *Contopus cooperi* A Nearctic migrant that is uncommon in south-east Brazil²¹. One present for two weeks in March 2006 flycatching from a dead *Cecropia* at Casa do Aníbal is the first record for the Serra dos Órgãos¹⁴.

Bare-throated Bellbird *Procnias nudicollis* Easily recorded throughout the reserve, most conspicuously after May–June, when vocal activity is more intense. Scarce in Rio de Janeiro and elsewhere in the Atlantic Forest because of heavy trapping and considered globally Vulnerable⁴. Tape-recorded (XC12851, XC15833).

Red-ruffed Fruitcrow *Pyroderus scutatus* Rare and threatened in Rio de Janeiro¹, its presence in the Serra dos Órgãos is documented only by old specimens and the species was feared locally extinct¹³. Scattered records available in the reserve, below 200 m. On 14 July 2007, one at the edge of secondary forest in the wetland area responded promptly to playback, and two were seen next day on the Green Trail at c.150 m while perched in the canopy, but were very wary.

Wing-barred Piprites *Piprites chloris* On 18 August 2008 one with a mixed-species canopy flock at c.500 m along the Grey Trail; it responded immediately to playback. The first documented record for Rio de Janeiro¹⁷. Tape-recorded (XC29562).

Thrush-like Mourner *Schiffornis turdina* Uncommon in Rio de Janeiro, where it reaches the southern edge of its range near REGUA. Scattered records along the Blue and Red trails, always responding strongly to playback. Tape-recorded (XC14003).

Elegant Mourner *Laniisoma elegans* Frequent at REGUA, where almost common. During February–August it is found at lower elevations (50–300 m), moving to 500–800 m thereafter. Always found alone, hairy caterpillars are a common food item. This Atlantic Forest endemic is considered globally Near Threatened⁴. Tape-recorded (XC14005) and photographed (Fig. 7).

Long-billed Gnatwren *Ramphocaenus melanurus* A pair observed for several minutes and photographed at Base 1 on 6 October 2003

foraging in the canopy; the species is usually found at lower elevations in the southern Atlantic Forest. Considered Vulnerable in Rio de Janeiro¹, this is the first documented record for the Serra dos Órgãos¹⁴.

Eastern Slaty Thrush *Turdus subalaris* On 2 September 2008 one was singing constantly in the canopy along the Green Trail at c.150 m. The next week two birds were found along the same trail, at 400 m, when photographs were taken. This is the first documented record for the Serra dos Órgãos of this inter-tropical migrant¹⁴.

White-bellied Tanager *Tangara brasiliensis* Formerly treated as a subspecies of *T. mexicana*, *T. brasiliensis* in eastern Brazil is as genetically distinct from *T. mexicana* in Amazonia as other *Tangara*⁶. This Atlantic Forest endemic is considered Vulnerable in Rio de Janeiro, at the southern end of its range, and may merit listing as globally Near Threatened or even Vulnerable. A group of 3–4 were first recorded along the ‘antwren trail’ on 9–11 October 2003, occasionally with other tanagers. Common in open areas and at forest edge, frequently visiting fruiting fig trees in adjoining pastures. Seen in family groups of 2–8 birds. Tape-recorded (XC13062).

Black-legged Dacnis *Dacnis nigripes* First recorded when three females (or immatures) were seen on 8 October 2003 along the ‘antwren trail’ in a canopy flock (including Rufous-winged Antwren *Herpsilochmus rufimarginatus*) that may also have included one male (not seen well). Easily overlooked and few records since, usually involving small flocks of up to five visiting lower areas during winter (Fig. 8). On 20 August 2007 a flock of four was at Casa do Aníbal. Considered globally Near Threatened⁴.

Buffy-fronted Seedeater *Sporophila frontalis* A globally threatened¹⁴ specialist tracking mast-seedings of *Guadua* and *Merostachys* bamboos. First recorded at REGUA on 11 July 2006, when flocks numbering >100 were feeding on seeds of *Guadua* bamboo at 700–1,000 m on the Green and Red trails. When seeding was over in higher areas they moved to secondary forests at c.300 m where they fed on seeds of an abundant Cyperaceae (apparently a *Scleria* sp.) on the forest floor and in clearings. Tape-recorded (XC11727).

Temminck’s Seedeater *Sporophila falcirostris* Another threatened bamboo specialist¹⁴ it was recorded during the same bamboo seeding as the previous species, but in smaller numbers. After the bamboo set seed at higher elevations, the species was also observed between 50 and 400 m. Males

were seen alone singing constantly atop the tallest trees, while females and young occurred in small flocks in the understorey and bamboo tickets. Tape-recorded (XC12826).

Chestnut-bellied Seed Finch *Sporophila angolensis* Considered probably extinct in the Serra dos Órgãos, the last record was made in 1950¹⁴. An adult male was singing in a dead tree at the wetland on 2 April 2007, and was seen for the next three weeks until it disappeared, probably caught by bird trappers living nearby. Tape-recorded (XC13103).

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Vocalisations and juvenile plumage of Azure-rumped Tanager *Tangara cabanisi*

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La Tángara de Cabanis *Tangara cabanisi* es endémica de la vertiente Pacífica de Guatemala y de Chiapas, México. La especie está en Peligro de Extinción y su biología es poco conocida. Para facilitar futuros esfuerzos de monitoreo de las poblaciones, se describen por primera vez el plumaje y las vocalizaciones de polluelos y de juveniles. En general los juveniles parecían grisáceos, pero su apariencia fue similar a la de los adultos por varias marcas conspicuas oscuras (antifaz, auriculares inferiores, puntos en el pecho) y bordes azules en las plumas remeras. Los juveniles obtienen el plumaje de adulto rápidamente. Se documentan con grabaciones y espectrogramas los llamados de polluelos en los últimos días antes de salir del nido, y dos diferentes vocalizaciones de juveniles perchados en el dosel del bosque. Además se documentan por primera vez con espectrogramas tres diferentes vocalizaciones sibilantes de adultos, así como llamados de gorjeo. Se describe por primera vez una vocalización de agresión entre adultos y también hacia invasores al territorio del nido.

Azure-rumped Tanager *Tangara cabanisi* is a globally Endangered species¹ that is restricted to <1,700 km² on the Pacific slope of Chiapas, Mexico, and western Guatemala^{3,8}. Because of the small number of field observers in the tanager's distribution, its natural history is little known, although habitat use and nesting ecology have been described from Chiapas^{5,6,9} and Guatemala^{2,4}. However, the species' juvenile plumage is unknown⁸. During research into habitat use⁴ and nesting ecology in Guatemala (to be published elsewhere), we noticed calls different from described vocalisations^{2,7–9}. Without familiarity with their calls, Azure-rumped Tanagers are easily overlooked in the canopy of tall humid broadleaf forest. To improve the efficiency of future population monitoring, we describe these vocalisations—including the calls of fledged juveniles—as well as the plumage of juvenile Azure-rumped Tanagers.

Study sites and Methods

Azure-rumped Tanager has been recorded in Guatemala at altitudes of 850–1,900 m on the southern slopes of the volcanic chain, in dptos. San Marcos, Quetzaltenango, Suchitepéquez, Sololá and Chimaltenango⁴. Observations of juveniles and sound-recordings were made at the following sites: Los Trrales Reserve (14°33'N 91°10'W) and Los Andes Reserve (14°33'N 91°11'W), both in dpto. Suchitepéquez on the south-east slope of Atitlán volcano, Finca Los Pirineos, dpto. Quetzaltenango (14°41'N 91°33'W) south-east of Santa María volcano, and Loma Linda, dpto. Quetzaltenango (14°44'N 91°38'W) south-east of Chicabal volcano. Juveniles were observed using a spotting scope at distances of 10–30 m. Vocalisations were recorded using a Fostex FR-2LE (enhanced by Oade Brothers Audio) digital recorder and Sennheiser M67

directional microphone. Sonograms were produced with Raven Lite 1.0 software. Nestlings at two nests were documented on video using camcorders.

Description of juveniles and vocalisations

We observed nestlings and fledglings at four nests. Nest 1 was sited in a *Heliocarpus* sp. (Tiliaceae), at Finca Los Pirineos, in June 2001. Nest 2 was placed in a *Neocupressus lusitanica* var. *lindenii* (Cupressaceae), at Los Trrales Reserve, in August 2008. Nest 3 was in a *Sideroxylon portoricense minutiflorum* (Sapotaceae), at Los Trrales Reserve, in September 2008, and nest 4 was in a *Ficus crassiuscula* (Moraceae), again at Los Trrales Reserve, in June 2009. Sound-recordings and video have been archived at the Macaulay Library (Cornell Lab of Ornithology, <http://macaulaylibrary.org>). We refer to video 1 (nestlings in nest 1 a few days before fledging, on 5 June 2001: ML56047, J. Berry), video 2 (adults feeding a nestling in nest 4 two days prior to fledging, on 11 June 2009: ML56048, A. Burge) and video 3 (a nestling in nest 4 two days before fledging, on 11 June 2009: ML56049, A. Burge).

Overall, juvenile Azure-rumped Tanagers appeared greyish but resembled adults due to some distinct dark markings (on the lower ear-coverts, lores, and spots on the breast) and blue fringes to the remiges. The nestlings at nests 1 and 4, and the fledgling from nest 3 had a grey bill, while a juvenile from nest 2 had a beige lower mandible. Legs were pale grey, similar to adults. In adults, the upper mandible is dark grey and lower mandible pale grey with a dark tip. Irides were dark and the lores black, similar to adults. The crown was greyish with a pale blue-green hue (videos 1–3). The black mark on the lower ear-coverts (Fig. 1) differed in extent individually, as is true also



Left, top to bottom:

Figure 1. Adult Azure-rumped Tanager *Tangara cabinisi* feeding fledgling from nest 2, Los Tarrales Reserve, Guatemala, 17 August 2008 (K. Eisermann)

Figure 2. Fledgling Azure-rumped Tanager *Tangara cabinisi* from nest 2, Los Tarrales Reserve, Guatemala, 17 August 2008 (K. Eisermann)

Figure 3. Fully-grown juvenile Azure-rumped Tanager *Tangara cabinisi*, Loma Linda, Guatemala, 29 October 2009 (K. Eisermann)



for adults. The throat was whitish with two fine dark lines (Fig. 2). The back was concolorous with the crown, with some dark spots on the upper part (videos 1, 2). Breast and belly were whitish.

The extent of dark spots on the breast differed individually; both young from nest 2 had reduced spots (Figs. 1–2), while the spots in the young from nest 3 were more extensive and similar to adults. Lesser wing-coverts, which are turquoise-blue in adults, were greyish in the nestling at nest 4, two days prior to fledging (video 2). Remiges were dark but fringed blue, less extensively than in adults. The tail feathers were c.10% grown on fledging. The young quickly attained adult-like plumage. Plumage of several fully-grown young in September 2009—identified as young based on their begging calls—was indistinguishable from adult plumage at a distance (KE pers. obs.). Only the yellowish skin near the base of the maxilla and mandible distinguished them visually as young (Fig. 3).

We heard different calls from young Azure-rumped Tanagers. Older nestlings gave a series of *zee* notes at 9–13 kHz, used as a begging call prior to being fed. The interval between calls became shorter with increased excitement (Fig. 4a,b; video 3). We recorded two different vocalisations from fledged juveniles, perched in the canopy. All juvenile vocalisations were series' of short sibilant notes at 7–11 kHz. The first type of vocalisation was a downslurred sibilant *siu* note given at irregular intervals, which appears at 0.7, 3.5 and 4.9 seconds in the sonogram in Fig. 4c (8 September 2008, Los Tarrales Reserve: ML137367, K. Eisermann). This call was sometimes followed by three shorter notes (at 1.3–1.9 seconds in the sonogram in Fig. 4c), which were given during short flights between branches and can be rendered *siu—zee-zee-zee*. A second type of vocalisation was a double-noted *zziu-zee*, as displayed in the sonogram in Fig. 4d (8 September 2008, Los Tarrales Reserve: ML137368, K. Eisermann).

We recorded three types of sibilant drawn-out calls by adult Azure-rumped Tanagers at frequencies of 5–15 kHz. The most complex was a combination of three notes, the first note downslurred, the second upslurred and the third note downslurred again, as in the sonogram in Fig. 4e (7 September 2008, Los Tarrales Reserve: ML137369, K. Eisermann). The interval between calls was irregular, e.g. the interval varies from 2.5–3.5 seconds in Fig. 4e, but at times the call

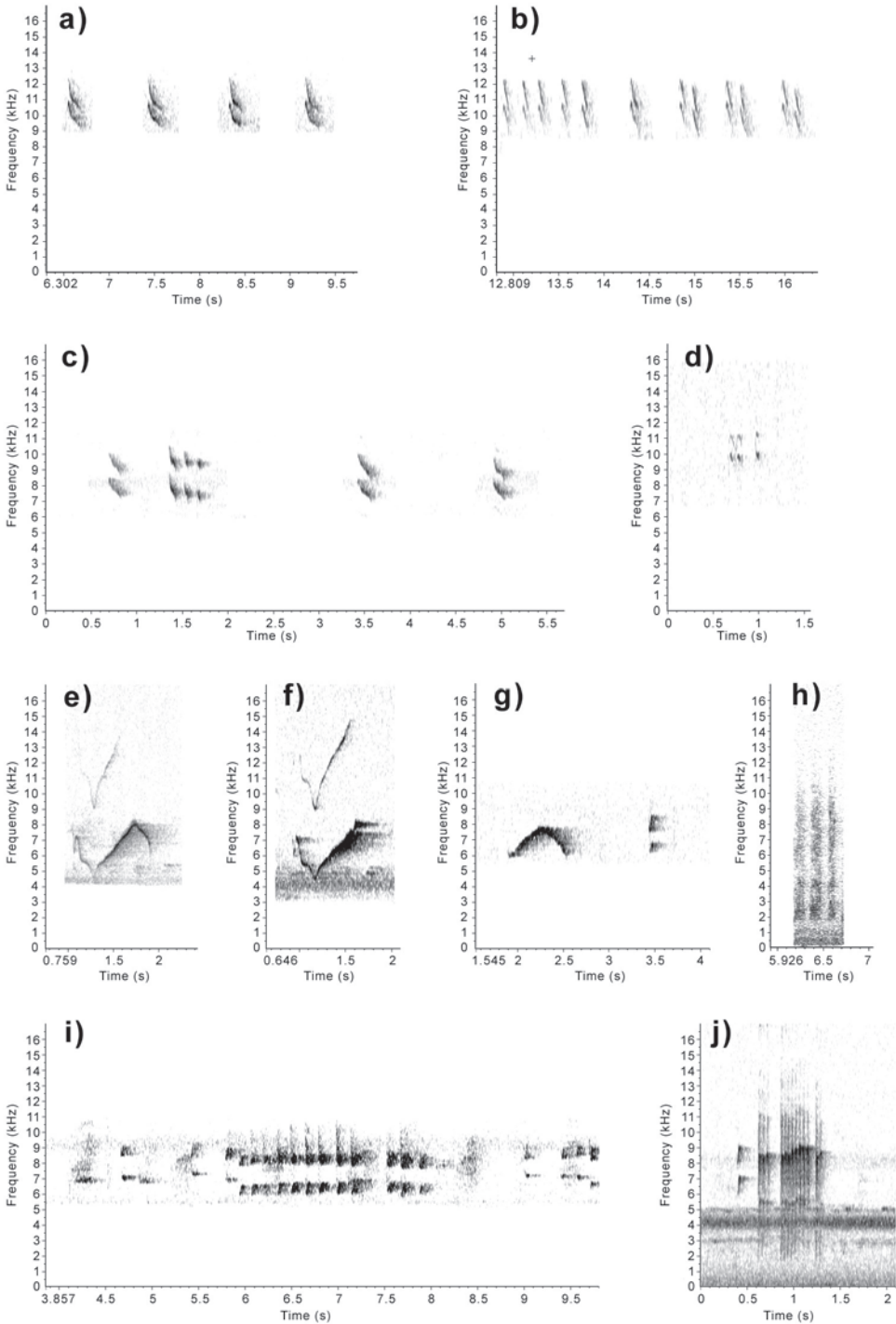


Figure 4. Sonograms of Azure-rumped Tanager *Tangara cabinisi* calls. (a) Begging calls of nestling two days prior to fledging, adult not in sight (Macaulay Library ML56049). (b) Begging call shortly before adult arrived at nest to feed young (ML 56049). (c–d) Fledged juvenile (c, MLI37367; d, MLI37368). (e–g) Sibillant drawn-out calls of adults (e, MLI37369; f, MLI37370; g, MLI37371). (h) Aggression call of adult (MLI37374); (i–j) Twitters and trills (i, MLI37372; j, MLI37373). The noise at 3–5 kHz in (j) is caused by insects.

is given only once. A variation of this call is shorter and lacks the final downslurred note; see Fig. 4f (7 September 2008, Los Tarrales Reserve: ML137370, K. Eisermann). The third vocalisation type was an up- and downslurred call followed by a sharp note, *siuuu-t*, see the sonogram in Fig. 4g (8 September 2008, Los Tarrales Reserve: ML137371, K. Eisermann).

The sharp notes sometimes run into a twitter given during short flights (Fig. 4i; 8 September 2008, Los Tarrales Reserve: ML137372, K. Eisermann), or into a sharp trill (Fig. 4j; 8 September 2008, Los Tarrales Reserve: ML137373, K. Eisermann). These calls recall those of Common Bush Tanager *Chlorospingus ophthalmicus*. During aggressive behaviour towards intruders in the nest area, adult Azure-rumped Tanagers gave a scratchy *rrrb-rrrb-rrrb*, similar to the call with a frequency range of 1.5–11.0 kHz, recorded during aggressive behaviour between two adults in a fruit tree (Fig. 4h; 28 February 2010, Los Andes Reserve: ML137374, K. Eisermann).

In conclusion, the juvenile plumages and juvenile vocalisations, and adult calls during aggressive behaviour described here have not been described previously. Several adult calls described from Chiapas^{7–9} and Guatemala² are similar to those documented here for the first time with sonograms.

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Recent conservation efforts and identification of the Critically Endangered Mangrove Finch *Camarhynchus heliobates* in Galápagos

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El Pinzón de Manglar *Camarhynchus heliobates* es la especie más rara del grupo de los pinzones de Darwin, y su distribución está restringida a los manglares de la costa de Isabela. Aproximadamente 100 individuos sobreviven y están amenazados principalmente por la depredación de la rata introducida *Rattus rattus* y por el parasitismo de la mosca *Philornis downsi*. Un amplio programa de conservación se inició en 2006 con el fin de estudiar las aves sobrevivientes, reducir sus amenazas y restaurar la especie en sitios históricos donde anteriormente se la registró. Un número creciente de pinzones en los sitios donde actualmente existe significará mayores probabilidades de dispersión a los sitios históricos. La identificación correcta es necesaria para seguir y monitorear la dispersión de las aves. Esta publicación pretende ayudar a la identificación de la especie y da pautas para distinguirla del Pinzón Carpintero *Camarhynchus pallidus*, una especie estrechamente emparentada al Pinzón de Manglar. Las dos especies pueden distinguirse por el patrón de coloración de la cabeza y por su canto fácilmente diferenciable.

Mangrove Finch *Camarhynchus heliobates* was the last species of Darwin's finches to be described¹³. Known historically from at least five different localities on Isabela and two on Fernandina^{3,8}, currently Mangrove Finches occur at two small mangroves on the north-west coast of Isabela, at Playa Tortuga Negra (PTN; 1 in Fig. 1; 18 ha) and Caleta Black (CB; 2 in Fig. 1; 10 ha), separated by 2 km of barren lava with three smaller mangroves.

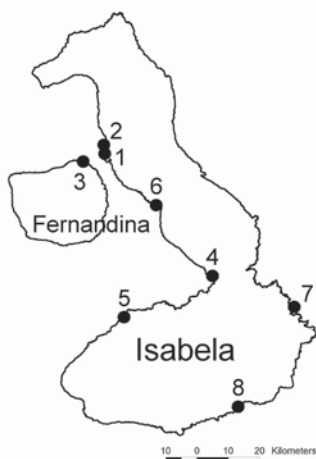


Figure 1. Recent and possible range of Mangrove Finch *Camarhynchus heliobates* in the Galápagos Islands. 1, 2, 7 = known breeding areas at Playa Tortuga Negra, Caleta Black and Bahía Cartago in south-east Isabela; 3, 8 = recent sightings at Punta Espinosa, Fernandina, and near Puerto Villamil; 4, 5, 6 = possible new range due to dispersal to Bahía Urquina, Punta Moreno and Bahía Elizabeth.

A second population persists on the south-east coast around Bahía Cartago (7 in Fig. 1; c.300 ha; Figs. 12–13) c.70 km from the main population in the north-west³ (Fig. 1). Most recent population estimates number c.100 individuals at all sites combined⁵, making Mangrove Finch certainly the rarest of the Darwin's finches and possibly that most at risk of extinction.

The Mangrove Finch Project

Following initial research into the status of Mangrove Finch, led by FHV, an extensive study by the Durrell Wildlife Conservation Trust, Charles Darwin Foundation and Galápagos National Park was initiated with funding from the UK government's Darwin Initiative programme in 2006. The project had four components: (1) research and monitoring of extant wild populations; (2) control of Black Rats *Rattus rattus* and other

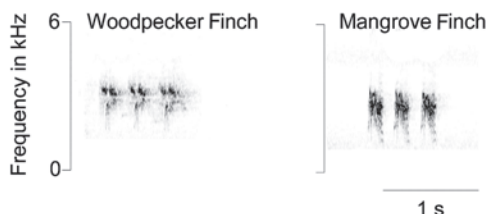


Figure 2. Sonograms of Woodpecker Finch *Camarhynchus pallidus* and Mangrove Finch *C. heliobates*, both recorded at Playa Tortuga Negra, Isabela, in 2009 with a Marantz PMD 660 solid state recorder (sampling rate: 44.1 kHz) and a Sennheiser ME67 directional microphone by BF. Sonogram prepared using Avisoft SASLABPro (R. Specht, Germany) by H. Brumm.



Legend to figures on opposite page

Figure 3. Male Mangrove Finch *Camarhynchus heliobates*, Caleta Black, Isabela, April 2008; strong whitish face pattern, greyish mantle and greyish-brown wing-coverts; the breast and belly are plain whitish in this individual (Birgit Fessl)

Figure 4. Mangrove Finch *Camarhynchus heliobates*, Punta Espinosa, Fernandina, November 2008; closely resembles the bird in Fig. 3 except for the creamy supercilium and upper breast (Nick Athanas)

Figure 5. Male Mangrove Finch *Camarhynchus heliobates*, Playa Tortuga Negra, Isabela, December 2006; strong facial pattern, greyish head and mantle, brownish wing-coverts and dark-mottled upper breast (Birgit Fessl)

Figure 6. Female Mangrove Finch *Camarhynchus heliobates*, Caleta Black, Isabela, April 2007; rather plain brownish with weak facial pattern and brownish breast similar to Woodpecker Finch *C. pallidus*, but greyer mantle and considerably smaller bill (Birgit Fessl)

Figure 7. Female Mangrove Finch *Camarhynchus heliobates*, Playa Tortuga Negra, Isabela, December 2006; supercilium indistinct but reaches in front of eye, mantle and head greyish brown, breast plain with few speckles, bill relatively short and slim (Birgit Fessl)

Figure 8. Mangrove Finch *Camarhynchus heliobates*, Playa Tortuga Negra, Isabela, February 2008; supercilium very short, but well marked, with strongly streaked breast, greyish-brown mantle and short bill (Michael Dvorak)

Figure 9. Male Mangrove Finch *Camarhynchus heliobates*, Playa Tortuga Negra, Isabela, December 2006; uniform black head and upper breast typical of some older males (Birgit Fessl)

Figure 10. Male Mangrove Finch *Camarhynchus heliobates*, Playa Tortuga Negra, Isabela, January 2008; black head and breast, and dark grey mantle (Birgit Fessl)

introduced animals; (3) characterisation of habitat and the suitability of other mangrove sites; and (4) evaluation of captive breeding and translocation of birds to selected historical and / or new mangrove sites. Field studies included surveys to estimate population size and distribution, during which birds were captured and ringed. Blood samples were collected to establish genetic relationships (K. Petren *et al.* unpubl.) of individual birds and overall genetic variability within the population. Some direct behavioural observations were made to further knowledge of the species' ecology, e.g. on diet and breeding. The most important threats identified were predation by Black Rats⁵ and nestling mortality due to parasitism by larvae of the botfly *Philornis downsi*, a fly first recorded in the islands in the 1960s and probably introduced^{2,4}. Tests for efficient control techniques including a programme of fly control were established. The impact of introduced insect-borne avian diseases such as avian pox¹⁵ or malaria¹⁰ on the survival of Mangrove Finch is unclear but studies are underway. The results will be published elsewhere.

Although Mangrove Finches might naturally disperse outside their currently known range, human-assisted dispersal might increase the frequency of such events. Mangrove Finch is very similar to its sister species, Woodpecker Finch *Camarhynchus pallidus*, which also occurs at the main breeding sites of Mangrove Finch. This paper provides guidelines for distinguishing the two species and aims to encourage birders to report sightings of Mangrove Finch.

Characteristics of Mangrove Finch

Morphology.—Birds were mist-netted and ringed using a numbered metal ring (right leg at CB, left at PTN) and an individual colour combination on the other leg. We initially used cellulose or Darvic rings but these disappeared from birds very rapidly and we subsequently used coloured aluminium rings ($n=14$). In total, we ringed 23 birds at PTN, one in a small mangrove north of PTN, nine at CB and one in south-east Isabela (Bahía Cartago, Fig. 12). Of these, 26 were sexed as males on behaviour (e.g. song) or plumage, four as females following nest observations or presence of brood patches, and four were caught as juveniles making sexing impossible. We measured wing length, tarsus and bill dimensions following Grant⁷. To reduce errors, bill dimensions were measured twice and means calculated. One bird from PTN was genetically identified as a Woodpecker Finch (Fig. 16) and another showed a significant level of hybridisation (Fig. 15; K. Petren *et al.* unpubl.). These two were treated separately for analysis (Table 1, group 3). Since we had few data for Woodpecker Finches on Isabela we used data from Santa Cruz for comparison: four birds from the arid zone and ten from the humid *Scalesia* zone. All measurements were taken by BF. For analysis, we used ANOVA with Bonferroni *post-hoc* test to identify significant differences between groups. The bird from south-east Isabela was excluded from analysis, as it showed morphological as well as genetic differences and a distinctive song type^{1,3} (Table 1). An ANOVA for all characters combined except mass (for difference in sample size, see Table 1) gave significant differences ($F=9.8$, $df_{\text{effect}}=20$, $df_{\text{error}}=68$; $p<0.001$). ANOVA for mass also differed between the three groups ($F=45.2$, $df=2$; $p<0.001$). For differences between single groups see Table 1.

Plumage.—Descriptions are based on field work in 1997–2009. During 2007–09 detailed observations on the entire breeding population of Mangrove Finch were undertaken. We photographed all those caught in mist-nets (see above) and some wild birds at PTN. Additionally, we observed several hundred Woodpecker Finches on Santa Cruz and Isabela.

There is no single diagnostic plumage character that separates the two species. Mangrove Finches are variable in most characters but generally

show some consistent traits. Males and females of both species cannot be separated with confidence except for those older male Mangrove Finches acquiring black feathers on the head (Figs. 9–11). Overall, Woodpecker Finch is much plainer than Mangrove Finch with a warmer and paler brownish coloration (Figs. 15–18). In contrast, all Mangrove Finches show a rather darker, often more greyish tone to the mantle and head. The best plumage character to separate the two species is head pattern. Mangrove Finches show a broad whitish or (rarely) creamy supercilium broadest above the eye and widening in front of it, in some birds forming a paler area between the bill base and the irides (Figs. 3–8). Woodpecker Finches usually possess an indistinct, creamy supercilium rarely extending in front of the eye (Figs. 15–18). Another good field mark is the coloration of the breast, flanks and upper belly. Many Mangrove Finches show distinctive black speckles of variable extent (e.g. Figs. 5, 7 and 8). However, some individuals show reduced speckling (Figs. 3–4). Three of four females trapped had a rather plain breast (Fig. 6) as did at least one male (Fig. 3). Initially, these birds look like Woodpecker Finches, which rarely show any streaks, specks or dots on their breast and never on the belly or flanks (Figs. 15–18). The nape to rump of Mangrove Finch is medium greyish brown, the greater coverts, primaries, secondaries and rectrices slightly darker with paler brownish fringes. Woodpecker Finches from Santa Cruz are overall warmer, more yellowish brown. The two Woodpecker Finches from PTN were also brownish but closely resembled some female Mangrove Finches.

Male Mangrove Finches possess a unique character not shared by any Woodpecker Finch: like other tree finches of the genus *Camarhynchus*, with age some become progressively blacker on the head and breast (Figs. 9–11). Of 26 trapped males, ten showed some black on the head. However, only a very small number possessed a complete black 'hood' (just four of c.45 observed in the field in 2009), whereas Small Tree Finches *C. parvulus* develop a black hood within five years⁹. Therefore, it seems that this character varies to an as yet unknown degree in the population.

Song.—Songs of the two species are readily distinguished by experienced observers (Fig. 2). Vocal activity is greatest during the breeding season, e.g. with the onset of heavy rains, normally from December to mid April. Mangrove Finches typically sing 3–4 syllables: *tscha- tscha-tscha-tscha ... tscha-tscha-tscha-tscha*. Mangrove Finches in the south-east sing very differently from those in the north-west³, the song being slower, *tschrrm-tschrrm-tschrrm*, with each syllable repeated 2–3 times. Playback experiments revealed that Mangrove Finches of both populations differentiate

song types¹. As song is culturally transmitted in Darwin's finches⁶, it is possible to find Mangrove Finches singing like Woodpecker Finches as noted twice during the study period. Woodpecker Finches at PTN sing 3–6 syllables, usually four. The song sounds more metallic and melodious (*tschue-tschue-tschue-tschue*) and its frequency is slightly higher. Some birds add a soft whistle at the end of their song, which is never heard in Mangrove Finches.

Recent records of Mangrove Finches away from breeding sites

In 2008–09 three sightings outside the main breeding area were documented. On 22 March 2008, G. Merlen & N. d'Ozouville photographed a silent bird in El Estero mangrove (west of Puerto Villamil; 8 in Fig. 1; Fig. 14). The bird possessed a strong facial pattern, dark mottled breast and comparatively short bill, which characters combined identified it as a Mangrove Finch. But, during four subsequent visits by BF & MD (May 2007, February 2008 and 2009, March 2009) the species' presence at the site could not be confirmed. On 26 November 2008, N. Athanas *et al.* observed a tentative Mangrove Finch in a small mangrove at Punta Espinosa on Fernandina (3 in Fig. 1; see Fig. 4). Identification was less straightforward, but the rather short bill, strong face pattern, and greyish mantle and head all suggest Mangrove Finch. The plain breast is shared by Woodpecker Finch, but is within the variation of Mangrove Finch; several trapped at PTN were very similar (Fig. 3). Photographic and video documentation is online at www.webfoundations.com/temp_photos/finch/Possible_Mangrove_Finch.wmv. On 25 November 2009, another individual was photographed at Punta Espinosa by A. Vásquez *et al.* The bird was discovered by its song and photographed. It showed all the characters of a typical Mangrove Finch (bill shape, face pattern, greyish-brown mantle and mottled breast).

Discussion

Mangrove and Woodpecker Finches are closely related sister taxa¹² and strongly resemble each other¹¹. Based on specimens, Woodpecker Finches from Santa Cruz have larger bills and paler plumage than those on Isabela¹⁴. Comparisons between specimens of Woodpecker Finch from Isabela and Mangrove Finches revealed that bill and tarsi measurements were significantly smaller for the latter, whereas Mangrove Finches had longer wings¹⁴. We confirmed that in most measurements Mangrove Finches are significantly smaller than Woodpecker Finches on Santa Cruz (Table 1). The two Woodpecker Finches caught at PTN were more similar to Santa Cruz Woodpecker Finches than to Mangrove Finches (Table 1).

Table 1. Bill, tarsus and wing dimensions (in mm), and mass data for Mangrove Finches *Camarhynchus heliobates* (group 1), Woodpecker Finches *C. pallidus* from Santa Cruz Island (group 2) and two individuals genetically and morphologically identified as Woodpecker Finches from PTN (group 3) as well as the data for the single bird trapped in south-east Isabela (Bahía Cartago). Significances between groups were calculated with a Bonferroni *post-hoc* test. Numbers sampled are in parentheses.

	Mean \pm SD (n)				Significant differences between groups
	Mangrove Finch, Isabela (group 1)	Woodpecker Finch, Santa Cruz (group 2)	Woodpecker Finch, Isabela (group 3)	Bahía Cartago	
Bill length (head)	31.5 \pm 0.7 (31)	35.0 \pm 0.5 (14)	33.5 \pm 2.4 (2)	31.3	* <0.5 ** <0.01 *** <0.001
Bill length (to feathers)	15.0 \pm 0.8 (31)	16.9 \pm 0.6 (14)	17 \pm 1.1 (2)	13.8	1*2 *** 1*3 *** 2*3 *
Bill length (to nostrils)	10.0 \pm 0.5 (30)	11.8 \pm 0.4 (14)	11.4 \pm 1.4 (2)	9.3	1*2 *** 1*3 ***
Bill depth	7.5 \pm 0.3 (31)	8.1 \pm 0.4 (14)	7.8 \pm 0.1 (2)	7.6	1*2 ***
Bill width	6.2 \pm 0.4 (31)	6.6 \pm 0.2 (14)	6.1 \pm 0.0 (2)	5.55	1*2 ***
Bill gape	9.6 \pm 0.6 (31)	9.8 \pm 0.4 (14)	9.8 \pm 0.2 (2)	8.3	Ns
Tarsus	24.2 \pm 1.1 (31)	24.9 \pm 1.1 (14)	25.7 \pm 1.3 (2)	23	Ns
Tarsus diameter 1	1.5 \pm 0.1 (31)	1.7 \pm 0.3 (14)	1.6 \pm 0.1 (2)		1*2 **
Tarsus diameter 2	2.1 \pm 0.3 (31)	1.9 \pm 0.4 (14)	2.5 \pm 0.2 (2)		Ns
Wing length	71.4 \pm 2.4 (31)	74.1 \pm 1.4 (14)	72.5 \pm 2.1 (2)	73	1*2 **
Mass (g)	18.9 \pm 1.3 (14)	25.6 \pm 2.4 (14)	19.6 \pm 0.6 (2)		1*2 *** 2*3 ***

Differences in bill size are rather difficult to assess in the field and should be used in conjunction with song and the plumage characters described above. The overall greyish-brown appearance, strong face pattern and speckled / mottled breast are particularly useful field marks for Mangrove Finch. Most Woodpecker Finches have much less pronounced supercilia, a brownish mantle and head, and a plain breast lacking speckles. However, some female Mangrove Finches are probably impossible to separate from Woodpecker Finch on plumage alone.

The intensive population studies during 2007–09 revealed an increase in productivity following rat control measures⁵; subsequently, there were multiple sightings during January–March 2009 in small mangroves between PTN and CB indicating dispersal. It is to be expected that such individuals might also appear at other mangroves in the wider environs. The two recent sightings on Fernandina (see above) probably relate to birds from the main breeding sites at PTN and CB. Because all visitors to Galápagos are restricted to certain areas, the following sites with larger mangroves are especially relevant for possible Mangrove Finch sightings (numbers refer to Fig. 1): on Isabela, Bahía Urvina (4), Bahía Elizabeth (6), Punta Moreno (5), and

on Fernandina, Punta Espinosa (3). In southern Isabela there are various mangroves around Puerto Villamil (8), most of them accessible to visitors. The March 2008 record in this area was the first since 1905 and was entirely unexpected. This bird probably originated from the small population in south-east Isabela and shows the potential for dispersal from this breeding area.

We hope that ornithologists will become aware of the possibility that Mangrove Finches could occur at these sites in the future and this paper will enable them to correctly identify these birds. To assist the Mangrove Finch Project, please send all future records (if possible including a detailed description) to Glyn.Young@durrell.org.

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Legend to figures on opposite page

Figure 11. Male Mangrove Finch *Camarhynchus heliobates*, Playa Tortuga Negra, Isabela, March 2009; all-black head and breast, and dark brown mantle (Michael Dvorak)

Figure 12. Male Mangrove Finch *Camarhynchus heliobates*, south-east Isabela, February 2009; only faint supercilium, mantle and head plain grey, greyish breast; this individual is rather different from all birds in north-east Isabela (Birgit Fessl)

Figure 13. Male Mangrove Finch *Camarhynchus heliobates*, south-east Isabela, February 2008; white supercilium very short but well marked, greyish-brown mantle, whitish underparts, densely streaked / spotted breast, and short slim bill (Michael Dvorak)

Figure 14. Mangrove Finch *Camarhynchus heliobates*, Puerto Villamil, Fernandina, March 2008; strong face pattern, breast heavily mottled black, and relatively short bill (Godfrey Merlen)

Figure 15. Male Woodpecker Finch *Camarhynchus pallidus*, Playa Tortuga Negra, Isabela, April 2008; indistinct supercilium, uniform brown mantle and wing-coverts, unspckled breast, and long massive bill (Birgit Fessl)

Figure 16. Male Woodpecker Finch *Camarhynchus pallidus*, Playa Tortuga Negra, Isabela, April 2008; no supercilium, uniform brown mantle and head, and very long bill (Birgit Fessl)

Figure 17. Juvenile Woodpecker Finch *Camarhynchus pallidus* from the dry zone, Santa Cruz; short supercilium, uniform brownish mantle and head, pale creamy breast and long bill (Erica Cartmill)

Figure 18. Woodpecker Finch *Camarhynchus pallidus* from transition zone, Santa Cruz, February 2008; no distinct supercilium, entire face yellowish white, no streaks or speckles on breast, and throat, breast and belly yellowish (Michael Dvorak)

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Is the population of Floreana Mockingbird *Mimus trifasciatus* declining?

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El Cucuve de Floreana *Mimus trifasciatus* es una de las cuatro especies endémicas de cucuves en Galápagos, el cual está en Peligro Crítico según la lista roja de la UICN. Esta especie habita en los islotes Gardner-por-Floreana y Champion, ambos cerca de la isla Floreana. En los censos realizados entre 2003–08, el índice poblacional tuvo variaciones entre 85 a 225 y un promedio de 168 (± 55) individuos. La población de juveniles tuvo asociación positiva con la precipitación. En los dos islotes no se registraron especies de vertebrados introducidos ‘agresivos’ establecidos, las cuales fueron una de las posibles causas de la extinción del Cucuve de Floreana en el siglo XIX en la isla Floreana. A futuro, el cambio climático podrá alterar la frecuencia y fuerza de fenómenos naturales para las islas como el caso de El Niño, igualmente, podrá ‘aportar’ en el establecimiento de especies de vertebrados y invertebrados agresivos, afectando a poblaciones indígenas pequeñas, como es este caso en particular. También, la pérdida de la variabilidad genética en estas poblaciones tan pequeñas y su aislamiento es importante de considerar. Por lo tanto, conocer la dinámica poblacional y las amenazas frente a la variación climática ayudará, a su conservación a largo plazo, principalmente, al existir planes de reintroducir la especie a la isla Floreana en el futuro.

Floreana Mockingbird *Mimus trifasciatus* is one of four species of mockingbirds found in the Galápagos Islands. The first non-scientific record of this species on Floreana Island was made by David Porter in 1813²³. Charles Darwin collected it when he visited the island in 1835 and reported that the species was ‘common’. The last individual collected on Floreana was by Kingberd²⁷ in 1852, and the species was last seen there in 1868 by Simeon Habel²⁴. It is believed to have become extinct on Floreana by 1880²⁶. Fortunately, small remnant populations remain on the small islets of Champion and Gardner-by-Floreana (hereafter Gardner), both adjacent to Floreana. Due to the increasing threats posed by invasive species and pathogens, the small population size and restricted range, this species is considered one of the most threatened birds in the world and is currently listed as Critically Endangered¹⁸.

Reasons for the extinction of Floreana Mockingbird on Floreana are uncertain, but it has been associated with predation by introduced Black Rats *Rattus rattus*, feral cats *Felis catus* and feral dogs *Canis familiaris*, the loss of cactus *Opuntia megasperma* (a nesting site for mockingbirds) due to grazing by introduced goats *Capra hircus*, and nest destruction by introduced House Mice *Mus musculus*^{5,14,26}. Champion and Gardner lack introduced mammals^{19,20} and maintain viable populations of *Opuntia megasperma*.

Prior to this study, Floreana Mockingbird population estimates for Champion ranged from 24–53 birds, with that on Gardner considered to be three to five times larger^{6,12,14} (Table 1). This

suggests a total population of <250 individuals. A population viability study for Champion suggested that mockingbirds there possess <50% chance of survival over the next 100 years (R. L. Curry unpubl.); no such analysis has been undertaken for Gardner²².

Annual surveys of Floreana Mockingbird on both islets commenced in 2003 following a standardised protocol. Both islets are visited annually and all mockingbirds in accessible areas are counted. The islets are also surveyed for introduced species and other threats. Here we report population counts for Champion and Gardner in 2003–08 and discuss the current status of the mockingbird and potential threats to its survival.

Methods

Study sites.—The islets of Champion (90°23.100'W 01°14.240'S) and Gardner (90°17.700'W 01°19.969'S) lie north-east and east of Floreana (90°26.060'W 01°17.865'S), respectively. Champion has a total area of 9.4 ha and is just 700 m distant from Floreana. Gardner has a total area of 76.5 ha² and is separated from Floreana by 8 km¹⁴. The two islets are 14 km apart (Fig. 1).

The islets differ in their structural characteristics. Gardner is a much steeper and more rugged islet than Champion, reaching an elevation of 210 m. It is a steep-sided tuff cone, surrounded by vertical cliffs of 50–100 m. A 100-m high plateau covers approximately the eastern third of the islet. Champion, in contrast, is much lower, reaching a max. of just 50 m. The centre of the island is dominated by a crater, but a plateau



Figure 1. Location of Champion and Gardner islets in relation to Floreana Island.

surrounds this, which is most pronounced in the east and south. The less steep and less rugged aspect of the islet makes human access throughout much easier than to any part of Gardner.

Floristically the islets are very similar. The most abundant plant species on both islets are *Croton scouleri* and *Opuntia megasperma*, which provide nesting sites for mockingbirds⁶.

Survey protocol.—Surveys were conducted annually in 2003–08 in the hot rainy season in mid May annually, except in 2006, when the survey was undertaken in mid June (due to logistical problems). Data were collected on distribution and abundance by age class on both islets. Adults were identified by their characteristic dark bill and fewer spots on the breast. Juveniles possess more breast spots and a yellowish base to the bill. Individuals

Table 1. Estimated population of Floreana Mockingbird *Mimus trifasciatus* from various literature sources, prior to the present study.

Year	Champion	Gardner (estimated)	Total
1906 ^{12,28}	24–26		
1966 ¹⁵			150
1973 ¹⁴			150
1979 ¹³	49	3–4 times more than Champion, >175*	224
1980 ⁴	49		
1983 ⁴	50	four times more than Champion	250
1984 ⁴	50	four times more than Champion	250
1980–91 ¹⁴	24–53	four times more than Champion, >154*	193*
1995 ⁺	20–25		
1996 ⁺	44		

* Mean in these periods.

+ Unpubl. data.

lacking obvious adult or juvenile characteristics, and those too distant for age-class identification, were classified as indeterminate. Detectability did not differ between age-classes, and there are no apparent behavioural differences between them. The locations of all birds seen were recorded using a GPS.

The field work was undertaken according to the following protocol: *Champion Islet*.—Five observers were involved in the census, each following a separate transect. Two surveyed the north of the islet and two the southern portion. In both cases, one person surveyed the coast and the other the hillside. The fifth observer surveyed the interior of the central crater. All five observers started at point A (the landing site, with the exception of the observer in the crater) and ended at point B (sea lion beach) in the south-east of the islet (Fig. 2i). Field work was undertaken between 07h30 and 08h30. Duplicate counts were avoided by constant (radio) communication between the observers. Because of the small size of the islet, observers are never more than c.50 m apart and the entire island was surveyed. *Gardner Islet*.—Five observers again followed separate transects. Two surveyed the north-east of the island (over level ground), with one close to the edge and the other on the slope and flat part of the islet. Two additional observers surveyed the rim of the crater in opposite directions. The fifth observer covered the north-west slope of the crater. The first four observers made their way from point A to B, but the fifth observer began and ended at point A (Fig. 2ii). The survey was undertaken between 07h30 and 09h30. Due to the larger size of Gardner, compared to Champion, it was impossible to cover the entire islet during a two-hour period, so counts were corrected for the proportion of the island sampled. Survey area was estimated as the total area within 150 m of the GPS track for each transect. This buffer width was chosen because mockingbirds are curious and often approach observers if they pass within 75 m of the bird's original position. A 75-m buffer is also consistent with the species' home range (territory size is usually slightly <1 ha for Galápagos Mockingbird *Mimus parvulus* on Genovesa⁷ and 0.9 ha for Floreana Mockingbird on Champion⁶). Assuming an even distribution, the population was estimated as (number of birds counted) / (proportion of island surveyed).

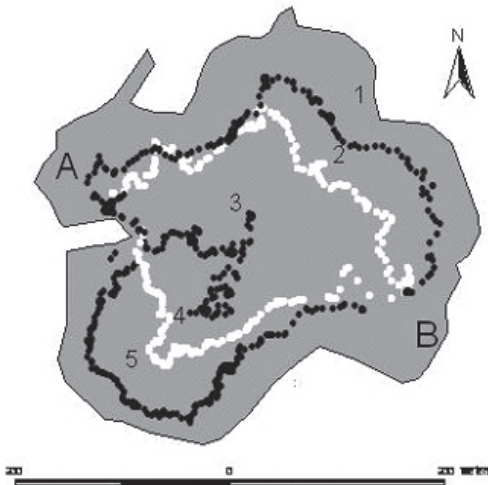
Presence / absence of introduced agents and species.—All observers were continuously alert for the presence of introduced vertebrates such as Smooth-billed Ani *Crotophaga ani*, Black Rats, Norway Rats *R. norvegicus*, House Mice, cats and goats¹⁹. In addition to direct observation, rat detection tubes²⁵ were placed on both islets overnight during the surveys. Abandoned mockingbird nests

Table 2. Floreana Mockingbird *Mimus trifasciatus* population, counted on Champion and Gardner, and estimated population on Gardner by age.

Islet	Age	2003	2004	2005	2006	2007	2008
Champion	Adults	34	31	26	12	17	32
	Juveniles	14	4	1	4	16*	13*
	Not aged	4	7	1	4	5	1
	Total	52	42	28	20	38	46
Gardner	Adults	54	56	66	32	18	24
	Juveniles	3	3	14	5	36*	31*
	Not aged	17	16	9	7	4	2
	Total	74	75	89	44	58	57
Gardner estimated	Covered area (ha)	33.4	50.8	45.2	53.0	47.8	24.9
	Adults	126	86	114	47	29	75
	Juveniles	7	5	24	7	59	97
	Not aged	40	25	16	10	7	6
	Total	173	115	154	65	95	179
Total population		225	157	182	85	133	225

* In 2007 and 2008 the numbers of juveniles were larger than in previous years, because Floreana Mockingbird responds to rainfall by breeding.

i.



ii.

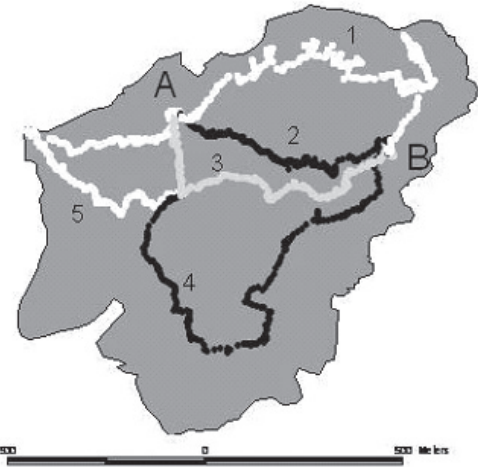


Figure 2. Champion Islet (i), Gardner Islet (ii). The five transects (1–5) on each islet during surveys in 2003–08. A: Start point. B: End point.

(without eggs or chicks and not in construction) were collected to determine the presence of the parasitic fly *Philornis downsi*, an introduced invasive species that has become a general problem throughout the Galápagos archipelago¹¹. Puparia of

the fly larvae can usually be detected in previously occupied nests for quite some time, possibly even years, after the nest is abandoned²⁹. Observers also inspected mockingbirds for evidence of infection by avian pox (*Avipoxvirus* DNA). Symptoms of

active infection such as deformities or scabs on the legs or around the eyes and bill, or signs of past infection such as loss of digits or limbs²¹ were readily apparent.

Results

Survey.—From 2003 to 2008, the index of the Floreana Mockingbird population on both islets varied from a low of 85 to a high of 225, with a mean 168 (± 55) individuals. These counts were consistent (Table 2) and indicated that the populations vary but with no decreasing trend. In relating the counts of the juvenile population (2003–08) with precipitation (polynomial regression) in the hot rainy season (January–May), a positive association emerged ($n=6$, $r^2=0.88$, $p=0.041$, level of confidence=95%).

On Champion, our census covered the entire islet each year. Numbers varied from 20 (2006) to 52 individuals (2003; Table 2), with a mean 38 (± 12) individuals. Relating the juvenile population with precipitation (polynomial regression) in the hot rainy season also suggested a positive association (but was not statistically significant) ($n=6$, $r^2=0.23$, $p=0.673$, $lc=95\%$).

On Gardner, our survey did not cover the entire islet each year, so the total population of mockingbirds was estimated (see Table 2 for counted and estimated totals). The population estimate in 2008 (179) was the highest, whilst the lowest was 65 individuals (2006), with a mean 131 (± 46) individuals. Comparing our data of the juvenile population with precipitation (polynomial regression) in the hot rainy season again suggested a positive association ($n=6$, $r^2=0.92$, $p=0.025$, $lc=95\%$).

Presence / absence of introduced species and infectious agents

Smooth-billed Ani.—Three individuals were observed on Gardner and seven on Champion in 2003. The species was not recorded in other years.

Other introduced vertebrates.—No signs of other exotic vertebrates were observed during the surveys. Rat detection tubes placed on the islets during the surveys in 2003–08 were all negative.

Philornis downsi.—Evidence of this invertebrate was detected in four (20%) of 20 old nests on Gardner in 2003, and in one (20%) of five old nests on Champion in 2007.

Avian pox.—No birds were observed with deformities or scabs on the legs or around the eyes and bill, or with missing digits or limbs, during any of the surveys. However, in 1984 on Champion Floreana Mockingbirds were reported with lesions on the legs⁴, which might have indicated the presence of avian pox in that year.

Discussion

Two questions are timely: is the population of the Floreana Mockingbird on the islets of Gardner and Champion declining, and do our research results give insights into possible causes of the mockingbird's extinction on Floreana Island?

Extreme aridity was noted on the islets in those years (2004–07) of low mockingbird abundance for which Charles Darwin Foundation rainfall records reveal below-average levels of precipitation³ (data taken from Santa Cruz meteorological station—no data are available from Floreana or its nearby islets). This suggests that rainfall may have an important role in regulating the mockingbird population. Curry & Grant^{4,9} mentioned that fluctuations in rainfall affected the population of Galápagos Mockingbird on Genovesa over 11 years of study, and this may also be the case for the Floreana Mockingbird (Fig. 4). Our data from 2003–08 suggest that the numbers of juvenile Floreana Mockingbirds may directly depend on the quantity of precipitation. Adults appear 'active' and breed immediately following the rains.

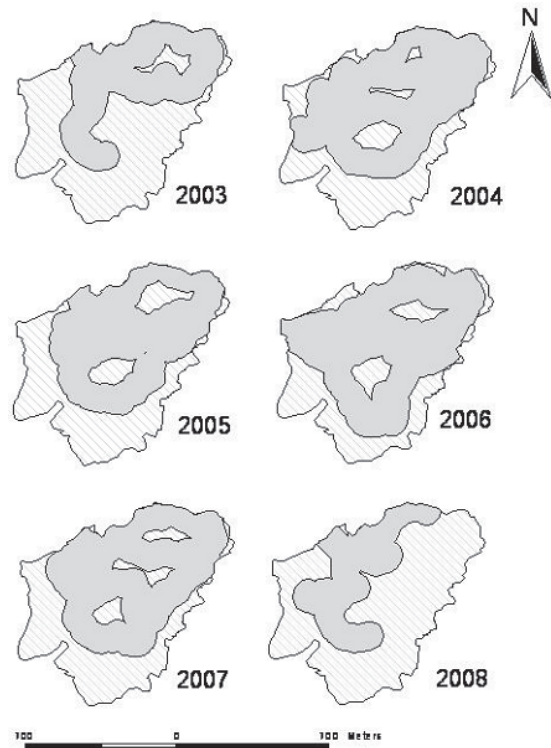


Figure 3. Gardner Islet with estimated areas covered by surveys in 2003–08 (buffer zone: 75 m each side of the observer). The difference in coverage in the surveys is because the vegetation differed annually, and is dependent on rainfall. The surveys were conducted over a two-hour period (see text).

However, in the long term, the population status depends on offspring production as well as survival through the adult stage. Our analysis of the number of adults as related to rainfall did not reveal any association, unlike the case for juveniles. However, what might happen during a longer drought? It is possible that in 1860–1954, during the cooler and drier conditions of the Little Ice Age¹⁰, the Floreana Mockingbird population was negatively affected by the dry climate, since the last record of this species on Floreana Island was in 1880²⁶. But if so, why were other passerines such as Darwin's finches not affected? It seems possible that the combined effects of the long drought, introduced predatory species^{5,14,16} and habitat loss could have caused the extinction of the mockingbird population on Floreana Island.

When the islets were evaluated separately, we see that the Champion population has fluctuated widely (Table 2, Fig. 4). Data obtained by Curry⁴ and Grant *et al.*¹⁴ (Table 1) reveal that the population fluctuated between 24 and 53 individuals (1980–91), although it has been even lower, e.g. the report by Gifford¹² in 1906 of apparently just 10–12 individuals: 'I think that two more days of hunting on Champion would have made the species extinct there'. However, if

we consider the 14 birds collected by the California Academy of Sciences (CAS)²⁸ at that time, the population would have been 24–26 individuals. Our results, showing a 20–52 individual fluctuation in Champion in the period 2003–08 accord with those of Curry⁴ (1984) and the CAS (1905–06). So, although the mockingbird population is small, it has managed to survive despite its isolation for c.120–130 years.

On Gardner the population has also been fluctuating, but the range is wider and fluctuations seem better correlated to precipitation. The population has fluctuated between 65 and 179 individuals (2003–08; Table 2, Fig. 4). Recent estimates are more accurate than previous totals and provide a more solid appraisal of what happens to the population on the islet during extended dry conditions such as during La Niña periods. If the climate changes in the future, El Niño and La Niña could be stronger and more frequent. Given such a scenario, the Floreana Mockingbird population might not have time to recover. And, if introduced species or agents exacerbate these problems, the mockingbird population could decline towards extinction.

We must also consider inbreeding as a result of a genetic bottleneck. The loss of genetic diversity

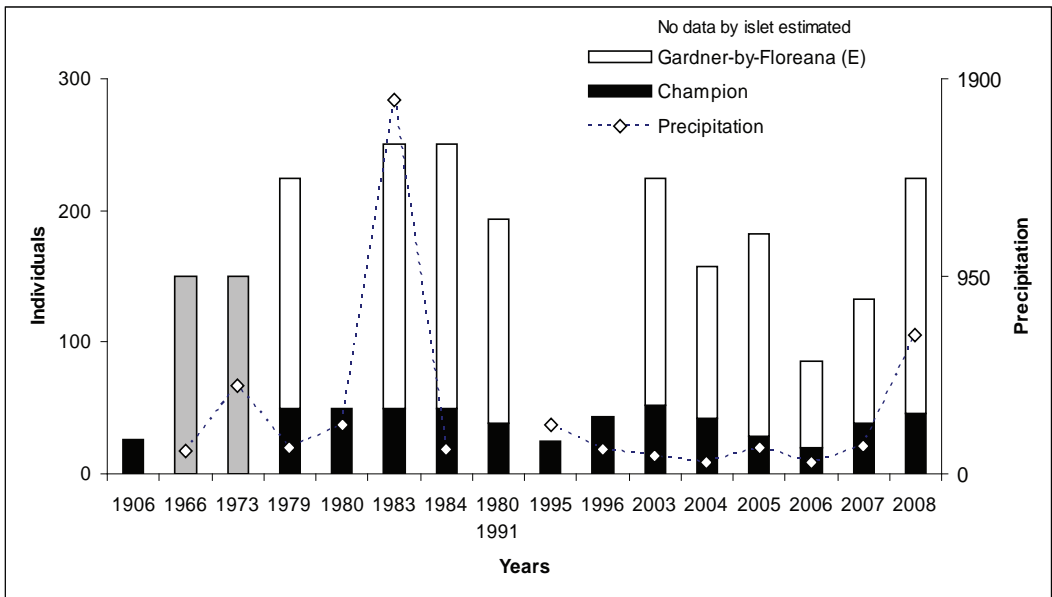


Figure 4. Estimated population of Floreana Mockingbird *Mimus trifasciatus* on both islets in relation to annual rainfall (mm) in January–May recorded at the Charles Darwin Found meteorological station on Santa Cruz³. Data taken from Gifford¹², Swarth²⁸, Harris¹⁵, Grant¹³, Curry⁴, Steadman 1995 (unpubl.), Grant *et al.*¹⁴, Vargas 1996 (unpubl.), and this study in 2003–08.

* 1906: mean in this year.

** 1980–91: mean in this period.

in the population^{14,17} during its c.130 years of isolation has possibly caused inbreeding depression; unfortunately this is irreversible.

To conserve the Floreana Mockingbird, the Charles Darwin Foundation and Galápagos National Park Service recently initiated the Floreana Project, a long-term programme which will seek to restore the island's ecosystem, eradicate introduced / invasive species, and eventually re-introduce native and endemic species, among them Floreana Mockingbird (from both islets to Floreana Island). Meanwhile, measures to protect the populations on the offshore islets are still required. This will include continuing to ban tourists from visiting and to limiting camping by scientists to short stays. In the long term, there must also be continued monitoring to ensure control or eradication of any introduced species.

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Foothill avifauna of the upper Urubamba Valley, dpto. Cusco, Peru

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Se registró un total de 311 especies en dos sitios bajos en las montañas del alto Valle de Urubamba, dpto. Cuzco, Perú. Se documentan primeros registros para la región, nuevas ocurrencias altitudinales y la abundancia relativa y estatus reproductivo de esta avifauna.

The upper Urubamba River is an inter-Andean valley in south-east Peru that originates in the altiplano of dpto. Cusco. From Quillabamba, at c.1,000 m and above, the vegetation is arid and shorter in stature as a result of a rain shadow that arises from moisture catchment by high cordilleras to the east. The effects of the rain shadow are much reduced just north of Quillabamba where the vegetation is much taller and lush. The avifauna of the upper Urubamba remains poorly known despite explorations commencing as early as 1868 in the region^{14,15}. Berlepsch & Stolzmann¹ reported on M. J. Kalinowski's 1896 collections from the upper Urubamba. Chapman's⁴ summary of the Yale University–National Geographic Society's expedition (1915), his and George Cherrie's work

(1916) and that of H. Watkins (1917) provided a solid foundation of our knowledge of this area. Louisiana State University Museum of Natural Science¹⁰ further explored the area with five expeditions in 1974–79, and the birds of Machu Picchu were treated by Walker & Fjeldså¹⁷.

Most of the above field work was concentrated at higher elevations of the upper Urubamba Valley. However, recently, as part of a multi-institutional rapid biological inventory, D. Lane and T. Pequeño provided data for the foothill avifauna in the Zona Reservada Megantoni, in the central Urubamba Valley, dpto. Cusco¹⁶. Herein, we present results from surveys in March–April 2009 of two foothill sites in the upper Urubamba Valley, dpto. Cusco (Fig. 1), by DG & BW, and by teams

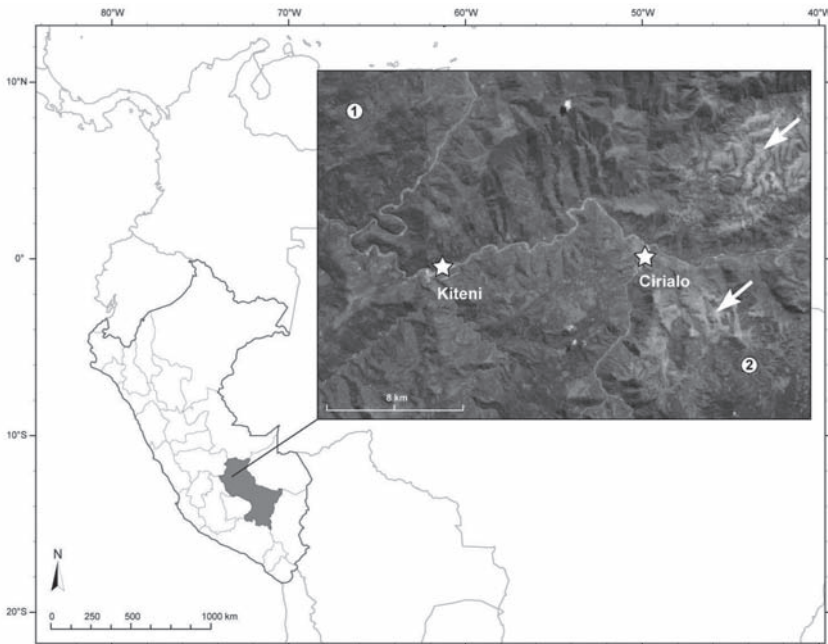


Figure 1. Google Earth image of study area. Dpto. Cusco is highlighted in grey. Two principal camp sites are denoted: 1. Alto Manguriari; 2. Alto Materiato. White arrows indicate presumed human-generated grassland. The rio Urubamba is the principal river in this image.

from the University of Kansas Natural History Museum (KUNHM) and Centro de Ornitología y Biodiversidad (CORBIDI).

Study sites and Methods

The KUNHM / CORBIDI team established two camps near the upper Urubamba River, Distrito Echarate, prov. La Convención. The first was located on the Comunidad Campesina Alto Manguriari, on 3–11 April 2009 (12°33.93'S 73°05.27'W; 1,325 m; elevations covered were c.1,100–1,400 m; Fig. 1). Personnel were MBR, TJD, MC, MDE and KPK. This camp was located beside a narrow, winding dirt road that was sparsely populated. All forest along the road was secondary, but above and below the road there was contiguous, relatively untouched forest. In disturbed areas, along the road and at the edge of clearings in the forest, there were bamboo patches (*Guadua* spp.). Surveys were concentrated in the forest around camp and along the road for several km in each direction, including the forest block at the road's terminus (6–7 road km beyond camp). Mist-nets (12 m in length, positioned at ground level; max. 25 / day during the last few days; opened from first light until late evening, except during heavy rain) were restricted to forest immediately above and below the campsite. Rainfall, ranging in periods of a few minutes to three continuous hours, was recorded every day but two.

The second KUNHM / CORBIDI camp (12°42.01'S 72°52.56'W, 1,700 m; c.30 km south-east of the first camp; Fig. 1) was located on the Comunidad Campesina Alto Materiato, near the terminus of a dirt road and was worked on 12–23 April 2009. Personnel were MBR, TJD, MC, MDE and KPK. On 12 March 2009, DG walked the road from Cirialo up to Tucantinas (above San Antonio and just east of the KUNHM / CORBIDI camp), and because of heavy rains he returned to Cirialo on 13 March. DG & BW revisited the area on 30 March–2 April 2009 and camped at two sites (12°42.75'S 72°55.17'W, 1,700 m; 12°40.07'S 72° 54.22'W, 1,325 m). Only birds that they encountered above c.1,000 m are included in the Appendix.

Except for a few tongues of primary forest on steep slopes, the forest near the KUNHM / CORBIDI Alto Materiato camp was secondary and much of the area from c.1,250 m up to the camp and Tucantinas had been completely cleared and comprised pasture with lush grasses (presumably introduced) up to 1 m tall. Extensively cleared areas, especially above the village of San Antonio, were covered with a dense fern and thorn-dominated herbaceous growth c.1 m in height. Cattle were present in small numbers, with none seen in large tracts of grassland. We presume cattle may be moved to these areas during the dry season. The ridge above camp (c.1,900 m) was contiguous

with largely undisturbed forest in all directions to the south. In addition to working the scrub and forest at our campsite, we drove down the road to c.1,000 m (12°39.06'S 72°55.36'W) above the small town of Cirialo. At 1,000–1,250 m our surveys were restricted to the road because of the extremely steep slopes. Use of mist-nets (eventually 25 / day) was restricted to the scrub and forest near camp. Although rain was recorded on all but the final three days, precipitation was far more extensive on higher ridges to the east and in the Cordillera Vilcabamba to the west. Thus, the area we worked appeared to be in a rain shadow, which may have been accentuated by forest clearance. Large tracts of pasture were also observed on slopes on the other side of the Urubamba River, north-east of our Alto Materiato camp (Fig. 1).

Specimens are deposited at KUNHM and CORBIDI. MBR's sound-recordings ($n=184$) are deposited at the Macaulay Library of Natural Sounds (MLNS), Cornell Lab of Ornithology, Ithaca, NY, and DG's are deposited at www.xeno-canto.org/america. Taxonomy and nomenclature follow the South American Checklist Committee¹¹ as of 1 September 2010.

Results

A total of 311 species was recorded at these two foothill sites (Appendix), with several new records for the upper Urubamba Valley and dpto. Cusco (see Species accounts). Relative abundance designations in the Appendix are positively correlated with the degree of singing for the majority of species, especially passerines.

For Peru, we obtained new upper-elevation records for the following taxa^{13,18}: Ocellated Poorwill *Nyctiphrynus ocellatus*, 1,700 m; Striolated Puffbird *Nystalus striolatus*, 1,350 m; Bar-breasted Piculet *Picumnus aurifrons*, 1,325 m; White-throated Woodpecker *Piculus leucolaemus*, 1,325 m; Cinnamon-throated Woodcreeper *Dendrexetastes rufigula*, 1,325 m; Cabanis's Spinetail *Synallaxis cabanisi*, 1,700 m; Peruvian Recurvebill *Simoxenops ucayalae*, 1,325 m; Barred Antshrike *Thamnophilus doliatus*, 1,700 m; Bluish-slate Antshrike *Thamnomanes schistogynus*, 1,800 m; White-lored Tyrannulet *Ornithion inerne*, 1,250 m; Yellow-browed Tody-Flycatcher *Todirostrum chrysocrotophum*, 1,250 m; Olivaceous Flatbill *Rhynchocyclus olivaceus*, 1,350 m; Large-headed Flatbill *Ramphotrigon megacephalum*, 1,400 m; Green-backed Becard *Pachyramphus viridis*, 1,700 m; Thrush-like Schiffornis *Schiffornis turdina*, 1,800 m; and Guira Tanager *Hemithraupis guira*, 1,650 m.

Both boreal and austral migrants were present for the duration of our field work (Appendix). Even on our last field day, 23 April, five Western Wood Pewee *Contopus sordidulus* and one Alder Flycatcher *Empidonax alnorum* were still present.

Species accounts

White-tailed Hawk *Buteo albicaudatus*

In the extensive pasture area at c.1,250–1,700 m in the Materiato area, individuals were observed dropping to the ground for presumed prey and soaring over grass-covered ridges. The maximum number of individuals observed included two pale-morph adults and an apparent subadult, in presumed Basic I plumage²⁰. Adults were distinguished from the similarly plumaged Variable Hawk *B. polyosoma* by having rufous on the dorsal surface confined to the wing-coverts and no rufous on the back. The dark-plumaged subadult in close proximity to the two adults was identified by shape and size, and the presence of a white patch on the centre of the upper chest. Previously, the species was known only from the Pampas del Heath in extreme south-east Peru¹³. The conversion of forest to pasture undoubtedly has led to its expansion in Peru, and observers may have been overlooking the species given its similar appearance to *B. polyosoma*. Recently, *B. albicaudatus* has been documented as far north as Satipo, dpto. Junín, where a pale-morph adult was photographed on 29–31 August 2008 (G. Seeholzer & M. Harvey pers. comm.), and there have been subsequent sight records in the Jaen area (BW pers. obs.).

Ocellated Crake *Micropygia schomburgkii*

Heard at all periods of the day in the grass-dominated landscape at c.1,250–1,500 m in March–April. Prior to these records, this often easily overlooked rail was known from singles trapped and photographed at Winay-Wayna ruins (13°11.09'S 72°32.30'W), dpto. Cusco, Pantiacolla Lodge (12°39.35'S 71°13.87'W), dpto. Madre de Dios¹⁷, and the Pampas del Heath, in the extreme south-east of the country¹³. Given the few records, it is unclear if this rail is a permanent resident and / or an austral migrant.

Andean *Nyctibius maculosus* and Long-tailed Potoos *N. aethereus*

Surprisingly, we recorded both species calling on the same date at our Manguriari camp (MLNS 147392, 147383). Andean was heard on several evenings, whereas Long-tailed was recorded only once pre-dawn; neither species was seen. These are the lowest and highest elevations, respectively, recorded for these two species and may represent the first time they have been recorded syntopically¹³.

Blue-fronted Lancebill *Doryfera johannae*

One mist-netted at Manguriari (CORB-AV-2010-1144) provides the southernmost record in Peru. Although indicated to occur south only to dpto. Junín¹³, there now exist several unpublished sight

records by experienced observers in recent years at Hacienda Amazonia Lodge, nearby Pantiacolla Lodge, Manu National Park, and along the lower Manu Road at Quita Calzones, dpto. Madre de Dios (H. Lloyd pers. comm.).

Brown Violetear *Colibri delphinae*, Peruvian Piedtail *Phlogophilus harterti* and Black-throated Brilliant *Heliodoxa schreibersii*

Our Manguriari records fill in distribution gaps for these hummingbirds¹³. The only records of the *Colibri* and *Heliodoxa* were of single, mist-netted birds, whereas two *Phlogophilus* were mist-netted and another was observed. Peruvian Piedtail is considered Near Threatened as a result of its limited distribution³.

Versicoloured Barbet *Eubucco versicolor*

This species was not vocalising at either locality. Of the four adult males collected at Materiato, all exhibited the narrow blue breast-band more typical of the southern nominate form. However, one (KUNHM 113512) has an admixture of yellow / blue on the malar stripe that is intermediate between central Peruvian *E. v. glaucogularis* and the nominate subspecies. Males with mixed characters have been noted at Santa Ana (a few km south-west of Quillabamba), just east of Materiato¹ and the Ayacucho / Cusco border¹³.

Ashy Antwren *Myrmotherula grisea*

An adult male in non-breeding condition (testes 1 × 1 mm) mist-netted at Manguriari on 6 April 2009 (CORB-AV-2010-1145) represents the first specimen for dpto. Cusco, Peru¹³. The first record for the department was a male mist-netted and photographed on the east slope near La Convención in the Cordillera Vilcabamba, at 1,630 m, on 18 November 2007 (J. Ugarte Núñez pers. comm.). These two records extend the species' range c.500 km north-west of the northernmost locality on the Peru / Bolivian border⁶. Although listed as Vulnerable by the IUCN based solely on criterion C2a², Herzog *et al.*⁶ demonstrated that it does not meet that requirement, and our range extension further supports their conclusion.

Sooty-headed Tyrannulet *Phyllomyias griseiceps*

Two of this poorly known foothill species were recorded, one of them collected (CORB-AV-2010-1142), at Manguriari (MBR recordings; MLNS 147418, 147501). Additionally, a sound-recording (XC31082) was made by DG of an unseen individual at 1,100 m above Cirialo on 3 March 2009. Vocal material is very similar to the recently described Yungus Tyrannulet *P. weedeni*⁵. Surprisingly, no comparative material of *P. griseiceps* was included in the analysis and formal description of *P. weedeni*⁵. Such comparison would provide important evidence

about the status of *P. weedeni* and its relationship to the *P. griseiceps* complex.

Yellow-olive Flycatcher *Tolmomyias sulphurescens*

A single immature mist-netted at Materiato represents the first specimen for dpto. Cusco (KUNHM 113557); it appears to represent the central Peruvian subspecies *T. s. peruvianus*. Recent sight records and sound-recordings are available from Aguas Calientes (upstream on the río Urubamba; various observers) and, in 2009, D. Lane obtained photographs and sound-recordings from San Pedro (on the Manu Road) that have extended this taxon's distribution well south of where it was mapped in Schulenberg *et al.*¹³.

Bran-coloured Flycatcher *Myiophobus fasciatus*

At least a dozen were heard and sound-recorded at dawn in bushes in the fern-dominated herbaceous growth along c.2 road km at our Materiato camp (MLNS 147426, 147479, 147500; XC32112). Although testes were moderately enlarged in two April males (4 × 2 mm, KUMNH 113561; 6.0 × 3.5 mm, CORB-AV-2010-102), we presume this was a reflection that it was the end of the breeding season. Apparently, this represents the first breeding evidence of the eastern Peruvian form, *M. f. saturatus*, in the country as Schulenberg *et al.*¹³ state that it 'may breed locally, especially near Andes.'

Rufous-tailed Tyrant *Knipolegus poecilurus*

MBR observed and sound-recorded vocalisations of displaying males at dawn in the fern- / thorn-dominated herbaceous growth at Materiato. Single males leapt vertically (c.<1 m) from a small, leafless bush as they gave a difficult to detect, thin, insect-like note along with a mechanical sound (MLNS 148314). We presume the latter is generated by the emarginated outer primaries. Although this display has been noted in Peru¹³, apparently it has not been described for other populations of *K. poecilurus* across its broad range¹².

Shrike-like Cotinga *Laniisoma elegans*

Two adult males in non-breeding condition (KUNHM 113625, CORB-AV-2010-1138) were mist-netted in primary forest at Manguriari at c.1,400 m. Apparently, these represent the first records between the Apurimac¹⁹ and the Cosñipata Valley, dpto. Cusco¹⁸.

Green-backed Becard *Pachyramphus viridis*

Several pairs were observed attending completed, bulky, globular nests on isolated trees in clearings at both sites (specimens and sound-recordings). The nearest known location is Hacienda Amazonia Lodge, dpto. Madre de Dios (12°52'S 71°23'W), where

a pair was photographed and sound-recorded⁸. Our records fill a gap in the species' known distribution from dpto. Junín to eastern dpto. Cusco¹³.

Purplish Jay *Cyanocorax cyanomelas*

DG observed and sound-recorded this species up to 1,000 m above Cirialo (XC31234). These are the first records outside the Madre de Dios drainage in Peru, where it is mostly restricted to the floodplain up to 1,000 m¹³.

Slaty Thrush *Turdus nigriceps*

The two mist-netted individuals, 17 and 20 April (male, KUNHM 113574; female, CORB-AV-2010-1139), represent some of the earliest records of this austral and trans-Andean migrant along the east Andean slope of Peru¹³. The only earlier record is of a bird taken on 13 February 1975, at Conchapien Mountain, Yurinaqui Alto, dpto. Junín, by P. Hocking & G. Lopez (Field Museum of Natural History 299306). Indicative of migrants, both individuals we collected had moderate to heavy fat and small gonads.

Vermilion Tanager *Calochaetes coccineus*

A non-breeding male and female collected (KUNHM 113603, CORB-AV-2010-1140) in primary forest at Materiato represent the first specimens for dpto. Cusco, although D. Lane & T. Pequeño observed the species in the middle Urubamba at Zona Reservada Megantoni¹⁶. This apparently represents the southernmost record for the species¹³.

Blue-winged Mountain Tanager *Anisognathus somptuosus*

Fairly common in scrubby, secondary forest at Materiato. Birds were not vocalising and were seen in monospecific groups of 2–4 individuals. All specimens were in non-breeding condition and had the olive-green rumps of the nominate subspecies. This extends the range of this subspecies further up the Urubamba, as it was recorded in the middle Urubamba at Zona Reservada Megantoni¹⁶.

Scarlet-rumped Cacique *Cacicus uropygialis*

Two non-breeding females (KUNHM 113609, CORB-AV-2010-1141) taken in primary forest at Materiato represent the southernmost records; the species is known just to the north from the east side of the Apurimac Valley in the Cordillera Vilcabamba^{13,19}.

Discussion

Our surveys help elucidate the status and distribution of the poorly known foothill avifauna of this region. We underscore that our inventories were conducted at the end of the rainy season, when most species were finishing their breeding seasons (fledged young were observed of a number

of species; see gonad data in species accounts) and vocalisations had ceased or were very infrequent for most species. There were of course exceptions; e.g., several antbird species at Manguriari and Tropical Parula *Parula pitayumi* at both camps persistently vocalised during the April surveys. Nonetheless, our inventories for both localities should be considered preliminary and undoubtedly many more species would be recorded if longer surveys were conducted during the height of the vocal period, presumably September–November (pers. obs.).

We recorded six species that are included in BirdLife International's Peruvian East Andean foothills Endemic Bird Area (053³), with one, Black Tinamou *Tinamus osgoodi*, ranked as Vulnerable, and another, *Phlogophilus harterti*, considered Near Threatened. Both species appear to require relatively intact forest. The remaining four species are ranked as Least Concern. Cerulean-capped Manakin *Lepidothrix coeruleocapilla*, Yungas Manakin *Chiroxiphia boliviana* and Bolivian Tyrannulet *Zimmerius bolivianus* were common to fairly common in disturbed forest, whereas Creamy-bellied Antwren *Herpsilochmus motacilloides* was seen in the canopy and subcanopy of forest edge and ridge-top forest. Another species that is not restricted to this EBA but is considered Vulnerable, is Blue-headed Macaw *Primolius couloni*; a few pairs were recorded at both our sites.

Patches of *Guadua* bamboo were fairly common along the road and forest edge at Manguriari, which is near the upper elevation of this habitat¹⁶. Although the specialised bamboo avifauna^{7,9} at Manguriari is clearly a subset of species that occupies this habitat at lower elevations, because of the low level of vocalisations during our inventory coupled with our effort being concentrated above 1,100 m, we hesitate to speculate on whether our list is complete for Manguiari: Yellow-billed Nunbird *Monasa flavirostris*, Cabanis's Spinetail *Synallaxis cabanisi*, Peruvian Recurvebill *Simoxenops ucayalae*, Crested Foliage-gleaner *Anabazenops dorsalis*, Ornate Antwren *Epinecrophylla ornata*, Dot-winged Antwren *Microrhophias quixensis*, Peruvian Warbling Antbird *Hypocnemis subflava* and Large-headed Flatbill *Ramphotricon megalcephalum*. We failed to record the following bamboo specialists that Lane & Pequeño¹⁶ found in the middle Urubamba River at Kapiromashi (c.760–1,000 m): Rufous-breasted Piculet *Picumnus rufiventris*, Bamboo Antshrike *Cymbilaimus sanctaemariae*, Striated Antbird *Drymophila devillei*, Manu Antbird *Cercomacra manu*, White-lined Antbird *Percnostola lophotes*, Yellow Tyrannulet *Capsiempis flaveola*, White-faced Tody-Tyrant *Poecilotriccus albifacies*, Flammulated Tody-Tyrant *Hemitriccus flammulatus* and Dusky-tailed Flatbill *Ramphotricon fuscicauda*.

Anthropogenic impact was significant at both localities, albeit with much less at Manguriari. We suspect that the extensive conversion of forest to pasture in the San Antonio region, from above Cirialo to Alto Materiato, has had dramatic effects on species composition and the relative abundance of many species. Aside from the loss of many forest species over a sizeable area (Fig. 1), several species that were presumably either non-existent (e.g. White-tailed Hawk *Buteo albicaudatus* and Ocellated Crake *Micropygia schomburgkii*) or very locally distributed (e.g. Cinereous-breasted Spinetail *Synallaxis hypospodia* and Rusty-backed Antwren *Formicivora rufa*) prior to habitat conversion were regularly encountered during our surveys. The short-stature xeric vegetation influenced by the rain shadow above Quillabamba may have been the source for several of these species that are now found in the Cirialo / Alto Materiato area. In grassland with scattered bushes, non-vocalising Black-faced Tanager *Schistochlamys melanopis* (adults and immatures seen together) and displaying Blue-black Grassquit *Volatinia jacarina* were the most abundant species. In the fern- / thorn-dominated herbaceous cover with scattered bushes, Azara's Spinetail *Synallaxis azarae*, Bran-coloured Flycatcher *Myiophobus fasciatus*, Rufous-tailed Tyrant *Knipolegus poecilurus* and Dull-coloured Grassquit *Tiaris obscurus* were the most abundant species.

The presence of cracids, *Primolius couloni*, Red-throated Caracara *Ibycter americanus*, Red Howler Monkey *Alouatta seniculus*, agoutis *Dasyprocta* spp., squirrels *Sciurus* spp., and Giant Armadillo *Prionotus maximus* was indicative of the quality of the forest and the low hunting pressure at Manguriari. In contrast, mammals appeared scarcer at Alto Materiato, probably due to a combination of factors: more impacted forest, higher hunting pressure (we were informed of a number of terrestrial mammal traps near our campsite) and the higher elevation. Nonetheless, the abundance of tinamous and cracids appeared to indicate only moderate hunting pressure on the avifauna at Materiato.

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Appendix. List of bird species recorded at two study sites in the foothills of the upper Urubamba Valley, dpto. Cusco, Peru, in March–April 2009. Relative abundance criteria: C = common (>20 individuals / day); F = fairly common (5–20 individuals / day); U = uncommon, present in small numbers (<5 individuals / day); R = rare; only occasionally encountered and in small numbers; X = single record. Documentation evidence: # = specimen; v = voice recorded; no symbol = sight and / or heard only, i.e., no concrete evidence

		Species	Manguriari	Materiato
TINAMIDAE	Grey Tinamou	<i>Tinamus tao</i>	X, D34#	
	Black Tinamou	<i>Tinamus osgoodi</i>		X, v
	Little Tinamou	<i>Crypturellus soui</i>	U	X, v
	Brown Tinamou	<i>Crypturellus obsoletus</i>		U, #
	Small-billed Tinamou	<i>Crypturellus parvirostris</i>		U
CRACIDAE	Wattled Guan	<i>Aburria aburri</i>	R, v	R
	Speckled Chachalaca	<i>Ortalis guttata</i>	U, v	C, #
ODONTOPHORIDAE	Rufous-breasted Wood Quail	<i>Odontophorus speciosus</i>		F, #
	wood quail sp.	<i>Odontophorus</i> sp.	X	
CATHARTIDAE	Turkey Vulture	<i>Cathartes aura</i>		U
	Greater Yellow-headed Vulture	<i>Cathartes melambrotus</i>	X	
	Black Vulture	<i>Coragyps atratus</i>	X	X
	King Vulture	<i>Sarcoromphus papa</i>	X	
ACCIPITRIDAE	Swallow-tailed Kite	<i>Elanoides forficatus</i>	R	
	Sharp-shinned Hawk	<i>Accipiter striatus</i>		R
	Cinereous Harrier	<i>Circus cinereus</i>		X
	Roadside Hawk	<i>Buteo magnirostris</i>	U, v	F, #
	White-tailed Hawk	<i>Buteo albicaudatus</i>		R
	Barred Forest Falcon	<i>Micrastur ruficollis</i>	U, #	
	Red-throated Caracara	<i>Ibycter americanus</i>	R, v	
	Bat Falcon	<i>Falco ruficularis</i>		X
RALLIDAE	Ocellated Crake	<i>Micropygia schomburgkii</i>		F, v
	Rufous-necked Wood Rail	<i>Aramides cajanea</i>	X	
	Russet-crowned Crake	<i>Anurolimnas viridis</i>		F, v
	Rufous-sided Crake	<i>Laterallus melanophaius</i>		U
COLUMBIDAE	Grey-breasted Crake	<i>Laterallus exilis</i>		X, v
	Plain-breasted Ground Dove	<i>Columbina minuta</i>		F, v
	Ruddy Ground Dove	<i>Columbina talpacoti</i>		X
	Blue Ground Dove	<i>Claravis pretiosa</i>	X	
	Band-tailed Pigeon	<i>Patagioenas fasciata</i>		R
	Plumbeous Pigeon	<i>Patagioenas plumbea</i>	U	U, v
	White-tipped Dove	<i>Leptotila verreauxi</i>	C, v	C
	Grey-fronted Dove	<i>Leptotila rufaxilla</i>	X, #	
PSITTACIDAE	White-throated Quail-Dove	<i>Geotrygon frenata</i>	X	
	Blue-headed Macaw	<i>Primolius couloni</i>	R, v	C, v
	White-eyed Parakeet	<i>Aratinga leucophthalma</i>	X	
	Rose-fronted Parakeet	<i>Pyrrhura roseifrons</i>	U	
	Blue-headed Parrot	<i>Pionus menstruus</i>	U, #	U
	Scaly-naped Parrot	<i>Amazona mercenaria</i>		R, v
	Mealy Parrot	<i>Amazona farinosa</i>	X, v	
CUCULIDAE	Squirrel Cuckoo	<i>Piaya cayana</i>	U, #	U, #
	Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	R	
	Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	R, #	
	Smooth-billed Ani	<i>Crotophaga ani</i>		U
STRIGIDAE	Tropical Screech Owl	<i>Megascops choliba</i>		U, #
	Rufescent Screech Owl	<i>Megascops ingens</i>		X, v
	Band-bellied Owl	<i>Pulsatrix melanota</i>	U, #	X
	Black-banded Owl	<i>Ciccaba huhula</i>	X	
NYCTIBIIDAE	Long-tailed Potoo	<i>Nyctibius aethereus</i>	X, v	

		Species	Manguriari	Materiato
	Andean Potoo	<i>Nyctibius maculosus</i>	X, v	
CAPRIMULGIDAE	Ocellated Poorwill	<i>Nyctiphrynus ocellatus</i>	X, #	F, v
	Scissor-tailed Nightjar	<i>Hydropsalis torquata</i>		F, #
APODIDAE	Chestnut-collared Swift	<i>Streptoprocne rutila</i>	U, v	X
	White-collared Swift	<i>Streptoprocne zonaris</i>	X	X
TROCHILIDAE	Buff-tailed Sicklebill	<i>Eutoxeres condensini</i>	U, #	U, #
	White-browed Hermit	<i>Phaethornis stuarti</i>	X	
	Green Hermit	<i>Phaethornis guy</i>	U, #	U, #
	Blue-fronted Lancebill	<i>Doryfera johannae</i>	X, #	
	Wedge-billed Hummingbird	<i>Schistes geoffroyi</i>		X, #
	Brown Violetear	<i>Colibri delphinae</i>		X, #
	Green Violetear	<i>Colibri thalassinus</i>		X
	Black-eared Fairy	<i>Heliothrix auritus</i>	R	
	Peruvian Piedtail	<i>Phlogophilus harterti</i>	R, #	X
	Speckled Hummingbird	<i>Adelomyia melanogenys</i>		F, #
	Bronzy Inca	<i>Coeligena coeligena</i>		F, #
	Chestnut-breasted Coronet	<i>Boissonneaua matthewsii</i>		X
	Booted Racket-tail	<i>Ocreatus underwoodii</i>		U, #
	Black-throated Brilliant	<i>Heliodoxa schreibersii</i>	X, #	
	Violet-fronted Brilliant	<i>Heliodoxa leadbeateri</i>	X, #	R, #
	White-bellied Woodstar	<i>Chaetocercus mulsant</i>		X
	Blue-tailed Emerald	<i>Chlorostilbon mellisugus</i>		C, #
	Violet-headed Hummingbird	<i>Klais guimeti</i>	X	
	Swallow-tailed Hummingbird	<i>Eupetomena macroura</i>		F, #
	Fork-tailed Woodnymph	<i>Thalurania furcata</i>	U, #	R, #
	Green-and-white Hummingbird	<i>Amazilia viridicauda</i>		R, #
	Golden-tailed Sapphire	<i>Chrysoronia oenone</i>	X	X, #
TROGONIDAE	Blue-crowned Trogon	<i>Trogon curucui</i>	U, v	X
	Collared Trogon	<i>Trogon collaris</i>	U, v	
	Masked Trogon	<i>Trogon personatus</i>		R, #
MOMOTIDAE	Andean Motmot	<i>Momotus aequatorialis</i>		R, #
GALBULIDAE	Bluish-fronted Jacamar	<i>Galbula cyanescens</i>	U, #	
BUCCONIDAE	Striolated Puffbird	<i>Nystalus striolatus</i>	U, #	
	White-eared Puffbird	<i>Nystalus chacuru</i>		X
	Black-streaked Puffbird	<i>Malacoptila fulvogularis</i>		F, #
	Yellow-billed Nunbird	<i>Monasa flavirostris</i>	X, #	
CAPITONIDAE	Gilded Barbet	<i>Capito auratus</i>	U, #	U, #
	Versicoloured Barbet	<i>Eubucco versicolor</i>		U, #
RAMPHASTIDAE	White-throated Toucan	<i>Ramphastos tucanus</i>	R	R
	Emerald Toucanet	<i>Aulacorhynchus prasinus</i>	U	
	Chestnut-tipped Toucanet	<i>Aulacorhynchus derbianus</i>	U, #	R, #
	aracari sp.	<i>Pteroglossus</i> sp.	X	
PICIDAE	Bar-breasted Piculet	<i>Picumnus aurifrons</i>	U, #	X
	Ocellated Piculet	<i>Picumnus dorbignyanus</i>		U, #
	Yellow-tufted Woodpecker	<i>Melanerpes cruentatus</i>	U	F, #
	Yellow-vented Woodpecker	<i>Veniliornis dignus</i>		X, #
	Red-stained Woodpecker	<i>Veniliornis affinis</i>	U, #	X
	White-throated Woodpecker	<i>Piculus leucolaemus</i>	U, #	
	Golden-olive Woodpecker	<i>Colaptes rubiginosus</i>	U	U, #
	Lineated Woodpecker	<i>Dryocopus lineatus</i>	U, v	U, v
	Crimson-bellied Woodpecker	<i>Campephilus haematogaster</i>	X, #	X
	Crimson-crested Woodpecker	<i>Campephilus melanoleucos</i>	U, #	
FURNARIIDAE	Tawny-throated Leaf-tosser	<i>Sclerurus mexicanus</i>	X, #	
	Grey-throated Leaf-tosser	<i>Sclerurus abigularis</i>	U, #	

	Species	Manguriari	Materiato
	Azara's Spinetail		F, #
	Dark-breasted Spinetail		X, v
	Cinereous-breasted Spinetail		U, #
	Cabanis's Spinetail	U, #	U, #
	Plain-crowned Spinetail	R, v	
	Ash-browed Spinetail	U, v	R, v
	Spotted Barbtail		R, #
	Montane Foliage-gleaner		R, #
	Lineated Foliage-gleaner		X, #
	Buff-browed Foliage-gleaner		F, #
	Peruvian Recurvebill	U, #	
	Chestnut-winged Foliage-gleaner	U, #	
	Dusky-cheeked Foliage-gleaner	R, #	
	Buff-throated Foliage-gleaner	U, #	R, v
	Plain Xenops	U, #	
	Streaked Xenops	R	C, #
	Plain-brown Woodcreeper	X, #	
	Olivaceous Woodcreeper	U, #	U, #
	Wedge-billed Woodcreeper	U	
	Cinnamon-throated Woodcreeper	R, #	
	Strong-billed Woodcreeper	R, v	
	Ocellated Woodcreeper	U, #	
	Olive-backed Woodcreeper		U, #
	Montane Woodcreeper		X
	Red-billed Scythebill	U, #	
THAMNOPHILIDAE	Barred Antshrike	U, v	F, #
	Chestnut-backed Antshrike	X	
	Plain-winged Antshrike	U, v	
	Variable Antshrike		X
	Plain Antvireo	U, #	U, #
	Bluish-slate Antshrike	U, #	X
	Foothill Antwren	R, #	
	Ornate Antwren	R, #	
	White-flanked Antwren		F, v
	Ashy Antwren	X, #	
	Creamy-bellied Antwren		R, #
	Yellow-breasted Antwren	U, #	
	Dot-winged Antwren	U	
	Rusty-backed Antwren		U, #
	Peruvian Warbling Antbird	C, #	U, v
	Blackish Antbird		C, #
	White-backed Fire-eye	R, #	R, #
	White-browed Antbird	C, #	
	Chestnut-tailed Antbird	C, #	U, v
	Hairy-crested Antbird	X, #	
FORMICARIIDAE	Black-faced Antthrush	F, #	U, v
	Short-tailed Antthrush	R, #	U, v
GRALLARIIDAE	Scaled Antpitta	U, v	X, v
CONOPOPHAGIDAE	Chestnut-crowned Gnatcatcher	X, #	U, #
RHINOCRYPTIDAE	White-crowned Tapaculo		R, #
TYRANNIDAE	Sooty-headed Tyrannulet	U, #	X, v
	Forest Elaenia	F, v	U, #
	Yellow-bellied Elaenia		F, #
	White-crested Elaenia		U, #

	Species	Manguriari	Materiato
Small-billed Elaenia	<i>Elaenia parvirostris</i>		X, #
elaenia sp.	<i>Elaenia cristata / chiriquensis</i>		U
White-lored Tyrannulet	<i>Ornithion inerne</i>	R, v	F, v
Torrent Tyrannulet	<i>Serpophaga cinerea</i>		R
Ringed Antpiper	<i>Corythopis torquata</i>	R, #	
Bolivian Tyrannulet	<i>Zimmerius bolivianus</i>	X, #	F, #
Marble-faced Bristle Tyrant	<i>Phylloscartes ophthalmicus</i>		R
Spectacled Bristle Tyrant	<i>Phylloscartes orbitalis</i>	X, photo	
Mottle-cheeked Tyrannulet	<i>Phylloscartes ventralis</i>		F, #
Cinnamon-faced Tyrannulet	<i>Phylloscartes parkeri</i>	F, #	
Streak-necked Flycatcher	<i>Mionectes striaticollis</i>	U, #	F, #
Olive-striped Flycatcher	<i>Mionectes olivaceus</i>	U, #	
Sepia-capped Flycatcher	<i>Leptopogon amaurocephalus</i>	U, #	U
Slaty-capped Flycatcher	<i>Leptopogon superciliaris</i>	U, #	U, #
Ornate Flycatcher	<i>Myiobicus ornatus</i>	U, #	
Short-tailed Pygmy Tyrant	<i>Myiornis ecaudatus</i>	U	X
Scale-crested Pygmy Tyrant	<i>Lophotriccus pileatus</i>	F, #	F, #
Stripe-necked Tody-Tyrant	<i>Hemitriccus striaticollis</i>		F, #
Common Tody-Flycatcher	<i>Todirostrum cinereum</i>	U	F, v
Yellow-browed Tody-Flycatcher	<i>Todirostrum chrysocrotaphum</i>	R, v	R
Olivaceous Flatbill	<i>Rhynchocyclus olivaceus</i>	R, #	
Fulvous-breasted Flatbill	<i>Rhynchocyclus fulvipectus</i>		X, #
Yellow-olive Flycatcher	<i>Tolmomyias sulphurens</i>	F, #	U
Yellow-breasted Flycatcher	<i>Tolmomyias flaviventris</i>	F, v	C, v
White-throated Spadebill	<i>Platyrinchus mystaceus</i>	F, #	X, #
Unadorned Flycatcher	<i>Myiophobus inornatus</i>	X	X
Bran-coloured Flycatcher	<i>Myiophobus fasciatus</i>		F, #
Tawny-breasted Flycatcher	<i>Myiobius villosus</i>		X, #
Cinnamon Flycatcher	<i>Pyrrhomyias cinnamomeus</i>	U	U, #
Cliff Flycatcher	<i>Hirundinea ferruginea</i>		U, #
Euler's Flycatcher	<i>Lathrotriccus euleri</i>	F, #	R, #
Alder Flycatcher	<i>Empidonax alnorum</i>	R, v	R, v
Olive-sided Flycatcher	<i>Contopus cooperi</i>	R	X
Western Wood Pewee	<i>Contopus sordidulus</i>	U	F
Olive Flycatcher	<i>Mitrephanes olivaceus</i>		X
Rufous-tailed Tyrant	<i>Knipolegus poecilurus</i>		U, #
Social Flycatcher	<i>Myiozetetes similis</i>	C, v	F
Lemon-browed Flycatcher	<i>Conopias cinchoneti</i>	X, v	R, #
Golden-crowned Flycatcher	<i>Myiodynastes chrysocephalus</i>	R, #	X
Streaked Flycatcher	<i>Myiodynastes maculatus</i>	F, v	U, #
Tropical Kingbird	<i>Tyrannus melancholicus</i>	R	F, #
Rufous Casiornis	<i>Casiornis rufus</i>		X
Dusky-capped Flycatcher	<i>Myiarchus tuberculifer</i>		R, #
Short-crested Flycatcher	<i>Myiarchus ferox</i>	R	
Pale-edged Flycatcher	<i>Myiarchus cephalotes</i>		F, #
Large-headed Flatbill	<i>Ramphotrigon megalcephalum</i>	R, #	
Bright-rumped Attila	<i>Attila spadiceus</i>		R, v
Masked Fruiteater	<i>Pipreola pulchra</i>		R, v
Andean Cock-of-the-Rock	<i>Rupicola peruvianus</i>	R	R
Amazonian Umbrellabird	<i>Cephalopterus ornatus</i>	U	R
Cerulean-capped Manakin	<i>Lepidothrix coeruleocapilla</i>	C, #	X, #
Fiery-capped Manakin	<i>Machaeropterus pyrocephalus</i>		C
Yungas Manakin	<i>Chiroxiphia boliviana</i>	C, #	
Jet Manakin	<i>Xenobipo unicolor</i>		R, #

	Species	Manguriari	Materiato
	White-crowned Manakin	<i>Pipra pipra</i>	R, #
	Round-tailed Manakin	<i>Pipra chloromeros</i>	R, #
TITYRIDAE	Masked Tityra	<i>Tityra semifasciata</i>	R, v
	Thrush-like Schiffornis	<i>Schiffornis turdina</i>	U, #
	Shrike-like Cotinga	<i>Lanius elegans</i>	R, #
	Green-backed Becard	<i>Pachyrhamphus viridis</i>	U, v
	Barred Becard	<i>Pachyrhamphus versicolor</i>	X
	White-winged Becard	<i>Pachyrhamphus polychopterus</i>	F, v
INCERTAE SEDIS	Wing-barred Piprites	<i>Piprites chloris</i>	F, v
VIREONIDAE	Rufous-browed Peppershrike	<i>Cycharhis gujanensis</i>	C, #
	Brown-capped Vireo	<i>Vireo leucophrys</i>	U, #
	Red-eyed Vireo	<i>Vireo olivaceus olivaceus</i> and <i>V. o. chivi</i>	C
	Dusky-capped Greenlet	<i>Hylophilus hypoxanthus</i>	U, v
	Olivaceous Greenlet	<i>Hylophilus ochraceiceps</i>	U, #
CORVIDAE	Violaceous Jay	<i>Cyanocorax violaceus</i>	U, v
	Purplish Jay	<i>Cyanocorax cyanomelas</i>	U, v
	Green Jay	<i>Cyanocorax yncas</i>	U, #
HIRUNDINIDAE	Blue-and-white Swallow	<i>Pygochelidon cyanoleuca cyanoleuca</i>	C, #
	White-thighed Swallow	<i>Atticora tibialis</i>	C
	Southern Rough-winged Swallow	<i>Stelgidopteryx ruficollis</i>	C, #
TROGLODYTIDAE	Scaly-breasted Wren	<i>Microcerculus marginatus</i>	F, #
	House Wren	<i>Troglodytes aedon</i>	C, v
	Thrush-like Wren	<i>Campylorhynchus turdinus</i>	R
	Moustached Wren	<i>Pheugopedius genibaris</i>	C, v
	Grey-breasted Wood Wren	<i>Henicorhina leucophrys</i>	R
	Chestnut-breasted Wren	<i>Cyphorhinus thoracicus</i>	U, #
TURDIDAE	Andean Solitaire	<i>Myadestes ralloides</i>	X, #
	Spotted Nightingale-Thrush	<i>Catharus dryas</i>	U, #
	Swainson's Thrush	<i>Catharus ustulatus</i>	X
	White-eared Solitaire	<i>Entomodestes leucotis</i>	X, #
	Slaty Thrush	<i>Turdus nigriceps</i>	R, #
	Glossy-black Thrush	<i>Turdus serranus</i>	X
THRAUPIDAE	Black-faced Tanager	<i>Schistochlamys melanopsis</i>	C, #
	Magpie Tanager	<i>Cissopis leveriana</i>	U
	Oleaginous Hemispingus	<i>Hemispingus frontalis</i>	X
	Black-goggled Tanager	<i>Trichothraupis melanops</i>	U, #
	Yellow-crested Tanager	<i>Tachyphonus rufiventer</i>	R
	White-lined Tanager	<i>Tachyphonus rufus</i>	X
	Silver-beaked Tanager	<i>Ramphocelus carbo</i>	C
	Blue-grey Tanager	<i>Thraupis episcopus</i>	R
	Palm Tanager	<i>Thraupis palmarum</i>	R
	Vermilion Tanager	<i>Calochaetes cocineus</i>	R, #
	Blue-winged Mountain Tanager	<i>Anisognathus somptuosus somptuosus</i>	F, #
	Yellow-throated Tanager	<i>Iridosornis analis</i>	U, #
	Fawn-breasted Tanager	<i>Pipraeidea melanonota</i>	X
	Golden-naped Tanager	<i>Tangara ruficervix</i>	X
	Silver-backed Tanager	<i>Tangara viridicollis</i>	X
	Blue-necked Tanager	<i>Tangara cyanicollis</i>	F, #
	Yellow-bellied Tanager	<i>Tangara xanthogastra</i>	X
	Spotted Tanager	<i>Tangara punctata</i>	F, #
	Beryl-spangled Tanager	<i>Tangara nigroviridis</i>	R, #
	Blue-browed Tanager	<i>Tangara cyanotis</i>	X
	Paradise Tanager	<i>Tangara chilensis</i>	C, #
	Bay-headed Tanager	<i>Tangara gyrola</i>	R, #

	Species	Manguriari	Materiato
	Saffron-crowned Tanager	<i>Tangara xanθοcephala</i>	X
	Flame-faced Tanager	<i>Tangara parzudakii</i>	X
	Green-and-gold Tanager	<i>Tangara schrankii</i>	C, #
	Golden Tanager	<i>Tangara arthus</i>	X
	Swallow Tanager	<i>Tersina viridis</i>	R
	Black-faced Dacnis	<i>Dacnis lineata</i>	U, #
	Blue Dacnis	<i>Dacnis cayana</i>	F
	Purple Honeycreeper	<i>Cyanerpes caeruleus</i>	X
	Green Honeycreeper	<i>Chlorophanes spiza</i>	F
	Golden-collared Honeycreeper	<i>Iridophanes pulcherrimus</i>	
	Guira Tanager	<i>Hemithraupis guira</i>	U
	Capped Conebill	<i>Cinnostrum albifrons</i>	
	Deep-blue Flowerpiercer	<i>Diglossa glauca</i>	R, #
	Masked Flowerpiercer	<i>Diglossa cyanea</i>	X, #
INCERTAE SEDIS	Bananaquit	<i>Coereba flaveola</i>	C, v
	Dull-coloured Grassquit	<i>Tiaris obscurus</i>	
	Slate-coloured Grosbeak	<i>Saltator grossus</i>	U, #
	Buff-throated Saltator	<i>Saltator maximus</i>	U
EMBERIZIDAE	Yellow-browed Sparrow	<i>Ammodramus aurifrons</i>	U
	Blue-black Grassquit	<i>Volatinia jacarina</i>	
	Black-and-white Seedeater	<i>Sporophila luctuosa</i>	C, #
	Yellow-bellied Seedeater	<i>Sporophila nigricollis</i>	X
	Chestnut-bellied Seed Finch	<i>Oryzoborus angolensis</i>	U, v
	Chestnut-capped Brush Finch	<i>Arremon brunneinucha</i>	U, #
	Red-crested Finch	<i>Coryphospingus cucullatus</i>	
	Common Bush Tanager	<i>Chlorospingus ophthalmicus</i>	C, #
	Yellow-throated Bush Tanager	<i>Chlorospingus flavigularis</i>	X, #
CARDINALIDAE	Hepatic Tanager	<i>Piranga flava</i>	R, v
	Blue-black Grosbeak	<i>Cyanocompsa cyanoides</i>	R, #
PARULIDAE	Tropical Parula	<i>Parula pititayuma</i>	C, v
	Cerulean Warbler	<i>Dendroica cerulea</i>	
	Masked Yellowthroat	<i>Geothlypis aequinoctialis</i>	X
	Canada Warbler	<i>Wilsonia canadensis</i>	R, #
	Slate-throated Redstart	<i>Myioborus miniatus</i>	U, #
	Golden-bellied Warbler	<i>Basileuterus chrysogaster</i>	F, v
	Russet-crowned Warbler	<i>Basileuterus coronatus</i>	C, #
	Three-banded Warbler	<i>Basileuterus tristriatus</i>	U
	Buff-rumped Warbler	<i>Phaeothlypis fulvicauda</i>	C, #
ICTERIDAE	Russet-backed Oropendula	<i>Psarocolius angustifrons</i>	C, #
	Crested Oropendula	<i>Psarocolius decumanus</i>	U
	Scarlet-rumped Cacique	<i>Cacicus uropygialis</i>	
	Epaulet Oriole	<i>Icterus cayanensis</i>	U, #
FRINGILLIDAE	Hooded Siskin	<i>Carduelis magellanica</i>	U, #
	Thick-billed Euphonia	<i>Euphonia lanirostris</i>	U
	Orange-bellied Euphonia	<i>Euphonia xanthogaster</i>	X
	Blue-naped Chlorophonia	<i>Chlorophonia cyanea</i>	F, #
			U, #

Two new species for Nicaragua and other notes on the avifauna of the Atlantic Region and Paso del Istmo Biological Corridor

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En este artículo reportamos dos nuevas especies para Nicaragua: *Butorides striata* y *Ornithion brunneicapillus*. Además registramos ampliaciones en la distribución y abundancia en la Región Atlántica y el Corredor Biológico del Paso del Istmo para 29 especies, durante el 2009. De estas observaciones diez corresponden a especies raras en toda Nicaragua, incluyendo cuatro que fueron recientemente incluidas en la lista de aves: *Cypseloides niger*, *Deconycura longicauda*, *Myiornis atricapillus* y *Tolomyias assimilis*. Las otras observaciones corresponden a ampliaciones de la distribución altitudinal y registros en bioregiones donde no han sido reportadas previamente estas especies. Además incluimos información sobre la abundancia de las especies y el hábitat donde se les observó.

Nicaragua's avifauna may be the least studied in Mesoamerica and the ecology, life history and distribution of most species remain little known. However, in the last decade resident and visiting ornithologists and birdwatchers have made several important contributions to our knowledge of Nicaraguan bird distribution, including more than 90 new species records and noteworthy range extensions^{1–5,8,11,13–18,20}. The publication of the *Lista patrón de las aves de Nicaragua*¹² was an important contribution because it summarises contemporary information on species distribution and abundance throughout the country, and set the foundations for additional studies. Here we report the first records of Striated Heron *Butorides striata* and Brown-capped Tyrannulet *Ornithion brunneicapillus* for Nicaragua. Also included are notes of range extensions and abundance data for 29 other species in the Atlantic Region and the Paso del Istmo Biological Corridor.

Methods

Most of LS's observations were made in 2009 during bird surveys of El Quebracho Private Reserve (hereafter QPR), dpto. Río San Juan (11°10'N 84°24'W; 80 m) and Mancarroncito Island in the Solentiname archipelago, within Lake Nicaragua (11°10'N 85°03'W; 30 m; Fig. 1) as part of a bird monitoring project sponsored by Fundación del Río. Other observations were made in San Juan del Sur or during trips to and from both aforementioned study areas.

WJA *et al.* conducted avian point-count surveys in March–November 2009 in the Paso del Istmo Biological Corridor (hereafter PIBC) on three private farms in dpto. Rivas: Finca Guadalupe (El Aceituno, Sapoá), Finca Sierra Serena (Cárdenas) and Las Fincas Nica Dev (Nicaraguan Development) (Escamequita). Additional observations were made

c.13 km south-east of Río Mena in the lower río San Juan watershed (11°06'39"N 85°16'49"W; Fig. 1). GPS coordinates of each observation are provided within the species accounts. When exact distances are presented, they were measured using a laser range finder. Other observers' initials are given where relevant and their names are provided in the Acknowledgements.

Results

Rufescent Tiger Heron *Tigrisoma lineatum*

An adult perched at a distance of 7 m and c.3 m above ground in a broadleaf tree within riparian habitat at Finca Guadalupe (11°10'24.832"N 85°41'5.521"W; 229 m) on 28 March 2009 (WJA, JH), and one in riparian habitat, Finca Isla Vista (11°14'0.281"N 85°33'6.208"W; 43 m) on 1 April 2009 (FO, MS). The species is uncommon but regular along rivers and the lakeshore in the PIBC. An adult perched at a height of c.8 m in a leafless tree at the edge of the río Frío c.0.5 km inland of Lake Nicaragua (=Lake Cocibolca: 11°06'N 84°46'W; 34 m), on 3 September 2009 (LS). Listed as rare in Nicaragua¹², but the abundance of small streams and rivers (prime habitat) throughout the PIBC and along the San Juan River suggests that this species may be commoner than previously reported.

Bare-throated Tiger Heron *Tigrisoma mexicanum*

Eight adults on different parts of Mancarroncito Island during daily bird surveys conducted from 05h30–11h00. All observations were of lone birds perched 1–5 m above the water in trees at the edge of the island, or among *Junco* sp. (Juncaceae) in the water, on 4 September 2009, with one each on 5–6 September 2009 (LS). The species is apparently commoner than reported previously in this area¹².

Striated Heron *Butorides striata*

On 10 March 2009, LS observed a heron perched on a dead snag (Fig. 2) in the water c.5 m from the río San Juan's edge (10°59'N 84°26'W; 30 m). It was perched near Snowy Egrets *Egretta thula*, permitting a definitive comparison of size. The extensive white belly and breast, green wings and pale neck distinguish the species from Green Heron *B. virescens*. This is the first documented record in Nicaragua.

Double-toothed Kite *Harpagus bidentatus*

Two at QPR: the first (12 March 2009), a juvenile, perched at a height of c.15 m in a forest gap, and the second (13 March 2009), an adult, perched in the lower canopy c.5 m up in the forest interior. Another adult was seen flying over the town of Buena Vista (11°10'N 84°25'W; 80 m), on 9 September 2009 (LS). Reported as sporadic in the Atlantic Region and rare elsewhere¹², these three records suggest that the bird may be commoner than previously reported.

Semiplumbeous Hawk *Leucopternis semiplumbeus*

The species' characteristic and unmistakable call was heard deep in secondary forest at QPR, at c.09h00, on 7 September 2009 (LS). The regenerating secondary forest in the reserve is very similar to that inhabited by the species in Costa Rica¹⁹. *L. semiplumbeus* was previously reported as rare in Nicaragua¹².

Common Black Hawk *Buteogallus anthracinus*

An adult at Playa Marsella, San Juan del Sur (11°17'N 85°54'W; 0 m) soared 50 m above the shore with 12 Black Vultures *Coragyps atratus* on 31 December 2008 (LS); another adult in coastal wetlands c.300 m south-east of the mouth of the río Ostional (11°06'29.73"N 85°45'34.92"W; 9 m) on 6 October 2009 (WJA); and two adults in the same area near the coast on 23 April 2010 (WJA). Considered common in the Atlantic Region but sporadic in Nicaragua's Pacific Region¹², whereas along the Pacific coast of Costa Rica, it is considered a common resident⁶. Perhaps commoner than previously reported in Nicaragua's Pacific Region, but more observations are needed to confirm its status locally.

Grey Hawk *Buteo nitidus*

Three observations of single adults at QPR, the first two on consecutive days (12–13 March 2009) in open areas near forest edge, soaring at 20–50 m over pastures with scattered trees, while the third bird was perched (and photographed) c.15 m above ground at the forest edge on 7 September 2009 (LS). At PIBC, a juvenile perched c.40 m away and c.5 m above ground in the midstorey of a broadleaf tree

at the edge of pastures bordering a dirt road c.13 km south-east of the lower río San Juan watershed (11°06'39"N 85°16'49"W; 49 m) on 28 March 2009 (WJA). *B. nitidus* had not been recorded previously in the Atlantic Region¹², but the species is fairly common along Costa Rica's north-west Atlantic slope within 20 km of QPR⁶. Our observations suggest that the species may be extending its range from the south and west in response to land use changes conducive to its ecological prerequisites.

White-tipped Dove *Leptotila verreauxi*

The species' characteristic call was heard at El Castillo, río San Juan (11°00'N 84°25'W; 30 m) at 05h45, on 9 March 2009 (LS). Another was observed in the middle of the main trail between Boca de Sábalo and Bella Vista, c.5 km from Buena Vista, on 11 March 2009. It was apparently searching for food or grit. A third was heard calling prior to 06h00 near the forest edge at QPR, on 12–13 March 2009 (LS). Grey-chested Dove *L. cassinii* is commonly heard in the same area, which helped confirm the differences between their songs. *L. cassinii* is common in Nicaragua's Pacific Region and Central Highlands but there are no published reports of it in the Atlantic Region¹². LS's observations constitute the first report in the latter region. Possibly, the fragmentation and deforestation that continues along the Atlantic slope favours the species, a trend also observed in other Central and South American countries⁷.

Grey-headed Dove *Leptotila plumbeiceps*

Five were seen in young, humid secondary forest on Mancarroncito Island. Three foraged on the ground next to a creek, while two others were observed perched 1 m above ground within a dense bush near the forest edge, on 4 September 2009 (LS). This dove is rare throughout Nicaragua¹². However, at least on this island, it appears to be common.

Crimson-fronted Parakeet *Aratinga finschi*

Twelve alighted in a coconut palm *Cocos nucifera* on the beach near San Juan del Sur (11°15'N 85°52'W; 0 m) at 17h35, on 1 January 2009 (LS). Apparently, they were using the palm to roost because they formed groups of 2–3 and vied for perches just before nightfall. A very vocal flock of eight was at Las Fincas, Nica Dev (11°13'5.174"N 85°47'51.850"W; 38 m) flying above pastures at a distance of 335 m (viewed through 10×42 binoculars) on 7 April 2009 (WJA, JH). Nine were at San Juan del Sur (11°15'09.85"N 85°52'19.56"W; 10 m) feeding c.7 m above ground in the crown of an almond (*Terminalia catappa*) in a garden c.150 m inland, on 18 June 2009 (WJA). A flock of six at Finca Sierra Serena (11°13'11.309"N 85°33'29.563"W; 186 m) near forest edge at a distance of 43 m and c.20 m above ground, landed

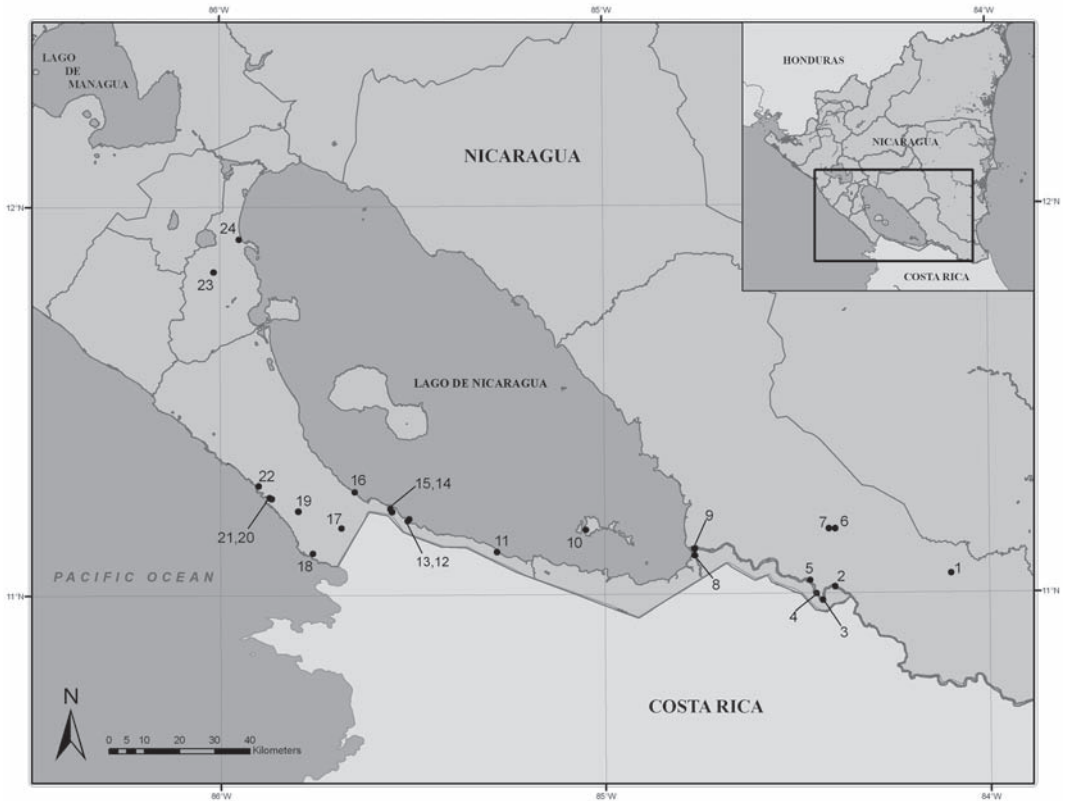


Figure 1. Map of Nicaragua showing locations mentioned in the text. (1) 1 km north-west of Brito; (2) Santa Fe, río San Juan; (3) El Castillo, río San Juan; (4) río San Juan between El Castillo and Boca de Sábalo; (5) mouth of the río Sábalo near Boca de Sábalo; (6) El Quebracho Private Reserve, dpto. Río San Juan; (7) Buena Vista; (8) río Frio c.0.5 km inland of Lake Nicaragua (=Lake Cocibolca); (9) San Carlos; (10) Mancarroncito Island, Solentiname archipelago, Lake Nicaragua; (11) 13 km south-east of Río Mena, lower río San Juan watershed; (12) military post on outskirts of Cárdenas; (13) Cárdenas; (14) Finca Isla Vista; (15) Finca Sierra Serena; (16) 15 km north of Peñas Blancas frontier pass; (17) Finca Guadalupe; (18) coastal wetlands c.300 m south-east of the mouth of the río Ostional; (19) Las Fincas, Nica Dev; (20) beach near San Juan del Sur; (21) San Juan del Sur; (22) Playa Marsella, San Juan del Sur; (23) Mombacho Volcano Natural Reserve; (24) Granada city.



Figure 2. Striated Heron *Butorides striata*, río San Juan, Nicaragua, 10 March 2009; note the Snowy Egret *Egretta thula* for size comparison (Luis Sandoval)



Figure 3. Female or young male Slate-coloured Seedeater *Sporophila schistacea*, Mancarroncito Island Nicaragua, 5 September 2009 (Luis Sandoval)

briefly in the crown of a tall broadleaf tree, on 3 October 2009 (WJA, JH). A flock of 16 was in the village of Cárdenas (11°11'47.63"N 85°30'29.23"W; 34 m) roosting among palm fronds c.50 m from the Lake Nicaragua shore, on 5 October 2009 (WJA). Distinguished from the similar Pacific Parakeet *A. strenua* on vocalisations and because *A. strenua* lacks the plush crimson forehead and bright red coverts at the bend of the wing, conspicuous when perched, and the red-and-yellow underwing linings visible in flight. Throughout its range, *A. finschi* inhabits mainly open and disturbed areas as well as humid forest edge from coastal lowlands to 2,000 m⁹. In Nicaragua, *A. finschi* is common in the Atlantic Region but less so in the Central Highlands¹². These are the first reports (a) over a broad area of the PIB, including the shores of Lake Nicaragua; (b) on the Pacific coast of Nicaragua; and (c) in dry forest habitat anywhere in the species' range.

Brown-hooded Parrot *Pyrilia haematotis*

LS watched several flocks in the Atlantic Region in the QPR and near the río San Juan during March and September 2009. On 11–13 March, he observed a pair and a flock of three flying above the canopy of the reserve. On 7 September, a flock of 16 flew south to north over the canopy within the same reserve. In Nicaragua, *P. haematotis* is sporadic in the Atlantic Region¹² but may be commoner than previously reported.

Mealy Parrot *Amazona farinosa*

Several flocks seen near the Costa Rican border (LS): two flocks of 8–10, the largest of the those he recorded, flew south over the río San Juan between El Castillo and Boca de Sábalo (11°00'N 84°27'W; 36 m) early in the morning of 10 March 2009. Three flocks were observed at QPR as follows. Three foraged in a fig tree (*Ficus* sp.) in a forest gap on 11 March 2009. On 12–13 March 2009, two flocks of four and six, respectively, flew over the forest canopy between 05h30 and 06h30, calling as they did so (LS). At PIBC, a very vocal flock of six was observed at a distance of 30 m perched c.7 m above ground in a broadleaf tree within secondary forest at Finca Guadalupe (11°11'15.562"N 85°40'31.699"W; 172 m) on 17 June 2009 (WJA, JH). Uncommon in the Central Highlands and Atlantic Region¹², but common in lowland forests of the Atlantic Region of Costa Rica and Honduras^{9,19}. It appears to be expanding west into the Pacific Region.

Crested Owl *Lophotrix cristata*

Nocturnal vocalisations of two birds were sound-recorded in QPR at just 80 m, on 11–12 March 2009 (LS). The recording has been deposited at the Laboratorio de Bioacústica, Universidad de Costa

Rica, San José, but is yet to be assigned a catalogue number. A pair was heard at 21h00 at the same site on 6 September 2009 (LS). Reportedly rare in Nicaragua, where it inhabits mid elevations of the Central Highlands¹², ours is the lowest elevational record in the country and the first report for the Atlantic Region.

Black Swift *Cypseloides niger*

Two foraged with a flock of c.20 Vaux's Swift *Chaetura vauxi* over pastures bordering riparian growth, c.1 km north-west of Brito (11°20'55.43"N 85°58'38.82"W; 12 m) on 21 October 2009 (WJA); and two foraged among a loose flock of c.40 Vaux's Swift and one White-collared Swift *Streptoprocne zonaris* near the entrance of Mombacho Volcano Nature Reserve (11°50'N 86°01'W; 325 m) on 27 December 2009 (LS). Rare in Nicaragua with only one record from the Pacific slope¹¹, our observations further support its presence in the country and near sea level.

White-collared Swift *Streptoprocne zonaris*

One foraged with c.40 Vaux's Swift and two Black Swift over pastures near the entrance of Mombacho Volcano Nature Reserve (11°50'N 86°01'W; 325 m) on 27 December 2009 (LS). This is the first report in the Pacific Region of Nicaragua¹².

Vaux's Swift *Chaetura vauxi*

A flock of c.20 with two Black Swifts over pastures bordering riparian habitat, c.1 km north-west of Brito (11°20'55.43"N 85°58'38.82"W; 12 m) on 21 October 2009 (WJA); and two over grassland with >100 Barn Swallows *Hirundo rustica* 15 km north of the Peñas Blancas frontier pass (11°16'N 85°39'W; 37 m) on 27 December 2008 (LS). On 27 December 2009, a flock of c.40 with two Black Swifts and a White-collared Swift was seen near the entrance to Mombacho Volcano Natural Reserve (11°50'N 86°01'W; 325 m) (LS). On 28 December 2009, in the centre of Granada (11°55'N 85°57'W; 33 m), ten Vaux's Swift foraged with >20 Grey-breasted Martin *Progne chalybea* (LS). We distinguished *C. vauxi* from *C. pelagica* by tail shape, the pale rump of *C. vauxi* and vocalisations. Chimney Swift is a common passage migrant in August–November in Costa Rica⁶ and Nicaragua (WJA unpubl.). Thus, the December records probably constitute resident *C. vauxi* because by then most *C. pelagica* have passed through en route to their wintering grounds in South America. Vaux's Swift is considered rare in the Pacific Region and has been recorded only above 100 m¹². Our records constitute the lowest elevations reported for Nicaragua and suggest the species is commoner than previously reported over dry forest and pastures in the Pacific Region.

Ruby-throated Hummingbird *Archilochus colubris*

A female foraged at a distance of 3.0 m and 1.5 m above ground among red-flowered bushes along a road cut c.13 km south-east of Río Mena, in the lower río San Juan watershed (11°06'39"N 85°16'49"W; 49 m) on 28 March 2009 (WJA). A female, after bathing, perched on a leafless branch beside a creek in secondary forest at QPR, on 7 September 2009 (LS). The QPR sighting is the first report in the Atlantic Region¹². In Costa Rica, although the species is primarily a winter resident in dry forest^{6,19}, it is also found sporadically throughout much of the rest of the country, including the Atlantic Region.

Long-tailed Woodcreeper *Deconychura longicauda*

Four seen at QPR, two on 13 March, and two on 7 September 2009 (LS). Observations involved singles foraging on moss-covered tree trunks in secondary forest. Previously reported just once in Nicaragua¹², also in the Atlantic Region, this woodcreeper is perhaps commoner than realised, given the difficulty in identifying woodcreepers in general and this species in particular; it is easily mistaken for commoner species such as Cocoa *Xiphorhynchus susurrans* and Streak-headed Woodcreepers *Lepidocolaptes souleyetii*. More surveys are needed to confirm *D. longicauda*'s abundance in Nicaragua.

Brown-capped Tyrannulet *Ornithion brunneicapillus*

One within the town limits of Buena Vista (11°10'N 84°25'W; 80 m) on 11 March 2009 (LS), perched 5 m above ground in a common teak *Tectona grandis* (Verbenaceae) beside a road. During the observation, a Yellow Warbler *Dendroica petechia* began to chase it for c.30 seconds, before both flew to a nearby teak plantation c.50 m away. Distinguished from the similar Yellow-bellied Tyrannulet *O. semiflavum*, which is rare in the area¹², by the brown crown. Brown-capped Tyrannulet ranges from north-west South America through Panama and is a common resident nearby on the Costa Rica–Nicaragua border⁶, meaning that it was anticipated in the area. This is the first report of *O. brunneicapillus* in Nicaragua.

Black-capped Pygmy Tyrant *Myiornis atricapillus*

Three observations at QPR (LS). The first (12 March) involved a pair moving furtively within a bush at the forest edge, possibly searching for a nest site. The other two observations were on the same day (7 September 2009), one in the morning (08h50) and the other in the afternoon (c.15h00),

on opposite sides of the reserve and involved a single and a pair. A recent addition to Nicaragua's avifauna¹⁶ these observations constitute the second published report for the country.

Yellow-margined Flycatcher *Tolmomyias assimilis*

Two perched at a distance of 33 m and c.6 m above ground in a broadleaf tree in riparian habitat, at Finca Guadalupe (11°11'11.355"N 85°40'22.686"W; 166 m) on 2 March 2009 (FO, MS). Four observations at QPR in 2009 (LS): three in the same area near a building at the forest edge, where a single was seen foraging and singing, on 11–12 March and 8 September. The fourth involved a single at the southern edge of the reserve. Recorded previously from just one locality, Bartola Refuge^{5,16}, these sightings further document the species' presence in Nicaragua.

Golden-crowned Spadebill *Platyrrinchus coronatus*

Three observed in QPR during 2009 at c.80 m (LS). On 5 March, two were seen foraging at 2 m in the understorey, of young secondary forest. On 7–8 September, singles foraged in separate areas of the reserve. Reported in the Atlantic Region at 200–600 m¹² these observations establish the lowest elevation yet recorded in Nicaragua.

Least Flycatcher *Empidonax minimus*

One perched 1 m above ground in a small tree at the forest edge in QPR (11°10'N 84°24'W; 80 m) on 12 March 2009 (LS). At PIBC, six were observed, all foraging in scattered trees in pastures or the understorey, at edges of forest fallows and young secondary forest, at Las Fincas, Nica Dev, between 11°12'53.455"N and 11°13'49.004"N, and 85°47'51.898"W and 85°48'27.957"W, at elevations of 30–188 m, on 7–9 October 2009 (WJA, JH, JC, MS). Common at PIBC during autumn and spring migration in a mosaic of habitat types extending from the coast to islands (e.g., Zanate) in Lake Nicaragua (Arendt *et al.* in prep.). The species' reported elevational range is 600–1,500 m in the Central Highlands and Pacific Regions¹². LS's observation is the first in the Atlantic Region and it, and the Las Fincas, Nica Dev sightings, constitute the lowest elevation (≤ 80 m) for the species in Nicaragua. Identification was based on a combination of overall plumage coloration, the paler upperparts, with much less yellow on the underparts compared to other *Empidonax*, compact size, relatively short tail, disproportionately large head, the conspicuous and complete white eye-ring, and contrasting white throat. When visible, the primary extension was measured 'visually'. With experience, the primary extension can be used in

combination with the other characters to make a positive identification. On some occasions, especially in spring, birds gave a repeated *whit* call.

Great Crested Flycatcher *Myiarchus crinitus*

Four observed on 11–13 March 2009 (LS), one in a private garden in Buena Vista (11°10'N 84°25'W; 80 m), and the others at forest edge in different parts of QPR. At PIBC, during spring and autumn migration 2009, one was observed in riparian growth at Finca Sierra Serena (11°13'23.473"N 85°33'27.558"W; 130 m), two at the edge of young secondary forest at Finca Guadalupe (11°11'10.758"N 85°40'27.534"W; 174 m) and one in young secondary forest at Finca Isla Vista (11°13'47.823"N 85°33'7.919"W; 84 m) (JC, JH, MS, WJA). The species' migratory routes and 'wintering' areas extend along both slopes of Nicaragua¹⁰. This flycatcher is uncommon to common at PIBC in a variety of habitats, but especially along forest edge and in riparian and young second growth, during spring and autumn. Reported as a rare migrant in the Atlantic Region¹¹, but it is common throughout Costa Rica below 1,800 m⁶. In Nicaragua, the species is undoubtedly commoner than previously reported.

Rufous-browed Peppershrike *Cyclarhis gujanensis*

One heard singing constantly during the afternoon of 11 March 2009 on the edge of young secondary forest in QPR (LS). Reported previously only in the Pacific Region and Central Highlands¹², this is the first published report for the Atlantic Region.

House Wren *Troglodytes aedon*

Seven were heard at El Castillo, San Carlos, Boca de Sábalo, Buena Vista and QPR along the río San Juan at 30–80 m, on 10–13 March and 6–9 September 2009 (LS). In the Paso del Istmus, one was singing at Finca Guadalupe (11°11'1.5"N 85°40'25.6"W; 216 m) on 16 June 2009 (WJA). One sang in a fallow field at Finca Isla Vista (11°13'49.0"N 85°32'54.8"W; 82 m) on 20 June 2009 (WJA), with another also heard in a fallow field in the same area (11°12'57.0"N 85°33'11.6"W; 212 m) on the same day (JC). One was seen and heard on the outskirts of Cárdenas (11°11'28.8"N 85°30'45.0"W; 45 m) on 23 June 2009 (WJA, JC, MS). The species' reported elevational range is 400–1600 m¹². These observations represent the lowest elevation reported in the country.

Cerulean Warbler *Dendroica cerulea*

An adult male in a forest gap at an elevation of c.80 m in QPR, on 7 September 2009 (LS), foraged within a mixed-species flock including Lesser Greenlet *Hylophilus decurtatus*, Tropical Gnatcatcher *Poliophtila plumbea* and Blue Dacnis *Dacnis cayana*. Reported previously only in the Central Highlands

at 800–1,200 m¹² this observation establishes the lowest elevation for the species in Nicaragua. However, it occurs at sea level at other migratory stopover sites such as Limón, Costa Rica^{6,19}. This is the first report in the Atlantic Region.

Slate-coloured Seedeater *Sporophila schistacea*

A female or young male (Fig. 3) fed on grass at the edge of young secondary forest on Mancarroncito Island, on 5 September 2009 (LS). Reported just once previously in Nicaragua, at Los Guatusos Wildlife Refuge¹², only 29 km away. The plain brownish plumage and strongly yellowish bill distinguish this species from similar seedeaters such as Variable *S. americana*, Yellow-bellied *S. nigricollis* and Ruddy-breasted *S. minuta*.

Orange-billed Sparrow *Arremon aurantiirostris*

Singles were heard twice (12 March and 7 September 2009) in secondary forest at QPR (LS). At PIBC, two males were singing in mature second-growth forest at Finca Guadalupe (11°11'16.963"N 85°41'1.461"W; 276 m) on 18 June 2009 (JC). Three were observed foraging in riparian habitat at Finca Guadalupe (11°11'0.510"N 85°41'5.689"W; 297 m) on 26 September 2009 (JC, MS). Previously reported as common but found only in the Central Highlands¹² these are the first reports in the Pacific and Atlantic regions of Nicaragua. In Costa Rica, it is common in the northern Atlantic lowlands 20 km from QPR^{6,19}.

Nicaraguan Grackle *Quiscalus nicaraguensis*

Six (two males and four females) perched in a partially submerged tree at the mouth of the río Sábalo near Boca de Sábalo (11°02'N 84°28'W; 37 m) on 11 March 2009 (LS). Three females were seen (one photographed) near the inland port of San Carlos (11°07'N 84°46'W) on 6 September 2009 (LS). Common but local in the Pacific Region¹² these are the first records from the Atlantic Region.

Yellow-throated Euphonia *Euphonia hirundinacea*

At PIBC, on 20 June–3 October 2009, the species was detected 18 times in four habitats, pastures with scattered trees ($n=2$), forest fallow ($n=6$), young second growth ($n=6$) and riparian growth ($n=4$) on four farms—Guadalupe, Isla Vista, Sierra Serena and Las Fincas, Nica Dev. Elevations ranged from 69 m to 309 m (WJA, JH, JC, MS). In the Atlantic Region, two were at the port town of Santa Fe, on the río San Juan (11°03'N 84°06'W; 30 m) on 6 September 2006 (LS). Common in the Central Highlands and Atlantic Region, and sporadic in the Pacific Region, at 500–1,500 m¹², LS's observation establishes the lowest elevation for the country and all sightings were well below 500 m.

Conclusions

For any regional avifauna, a fundamental prerequisite for sound conservation practice is a thorough knowledge of the abundance and distribution of species. The numerous sightings reported here of nationally rare species, and regional and altitudinal range extensions for several others, underscore the considerable effort still required to understand the contemporary status and distribution of Nicaragua's avifauna. This is especially true in the Atlantic Region, which is perhaps the most diverse in the country. Additional studies in all three regions, but especially the Atlantic, should produce more precise abundance estimates, reveal a broader distributional range for additional species, and continue to augment the national inventory of migrant and resident birds. Long-term monitoring programmes are needed throughout the Atlantic Region and the country in general. To that end, we encourage further studies to develop a more comprehensive understanding of Nicaragua's rich avifauna.

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Notes on breeding by Yellow-crowned Night Heron *Nyctanassa violacea* in southern Brazil

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Este trabalho apresenta informações sobre a reprodução do socó-caranguejeiro *Nyctanassa violacea* em sítios nos estados de Santa Catarina (Saco da Fazenda e Manguezal do Itacorubi) e Rio Grande do Sul (estuário da Lagoa dos Patos [ELP]), na extremidade sul da sua distribuição, obtidas entre 2004 e 2009. A atividade reprodutiva dos socós-caranguejeiros estendeu-se de setembro até janeiro / fevereiro. A colônia do manguezal do Itacorubi foi a maior, com 74 ninhos ativos, e a do ELP a menor, com apenas seis. Nos sítios reprodutivos em Santa Catarina os socós-caranguejeiros nidificaram em manguezais (*Avicennia schaueriana* e *Laguncularia racemosa*), enquanto no ELP nidificaram sobre arbustos (*Myrsine parvifolia* e *Cephalanthus glabratus*) e pinheiros (*Pinus elliottii*), fora da zona entremarés. No ELP foram identificadas sete espécies de aves, quatro de mamíferos terrestres e uma serpente como potenciais predadores de ovos e filhotes, resultado da variedade de habitats utilizados pela espécie para nidificar nessa área. O tamanho máximo de postura foi de três ovos para os três sítios estudados. No ELP o volume médio dos ovos C (terceiro ovo da postura) foi 12,5% menor que o dos ovos A e B, enquanto no Saco da Fazenda não ocorreram diferenças significativas entre o volume dos ovos A, B e C. O menor volume dos ovos C no ELP pode ser decorrente da menor temperatura ambiental, o que acarreta em um maior custo energético para a manutenção corporal, além de uma baixa disponibilidade de alimento, reduzindo a energia alocada na reprodução. Os sítios reprodutivos de socós-caranguejeiros no Saco da Fazenda e no manguezal do Itacorubi estão em locais de alta influência antrópica, assim como os localizados em Santos / Cubatão (SP), situação que provavelmente representa um risco às populações do socó-caranguejeiro no sudeste-sul do Brasil.

Yellow-crowned Night Heron *Nyctanassa violacea* occurs from the USA to southern Brazil and northern Peru, including some coastal islands and the Galápagos⁴⁴. It is specialised to feed on hard-shell crustaceans (e.g. crabs, crayfish). Although in the USA the species sometimes inhabits inland swamps, primary habitat is coastal wetlands^{44,48,60,72}.

Studies on the breeding and abundance of Yellow-crowned Night Heron have been undertaken in North America^{9,10,19,46,72}, but in South America available data on the species' breeding biology pertain solely to coastal Brazil, particularly Cajual Island, in Maranhão¹⁶, the estuarine complex of Santos / Cubatão, in São Paulo⁵⁵, and the Perequê estuary, in Paraná⁵⁸.

The regular presence and breeding of Yellow-crowned Night Heron in South America is dependent on mangrove^{16,55,58}. However, Gianuca³⁰ reported the species nesting in Patos Lagoon, extending its breeding range 400 km south¹¹. According to Gianuca *et al.*³¹ this recent expansion, as well that of Little Blue Heron *Egretta caerulea*—which in Brazil also breeds almost exclusively in mangrove—may be influenced by global warming and by degradation of some Brazilian estuaries forcing birds to colonise new areas.

Brazil lost 54% of its mangroves during the 1980s and 1990s due to human activity, yet,

nonetheless, c.36% of the current total area of Neotropical mangrove is within Brazilian territory⁷⁰. Because of the high human pressure to which Brazilian estuaries are exposed^{11,21,61} and the close association between Yellow-crowned Night Herons and mangrove, the species is considered Vulnerable in Paraná⁶⁶ and São Paulo (see http://www.ambiente.sp.gov.br/fauna/livro_vermelho2009.zip).

It is important to identify the species' breeding areas in order to assess its conservation status and to define important areas for it in Brazil. According to Kushlan⁴³ and Frederick²⁷ protecting colonies is essential to the conservation of wading birds in the face of increasing human use of coastal wetlands. In Brazil, only two nesting sites of Yellow-crowned Night Heron holding >50 breeding pairs are known, both in mangrove, in São Paulo⁵⁵ and Maranhão⁴⁸.

Our aim here is to present information on the abundance and breeding ecology of Yellow-crowned Night Heron in southernmost Brazil, in Santa Catarina (SC) and Rio Grande do Sul (RS).

Methods

Study area.—Patos Lagoon estuary, Rio Grande do Sul (31°58'03"S 52°07'20"W) occupies 971 km² and is connected to the ocean by a 0.5–3.0 km wide, 20-km long, and 18-m deep channel². Tides are lower than 0.5 m, and variations in salinity and hydrology are mainly controlled by

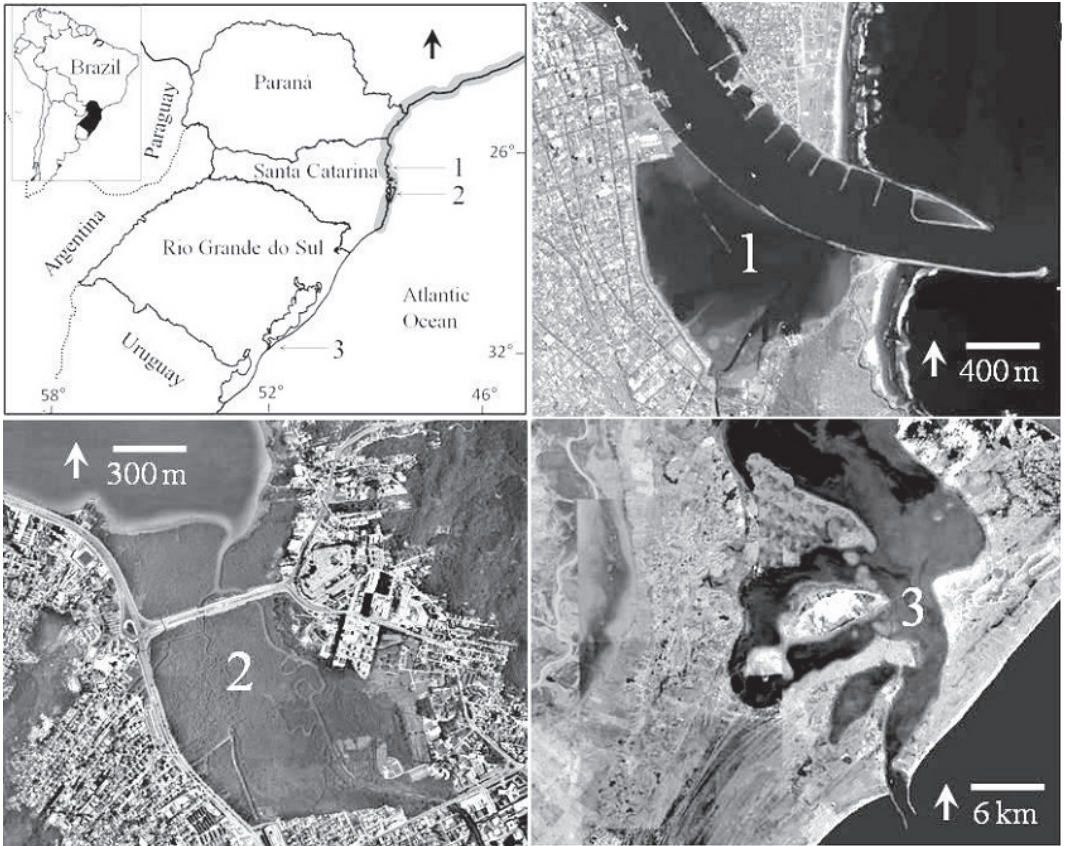


Figure 1. Southern Brazil showing the three study sites: (1) Saco da Fazenda, (2) Itacorubi mangrove and (3) Patos Lagoon. The grey line along the coast indicates mangrove distribution.

meteorological factors¹⁴. Climate is subtropical⁴⁰, and saltmarsh covers 70 km² of the estuary¹³. The nesting sites of Yellow-crowned Night Herons are Pólvara Island (32°01'18"S 52°06'17"W), the Oceanographic Museum Professor Eliezer de C. Rios (500 m south-west of Pólvara Island; 32°01'34"S 52°06'22"W), and within a mixed colony of Ciconiiformes on Marinheiros Island (32°01'25"S 52°09'13"W).

Saco da Fazenda estuary is located in the mouth of the rio Itajaí-Açu, near Itajaí, Santa Catarina (26°54'44"S 48°38'52"W). Due to the construction of containment piers that changed the original outflow of the river, the estuary is a semi-closed waterbody of c.0.7 km², with a silt-clay substrate, maximum depth of 2 m (except in the channel, where it reaches 9 m) and tides <1.4 m. It receives fresh water and domestic effluents from the Ribeirão Schneider and the Saco da Fazenda neighbourhood, respectively⁷. Nests of Yellow-crowned Night Herons are in mangrove patches surrounded by saltmarsh along the channel banks.

Itacorubi mangrove (27°34'47"S 48°31'02"W) covers 1.02 km², or 81% of its original area. It is

situated in the urban zone of Santa Catarina Island and is subject to increasing human influence, including structural impacts (deforestation, construction of drainage channels) and contamination by sewage and chemicals, including metals^{56,61,68}. Yellow-crowned Night Herons mainly breed in a colony adjacent to the confluence of the rio Itacorubi with the Baía do Norte (27°34'30"S 48°31'14"W).

Data collection.—Breeding sites of Yellow-crowned Night Herons at Saco da Fazenda and Patos Lagoon (Pólvara Island and the Oceanographic Museum) were visited at least once a month between August 2004 and March 2009. Additionally, some data were obtained at Itacorubi mangrove in the 1990s by JOB, whose field work numbered 60 days at all seasons over five years, and in October 2007 by DG, who discovered the main colony. DG & CMV visited the colony on Marinheiros Island twice in November 2007, and 18 times between August 2008 and May 2009.

At each breeding site, active nests (with eggs or nestlings) were counted once. Nests that

Table 1. Growth classes of Yellow-crowned Night Heron *Nyctanassa violacea* nestlings. Culmen length = (Lc).

Growth stage	Lc (cm)	Plumage	Behaviour
I	1–3*	Sparse grey feathers over the head, back and wings.	Quiet, generally remaining in the centre of the nest.
II	3.1–4.0	Brown mixed with white on the neck and wings, with longer, narrower feathers on the head; naked abdomen.	Able to stand in the nest but do not venture onto adjacent branches.
III	4.1–5.0	Brown over the entire body, admixed beige over the neck, chest and abdomen; pinions emerging.	Active, exercising the wings and making short sorties onto nearby branches.
Fledgling	5.1–6.0	Brown over the entire body, admixed beige over the neck, chest and abdomen. Noticeable development of the pinions and rectrices.	Able to walk nimbly through the branches and leave the nest if threatened.
Juvenile	6.1–7.0	Brown admixed beige, especially over the neck, chest and abdomen. Pinions and rectrices fully developed.	Leave the nest, walking on branches and able to fly short distances.

* Presence of egg tooth.

contained only eggs were identified as belonging to *N. violacea* by the presence of regurgitates consisting of fragments of crabs, characteristic of the species⁴⁴. No other bird species in this area forages on hard-shell crustaceans. Nest height in Patos Lagoon was measured with 10-cm accuracy. A measuring stick and / or a ladder were used to access the highest nests, whereas in Itacorubi mangrove and Saco da Fazenda visual estimates of the maximum and minimum height of nests were made.

Qualitative data about nesting sites were obtained, e.g. habitat type, support vegetation, any other species of Ciconiiformes nesting in the environs, and potential predators of eggs and nestlings. Raptors observed foraging above the colony or landing nearby, as well as snakes and mammals (carnivores and marsupials) were considered potential predators; presence of the latter was confirmed by direct or indirect observations (footprints or faeces).

Total length (Le) and max. width (Wid) of eggs at Saco da Fazenda ($n=9$ nests and 26 eggs) were measured in September 2005. In September 2006, the eggs in only three of the total four nests in Patos Lagoon ($n=9$ eggs) were measured, because in the fourth nest the eggs were already hatching. Callipers with 0.05-mm accuracy were used to measure eggs.

Egg volume was determined as follows: $\text{Vol (cm}^3\text{)} = \text{Kv} \cdot \text{Le} \cdot \text{Wid}^2$, where Kv = volumetric coefficient, Le = total length, and Wid = largest width of the axis of the egg³⁵. The volumetric coefficient used (Kv = 0.5193) was that obtained for Black-crowned Night Herons *Nycticorax nycticorax*⁸ according to their similar egg size and the taxonomic similarity between this species and Yellow-crowned Night Heron.

Culmen (Lc) and tarsus (Lt) length, and nestling mass during different growth classes (except recently hatched) were recorded only at Saco da Fazenda, during the 2005–06 breeding season. As many nestlings in each growth class as possible were captured. Five growth classes were

established based on culmen length (Lc), plumage characters and behaviour (Table 1). Callipers and spring scales (Pesola) of 100, 350 and 500 g, with 1, 3 and 5-g accuracy, respectively, were used to obtain biometric data and to measure mass.

Data analysis.—The eggs in each nest were classified A, B or C (highest to lowest volume) based on Custer & Frederick¹⁷. Volume of A, B and C eggs (separately) was analysed at each site using non-parametric ANOVA. Possible differences in the volume of A, B and C eggs at Saco da Fazenda and Patos Lagoon were examined using a Student test (t-test)⁶⁴.

Results

Breeding period and abundance.—Breeding at the three study sites extended from September, when the birds started nest occupation, to January–February, when they left the colonies after the young had fledged (Table 2). The colony at Itacorubi was the largest, containing 70% of the total of 106 active nests found at the three study sites, while that at Patos Lagoon was the smallest, with 5.7% of nests (Table 2). At Patos Lagoon the number of breeding pairs remained constant in 2004–06, with an increase of two pairs in 2007 (Fig. 2). In February 2009, 33 adults and four juveniles were

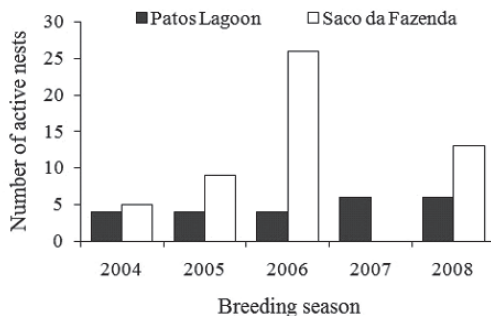


Figure 2. Number of breeding pairs of Yellow-crowned Night Herons *Nyctanassa violacea* at Saco da Fazenda and Patos Lagoon in 2004–08.

Table 2. Characteristics of the breeding sites of Yellow-crowned Night Heron *Nyctanassa violacea* studied in Rio Grande do Sul (RS) and Santa Catarina (SC).

Characteristic	Site		
	Patos Lagoon (RS)	Saco da Fazenda (SC)	Itacorubi Mangrove (SC)
Max. number of breeding pairs	6 (2007 and 2008)	26 (2006)	74* (2007)
Breeding period	September–February	September–January	September–January
Breeding habitat	Infrequently flooded saltmarsh ¹ ; grove of <i>Pinus elliottii</i> ² ; swamp forest ³	Periodically flooded saltmarsh, with patches of mangrove	Mangrove
Nest height range (m)	1.4–1.81 6.0–11.52 1.2–1.63	1.8–6.0	1.5–3.0
Nest vegetation	<i>Myrsine parvifolia</i> ¹ , <i>Pinus elliottii</i> ² , <i>Cephalanthus glabratus</i> ³	<i>Laguncularia racemosa</i>	<i>Avicennia schaueriana</i> , <i>Laguncularia racemosa</i>
Other Ciconiiformes breeding at the site	<i>Butorides striata</i> ¹ , <i>Syrigma sibilatrix</i> ² , <i>Ardea alba</i> ³ , <i>Ardea coccyz</i> ³ , <i>Egretta thula</i> ² , <i>E. caerulea</i> ³ , <i>Bubulcus ibis</i> ³ , <i>Nycticorax nycticorax</i> ³ , <i>Platalea ajaja</i> ³	<i>Butorides striata</i> , <i>Nycticorax nycticorax</i>	None confirmed
Potential predators	<i>Phylodrias patagonensis</i> ^{1,2} , <i>Coragyps atratus</i> ³ , <i>Caracara plancus</i> ^{1,3} , <i>Milvago chimango</i> ¹⁻³ , <i>M. chimachima</i> ² , <i>Circus buffoni</i> ^{1,3} , <i>Bubo virginianus</i> ^{2,3} , <i>Rhinopteryx clamator</i> ² , <i>Procyon cancrivorus</i> ³ , <i>Lutreolina crassicaudata</i> ³ , <i>Didelphis albiventris</i> ³ , <i>Leopardus geoffroyi</i> ³	<i>Coragyps atratus</i> , <i>Caracara plancus</i>	<i>Coragyps atratus</i> , <i>Caracara plancus</i> , <i>Milvago chimachima</i>

* Estimated as the % of active nests (90%) of the 40 sampled, projected to the total number of nests (n=83).

¹ Pólvora Island ² Oceanographic Museum ³ Marinheiros Island

counted, suggesting that numbers had increased, although only five nests were found on Marinheiros Island in 2008–09. There was a gradual increase in the number of breeding pairs at Saco da Fazenda in 2004–06, despite that in 2007 none nested, although in 2008 the species bred there again (Fig. 2).

Breeding site characteristics.—The colony at Itacorubi was established in a mangrove forest dominated by *Avicennia schaueriana*, while that at Saco da Fazenda was in a mangrove / saltmarsh mosaic. Although there were differences between these two colonies, all nests were built on mangroves in the inter-tidal zone. However, in Patos Lagoon, where there are no mangroves, all nests were above the inter-tidal zone. On Pólvora Island Yellow-crowned Night Herons nested in rarely flooded saltmarsh, building their nests on *Myrsine parvifolia* bushes. The species also nested in a grove of *Pinus elliottii* at the Oceanographic Museum (Fig. 3), where there is daily movement of

Table 3. Number of breeding pairs of Yellow-crowned Night Heron *Nyctanassa violacea* at the three sites in Patos Lagoon over five consecutive breeding seasons.

Location	2004	2005	2006	2007	2008
Pólvora Island	4	4	1	-	-
Oceanographic Museum	-	-	3	6	1
Marinheiros Island	-	5

(-) = species absent; (...) = lack of sampling

people and vehicles. In 2008, Yellow-crowned Night Herons nested on Marinheiros Island, in a swamp forest on the shore dominated by *Sebastiania brasiliensis*, *Sapium glandulosum*, *Erythrina crista-galli* and *Ficus cestrifolia*. At this site, all nests were built on a *Cephalanthus glabratus* (Tables 2–3), in an area permanently flooded by fresh water.

Nests were concave platforms of dry sticks, supported by branches of a tree or a bush, always



Figure 3. Yellow-crowned Night Heron *Nyctanassa violacea* fledglings close to a nest on *Pinus elliottii* in Rio Grande do Sul (Dimas Gianuca)

below the canopy. Some green branches of mangrove were also used in nests at Itacorubi and Saco da Fazenda.

Other Ciconiiformes were not observed breeding at Itacorubi, while at Saco da Fazenda nests of Yellow-crowned Night Herons were scattered along the banks with nests of Striated Herons *Butorides striata* and Black-crowned Night Herons. In Patos Lagoon, Striated Herons nested alongside Yellow-crowned Night Herons on Pólvora Island, while at the Oceanographic Museum, Whistling Herons *Syrigma sibilatrix* bred in the same pine grove. On Marinheiros Island Yellow-crowned Night Herons nested in a mixed colony with seven other species of Ciconiiformes totalling c.3,000 breeding pairs (Table 2).

At Itacorubi and Saco da Fazenda, Southern *Caracara plancus* and Yellow-headed *Caracaras Milvago chimachima*, and Black Vulture *Coragyps atratus* were identified as potential predators of eggs and nestlings, while at Patos Lagoon an additional four bird species, four terrestrial mammals and one snake were potential predators (Table 2).

Egg and chick size.—At Patos Lagoon, volume of C eggs (third egg laid) was significantly smaller than A and B ($W=7538, P=0.01, n=3$), with a mean difference of -12.5% relative to eggs A and B, and -8.7% compared to the mean volume of all eggs. However, at Saco da Fazenda volume of A, B and C eggs was not significantly different ($W=1062, P=0.05, n=10$). C eggs had a mean difference of

Table 4. Egg volume of Yellow-crowned Night Herons *Nyctanassa violacea* at Patos Lagoon and Saco da Fazenda.

Site	Laying order	N	Egg volume (ml ³)		
			Mean	SD	Range
Patos Lagoon	A	3	38.90 a ¹	1.37	37.28–40.33
	B	3	38.55 a	1.31	36.91–39.73
	C	3	33.87 b	0.92	33.25–35.06
	Grouped	9	37.11 c	2.62	33.25–40.33
Saco da Fazenda	A	10	35.72 c	1.91	33.08–38.24
	B	10	35.53 c	2.10	31.17–38.02
	C	6	34.72 c	1.26	31.09–36.26
	Grouped	26	34.85 c	3.77	31.09–38.24

¹Significant difference in mean egg volumes between laying order are denoted by different letters (ANOVA, $P<0.05$).

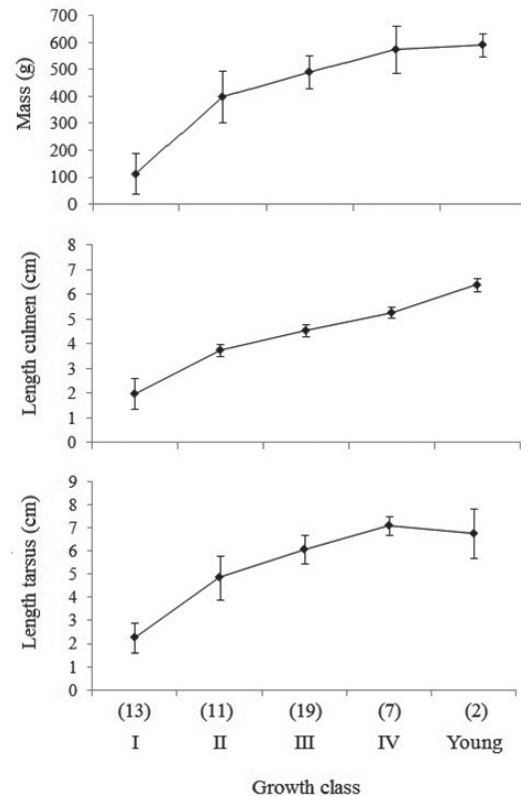


Figure 4. Mean values (and standard deviation bars) for the mass and culmen and tarsus lengths of Yellow-crowned Night Heron *Nyctanassa violacea* nestlings of different growth classes at the Saco da Fazenda colony. Numbers in parentheses indicate the number of nestlings measured in each class.

only -2.5% relative to A and B eggs, and only -1.7% compared to the mean volume of all eggs (Table 4).

The volume of A ($t=2.615$, $P=0.024$, $gl=11$) and B eggs ($t=2.286$, $P=0.043$, $gl=11$) in Patos Lagoon was significantly higher than in Saco da Fazenda, despite the volume of eggs C was lower ($t=1.368$, $P=0.213$, $gl=7$). Mean volume in Patos Lagoon and Saco da Fazenda did not differ significantly ($t=2.022$, $P=0.051$, $gl=33$) (Table 4).

Nestlings in growth class III were on average 83% of the mass of juveniles, which are similarly sized to adults. The tarsus had a mean growth rate slightly greater than that of the bill, and reached 91% of juvenile length in stage IV while the bill reached 82% (Fig. 4).

Discussion

Breeding period and abundance.—The breeding period of Yellow-crowned Night Heron in Rio Grande do Sul and Santa Catarina is similar to that in coastal Paraná⁵⁸ and São Paulo⁵⁵. It coincides with increased availability of crabs (e.g. *Neohelice*, *Erythrum*, *Aratus*, *Goniopsis*, *Cardisoma*, *Armases*, *Uca*, *Callinectes*) in the spring / summer^{5,6,22,55}, which provide a constant prey supply while the nestlings are growing. In northern Brazil (02°26'S), the breeding period is the opposite of that in south-east Brazil, but it also commences in the local wet season, when crab abundance reaches its peak^{16,33,48}. In the Northern Hemisphere, the seasonal breeding pattern is similar to that in southern South America, i.e. commencing in spring (April–June) and extending until late summer (June–September)^{1,10,35,44}.

The seasonal presence of Yellow-crowned Night Heron at Patos Lagoon³⁰ differs from that observed elsewhere in Brazil^{7,16,50,55}, as well as in Colombia⁵² and in Guatemala²³, where the species is resident. Northward migration following breeding at Patos Lagoon is presumably related to the high energy costs of maintaining the body temperature during winter^{15,62}, a situation exacerbated by low food availability.

The main prey of Yellow-crowned Night Herons at Patos Lagoon is the crab *Neohelice* (= *Chasmagnathus*) *granulata*, which represented 85% of 282 prey items collected in the 2005 and 2007 breeding seasons (pers. obs.). According to D'Incao *et al.*²², these crabs practically disappear from the surface of mudflats in winter, remaining in their burrows due to the cold temperatures, and thus unavailable to a visual predator like this heron. Yellow-crowned Night Herons breeding in the northern USA also migrate in late summer to subtropical and tropical regions, where crab availability remains high all year^{9,44}.

The principal Yellow-crowned Night Heron breeding sites in Brazil are the mangroves of Santos / Cubatão (SP), with c.180 breeding pairs⁵⁵,

and those in coastal Maranhão and Pará, with c.200 breeding pairs⁴⁸. Itacorubi, which holds at least 74 pairs, represents the third most important breeding site for the species in Brazil, reinforcing the importance of urgent and effective protective against human impact there^{56,61,68}.

Breeding site characteristics.—Patos Lagoon was recently colonised by Yellow-crowned Night Heron, 400 km beyond the southernmost limit of Neotropical mangroves¹¹, and is the only known locality in South America where the species does not breed in mangrove. The nests were constructed on pines (*Pinus elliottii*) at the Oceanographic Museum, unlike elsewhere in South America, but in coastal Virginia, USA, pines (*P. taeda*) were the substrate for 95% of 257 nests sampled by Watts⁷².

That Yellow-crowned Night Herons mainly use mangroves for nesting is related to the high abundance of crabs in such habitat^{5,48,55}, as the proximity of available food resources is the main factor used to select breeding sites by Ardeidae^{25,27,37}. Yellow-crowned Night Herons will construct their nests in other trees or bushes in the absence of mangroves, if they are close to areas of high prey availability, as was observed at Patos Lagoon. At least 14 tree species were used by this heron for nesting in North America^{9,19,32,46,72}, whilst in the Gulf of Panama, they nested on coastal islands where shrubs and herbaceous vegetation were dominant¹.

The larger number of predators in Patos Lagoon reflects the diversity of habitats used by Yellow-crowned Night Herons for nesting there. The colony on Marinheiros Island was the only place where mammalian predators were recorded, it being located within partially flooded forest, with no surrounding water thereby granting access to terrestrial predators. Furthermore, Marinheiros possesses several fragments of native forest, whereas dense urban areas surround the Oceanographic Museum, Saco da Fazenda and the Itacorubi mangrove.

Mammals, especially nocturnal species, may cause high predation rates^{27,28}, as with the four species recorded on Marinheiros Island. Such predation may have been responsible for the fact that only five active nests were found on Marinheiros Island, despite 37 adults and juveniles being observed. These five nests were sited at 1.2–1.8 m on shrubs, and were predated during the egg laying and incubation periods, leading to their being abandoned. In addition, just one of the 37 birds observed at the end of the breeding period was in first-year plumage (pers. obs.), offering further evidence of low breeding success in 2008/2009.

Predation events may also have induced the small population at Patos Lagoon estuary to switch breeding sites. In 2006 on Pólvora Island, three

breeding pairs abandoned their nests after the eggs were predated, but subsequently nested at the Oceanographic Museum (pers. obs.). None nested on Pólvora Island in 2007 and 2008.

Eggs and chicks.—In Ardeidae hatching is asynchronous and the death of the final nestling is common due to competition for food and aggressive interactions with their siblings (siblicide), especially in nests with more than two young^{17,27}. Custer & Frederick¹⁷ noted that in three-egg clutches of Great Egrets *Ardea alba*, Snowy Egrets *Egretta thula* and Black-crowned Night Herons, the last egg (C) tended to be smaller, which may contribute to the low survival rate of the youngest nestling.

The difference between the mean volume of C eggs and that of A and B eggs (-2.5%) at Saco da Fazenda was lower than that observed in three heron species in Texas and Florida, where the difference varied between -3.9% and -6.5%¹⁷. At Patos Lagoon, despite the smaller relative size of C eggs (-12.5%), all nestlings survived unless predated or the nest collapsed³⁰, as was also the case at Santos / Cubatão⁵⁵. Such low mortality rates in successful nests of Yellow-crowned Night Herons contrasts with the pattern observed in other Ardeidae (e.g. Great Egret, Little Blue Heron, Snowy Egret, Cattle Egret *Bubulcus ibis* and Black-crowned Night Heron) in which siblicide is very common^{17,27,55}, and is probably due to the 'calm' behaviour of the nestlings, among which aggressive interaction is rare⁵⁵.

The lower volume of C eggs at Patos Lagoon (but not at Saco da Fazenda) is perhaps due to lower ambient temperatures during egg formation. A positive correlation between egg volume and ambient temperature during this period has been observed in several bird species, with the last egg to be laid affected most markedly. This pattern is probably due to the higher energy cost of body maintenance, exacerbated by low food availability, which reduces the energy allocated for breeding and contributes to smaller egg size^{12,36,47}. Mean temperature during egg laying (September, 2005) was 14.6°C with a minimum 6.0°C (Meteorological Station, FURG) in Patos Lagoon, while at Saco da Fazenda mean and minimum temperatures during September (2006) were 18.3°C and 7.2°C, respectively (Meteorological Station of the Brazilian Institute of Meteorological Research). In addition, crab availability during the colder months at Patos Lagoon is very low.

Clutch size in the states of Rio Grande do Sul and Santa Catarina (max. three) was lower than in coastal Paraná, São Paulo and Maranhão, where up to five eggs were recorded^{55,58}. This might be related to the unfavourable temperatures and food availability during the early breeding period, which compromise female reserves and foraging during

egg formation^{12,36,47}. This pattern is the reverse of what is noted in birds generally, including some Ardeidae, in which clutch size tends to be lower nearer the tropics^{41,49,59}.

The growth pattern of nestlings at Saco da Fazenda was the same as in Maranhão¹⁶ and for Black-crowned Night Heron young in Santa Catarina⁸. Generally, this pattern varies little among populations and species of Ardeidae^{16,18}, with swift growth of tarsi and feet considered an adaptation to acquire locomotive ability, increasing their chances of escaping from predators^{24,74}.

Conservation.—The nesting areas of Yellow-crowned Night Herons at Patos Lagoon (except Marinheiros Island), Saco da Fazenda, and Itacorubi mangrove were sited in areas heavily impacted by humans, as is also true at Santos / Cubatão⁵⁵ and the rio Perequê⁵⁸, the other breeding sites in south-east Brazil. This illustrates that the proximity of high-quality foraging areas is the most important factor determining where Ciconiiformes breed^{25,27,37}, with isolation from human-impacted areas generally secondary²⁷. Nevertheless, high concentrations of pollutants near urban and industrial areas are associated with the formation of fragile eggs, atrophy, slow growth, deformation and nestling death in aquatic birds that nest and forage in such areas^{20,45,53,55,65,67}.

Yellow-crowned Night Heron may become at greater risk in southern Brazil because the main colonies (Santos / Cubatão and Itacorubi) are in areas subject to marked human influence, with high levels of environmental pollution, including metals^{4,34,55,56,61,68,69}. The Paranaguá (Paraná) estuarine complex has 551.8 km² of well-preserved mangrove⁵⁴, and thus has the potential to support a significant population of Yellow-crowned Night Heron. However, Mestre *et al.*⁵⁰ observed that the species was infrequent in mangrove in the south of bay, where Rechetelo⁵⁸ recorded just 20 pairs breeding on the rio Perequê. Surveys of the large estuaries of southern Brazil for breeding Yellow-crowned Night Herons are needed. Special attention should be afforded the mangroves of Araquari / São Francisco do Sul and Ilha de Santa Catarina (Santa Catarina), Guaratuba Bay and the Paranaguá estuary (Paraná) and Cananéia (São Paulo).

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Descrição de ninhos do pato-mergulhão *Mergus octosetaceus* em cavidade arbórea na região do Jalapão, Tocantins, Brasil

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The range of Brazilian Merganser is currently restricted to three Brazilian states—Minas Gerais, Goiás and Tocantins—with fewer than 250 individuals estimated to survive in the wild. Brazilian Merganser commences breeding during the dry season, when rivers and streams possess clean water, building its nests in tree hollows, rock and riverbank cavities. We describe the first two nests of mergansers to be found in the Jalapão region, in tree holes beside the rio Novo, both in *Vochysia pyramidalis* (Vochysiaceae). One of the nests was outside the Jalapão State Park limits and was consequently vulnerable to riparian deforestation and unregulated tourism, making it important that the rio Novo should be subject to greater environmental regulation to assist the species' reproductive success.

O raro e criticamente ameaçado¹¹ pato-mergulhão *Mergus octosetaceus* habita rios e riachos de águas límpidas, com corredeiras e envoltos ou não por vegetação ciliar em áreas de Cerrado. Estima-se que menos de 250 indivíduos sobrevivam hoje na natureza⁶, estando atualmente distribuídos em três estados brasileiros, Minas Gerais^{4,8,10,12,15,16}, Goiás^{5,17} e Tocantins^{3,7}.

O período reprodutivo da espécie inicia na estação seca quando os rios permanecem com águas límpidas, compreendendo os meses de junho quando se inicia a postura e incubação dos ovos^{8,9,13}, julho / agosto o período de eclosão dos ovos e nascimento dos filhotes^{3,14}, de agosto a novembro quando os pais efetuam o cuidado parental, podendo este se estender até dezembro / fevereiro^{8,9}, quando em seguida os indivíduos jovens passam a perder o vínculo com o casal.

As primeiras informações referentes ao ninho da espécie datam de 1950 e apontavam as rochas e vegetação aquática como prováveis locais de nidificação do pato-mergulhão¹³. No entanto, o habitat de nidificação permaneceu uma incógnita até o ano de 1954 quando Partridge¹⁴ encontrou no Arroyo Uruguai-i, província de Misiones, Argentina, o primeiro ninho da espécie, localizado em uma cavidade arbórea (Leguminosae).

Um segundo ninho foi descrito em 2002, localizado em uma cavidade de um paredão rochoso¹³ às margens de um pequeno riacho no Parque Nacional da Serra da Canastra (PNSC), Minas Gerais, Brasil.

Em 2005, dois ninhos foram documentados no PNSC em uma cavidade arbórea⁹ (Clusiaceae) e em uma cavidade rochosa¹⁰. Neste mesmo ano, outro ninho foi encontrado em cavidade rochosa localizado nas margens do rio dos Couros, região da Chapada dos Veadeiros, Goiás². Em 2008, outro ninho foi encontrado em cavidade rochosa nas margens do rio Preto (Parque Nacional da Chapada dos Veadeiros—PNCV)².

Na Serra da Canastra há registros de buracos no barranco do rio sendo utilizados como ninhos¹ e mais recentemente ninhos em cavidade terrícola (barranco do rio) também foram registrados na região de Patrocínio, Minas Gerais (F. S. Almeida & L. R. Oliveira dados não publicados).

Neste trabalho são descritos dois ninhos localizados em cavidades arbóreas encontrados em caráter inédito na região do Jalapão, leste do Tocantins.

Resultados

Durante os trabalhos de censo e monitoramento da espécie em um trecho do rio Novo, utilizando-se de um bote inflável para percorrer o rio, foram localizados dois ninhos em cavidades arbóreas, ambos em *Vochysia pyramidalis* (Vochysiaceae).

O primeiro ninho (Par 3, veja Barbosa & Almeida³) foi encontrado em 10 de junho de 2010 após verificar que o macho estava vigilante próximo ao ninho (Fig. 1a–c). Ao efetuar a reprodução do canto da ave, verificou-se resposta imediata e uma postura de defesa da área por parte do macho, comportamento que nos levou a crer se tratar da área do ninho. Ao efetuarmos uma varredura ao longo da margem, o ninho foi localizado em sua margem direita no limite oeste do Parque Estadual do Jalapão (PEJ). A fêmea encontrava-se no interior da cavidade (Fig. 1c), permanecendo imóvel enquanto efetuava-se o registro fotográfico. Optou-se por não molestar a ave o que impediu a verificação do conteúdo do ninho. As medidas da cavidade e informações sobre ninho foram tomadas em ocasião posterior (27 de julho de 2010). O ninho estava vazio, sem vestígios de cascas de ovos e o casal que ocupa o trecho do rio foi observado sem filhotes.

Características do ninho 1.—Árvore parcialmente morta posicionada diretamente na margem direita do rio, com tronco principal mais espesso (câmara interna), e uma aba lateral

voltados para o leito do rio (sudeste 240°) e paralelo à lâmina d'água (Fig. 1a). Possui galho secundário de c.38 cm de circunferência na base com o tronco principal e com c.3,5 m de altura. A entrada principal do ninho com 18 cm (altura) e 17 cm (largura) está posicionada sobre o leito do rio 70 cm acima da lâmina d'água e afastada 1,20 m da margem. A câmara interna com 1,40 m de profundidade e de forma cônica encontrava-se forrada por uma camada de areia fina do rio e apresentava vestígios de plumas. Possui uma abertura secundária inferior de 9 cm por 9 cm, a qual possivelmente permitiria a saída dos filhotes do ninho.

A margem do rio onde se localiza o ninho é formada por uma estreita faixa de vegetação ciliar de c.5 m de largura, com presença de palmeiras buriti (*Mauritia flexuosa*), gramínea e cipós, contínua a um fragmento natural de mata densa (c.3,6 ha) e adjacente a uma área de campo úmido. A margem oposta é formada por áreas de cerrado aberto, veredas e fragmentos de mata densa. O leito do rio imediatamente em frente ao ninho mede c.115 m de largura, ausente de corredeiras e com profundidade variando até 2,5 m. Possui banco de areia a c.12 m distante do ninho e praia na margem oposta, onde o casal foi visualizado em ocasiões anteriores descansando.

O segundo ninho (Par 2, veja Barbosa & Almeida³) foi encontrado em 27 de julho de 2010 (Fig. 2a–d). O ninho foi identificado na margem esquerda do rio Novo no limite oeste da Área de Proteção Ambiental Jalapão. A presença das plumas presas às cascas da árvore que circundam a entrada do ninho permitiu a sua localização (Fig. 1c). Próximo à área do ninho (à montante) foi observado um casal com seis filhotes de aproximadamente uma semana de vida.

Características do ninho 2.—Árvore viva posicionada diretamente na margem, com tronco voltado para o leito do rio (nordeste 60°) e c.7,5 m de altura (Fig. 2b). Tronco com 1,48 m de circunferência e inclinado c.45° em relação à lâmina d'água. Possui dois orifícios, sendo um superior com c.12 cm (largura) por 10 cm (altura) e um inferior com 10 cm (altura) por 14 cm (largura) por onde os filhotes eventualmente deixam o ninho. A entrada inferior está posicionada a 2,20 m da margem e a 1,30 m acima da lâmina d'água. A entrada superior está posicionada ligeiramente à esquerda c.80 cm acima da entrada inferior. A presença de plumas na entrada superior nos leva a crer ser esta a entrada principal do ninho. A câmara interna, em forma cônica, possui 65 cm de profundidade e 25 cm de largura no centro da câmara de incubação (Fig. 2d). O ninho estava forrado por uma camada de areia fina onde havia restos de cascas de ovos, plumas e um ovo não eclodido de cor creme com 58,3 mm

(comprimento) por 41,7 mm (largura) e pesando 44,5 g.

Ambas as margens do rio onde o ninho foi encontrado são formadas por uma estreita faixa de vegetação ciliar de c.4–6 m de largura e adjacente a estas extensas áreas de campo úmido. O leito do rio mede c.45 m de largura, com profundidade variando entre 1,5–2,0 m, fundo arenoso, apresentando águas calmas e ausente de corredeiras.

Discussão

Mesmo com o crescente número de artigos publicados nos últimos anos abordando os aspectos biológicos da espécie, as informações relativas à descrição de ninhos ainda é pouco conhecida^{9,13,14}. A escassa informação existente pode estar relacionada com a raridade da espécie e sua baixa densidade populacional, disponibilidade de habitats adequados, pelo fato do pato-mergulhão utilizar seguidas vezes o mesmo ninho⁹, ou ainda por um reduzido número de pesquisadores em campo, acessibilidade às áreas de ocorrência da espécie, ou pela pouca importância dada à disseminação dessas informações, ainda que sejam fundamentalmente valiosas para a definição de ações e medidas de conservação do pato-mergulhão.

Tanto as populações que ocorrem na Chapada dos Veadeiros e Serra da Canastra quanto à do Jalapão, por exemplo, estão em habitat predominantemente de Cerrado, onde as margens dos rios são formadas por diferentes formações vegetais. A descoberta do pato-mergulhão nestas áreas indica que a espécie não é totalmente dependente de extensas áreas de vegetação marginal florestada para sobreviver^{9,7,16}, como anteriormente sugerido¹⁴. No entanto, é notória a forte dependência da espécie com o rio e suas margens para sua sobrevivência e reprodução. A descrição de novos ninhos sejam eles em cavidades rochosas, arbóreas ou terrícolas, demonstra também a versatilidade da espécie na escolha dos locais de nidificação e a importância da manutenção e proteção dos ambientes a eles relacionados como fundamentais na conservação da espécie.

Chama atenção o fato de que em Minas Gerais, na Serra da Canastra e em Patrocínio, o pato-mergulhão esteja utilizando cavidades no barranco para instalação dos ninhos. É sabido que a maior população conhecida encontra-se na Serra da Canastra, com estimativa de c.80 indivíduos¹². Esse expressivo número de aves, ambientes ribeirinhos campestres e com pouca disponibilidade de vegetação ciliar apropriada, além de uma forte pressão antrópica existente na região, pressupõem estar conduzindo a espécie a buscar locais alternativos para a instalação dos ninhos e algo que merece ser investigado.

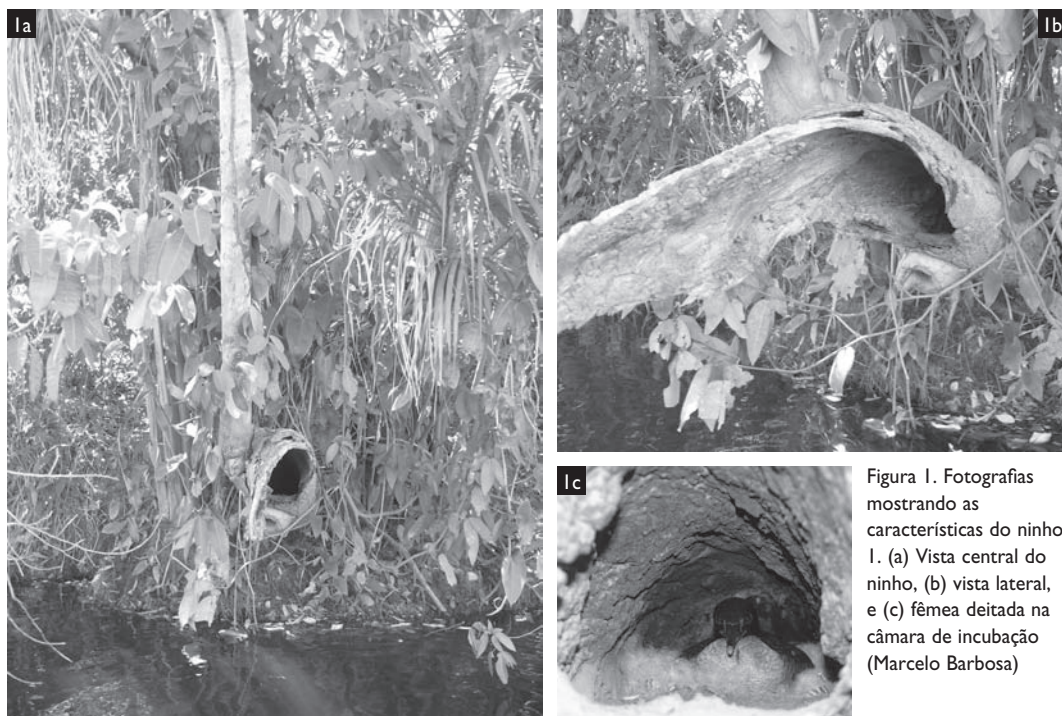


Figura 1. Fotografias mostrando as características do ninho 1. (a) Vista central do ninho, (b) vista lateral, e (c) fêmea deitada na câmara de incubação (Marcelo Barbosa)

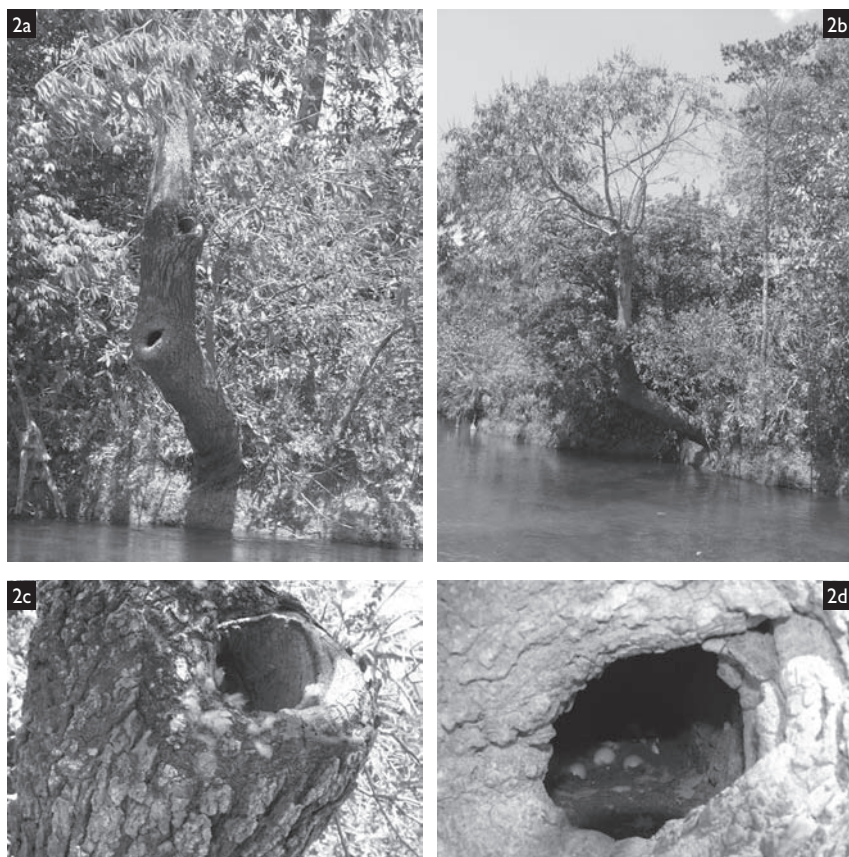


Figura 2. Fotografias mostrando as características do ninho 2. (a) Vista lateral do ninho, (b) visão geral da árvore e parcial da margem do rio, (c) entrada principal, e (d) visão da câmara interna inferior mostrando os vestígios de plumas e cascas de ovos (Marcelo Barbosa)

As margens do rio Novo são em grande parte de sua extensão constituídas de ambientes bem preservados, formadas por uma estreita faixa de vegetação ciliar, intercalada por formações abertas de cerrado e fragmentos naturais de mata densa, esta última ocorrendo em áreas onde o solo é mais fértil. Também não existem paredões de formação rochosa semelhantes aos encontrados nas Serra da Canastra e Chapada dos Veadeiros.

Ao longo das margens do rio Novo, a espécie arbórea *V. pyramidalis* é bastante abundante, algumas delas possuindo cavidades potenciais de serem utilizadas para nidificação. Com a oferta deste recurso e pelas características das margens do rio, é provável que os outros casais estejam priorizando a utilização de cavidades arbóreas para instalação do ninho.

Ainda que parte do rio Novo esteja totalmente inserido em Unidades de Conservação de Proteção Integral, o segundo ninho aqui descrito encontra-se fora dos limites do PEJ e conseqüentemente vulnerável a interferências como a supressão irregular de matas e vegetação ciliar e o turismo desordenado nas margens do rio.

Outro fator importante é que atividades turísticas de *rafting* desenvolvidas podem interferir na postura, incubação e desenvolvimento dos filhotes. A atividade era desenvolvida em um trecho de 55 km do rio Novo, principalmente durante o período reprodutivo da espécie, com até quatro botes e cerca de trinta pessoas envolvidas em dois dias e meio de atividade. No mês de julho a frequência de descidas aumentava passando a ser semanal. O trecho do rio usado para a atividade é o mesmo onde os ninhos aqui descritos estão localizados.

Adicionalmente, em junho de 2009 foi realizada uma corrida de aventura no mesmo trecho do rio Novo e que é ocupado por dois casais. Cerca de quarenta botes e duzentas pessoas envolvidas efetuaram descida de dois dias ao longo do rio. Na ocasião, quando o primeiro autor efetuava vistoria do evento, foi registrada atividade noturna dos casais, comportamento este até então desconhecido para a espécie. Posteriormente ao evento (julho), dando continuidade aos trabalhos de censo no rio Novo, apenas três filhotes foram registrados, número inferior ao registrado em 2008.

Portanto, medidas como a restrição no desenvolvimento da atividade de *rafting* no rio Novo durante o período reprodutivo da espécie, que foi regulamentada pelo órgão ambiental local a partir de 2010, e o ordenamento do uso das margens do rio devem ser priorizadas de forma a contribuir para o sucesso reprodutivo do pato-mergulhão na região.

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A pilot study of breeding White-tufted Grebes *Rollandia rolland rolland* at selected wetlands on the Falkland Islands, with notes on breeding ecology

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El presente estudio investiga la población de la forma nominal del Macá Común *Rollandia rolland rolland* de 37 lagunas en las Islas Malvinas. De los números de macas encontrados se estima una población media de 8,1–9,3 parejas nidificantes por los 10 km cuadrados visitados. Este nombre es al margen inferior de la estimación del *Atlas of breeding birds of the Falkland Islands* exprimado en parejas/10 km cuadrado. En contraposición a las formas continentales de la especie y atípico por la familia Podicipedidae, una mayoría de los nidos encontrados no fueron flotantes, pero construidos sobre suelo sólido entre islas de *Poa flabellata* o sobre un pequeño saliente debajo de un saledizo de la orilla elevada de las lagunas. También, se observaban copulas a orillas de lagunas sobre tierra firme.

White-tufted Grebe *Rollandia rolland rolland* is endemic to the Falkland Islands and differs in size from the two continental South American subspecies, *R. r. morrisoni*, which is endemic to Lake Junín in Peru, and *R. r. chilensis*, which comprises all other populations. Both of the mainland subspecies are noticeably smaller than *R. r. rolland*, leading some authors to suggest that the Falkland race might be best treated specifically^{4,13}, while others at least did not exclude the possibility^{6,7}. However, whereas the mainland forms *chilensis* and *morrisoni* have been studied in some detail^{2,4,5,8,9}, knowledge of the Falkland Islands population is incomplete. This population is small and, therefore, at greater potential risk of extinction. A complete assessment of its size is lacking, apart from that in the *Atlas of breeding birds of the Falkland Islands*, wherein the total population during 1983–93 was estimated at 750–1,400 breeding pairs¹³. No data were collected prior to the Atlas project and none since, making it impossible to detect any potential population trends. Similarly, no attempts to reassess the taxonomic status of *R. r. rolland* have been made, making its conservation status uncertain, although there is no current evidence of threats.

For a small number of ponds in the Falkland Islands, the present paper presents an assessment of the White-tufted Grebe breeding population. During my surveys, additional data about the subspecies' breeding ecology were obtained to complement our limited knowledge of the nominate form.

Study area and methods

The study was conducted on the islands of Pebble, Saunders, Carcass and East Falkland on 6–20 November 2010, complemented by data obtained on the islands of Sea Lion, Bleaker, Pebble and

East Falkland during 16–26 January 2008. The 2010 visit was entirely devoted to observations of White-tufted Grebes and consisted of a mean nine hours of field work per day. All ponds visited were subject to a complete shoreline survey on foot, and observations were made using binoculars. All GPS readings were taken using a WAAS-enabled Geko 201 (Garmin).

Results

Breeding population.—The population in 2010 amounted to 47–55 breeding pairs. Long Pond (8–9 pairs) and Big Pond (6–7 pairs), both on Pebble Island, and Swan Inlet Pond 4 (7–9 pairs) on East Falkland held the most important populations. White-tufted Grebes appear to use Carcass Island only in the non-breeding season and none was observed during the 2010 complete survey (Table 1).

In 2008, the species was not recorded on Sea Lion Island where five ponds were visited on 21 January. On Bleaker Island, three pairs were present on Big Pond, whereas two smaller ponds further north did not hold any grebes.

Considering these records in terms of the 10-km grid system used in the Atlas¹³, square UC85 held the largest population with 19–22 pairs followed by square UD21, which comprises all Pebble Island ponds, with 15–17 pairs and square UC75 on East Falkland with 8–9 pairs. Four additional squares each held <5 pairs and two squares held none (Table 2). On average, the seven squares where White-tufted Grebes were recorded held 7.1–8.3 breeding pairs. This figure certainly requires upward correction as two squares were only surveyed partially. Assuming that in both squares the populations relative to the water surface in the parts surveyed and not surveyed were identical, a correction of one additional breeding pair could be applied.

Table 1. Ponds visited and White-tufted Grebes *Rollandia rolland* recorded in 2010 and 2008.

	Pond	Coordinates		Approximate size (ha)	Grebes observed ²	Breeding pairs
		S	W			
Pebble	Big Pond	51°18'842	59°34'199	40	5 × 2 + 2 × 1	6–7
	Long Pond	51°18'906	59°33'545	20	7 × 2 + 2 × 1	8–9
	Quark Ponds	51°17'580	59°32'026	15	0	
	Betts Pond	51°17'677	59°31'676	20	1 × 2	1
	Green Pond*	51°18'228	59°30'755	40	0	
	Swan Pond	51°17'350	59°30'284	50	0	
Saunders	'Little' Pond	51°18'939	59°35'149	2	0	
	Rookery Flat Pond 1	51°18'942	60°05'473	1.2	0	
	Rookery Flat Pond 2	51°19'094	60°05'442	3	1 × 2	1
Carcass	Big Pond	51°22'286	60°06'189	20	4 × 1	2–4
	'Gentoo' Pond	51°18'512	60°31'432	0.5	0	
	'Airfield' Pond 1	51°15'344	60°35'553	2	0	
	'Airfield' Pond 2	51°15'612	60°35'826	5	0	
	'Airfield' Pond 3	51°16'226	60°35'792	0.5	0	
	Goose Green Pond 1	51°49'687	58°58'759	0.3	1 × 1	1
East Falkland	Goose Green Pond 2	51°49'722	58°58'530	0.3	0	
	East of Isla Pond	51°49'379	58°45'089	15	2 × 2 + 3 × 1	4–5
	Laguna Ronde	51°49'126	58°44'078	50	2 × 2 + 1 × 1	3
	Pond west of Ronde	51°49'872	58°42'794	10	0	
	Shingly Pond**	51°49'810	58°41'100	130	0	
	Ewe Pond	51°50'110	58°44'078	10	1 × 2 + 1 × 1	2
	Laguna Isla	51°49'606	58°46'160	130	3 × 2 + 1 × 1	4
	Laguna Verde*	51°47'867	58°53'254		0	
	Swan Inlet Pond 1	51°49'763	58°38'999	100	1 × 2	1
	Swan Inlet Pond 2	51°50'778	58°38'659	90	2 × 2	2
	Swan Inlet Pond 3	51°50'777	58°37'353	30	2 × 2 + 1 × 1	3
	Swan Inlet Pond 4	51°50'663	58°36'625	50	4 × 2 + 6 × 1	7–9
	Swan Inlet Pond 5	51°50'337	58°36'865	5	0	
East of Mt. Misery pond	51°51'363	58°38'218	75	2 × 1	1–2	
Extension Bodie Creek	51°13	59°02		1 2	1	
Total 2010						47–55
Bleaker ¹	Big Pond	52°12	58°51	14	2 × 2 + 1 × 1	3
	North of Big Pond 1	52°12	58°51	0.5	0	
	North of Big Pond 2	52°12	58°51	0.5	0	
Sea Lion ¹	Long Pond	52°26	59°05	5	0	
	Beaver Pond	52°26	59°05	20	0	
	Next to Beaver	52°26	59°05	6	0	
	Tussac Pond	52°26	59°05	5	0	
Total						50–58

¹ results from 2008 (only included for ponds not visited in 2010)² a distinction is made between grebes encountered in pairs (x 2) and singly (x 1)

* reduced to c.50% of normal size during survey

** reduced to c.10% of normal size during survey

Additional observations.—Three copulations were observed in 2010, all on land, the grebes hopping ashore and walking up to 2 m before the female invited copulation.

In 2010, a total of 13 nests and platforms were found. Seven were located under the overhanging bank of ponds, two in small ditches connected to larger ponds and also below overhanging banks

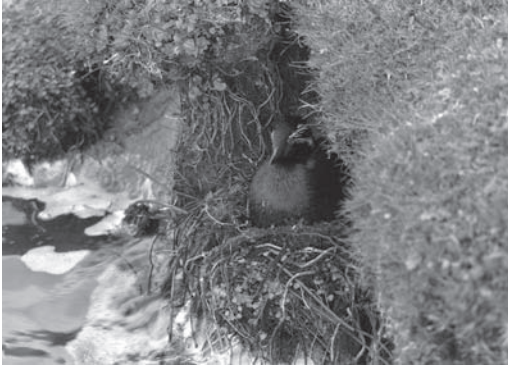


Figure 1. Nest of White-tufted Grebe *Rollandia r. rolland*, under an overhanging bank, Big Pond, Pebble Island, Falkland Islands, November 2010 (André Konter)



Figure 2. Nest of White-tufted Grebe *Rollandia r. rolland*, on an island of tussac grass, east of Laguna Isla, East Falkland, Falkland Islands, November 2010 (André Konter)

(one nest c.50 m from the pond itself), three on tussac grass *Poa flabellata* islands and one in rushes (Juncaceae) in the shallows of a pond. None of these platforms was floating. Nine rested on the mud of an elevated bank (Fig. 1) and three were sited in stands of tussac (Fig. 2), all above water level, and the last was in rushes in water c.10–15 cm deep, with its base completely sunk into the ground. Three platforms were observed in 2008, one in a bank below overhanging grasses and two floating on pondweed *Myriophyllum quitense*. White-tufted Grebes incubating under the overhanging vegetation of a bank can observe little of their surroundings. They are well hidden from potential predators, but can only escape forwards.

Nest contents were observed only twice and consisted of two stained eggs in both cases. In 2010 seven pairs and in 2008 four pairs tending young were observed. Ten of them had one chick and just one had two chicks. One chick at Long Pond, Pebble Island, was c.2 weeks old on 9 November 2010. Another chick observed at Laguna Ronde, East

Table 2. Distribution of pairs of White-tufted Grebes *Rollandia rolland* by 10-km square.

Square no.	Location	Pairs observed
TD51	Carcass	0
TD80	Saunders, Big Pond	2–4
TD81	Saunders, Rookery	1
UD21	Pebble, all ponds	15–17
UC71	Bleaker ponds	3
UB58	Sea Lion	0
UC65	East Falkland, Goose Green	2
UC75	East Falkland, Laguna Verde to east of Laguna Isla	8–9
UC85	East Falkland, Laguna Ronde to Swan Inlet Ponds	19–22
	Total	50–58

Falkland, on 18 November 2010 was c.80% of adult size and had already acquired juvenile plumage; it was probably c.4 weeks old. Two additional chicks seen on Swan Inlet Pond 4, East Falkland, on 19 November 2010 were only slightly younger, being c.3–4 weeks old.

Discussion

Woods & Woods¹³ estimated the breeding population during 1983–93 at 750–1,400 breeding pairs (allowing 30% variation from the mean). This estimate was based on observers' counts or estimates in ranges 1–10 or 11–100 from 51 of 90 of the 10-km squares where the species was recorded in possible breeding habitat, with means calculated for the other 39 squares. Per square with a positive record, the mean estimate was 8.3–15.5 breeding pairs. My survey found the species in seven squares with a mean 7.1–8.3 breeding pairs or, taking into account the correction for the two squares not entirely surveyed, 8.1–9.3 breeding pairs. This figure is at the lower end of the mean estimate of Woods & Woods¹³. It would, however, be wrong to conclude that the population has declined over the last 20 years, as my survey was insufficiently broad geographically to draw archipelago-wide conclusions. Nevertheless, it provides an accurate figure for the wetlands visited.

The statement that egg laying generally occurs in October and that eggs have been found between mid October and January^{3,12} is confirmed, although following mild winters (as in 2010) the first eggs may be laid earlier. Indeed, assuming an incubation period of three weeks and considering the age of the chicks encountered, the first eggs must have been laid by late September or very early October. Breeding rates in successful pairs appears to be usually one chick, with two chicks being possibly more unusual.

In the recent literature, the nest of the Falkland Islands race is stated to be floating^{10,12,14}. Only Cobb³ observed nests under the bank of a pond and Brooks¹ was informed by an island resident that 'these grebes nest on the shore very near the water'. Based on my observations, and in contrast to the behaviour of grebes (Podicipedidae) in general, floating nests are unusual, although their frequency might increase later in the breeding season in line with the development of floating vegetation. White-tufted Grebes perhaps more regularly build on 'solid' ground to ensure the platform is better protected from waves. From my observations, these platforms are often sited in places where copulation is inhibited thereon, possibly explaining why copulation often, perhaps mainly, occurs onshore. Copulation on land and nesting in cavities under banks have not been reported for mainland *R. r. chilensis* and *R. r. morrisoni*. Behavioural differences between insular and mainland populations require additional study.

Wetmore¹¹ remarked that 'the grebe described from the Falkland Islands as *rollandi* by Quoy and Gaimard is a large representative of the present species (*morrisoni*), distinguished by much larger size and darker colouration. It is sufficiently distinct to be recognized as a separate species on the basis of material available at present, though formerly the name *rollandi* was used for all grebes of this type in South America.' Should specific status be recognised, Fjeldså & Krabbe's⁶ proposal to name the insular form Rolland's Grebe *Rollandia rolland* and the continental forms White-tufted Grebe *R. chilensis* should be followed. Further studies concerning any potential differences in courtship and molecular analyses are certainly required.

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Range expansion of Red-breasted Blackbird *Sturnella militaris* in western Ecuador and notes on its contact zone with Peruvian Meadowlark *S. bellicosa*

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El Pastorero Pechirojo *Sturnella militaris* ha sido reportado recientemente en el occidente de Ecuador y su situación y distribución en la región aún no son bien conocidas. Presentamos un recuento de todos los registros del occidente de Ecuador, la mayoría previamente no publicados, y documentamos el avance de la especie hacia las áreas piemontanas occidentales de los Andes. Discutimos la zona de contacto entre la especie mencionada y el Pastorero Peruano *S. bellicosa*, especie cercanamente relacionada, la cual ahora es también conocida del suroccidente de Colombia. A pesar de que estos dos congéneres han entrado en simpatria recientemente, hasta la fecha no hay evidencia de competencia, segregación de recursos, o hibridación. También hacemos hincapié sobre la persistencia de datos desactualizados sobre la distribución de ambas especies en la región.

The ongoing destruction of tropical forests has resulted in the decline of many forest-dwelling species. However, certain adaptable non-forest species can profit from the increase in available habitat. Red-breasted Blackbird *Sturnella militaris* is one such beneficiary of the deforestation process. Formerly restricted to natural savannas, it has adapted to agricultural landscapes such as cattle pastures. Its distribution now extends from Nicaragua throughout northern South America to the Guianas and eastern Brazil, south to northernmost Bolivia^{1,6}. The species prefers moist conditions and typically thrives in areas where forest has been recently cleared⁶. In recent decades Red-breasted Blackbird has been rapidly expanding its range^{6,10}.

Ridgely & Greenfield¹¹ reported Red-breasted Blackbird to be a local resident in the lowlands of eastern Ecuador (to 400 m), where it was considered a relatively recent arrival, but the species was apparently unknown west of the Andes. The species has since expanded its range in eastern Ecuador, to 1,855 m in prov. Napo¹⁷. More recently Solano-Ugalde *et al.*¹⁵ published the first record of Red-breasted Blackbird from western Ecuador, at Laguna de la Ciudad, in the coastal lowlands south of San Lorenzo, prov. Esmeraldas. Here we present a summary of all known sightings from western Ecuador, including from the west Andean foothills in prov. Pichincha, and discuss these in relation to the contact zone with the congeneric Peruvian Meadowlark *S. bellicosa* in western Ecuador and western Colombia. All observations were made opportunistically.

Summary of records

DFCH first observed Red-breasted Blackbird in western Ecuador at Hacienda La Joya, prov. Pichincha, at km 109 on the Calacalí–La

Independencia highway (00°05'N 78°59'W) at 750–800 m. The first sightings were of single males foraging in cattle pastures in December 1994 and July 1996; on both occasions the birds stayed less than one week. Hacienda La Joya is a mosaic of predominantly anthropogenic wet pastures with natural borders, orchards and small patches of secondary evergreen forest. Subsequently,



Figure 1. Map showing records of Red-breasted Blackbird *Sturnella militaris* in north-west Ecuador reported here. 1: San Lorenzo, Esmeraldas; 2: Mompiche, Esmeraldas; 3: Zapallo, Esmeraldas; 4: Pedro Vicente Maldonado, Pichincha; 5: Hacienda La Joya, Pichincha; 6: Santo Domingo, Santo Domingo de las Tsáchilas; 7: Río Palenque Science Station, Los Ríos; 8: South of San Miguel de los Bancos, Pichincha; and 9: Laguna de la Ciudad, Esmeraldas.

Table 1. Records of Red-breasted Blackbird *Sturnella militaris* in western Ecuador.

Date	Locality	Observer	No. / Sex	Documentation
23–26 December 1994	Hacienda La Joya, Pichincha	DFCH	one male	
10–18 July 1996	Hacienda La Joya, Pichincha	DFCH	one male	
1 January 1999	Hacienda La Joya, Pichincha	DFCH	a pair	
15–17 February 2002	Hacienda La Joya, Pichincha	DFCH	one male + one female	
10 November 2004	Río Palenque Science Station, Los Ríos	DFCH	two males	
22–25 December 2005	Hacienda La Joya, Pichincha	DFCH	one male	
3–5 February 2006	Hacienda La Joya, Pichincha	DFCH	one male + one pair	
18–19 February 2006	San Lorenzo, Esmeraldas	T. Santander et al.	one pair	photograph
8 April 2006	Pedro Vicente Maldonado, Pichincha	AS-U	one male	
2–7 May 2006	Mompiche, Esmeraldas	DFCH	two pairs	
10 January 2007	Pedro Vicente Maldonado, Pichincha	AS-U	one male	
31 January 2007	Near Zapallo, Esmeraldas	SO	a pair	
3 February 2007	Near Zapallo, Esmeraldas	SO	one male	
26 March 2007	Near Zapallo, Esmeraldas	R. S. Ridgely	one male	
30 March 2007	Near Pedro Vicente Maldonado, Pichincha	AS-U	one male	
7 April 2007	San Lorenzo, Esmeraldas	R. S. Ridgely	one male	
17 July 2007	Pedro Vicente Maldonado vicinity, Pichincha	SO	one male	
21 January 2009	Pedro Vicente Maldonado vicinity, Pichincha	O. Licuy	a pair	photograph
9 April 2009	Santo Domingo, Santo Domingo de los Tsáchilas	DFCH	one male	
3 August 2009	Near Zapallo, Esmeraldas	D. Brinkhuizen et al.	two pairs	photograph
1–2 May 2010	South of San Miguel de los Bancos, Pichincha	DFCH	one pair + one displaying male	

individuals were observed at the same locality on a sporadic basis until February 2006. DFCH's earliest observations predate the publication of *Birds of Ecuador*¹¹; consequently the noteworthy nature of these observations was overlooked.

Since 2004 records of Red-breasted Blackbird have become more frequent and have come primarily from three areas in north-west Ecuador: the San Miguel de los Bancos–Pedro Vicente Maldonado region of Pichincha (including Hacienda La Joya), far north-west Esmeraldas near San Lorenzo, and southern Esmeraldas near Zapallo. Other records come from prov. Los Ríos, prov. Santo Domingo, and the southern coast of Esmeraldas. Table 1 summarises all unpublished records of Red-breasted Blackbird in western Ecuador that we are aware of.

Most of these records are from habitats similar to that at Hacienda La Joya: wet pastures mixed with orchards and disturbed secondary forest. Notable exceptions include an observation of a displaying male at an abandoned grassy shrimp pond near San Lorenzo, Esmeraldas (R. S. Ridgely pers. comm.) and a male found by DFCH in a suburban setting in Santo Domingo. Elevations range from sea level in coastal Esmeraldas to c.800 m at Hacienda La Joya. The approximate locations



Figure 2. Male Red-breasted Blackbird *Sturnella militaris*, near Pedro Vicente Maldonado, prov. Pichincha, Ecuador, 21 January 2009 (Olger Licuy)

of the records discussed here, in addition to that by Solano-Ugalde et al.¹⁵, are plotted in Fig. 1.

Discussion

These reports mostly involve single males, and in some cases pairs or small groups of up to four. The small number of individuals involved

and the sporadic nature of the observations may indicate that Red-breasted Blackbird is a local resident, present at relatively low density in western Ecuador. Alternatively, these observations may represent vagrants. Veit¹⁶ demonstrated a positive correlation between vagrancy and breeding abundance and / or population growth in five North American passerines over a period of 22 years. Observations of Red-breasted Blackbirds in western Ecuador could accordingly be the result of exceptional breeding success in another part of the species' range. However, due to the absence of data on breeding success, this hypothesis cannot be verified. We believe the repeated observations over many years at one site (i.e. Hacienda La Joya, Pichincha) support the hypothesis that the species is resident.

Regardless of the status of the species in western Ecuador, we concur with Solano-Ugalde *et al.*¹⁵ and speculate that these observations probably correspond with southward expansion from source populations in western Colombia. Other possible colonisation scenarios, such as a trans-Andean expansion and an escaped cagebird origin are less likely. The northern Andes in southern Colombia and northern Ecuador are mainly higher than 3,500 m and would thus present a significant dispersal barrier. While the species is at least occasionally kept in captivity in eastern Ecuador (M. Andy pers. comm.), we are unable to find any instance of the species being traded or kept in captivity west of the Andes. Furthermore, the widespread records in western Ecuador and adjacent Colombia support the hypothesis of natural expansion.

Hilty & Brown⁵ reported Red-breasted Blackbird in western Colombia as far south as dpto. Cauca, but excluded dpto. Nariño from its range. The species was confirmed in Nariño in 1993, with the first published record from near Altaquér, where it is common³. This site is just c.30 km from the Ecuadorian border, thus expansion into Esmeraldas, Ecuador, and beyond was expected. It is widely recognised that forest clearance facilitates movements by Red-breasted Blackbird, by eliminating the dispersal barrier in the form of unsuitable habitat^{6,8,10}. The large areas of forest that have been cleared in the lowlands and foothills of western Colombia and Ecuador during the last century have mostly been converted to agriculture and savanna-like habitat, providing a corridor for southbound expansion through the coastal lowlands and foothills of the western Andes.

Given the documented expansion in western Colombia, the first sightings from western Ecuador might have been expected from the lowlands of Esmeraldas, adjacent to dpto. Nariño. However, the early observations from Pichincha, Ecuador, are not entirely surprising. We hypothesise that poor observer coverage in Esmeraldas and a sampling

artefact (most observers tend to concentrate on extensively forested areas) may have contributed significantly to the lack of sightings pre-2006. Furthermore, the reports summarised here primarily consist of single males, pairs and small groups, which are less likely to be detected.

As Red-breasted Blackbird has advanced south it has come into contact with the similar and closely related Peruvian Meadowlark *Sturnella bellicosa*. Historically, both species were absent from north-west Ecuador and south-west Colombia, separated by extensive lowland evergreen forests. Peruvian Meadowlark was formerly confined to xeric non-forest habitats in the lowlands of western Peru, south-west Ecuador and northernmost Chile¹². However, the species is expanding its range north, presumably as a result of deforestation in the Chocó lowlands, much like Red-breasted Blackbird. Peruvian Meadowlark has reached south-west Colombia, where it has been documented in Nariño^{2,7}.

The degree of competition or hybridisation between these two newly sympatric congeners is unknown. *Sturnella* meadowlarks overlap in temperate areas of the Americas, and the two resident species of North America, Eastern Meadowlark *S. magna* and Western Meadowlark *S. neglecta*, are the best studied. Assortative mating and sterile hybrids are two mechanisms that serve to keep these two species separate^{9,14}. Pampas Meadowlark *S. defilippii*, Long-tailed Meadowlark *S. loyca* and White-browed Blackbird *S. superciliaris*, which breed together in Argentina, have also been investigated. In both North and South America, interspecific territoriality has been observed^{14,9,14}.

During field work at Laguna de la Ciudad, Esmeraldas, AS-U found both Red-breasted Blackbird and Peruvian Meadowlark. No evidence of direct competition was noted and no interaction was observed between them. To date this is the only locality at which both species are known. We speculate that they will coexist in the newly deforested Chocó lowlands. Both species occur at very low densities in this region and presumably it will be years before they approach population capacity. The Red-breasted Blackbird's smaller bill and preference for wetter environs, factors which contributed to its former placement in the genus *Leistes*¹³, may also serve to reduce overlap in diet and breeding habitat, thereby negating competition.

One issue that bears addressing is field identification. These two species' morphological similarity and over-reliance on old distributional maps^{5,11} may have lead some observers to preconceived conclusions as to which *Sturnella* should be found in a given area. This bias can easily contribute to misidentifications and under-

reporting of the 'unexpected' species. For example, the presence of Red-breasted Blackbird in Nariño, Colombia, appears poorly known. When de las Casas *et al.*² presented the first confirmed records of Peruvian Meadowlark for Colombia they stated that Red-breasted Blackbird was still present locally only as far south as southern dpto. Cauca in the Western Andes. Given their discovery of Peruvian Meadowlark, they went on to evaluate previous sight records of 'red-breasted' meadowlarks from Nariño, and ascribed these to Peruvian Meadowlark with near certainty; the work of Downing³, which might have influenced their conclusions, was still unpublished. The deforested Chocó lowlands of north-west Ecuador and south-west Colombia therefore represents a new zone of contact for two closely related species formerly separated by biogeographical barriers. Ornithologists in these areas should study *Sturnella* meadowlarks closely and use diagnostic field marks, as the status of these two species continues to evolve.

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First nesting record of Blue-fronted Parrotlet *Touit dilectissimus* with some ecological notes

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Se reporta el primer registro de un nido del Periquito Alirrojo *Touit dilectissimus* con notas de comportamiento, estructura y características vegetales del sitio de anidación. El nido fue hallado en un termitero en interior de bosque; este tipo de cavidades podrían considerarse los principales sitios de anidación para la especie y el género.

Touit parrotlets are among the least-studied Neotropical parrots¹⁴. The genus comprises eight species found in South and Central America, and represented in Colombia by five species¹¹ all of them little known¹⁰. They are fast flying and noisy, but are easily overlooked when perched. All five species in Colombia have generally low densities or are difficult to observe, and all of them are usually considered uncommon or rare^{9,11}.

The monotypic Blue-fronted Parrotlet *Touit dilectissimus* occurs from Panama across north-east Colombia to Venezuela, and over the Pacific slope to north-west Ecuador. In Colombia, it inhabits the Pacific slope from the Serranía del Baudó to dpto. Nariño, the northern Cordillera Central and the eastern slope of the Cordillera Oriental, at 700–2,000 m^{4,5,9,11}. Few nesting data are available, but the breeding season appears to usually commence mid year, based on males collected in breeding condition and juveniles accompanied by adults, in Colombia and Panama, although a bird has also been observed leaving a termite mound in January^{3,8}.

Observations on the nesting ecology of Blue-fronted Parrotlet were made in the Arrierito Antioqueño Natural Reserve of Fundación ProAves, near Anorí, dpto. Antioquia, Colombia. The reserve encompasses c.320 ha of premontane humid forest at 1,500–1,800 m, adjoining La Forzosa Reserve (c.300 ha)^{4,5,12}. The forest is dominated by *Compsonera* sp., *Protium* sp., *Tovomita weddeliana*, *Tapirira gujanensis* and *Billia rosea*⁷ at the elevation where the nest was found. The canopy reaches 20 m, there are few epiphytes and Melastomataceae, Clusiaceae, Araliaceae, Myristicaceae, Rubiaceae, Myrtaceae, Annonaceae, Bombacaceae, Ericaceae, Leguminosae and Palmae are the main tree and shrub families⁷.

The locality has been designated an AZE (Alliance for Zero Extinction) site¹⁰ on account of the presence of the restricted-range and globally threatened Chestnut-capped Piha *Lipaugus weberi*, and is part of La Forzosa Important Bird Area, protecting seven endemic and / or threatened bird species in the Central Andes⁶, as well as several endemic and / or threatened amphibians and mammals.



Figure 1. Blue-fronted Parrotlet *Touit dilectissimus* excavating termite mound, Arrierito Antioqueño Natural Reserve, Anorí, Antioquia, Colombia (Nick Athanas)



Figure 2. Blue-fronted Parrotlet *Touit dilectissimus* nest, Arrierito Antioqueño Natural Reserve, Anorí, Antioquia, Colombia, 11 December 2007 (Luis Eduardo Uruña)

The site has few parrot species: Blue-fronted Parrotlet is the smallest and commonest of those found in the area⁵. At Arrierito Antioqueño Natural Reserve, Blue-fronted Parrotlet is observed overflying the area on a daily basis. At the site, this parrotlet inhabits mature forest and its edges in groups of 8–24 individuals⁵.

Nesting activity was studied between December 2007 and March 2008, on a total of four days for six hours, and general observations of the species' ecology and behaviour were made non-systematically in September 2007–March 2008.

Blue-fronted Parrotlet was only seen foraging in *Clusia* sp. trees. During part of the year the species can be observed roosting in the crowns of *Eucalyptus globulus* at road edges, revealing the importance of these trees as temporary alternatives while natural ecosystems are restored.

On 12 December 2007 a pair of parrotlets was found excavating an arboreal termite mound on a low ridge within mature forest. Further observations confirmed the cavity was being used as a nest. On 14 January 2008 the pair was still engaged in preparing the nest. Both individuals excavated, taking turns. Whilst one bird excavated, the other mostly perched near the cavity entrance. The eggs hatched in the second week of March. The nest was at 1,709 m, in an arboreal termite mound c.7 m above the ground. The termite mound was on a 17-m *Chrysophyllum* sp. (Sapotaceae). The cavity entrance was 10 cm high × 9 cm wide, funnel-shaped and inclined c.110° from the end of the tunnel, which prevented our checking the contents. At the nest site, canopy cover was estimated at 95% vegetation and the undergrowth as 70% vegetation.

This is the first description of a Blue-fronted Parrotlet nest. Use of arboreal termite mounds is common in several species of parrots, and most nest records of *Touit* parrotlets have been in such cavities^{2,3,8,11,13}. Nesting in arboreal termite mounds contributes to lower predation rates¹. The type of entrance to the nest of the Blue-fronted Parrotlet and the difficult access to the inside would favour the latter hypothesis.

Previous data mainly suggested that Blue-fronted Parrotlet breeds in the latter part of the year, although see above⁸. We found that nesting commenced in December with nest building occupying at least one month, and the eggs hatched in March. By this time, groups of parrotlets had ceased roosting in the *Eucalyptus* near the road.

Due to the general lack of data on the biology and seasonal movements of this parrotlet, its ecological requirements cannot be determined precisely. However, the nest was in relatively well-preserved mature forest, which is probably a prerequisite for breeding. Artificial nest experiments might be

considered, to discover more concerning the species' reproductive biology.

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Records of Semi-collared Hawk *Accipiter collaris* in northern Peru

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Reportamos el registro de *Accipiter collaris* en el norte de Perú. La especie fue observada, grabada y fotografiada en el departamento de Amazonas. Este registro es el primero documentado fuera del dpto. de Cusco, estando a 1,100 km al noroeste de los registros en este departamento y a 220 km al sureste del registro más al sur en Ecuador. Este reporte nos permite suponer que la especie se encuentra distribuida a lo largo de la vertiente este de los Andes del Perú entre los 1,100 y 2,500 m.

Semi-collared Hawk *Accipiter collaris* is a very rare and poorly known Neotropical raptor that occurs in Venezuela, Colombia, Ecuador and Peru⁴. In Venezuela it has been recorded in humid montane forest in the Andes of Táchira and Mérida, and in north-west Barinas, at 1,300–1,800 m⁷. In Colombia *A. collaris* is known from 600–1,800 m in the Western, Central and Eastern Andes⁶, while in Ecuador it is a very rare to rare resident in the subtropical zone on both slopes (Pichincha, Napo and Zamora-Chinchipe) at 1,500–2,200 m⁹. In Peru the species is considered rare in humid montane forest on the east slope of the Andes at 1,500–2,500 m¹⁰. In all four countries, *A. collaris* has been reported from the interior of montane forest and at forest borders and clearings with scattered trees^{4,7,9,10}.

In Peru, Semi-collared Hawk was first reported in 1980 based on a specimen collected in 1974 from Aputinye, dpto. Cusco, at 1,730 m⁸. Since then, the species has been reported at just two further localities in Cusco: Machu Picchu Historical Sanctuary, below 2,000 m¹², and in the San Pedro sector of the Cosñipata drainage, near Manu Biosphere Reserve and adjacent to the border with dpto. Madre de Dios, at 1,100–2,500 m¹³, but most frequently at 1,300 m (B. Walker pers. comm.). Valdez & Osbourne¹¹ also recorded it in the Cosñipata drainage but without offering precise details. On 31 July 2005, at c.16h00, D. F. Lane (pers. comm.) observed an adult at Afluente, dpto. San Martín, at 1,400 m, but his record is unpublished.

New sightings

On 3 September 2010 at 12h00, we photographed a juvenile *A. collaris* flying over a pasture with scattered trees in El Toro sector, 6 km south of the town of La Esperanza, dpto. Amazonas (05°39'16"S 77°54'44"W; 1,935 m; Fig. 1). The bird called in flight and its vocalisations were sound-recorded. Playback was performed and it (or another bird) flew towards us and perched for a few seconds on a lone tree 200 m distant and c.25 m above ground.

After one minute the bird flew towards a forested hillside where it disappeared.

It was identified as a juvenile rufous-morph Semi-collared Hawk due to the obvious collar at the base of neck, which is absent in *A. superciliosus*, and the rufous tail (lacking in *A. striatus*⁴) (Fig. 1a). C. Artuso photographed another *A. collaris* at the same location, on 26 August 2010 (Fig. 1b). His photograph shows a rufous-morph Semi-collared Hawk based on the collar at the base of the neck, yellow irides and incomplete breast barring (leaving the central underparts unbarred), which separate the species from *A. superciliosus*. *A. superciliosus*, which is smaller than Semi-collared Hawk but possesses a similar rufous morph, has been reported in Peru only to 1,350 m¹⁰ yet in Venezuela is known to 1,800 m⁷. On 3 September 2010 at 16h00 we recorded another juvenile Semi-collared Hawk, this time of the brown morph, perched atop an isolated tree in what appeared to be an abandoned pasture with scattered bushes and trees at the same site. An adult *A. bicolor* was seen perched in similar habitat 700 m away, but was easily separated by its pale grey underparts.

Discussion

Few records of *A. collaris* are available for Peru and all published reports are from the area between the Cosñipata and Urubamba basins, within c.2,700 km² in Cusco. Ours are the first to be documented outside dpto. Cusco and lie c.1,100 km north-west of the previous northernmost record in Peru (Aputinye) and 220 km south-east of the southernmost in Ecuador (Zamora-Chinchipe province)⁹ (Fig. 1). Our records confirm the species' occurrence in northern Peru, as suggested by Schulenberg *et al.*¹⁰, and 'fill' a large gap in its distribution in the Peruvian Andes, indicating that *A. collaris* might be present along the entire east slope of Peru at 1,100–2,500 m.

Habitat requirements of this species have not been studied in detail and are known only from a few published reports. Parker & O'Neill⁸ found the species perched atop a tall dead tree at the

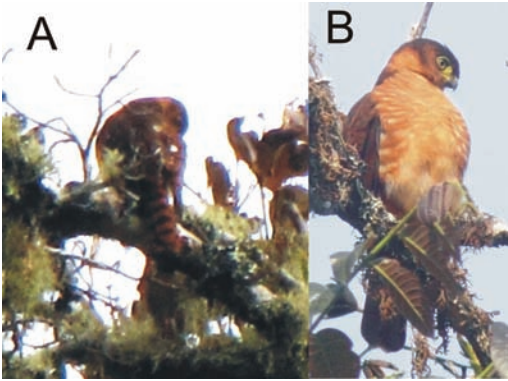


Figure 1 (a) Juvenile rufous-morph Semi-collared Hawk *Accipiter collaris*, La Esperanza, dpto. Amazonas, Peru, 3 September 2010 (Renzo Piana); note the brown tail narrowly barred black, and the pale collar on the neck-sides; (b) juvenile rufous-morph Semi-collared Hawk *Accipiter collaris*, La Esperanza, dpto. Amazonas, Peru, 26 August 2010 (Christian Artuso)

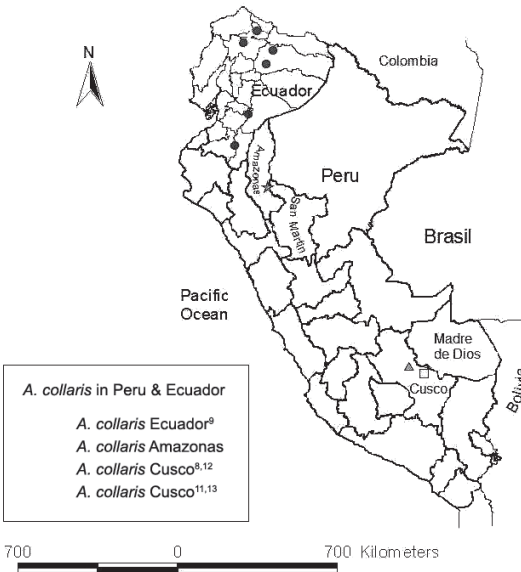


Figure 2. Known localities for Semi-collared Hawk *Accipiter collaris* in Peru and Ecuador.

edge of the Aputinye cloud forest at 1,730 m, and D. F. Lane (pers. comm.) saw one c.25 m up in a *Cecropia* tree amid second growth beside a road. Cuervo *et al.*² found *A. collaris* in the subcanopy of forest interior and edges at 1,400–1,750 m in the Cordillera Central (Colombia), and Freile & Chaves⁵ soaring above a cleared area adjacent to primary forest and attacking bush tanagers at a secondary forest edge (north-west Ecuador at 1,900 m). These observations are consistent with

ours and indicate that the species usually perches in tall trees at forest edges, where it presumably waits for prey.

Due to its small population, *A. collaris* is considered globally Near Threatened¹. In Peru the species is not included in the national list of threatened wildlife species³, but a proposal has been prepared to list it as Near Threatened due to the paucity of sightings in the country (Piana in press).

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We thank Tom Schulenberg, Barry Walker and Manuel Plenge for providing references and comments on the species' distribution in Peru. Dan Lane shared his observation from Afluente. Andrés Cuervo and Juan Freile kindly shared bibliography. We thank Christian Artuso for sharing his photograph of Semi-collared Hawk. BirdLife International and the Marshall-Reynolds Foundation funded our field work project 'Northern Peru Threatened Endemics'. Noga & Sam Shanee of Neotropical Primate Conservation provided logistics and permits to access the area. We also thank community members at La Esperanza for help in the field. Finally, C. Witt made useful comments on the manuscript.

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First notes on the courtship behaviour of Black-throated Tody-Tyrant *Hemitriccus granadensis*

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Describimos por primera vez el comportamiento de cortejo del Picochato carinegro *Hemitriccus granadensis*, un aspecto desconocido para la especie y demás miembros del género *Hemitriccus*. Observamos machos en vuelo sostenido en frente de las hembras por un minuto o más, algunas veces moviéndose de lado a lado en un ángulo de hasta 15°, mientras producían un fuerte sonido mediante la vibración de sus alas. La duración del vuelo sostenido varió ampliamente entre las observaciones. El número de despliegues consecutivos o la duración de los mismos podrían ser un indicativo para la hembra del potencial desempeño reproductivo del macho.

The tyrannid genus *Hemitriccus* includes 21 species of forest-associated birds found throughout the Neotropics². Species in this genus have flat and narrow bills and long tarsi, traits that are related to their foraging behaviour^{1,2}. Their natural history is little known and their systematics unclear, partly because some species exhibit atypical reproductive habits for the genus². Recent molecular phylogenies indicate that *Hemitriccus* is polyphyletic^{6,8}.

One of the better-known species is Black throated Tody-Tyrant *Hemitriccus granadensis*. This locally common understory bird is often found at edges or in clearings inside forests at 1,800–3,000 m, and can be common in dense thickets or other second growth^{2,4}. As with most members of the genus, little is known about its breeding biology, other than records of birds in breeding condition in March–July². Nothing has been published concerning courtship behaviour in *Hemitriccus* or closely related genera (e.g. *Atalotriccus*) other than brief explanatory notes to sound-recordings of *H. granadensis*: ‘wing whirr of displaying male hovering below female’⁵. Here we describe this courtship behaviour of *H. granadensis*.

Observations and courtship display

Our observations were made in 1998 and 2007 by NK at the Tapichalaca Reserve, Ecuador, and in 2008 by EB-D at El Dorado Reserve, Sierra Nevada de Santa Marta, Colombia. We observed males in different months in January–August hovering in front of females perched 3.2–4.1 m above ground, in dense thickets near open areas. The males used perches 8–10 cm below the female’s perch during pauses between displays (Fig. 1a). The duration of these flights averaged 11.82 seconds ($n=12$), but varied considerably, from two to 65 seconds. There were 1–7 pauses per display, lasting a mean 4.2 seconds and ranging from 0.15 to 30.0 seconds ($n=11$).

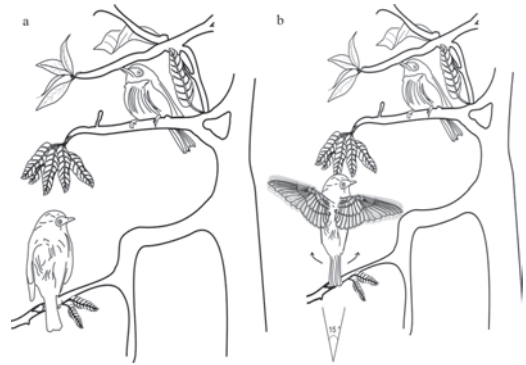


Figure 1. Diagram of courtship display by male Black-throated Tody-Tyrant *Hemitriccus granadensis*: (a) male perched 8–10 cm below the female’s perch during display pauses; (b) male hovering in front of the female, moving from side to side (Alvaro Monroy)

Males made short flights to hover below and in front of the female at a distance of 6–10 cm, sometimes moving from side to side within an angle of <15° (Fig. 1b). During these, a sound was apparently produced by the male’s wings, similar to that reported for congenics during territory patrolling or foraging^{2,4}, and is probably produced by very fast wingbeats and not by modifications to the wing feathers¹. The sounds produced by the males were recorded using a ME67 Sennheiser directional microphone on Type 1 cassettes in a Sony TCM5000 tape-recorder, and some were published by NK in 2001⁵.

While foraging or patrolling, birds produced a similar sound that matched the duration of their short flights perfectly. Wing-whirring during short flights usually lasted <0.59 seconds. The whirring fundamental frequency was nearly 1.50 kHz (Fig. 2a), somewhat lower (but not significantly different) than the courtship hover, which exhibited a fundamental of 1.50–1.60

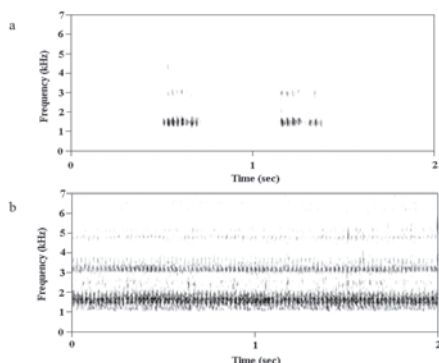


Figure 2. Sonograms of wing-whirring produced by male Black-throated Tody-Tyrant *Hemitriccus granadensis*, El Dorado Reserve, Sierra Nevada de Santa Marta, Colombia (top) and Tapichalaca Reserve, Ecuador (bottom): (a) during foraging or patrolling act, and (b) during courtship display.

kHz (Fig. 2b). The incipient higher values of the courtship display were related to a higher mean wingbeat frequency of 42.7 beats per second (SD = 0.95) compared to a mean 35.9 beats per second (SD = 1.02) during patrolling or foraging movements. This was measured by counting the silent intervals on the spectrogram for both sounds. The reason for this beat frequency is that the bird must move its wings faster to stay still in front of the female than for movement between perches.

Discussion

This courtship is clearly different from all reported behaviours for Tyrannidae, although the family exhibits a high degree of variation in displays^{2,7}. Among these, there are acrobatic flights with quick flapping of the wings in *Tyrannus* (executed by both sexes), leks or similar displays in the polygynic species and the elaborated manoeuvres of many Fluvicolinae^{2,7}. In those displays that involve flights or postures, use of vocalisations is common^{2,7}. However, our observations suggest that in the case of *H. granadensis* the displays are not accompanied by any vocalisation.

Compared to many species, this seems to be a more complex display than might be expected for a monogamous bird. However, evolutionary explanations exist, suggesting reproductive conflicts between sexes as a possible cause for this pattern³. Under this scenario, the development of more elaborated courtship rituals by males could permit them to exploit biases in females' responses, increasing the chance of copulation irrespective of parental performance⁹. Whatever the cause, it is probable that the number of

consecutive displays or the duration of fluttering could be interpreted by the female as a measure of a male fitness.

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First record of Buff-necked Ibis *Theristicus caudatus* for Peru

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Presentamos el primer registro de la Bandurria de Ala Blanca *Theristicus caudatus* para el Perú. Registramos tres individuos en las Pampas del Heath, Parque Nacional Bahuaja-Sonene, dpto. Puno en septiembre de 2009 y dos individuos en el mismo localidad en agosto de 2010. El registro fue documentado con fotos y grabaciones de sonidos.

Buff-necked Ibis *Theristicus caudatus* is a polytypic species of lowland savannas and wetlands in South America: *T. c. caudatus* occurs in Colombia and Venezuela, and *T. c. hyperorius* south of the Amazon in Brazil, Bolivia, Paraguay, Uruguay and Argentina⁴. In Bolivia, the species is widespread in the lowlands and foothills of the Andes to 2,400 m in dptos. Beni, Cochabamba, Santa Cruz, Chuquisaca, Tarija and La Paz, where this subspecies reaches its north-west limit at Pílon Lajas³.

During a visit to the Peruvian Pampas del Heath on 27–30 September 2009 we documented the presence of Buff-necked Ibis. Observations were made at Pampa Juliaca, dpto. Puno (12°57'14"S 68°54'48"W; 165 m), 3.2 km from the confluence of

the río Heath and Quebrada Juliaca. This is the same area visited by Zeppilli *et al.*⁵ in 2006 and that most visited by other biologists, it being the most accessible savanna habitat. It forms part of the 1,091,416-ha Bahuaja-Sonene National Park, in extreme south-east Peru (dptos. Madre de Dios and Puno). The Pampas del Heath is the only edaphic tropical savanna in Peru, with an area of 6,549 ha (based on a Landsat image from 24 August 2010) distributed in two blocks, of which Pampa Juliaca is the larger. Our observations were made in savanna interspersed by scattered woodlots, isolated trees and open *Mauritia minor* palm swamps along permanent watercourses. The grassland had been burnt (regularly burning by local communities maintains the habitat and facilitates hunting) c.1 month previously and was dominated by relatively short grass c.40 cm high, but there were also more humid patches with grass growing in standing water and a sward c.10 cm high.

The first record was of a single bird heard calling as it flew over our campsite in gallery woodland at c.15h00 on 27 September 2009, shortly after our arrival. RSRW relocated the bird 15 minutes later, c.400 m north of the camp, and obtained photographs (Figs. 1–3) and sound-recordings to document the observation. During the next three days we observed the species on nine



Figures 1–2. Buff-necked Ibis *Theristicus caudatus*, Pampa Juliaca, dpto. Puno, Peru, 30 September 2009 (Robert S. R. Williams)



Figure 3. Buff-necked Ibis *Theristicus caudatus*, Pampa Juliaca, dpto. Puno, Peru, 29 September 2009 (Robert S. R. Williams)

separate occasions, mostly in pairs or single birds, but once three together (Fig. 3). Sound-recordings were made using a Sennheiser ME-66 microphone and Edirol R-09 digital recorder, and one recording has been archived online at www.xeno-canto.org (XC39406). In 2010, RSRW returned to the Pampas del Heath on 28–30 August and observed two Buff-necked Ibis in the same area.

This documentation of Buff-necked Ibis at Pampas del Heath is the first record for Peru and the westernmost for *T. c. hyperorius*. The species had previously been recorded at Pilón Lajas, in Madidi National Park, Bolivia, c.220 km south-east of Pampas del Heath, making Buff-necked Ibis a relatively unexpected addition to the Peruvian avifauna, especially given that previous ornithological work at the Peruvian Pampas del Heath did not find the species despite being similarly timed^{1,2,5}. Also, we are unaware of any records of the species from the more frequently visited savannas on the Bolivian side of the río Heath. The Pampas del Heath is the westernmost limit for many species of tropical savannas south of the Amazon and is the only Peruvian locality for these birds, though some have recently colonised newly created pastures around the city of Puerto Maldonado, dpto. Madre de Dios (RSRW pers. obs.). It is probable that further new species for the country will be recorded in both the Pampas del Heath and these new, savanna-like pastures. The Pampas del Heath represent one of the few areas of tropical savanna habitat not grazed by cattle. Although protected, the savannas are still burned in an uncontrolled manner by local communities, and to ensure their long-term conservation the burning regime requires adequate management.

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Novos registros ornitológicos para a região da Serra da Canastra, Minas Gerais, Brasil

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We present the first records of 43 bird species for the Serra da Canastra region located in south-west Minas Gerais state, Brazil. Notes on geographic distribution and range expansion, as well as breeding, are discussed for some species. The record of White-cheeked Pintail *Anas bahamensis* reported here appears to be the first for Minas Gerais, while that of Blue-tufted Starthroat *Heliomaster furcifer* is apparently the third documented occurrence in the state, and that of Plumbeous Rail *Pardirallus sanguinolentus* one of the few records within the Cerrado biome.

Embora seja um destino freqüente de ornitólogos e observadores de aves, trabalhos a respeito da avifauna da Serra da Canastra são recentes^{2,6,13,39}. O primeiro a publicar um trabalho especificamente sobre as aves da Serra da Canastra foi Forrester¹³. Este autor compilou diversas listas de observadores de aves de todo o mundo, resultando em um documento que serviu de base para o trabalho de Silveira³⁹, que realizou uma revisão crítica da lista apresentada por Forrester¹³, além de incluir dados inéditos para a região. Paralelamente, Andrade & Marini² estudaram o deslocamento das aves em ilhas naturais de florestas, na parte alta do Parque Nacional da Serra da Canastra (PNSC), contribuindo também para o conhecimento da riqueza de espécies. Buzzetti⁶, durante a revisão do Plano de Manejo do PNSC efetuou diversas adendas que culminaram com o documento mais recente e completo sobre a avifauna do PNSC. Desde então, trabalhos isolados vêm sendo publicados contribuindo ainda mais para o conhecimento da ornitofauna da localidade^{5,45,46}.

Os estudos supracitados totalizaram 360 espécies de aves. Tendo em vista a atualização do conhecimento ornitológico da localidade, este estudo apresenta novos registros de aves até então não detectadas na Serra da Canastra.

Área de estudo e Metodologia

O PNSC (20°08'S 46°39'O) está localizado na região sudoeste do Estado de Minas Gerais e abrange oficialmente uma área de 200.000 ha. O relevo é ondulado e as altitudes variam de 800 a 1.460 m. A região apresenta duas estações bem definidas, a chuvosa (setembro–fevereiro) e a seca (março–agosto). O Parque congrega formações vegetais que, sob o ponto de vista da avifauna, assumem vital importância para sua conservação. A região está inserida no bioma Cerrado, sendo observado dentro do Parque um mosaico vegetacional de diferentes formações, tais como o campo limpo, campo sujo, campo rupestre, mata de galeria e cerrado *strictu*

sensu. Em pequenas porções surgem as florestas semidecíduas, pouco representadas na região²⁴.

Este estudo considera como região da Serra da Canastra toda a área incluída no decreto oficial de criação do PNSC, isto é, os 200.000 ha que incluem os chapadões da Canastra e da Babilônia e ainda toda zona de amortecimento do Parque, que é caracterizada como uma linha de 10 km de distância dos limites da Unidade de Conservação (UC). Desta forma, a região tem como influência, parte dos municípios de São Roque de Minas, Vargem Bonita, Delfinópolis, Capitólio, Piumhi, São João Batista do Glória e Sacramento²⁴.

Os registros aqui descritos foram obtidos em diversas saídas a campo realizadas entre 1999 e 2010 e segue a nomenclatura científica proposta pelo CBRO⁸. Fez-se uso de binóculos para auxiliar as observações que, quando possível, foram documentadas através de registros fotográficos ou pela gravação de suas vocalizações que foram posteriormente depositadas no arquivo digital do Wikiaves (www.wikiaves.com.br) sendo, nestes casos, citadas pelo número de tombamento no site. As siglas RB, RP, AA, GMK, LP e SFB fazem referência as iniciais dos respectivos autores dos registros.

Resultados e Discussão

Novos registros para a região da Serra da Canastra

Asa-branca *Dendrocygna autumnalis*

Um indivíduo foi observado por RB & SFB em 3 de agosto de 2005 nadando no rio São Francisco, próximo à parte alta da cachoeira Casca D'anta, São Roque de Minas. Em 7 de novembro de 2009, GMK observou dois indivíduos em uma área brejosa localizada a 25 km a noroeste de Piumhi. Posteriormente a espécie foi observada e fotografada (Fig. 1; WA110176) por AA no ribeirão Borá, Sacramento em 15 de fevereiro de 2010.

Marreca-toicinho *Anas bahamensis*

Em 29 de julho de 2006, a espécie foi observada por RB & SFB na parte alta do rio São Francisco, nas proximidades da cachoeira Casca D'anta nadando ao lado de um indivíduo de *Podilymbus podiceps*. Embora seja um anatídeo com ampla distribuição no Brasil leste setentrional e oriental³³, a espécie não é citada por Mattos *et al.*²² na lista de aves de Minas Gerais. A única indicação sobre sua presença no estado que fomos capazes de encontrar constitui-se de uma citação a respeito de seu status na nova lista de espécies ameaçadas de Minas Gerais⁴⁰. Desta forma, acredita-se que embora presente, ocorra em baixas densidades, o que certamente dificulta sua localização.

Marreca-de-bico-roxo *Nomonyx dominica*

GMK realizou diversas observações desta espécie em uma área brejosa localizada 25 km a noroeste de Piumhi em 21 de outubro de 2004, 14 de agosto de 2005, 13 de outubro de 2005, 13 de dezembro de 2008 e 7 de novembro de 2009.

Savacu *Nycticorax nycticorax*

Um indivíduo foi observado e fotografado (WA110177) por AA pousado sobre uma *Cecropia* sp. em 16 de fevereiro de 2010, às margens do ribeirão Borá, Sacramento. GMK observou a espécie nos limites sul do PNSC em 13 de dezembro de 2008 e 6 de novembro de 2009. Posteriormente, em 25 de maio de 2010, RB observou dois indivíduos (WA177872) pousados à margem do rio do Peixe, próximo à pousada Chapadão da Canastra em São Roque de Minas.

Urubu-de-cabeça-amarela *Cathartes burrovianus*

Um indivíduo foi observado e fotografado por RB & SFB em 14 de outubro de 2008 sobrevoando uma área de pastagem às margens do rio São Francisco na vila de São José do Barreiro em São Roque de Minas.

Gavião-bombachinha *Harpagus diodon*

Um indivíduo foi observado e fotografado por LP em 15 de janeiro de 2008, pousado sobre uma árvore, próximo à portaria IV na parte baixa do PNSC, São Roque de Minas. Esta espécie apresenta uma ampla distribuição no Brasil, ocorrendo em diversos tipos de formações florestais ao longo de sua área de ocorrência³³. Estudos recentes na região da Serra da Mantiqueira indicaram a possibilidade de *H. diodon* realizar movimentos migratórios⁷. Desta forma, registros da espécie ao longo de sua área de ocorrência e no decorrer do tempo, podem contribuir para o esclarecimento de suas rotas migratórias.

Gavião-pernilongo *Geranospiza caerulescens*

Um indivíduo observado e fotografado (WA7590) no entorno da nascente do São Francisco na parte

alta do PNSC nos dias 25 e 26 de julho de 2008 por RB & SFB.

Gavião-belo *Busarellus nigricollis*

No dia 23 de setembro de 2009, a espécie foi observada e fotografada por AA (WA48856) pousada sobre um tronco seco, localizado em uma lagoa na margem direita do ribeirão Borá, nas proximidades de sua desembocadura no Rio Grande, município de Sacramento.

Gavião-caracoleiro *Chondrohierax uncinatus*

Em 25 de setembro de 2007, GMK (juntamente com P. Ginsburg) observou um indivíduo em Vargem Bonita nos limites do PNSC. Um indivíduo foi observado e fotografado por AA (WA119888) no dia 31 de janeiro de 2010 às margens do ribeirão Borá, município de Sacramento.

Sanã-parda *Laterallus melanophaius*

Um indivíduo foi observado e ouvido por E. Endrigo em outubro de 2008 em um brejo localizado na estrada que liga a cidade de Vargem Bonita a São Roque de Minas. GMK registrou a espécie em um brejo 25 km a norte de Piumhi, na direção do PNSC, em 90% de suas visitas à localidade realizadas entre 2004 e 2009. Observações regulares desta espécie na região também foram realizadas em um brejo localizado em Campinópolis, a 30 km de São Roque de Minas até 2007, quando então, esta área foi drenada para a construção da estrada.

Saracura-do-banhado *Pardirallus sanguinolentus*

Um casal foi ouvido por RP em um brejo próximo da cidade de Piumhi no dia 17 de dezembro de 2001. *P. sanguinolentus* é uma espécie méridio-andina, ocorrendo desde a Terra do fogo, até o Rio de Janeiro³³. Registros no Estado de Minas Gerais são escassos e estão concentrados principalmente no sul do Estado, como no planalto de Poços de Caldas^{17,22}. A ocorrência da espécie na Serra da Canastra representa, provavelmente, o registro mais setentrional em Minas Gerais e um dos poucos registros para o bioma Cerrado^{34,37}.

Frango-d'água-carijó *Gallinula melanops*

Em 13 de outubro de 2005, GMK e colegas observaram, com o auxílio de telescópio, um indivíduo forrageando próximo a *Gallinula galeata*, *Porphyrio martinica* e *Jacana jacana* em uma área brejosa localizada 25 km a noroeste de Piumhi.

Frango-d'água-azul *Porphyrio martinica*

Em 13 de outubro de 2005, GMK registrou dois indivíduos em uma área brejosa localizada 25 km a noroeste de Piumhi. Em 19 de setembro de 2010, um indivíduo foi observado e fotografado (WA204339) por AA nas proximidades do ribeirão Borá, Sacramento.



Figura 1. Bando de *Dendrocygna autumnalis*, Serra da Canastra, Minas Gerais, 15 de fevereiro de 2010 (Alessandro Abdala)



Figura 2. Indivíduo de *Hylocryptus rectirostris*, próximo ao Ribeirão Borá em Sacramento, Minas Gerais, 11 de outubro de 2009 (Alessandro Abdala)



Figura 3. Exemplar de *Fluvicola albiventer*, Serra da Canastra, Minas Gerais, 2 de novembro de 2009 (Alessandro Abdala)



Figura 4. Exemplar de *Sporophila hypoxantha*, Serra da Canastra, Minas Gerais, outubro de 2008 (Rafael Bessa)

Baituiruçu *Pluvialis dominica*

Um indivíduo foi observado e fotografado por R. Biancalana (WA233142, WA233149) ao lado de alguns indivíduos de *Bartramia longicauda* no dia 31 de outubro de 2010, logo após uma forte chuva em uma extensa área de campo limpo na parte alta do PNSC.

Maçarico-solitário *Tringa solitaria*

A espécie foi observada por GMK em área brejosa localizada 25 km a noroeste de Piumhi em 14 de agosto de 2005, 9 de outubro de 2006 e 24 de setembro de 2007.

Maçarico-de-perna-amarela *Tringa flavipes*

Em 9 de outubro de 2006, GMK & C. G. Bradshaw observou um indivíduo em área brejosa a 25 km do município de Piumhi.

Rolinha-vaqueira *Uropelia campestris*

Um indivíduo observado por E. Endrigo próximo à pousada da Limeira em Vargem Bonita em outubro de 2008.

Andorinhão-de-colheira-falha *Streptoprocne biscutata*

Um bando observado por RP em 12 de novembro de 1999 sobrevoando a cachoeira Casca D'anta em São Roque de Minas. Posteriormente em 13 de agosto de 2005, GMK observou alguns indivíduos em voo conjunto com *S. zonaris* na mesma localidade citada.

Bico-reto-azul *Heliomaster furcifer*

Observado e fotografado por AA (WA184078) nas proximidades do ribeirão Borá em Sacramento no dia 29 de julho de 2010. Esta espécie apresenta registros escassos em Minas Gerais⁴⁵ e este é provavelmente o terceiro registro documentado de *H. furcifer* no Estado.

Beija-flor-cinza *Aphantochroa cirrochloris*

Um indivíduo foi observado por RB & SFB entre 14 e 18 de novembro de 2008 alimentando-se num ingazeiro (*Inga* sp.), próximo ao centro de visitantes da portaria IV do PNSC. Embora seja considerada endêmica de Mata Atlântica⁴¹, sua distribuição também inclui o interior do Brasil (Goiás, e Distrito Federal¹⁹). Recentemente a espécie foi registrada

numa área de transição entre Caatinga e Cerrado, no Estado de Minas Gerais⁴⁵, fato que reforça o argumento de que não se trata de uma espécie restrita à Mata Atlântica.

Pica-pau-anão-escamado *Picumnus albosquamatus*

A espécie foi observada por GMK em uma mata de galeria no limite oeste do PNSC em 13 de outubro de 2005 e 3 de dezembro de 2008. Posteriormente, em 9 de agosto de 2009, AA observou e fotografou (WA46385) um casal de *P. albosquamatus* forrageando sobre um tronco em processo de decomposição em uma mata de galeria, localizada nos limites da Fazenda Mumbuca, município de Sacramento.

Papa-formiga-vermelho *Formicivora rufa*

No dia 22 de agosto de 2009, AA observou e fotografou (WA93178) uma fêmea de *F. rufa* sobre uma moita de bambus nativos, localizada nas margens do ribeirão Borá, município de Sacramento. Posteriormente, em 31 de janeiro de 2010 um macho foi observado na mesma localidade (WA105174).

Curutiê *Certhiaxis cinnamomeus*

A espécie foi observada por LP no dia 15 de janeiro de 2008, em uma área de brejo, as margens do rio São Francisco, na sua porção que corta o município de Vargem Bonita. Posteriormente, AA observou e fotografou (WA195419) um casal forrageando na margem do ribeirão Borá em Sacramento no dia 5 de setembro de 2009. A espécie foi comumente observada por GMK em área brejosa localizada 25 km a noroeste de Piumhi em todas as visitas realizadas entre 2004 e 2009.

Graveteiro *Phacellodomus ruber*

Em 17 de outubro de 2009, AA observou e fotografou (WA222357) um casal de *P. ruber* na beira de um curso d'água localizado na fazenda Nova Suécia, nos limites do PNSC, em Sacramento. O casal encontrava-se em plena atividade de construção do ninho em uma palmeira.

Fura-barreira *Hylocryptus rectirostris*

Em 11 de outubro de 2009, AA encontrou um ninho ativo de *H. rectirostris* (Fig. 2) sob uma pequena ponte às margens de um curso d'água nos limites da Fazenda Mumbuca, município de Sacramento. Na ocasião, macho e fêmea participavam dos cuidados parentais, revezando-se na alimentação dos dois filhotes (WA67233), comportamento já apontado por Faria *et al.*¹¹. Uma semana após as primeiras observações, os filhotes já haviam abandonado o ninho e foram observados nas imediações do mesmo ainda sendo alimentados pelos pais. O fura-barreira é uma espécie endêmica do Cerrado³⁴, que habita as matas ciliares da região centro-sul do

Brasil (Mato Grosso, sul de Goiás, extremo sul da Bahia, sul-sudoeste de Minas Gerais, oeste de São Paulo e noroeste do Paraná), chegando ao extremo leste do Paraguai³⁰.

Tachuri-campainha *Hemitriccus nidipendulus*

Observado por RP na parte baixa do PNSC em São Roque de Minas em 3 de maio de 2006. Embora seja considerada uma espécie endêmica da Mata Atlântica⁴, sua presença em outros biomas como Caatinga e Cerrado é conhecida^{34,38}. Segundo Silva³⁵, aves que tem o centro de sua distribuição na Mata Atlântica expandem sua ocorrência para o interior do Cerrado, através de matas de galeria estreitas ou corredores de mata semidecídua localizados em planaltos, formações estas que ocorrem na Serra da Canastra²⁴.

Ferreirinho-de-cara-parda *Poecilatriccus latirostris*

Em 22 de agosto de 2009, AA observou e fotografou (WA48827) um indivíduo de *P. latirostris* na margem direita do ribeirão Borá, próximo à sua foz no Rio Grande, município de Sacramento.

Guaracava-grande *Elaenia spectabilis*

Um indivíduo observado e fotografado por E. Endrigo em área brejosa localizada as margens da estrada que liga São Roque de Minas à Vargem Bonita em outubro de 2008.

Guaracava-de-bico-curto *Elaenia parvirostris*

Um indivíduo foi observado e fotografado (WA177851) por RB na companhia de E. Endrigo em 29 de maio de 2010, próximo à pousada Recanto da Canastra no distrito de São José do Barreiro, São Roque de Minas.

Tesoura-cinzenta *Muscipipra vetula*

Um indivíduo foi observado por RP na parte baixa do PNSC em 15 de setembro de 2001. *M. vetula* ocorre da região nordeste da Argentina e sudeste do Paraguai ao Espírito Santo no Brasil, incluindo Minas Gerais. Sua distribuição está associada a regiões montanhosas, aparecendo sempre em baixas densidades³². Em Minas Gerais, sua presença é citada para a Cadeia do Espinhaço¹⁰, para diferentes localidades da Serra da Mantiqueira como, por exemplo, Baependi²⁹, Parque Nacional de Itatiaia¹⁴ e Parque Estadual do Ibitipoca²⁷ e, também, para a cidade de Lavras na região sul do Estado⁴⁴, sendo esta última, a ocorrência mais próxima que pôde ser localizada. Estas localidades distam pelo menos 200 km do PNSC e, portanto, este achado representa o primeiro registro da espécie para o sudoeste mineiro e uma expansão de sua distribuição em cerca de 200 km no sentido noroeste de Lavras.

Lavadeira-de-cara-branca *Fluvicola albiventer*

Um indivíduo foi observado e fotografado (Fig. 3) por AA no dia 2 de novembro de 2009 sobrevoando o leito do ribeirão Borá, Sacramento. A ave realizava pequenos vôos, pousando nos arbustos às margens do referido ribeirão, enquanto era importunada por um indivíduo de *F. nengeta*. *F. albiventer* habita áreas da Caatinga, Cerrado e borda de florestas degradadas próximas a cursos d'água. No Brasil ocorre localmente do leste do Amazonas e Pará, na região nordeste, no Brasil-central incluindo noroeste de Minas Gerais e São Paulo e regiões do Paraná^{12,32,33}. Trabalhos recentes apontam uma possível expansão da espécie para locais até então não ocupados por ela, como Santa Catarina, litoral de São Paulo^{1,26} e o município de Belo Horizonte em Minas Gerais²⁸, o que pode explicar o recente registro da espécie na região da Serra da Canastra.

Bentevizinho-de-asa-ferrugínea *Myiozetetes cayanensis*

Um indivíduo observado e fotografado por RB & SFB parte baixa do rio São Francisco próximo à localidade conhecida como pontilhão, na cidade de Vargem Bonita em 16 de julho de 2006. Outros registros da espécie foram efetuados por AA em 15 de fevereiro (WA44483) e 10 de maio de 2009 (WA44472) no interior da Fazenda Mumbuca, Sacramento.

Garrincho-de-barriga-vermelha *Cantorchilus leucotis*

Em 10 de maio de 2009, AA observou e fotografou (WA45139) um casal de *C. leucotis* forrageando no entorno de um brejo localizado nos limites da Fazenda Mumbuca, município de Sacramento.

Andorinha-azul *Progne subis*

Um casal foi observado e fotografado (WA20627, WA66014) por RB & SFB em 2 de agosto de 2006, 17 de agosto de 2007 e mais recentemente em 17 de novembro de 2008, pousado sobre um fio elétrico localizado em frente à Sede do ICMBio, na cidade de São Roque de Minas. *P. subis* é um visitante setentrional que migra para a América do Sul no período do inverno boreal³³. Permanece no Brasil entre setembro e março e tem preferência por áreas abertas e semi-abertas com a proximidade de água^{33,42}, habitat abundante no PNSC²².

Balança-rabo-de-mascara *Poliophtila dumicola*

Um casal foi observado e fotografado (WA175419) por AA no dia 31 de julho de 2009 em uma área típica de Cerrado localizada na região de Jaguará, município de Sacramento.

Sanhaçu-de-coleira *Schistochlamys melanopsis*

Em 13 de setembro de 2009, AA observou e fotografou um casal de *S. melanopsis* em um brejo próximo à fazenda Mumbuca em Sacramento.

Pipira-da-taoca *Eucometis penicillata*

Em 20 de setembro de 2009, AA observou e fotografou dois indivíduos de *E. penicillata* em uma mata de galeria na fazenda Mumbuca, Sacramento. O casal se mostrou irrequieto, com a fêmea pousada, e o macho realizando pequenos vôos semicirculares, retornando para o poleiro ao lado da fêmea, ao que tudo indica, numa atitude de corte sexual. No dia 1 de novembro de 2009, durante uma nova visita a localidade, um ninho foi encontrado em uma forquilha de um arbusto a 0,3 m do solo, construído em forma de cesto formado de raízes e fibras vegetais, com dois filhotes em seu interior (WA74865). Durante os 20 minutos de observação somente a fêmea alimentou os ninhegos, enquanto o macho permaneceu pousado próximo ao ninho. Este ninho possui características semelhantes às citadas por Hilty¹⁵ e Lopes & Ferreira¹⁸, diferindo quanto à altura do mesmo, já que estava a 0,3 m do solo, enquanto os demais encontravam-se na altura mínima de 0,6 m¹⁵. A pipira-da-taoca é uma espécie tipicamente florestal, estando associada a ambientes de várzea na Amazônia e penetrando no Cerrado através das matas de galeria³⁴. No Brasil, sua distribuição se estende até o Mato Grosso, sul de Goiás, oeste de São Paulo e Minas Gerais, leste do Pará e Maranhão³³. A espécie foi recentemente observada em Itaú de Minas a poucos quilômetros da Serra da Canastra, também no sudoeste mineiro¹⁸, sendo, esta área, o limite meridional da espécie no Estado.

Coleiro-do-brejo *Sporophila collaris*

Em 17 de dezembro de 2001, RP observou um indivíduo em um brejo próximo a cidade de Piumhi. A espécie foi encontrada novamente por AA em 26 de setembro de 2009 em uma região pantanosa nas proximidades do ribeirão Borá no município de Sacramento. Na ocasião, foram observados ao menos cinco indivíduos de *S. collaris* tanto com o ventre branco, quanto acanelado, que forrageavam associados a *S. caerulescens*, *S. plumbea*, *S. leucoptera* e *S. nigricollis*.

Papa-capim-de-costas-cinzas *Sporophila ardesiacae*

A espécie foi observada por RB & SFB na pousada Recanto da Canastra, próximo à Vila de São José do Barreiro, São Roque de Minas, em 20 de novembro de 2008. Na ocasião a espécie alimentava-se em um comedouro, junto com *S. nigricollis*, *S. caerulescens*, *Sicalis flaveola* e *Volatinia jacarina*. Em 29 de maio de 2010, RB & E. Endrigo observaram novamente a espécie na margem do rio São Francisco, na cidade de Vargem Bonita (WA177873).

Caboclinho-de-barriga-vermelha *Sporophila hypoxantha*

Em 10 de novembro de 2002, RP observou um macho de *S. hypoxantha* associado a *S. melanogaster* e *S. lineola* nas proximidades da nascente do rio São Francisco, parte alta do PNSC. Posteriormente, entre 25 e 27 de outubro de 2008, RB & SFB observaram e fotografaram (Fig. 4; WA7531) um macho forrageando junto à *S. nigricollis*, *S. plumbea*, *S. caerulescens* e *S. bouvreuil* em uma área dominada pelo capim exótico *Brachiaria* sp. no entorno da sede do Jaguarê, também dentro do PNSC. *S. hypoxantha* ocorre da Bolívia, Argentina, Paraguai e Uruguai ao Brasil no Rio Grande do Sul, Santa Catarina, Paraná, São Paulo, Mato Grosso do Sul e Goiás. É migratório, aparecendo no Sul do Brasil no final do ano (novembro, dezembro) para reproduzir³³. Relatos recentes da presença desta espécie em Minas Gerais são escassos e indicam sua ocorrência em áreas que vem sofrendo forte pressão antrópica como os municípios de Monte Carmelo e Morro do Ferro²⁰, ambos a cerca de 200 km do PNSC.

Iraúna-de-bico-branco *Proccacius solitarius*

Em 20 de agosto de 2006, RB & SFB observaram um indivíduo de *P. solitarius* pousado sobre o galho de uma palmeira, próximo à vila de São José do Barreiro, São Roque de Minas.

Guaxe *Cacicus haemorrhous*

No dia 19 de setembro de 2009, AA observou e fotografou (WA58403) uma colônia de *C. haemorrhous* às margens do rio Araguari, na localidade de Caxambú, Sacramento. Inicialmente apenas dois indivíduos foram observados pousados sobre uma árvore, posteriormente, localizou-se uma colônia de oito ninhos dessa espécie construídos em forma de pêndulo sobre o leito do rio Araguari.

Polícia-inglesa-do-sul *Stumella supercilaris*

Em 17 de outubro de 2009 um casal de *S. supercilaris* foi observado e fotografado por AA (WA70001) em uma região de campo limpo, próxima ao ribeirão Borá no município de Sacramento. A espécie foi comumente observada por GMK em área brejosa localizada 25 km a noroeste de Piumhi em todas as visitas realizadas entre 2004 e 2009.

Conclusão

Conforme apresentado, e com base nos levantamentos conduzidos recentemente na região^{2,5,6,13,46}, até o momento eram conhecidas 360 espécies para a Serra da Canastra. Com as adendas aqui apresentadas, este número sobe para 403, o que representa quase 50% de toda avifauna conhecida para o Estado de Minas Gerais²² e ainda, um acréscimo de mais de 10% para a avifauna da Serra da Canastra.

Dentre as novas espécies registradas, nove são conhecidas por realizar deslocamentos sazonais (*Harpagus diodon*, *Pluvialis dominica*, *Tringa solitaria*, *T. flavipes*, *Elaenia spectabilis*, *E. parvirostris*, *Progne subis*, *Sporophila ardesiaca* e *S. hypoxantha*)³¹⁻³³, duas representam novos registros para sua área de ocorrência conhecida (*Pardirallus sanguinolentus*, *Muscipipra vetula*) e o restante é composto por espécies autóctones, mas que provavelmente possuem baixa densidade na região.

Com relação às espécies migratórias de caboclinhos (Emberizidae) a Serra da Canastra, por ser uma área efetivamente protegida, representa uma importante região do sudoeste de Minas Gerais na rota migratória destas espécies uma vez que esses locais têm importância fundamental para conservação dessas aves, que, ao realizarem grandes migrações, necessitam de áreas chave para realizar a muda das penas, se alimentarem e adquirir reservas energéticas necessárias para a continuação das longas viagens³³.

Desta forma, os esforços na conservação de aves migratórias dependem da identificação dos sítios de forrageio, repouso e reprodução, pois a perda dos sítios de invernada pode acarretar diminuição e até mesmo a extinção local de algumas espécies ou população das mesmas^{25,33}. No caso das espécies do gênero *Sporophila*, visto que as rotas migratórias e os períodos de permanência em cada localidade ainda são pouco conhecidos, cada registro torna-se relevante para o entendimento de sua biologia migratória³⁹.

Embora a Serra da Canastra seja considerada uma área com um nível de conhecimento ornitológico representativo, apresentando uma lista de espécies razoavelmente completa³, sua fauna, assim como a de qualquer outro local, não é estática, sendo necessários estudos contínuos para observar mudanças na comunidade⁴⁴. Isto é corroborado em nosso trabalho, uma vez que foram observadas diversas espécies de fácil detecção, como as de grande porte, conspicuas ou com ampla distribuição pelo Brasil³¹⁻³³. Vale salientar que a ausência de registros destas espécies em estudos prévios na região pode ser meramente fruto do menor esforço amostral principalmente nas proximidades de Sacramento, no extremo oeste do PNSC.

A região da Serra da Canastra foi considerada recentemente como uma das Áreas Importantes para a Conservação das Aves no Brasil (IBA, do inglês Important Bird Areas) pela BirdLife International (IBA MG15³). Essas áreas se caracterizam pela presença de um grande número de aves ameaçadas, de distribuição restrita e endêmicas. Os recentes registros de espécies regionalmente ou globalmente ameaçadas como *Crax fasciolata* e *Scytalopus iraiensis*, respectivamente^{5,16,40,46}, associado à inclusão de

espécies endêmicas do Cerrado (*Hylocryptus rectirostris*)^{34,36,49} e da Mata Atlântica (*Hemitriccus nidipendulus*)⁴, dois hotspots mundiais²³, reafirmam a importância desta área como UC de proteção integral e reforçam a necessidade da continuidade dos estudos ornitológicos na região.

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New records of Peregrine Falcon *Falco peregrinus* in Minas Gerais, Brazil

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Apresentamos novos registros do falcão-peregrino *Falco peregrinus* para o Estado de Minas Gerais, Brasil, acrescentando novos registros de locais de invernada. Os registros foram obtidos em dez localidades (nove dos quais são novos para a espécie), no período compreendido entre os anos de 2002–10.

Peregrine Falcon *Falco peregrinus* is a cosmopolitan species^{4,17} with an extremely broad latitudinal distribution⁴. Nineteen subspecies are presently recognised¹⁷ of which just three occur in South America: *F. p. anatum*, which migrates from North America (Alaska) to southern South America; *F. p. tundrius*, which breeds over northern North America and Greenland^{13,15}; and *F. p. cassini*, which breeds in southern South America¹² with a single nesting record in Ecuador¹⁶. The species occurs in Brazil during September to April, and winters in the same localities each year¹². The first Brazilian record of *F. peregrinus* was by Johann Natterer, in March 1835, at Praia de Cajutuba, Pará¹². In Brazil *F. peregrinus* is a northern migrant¹⁴ but *F. p. cassini* might occur in the south of the country⁶.

Five published records of *F. peregrinus* are available from Minas Gerais, in south-east Brazil.

In 1989, a record was reported by Sick from Viçosa municipality¹⁰. A *F. peregrinus* ringed in Texas, USA, was also recorded in the state between 1973 and 1985¹¹. Individuals were recorded in December 1999 and January 2000 at Caraça reserve¹⁴, with other records in the state from Belo Horizonte (19°55'S 43°56'W)¹² and south of Januária⁵. Here we present 16 new records of *F. peregrinus* in Minas Gerais, involving nine new localities, and provide additional behavioural and ecological data.

Methods

Records were obtained opportunistically during general ornithological surveys. We also report a bird received at a screening centre for wild animals operated by the Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais (IBAMA) in Minas Gerais. Where possible, we photographed

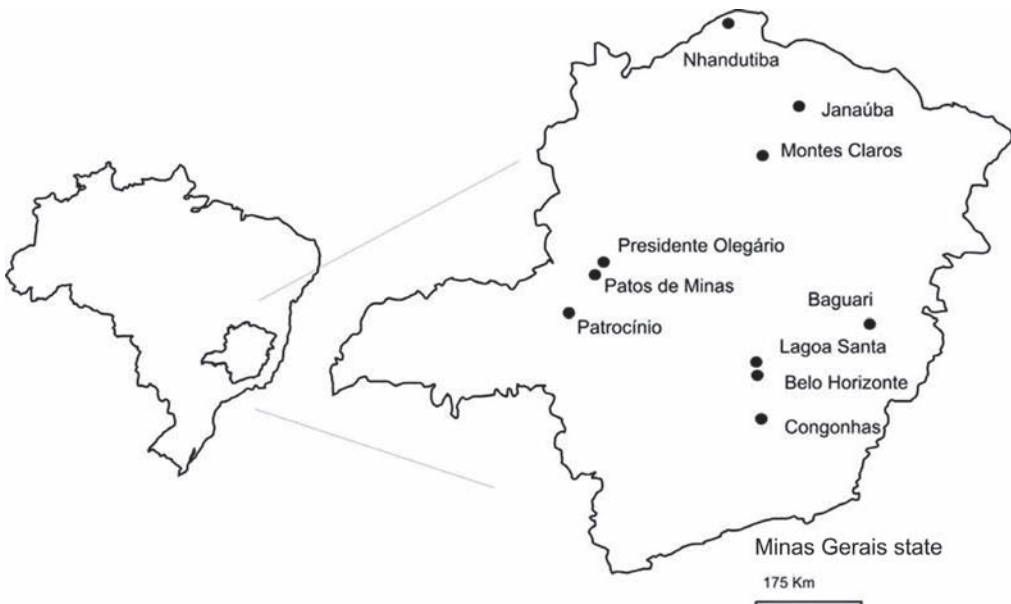


Figure 1. Localities of new records of Peregrine Falcon *Falco peregrinus* in Minas Gerais, Brazil.

the falcons. All geographic coordinates were obtained using a GPS receiver or extracted via satellite images.

Results and Discussion

Sixteen new records of *F. peregrinus* in Minas Gerais were obtained, from the following localities (Fig. 1).

Baguari (19°04'S 42°07'W): one on 4 February 2010 perched in a partially submerged tree, in the lower part of the rio Doce, and another on 22 November 2009 in the same place predated a Ruddy Ground Dove *Columbina talpacoti*.

Belo Horizonte: a male on 7 March 2008 near Pampulha airport (19°51'S 43°57'W) observed gliding with Black Vultures *Coragyps atratus*; an adult on 21 December 2008 over Pampulha airport was moulting the ninth primary; one on 15 November 2007 near Serra do Curral (19°57'S 43°55'W); and one on 8 February 2006 in the centre of the city (19°56'S 43°55'W).

Congonhas (20°29'S 43°53'W): on 5 December 2002 one was perched in a tree at the edge of a dam near Congonhas.

Janaúba (15°44'S 43°24'W): on 8 February 2007 one was perched on an electricity tower. Vegetation in this area is a mixture of *cerrado*, *caatinga* and pastures.

Lagoa Santa (19°39'S 43°56'W): on 5 February 2005 one was perched on a roadside phone tower, and on 12 February 2005 one bird was on the same tower.

Montes Claros (16°43'S 43°51'W): an adult was found on 3 February 2009 on a street in the town and was taken to the wild animal screening centre of the local IBAMA. This is the first record for this region¹⁶.

Nhandutiba (19°39'S 44°23'W): two on 22 March 2006 were seen over the rio Calindó.

Patos de Minas (18°35'S 46°31'W): on 26 January 2010 one was seen unsuccessfully attempting to predate an Eared Dove *Zenaida auriculata*, in a municipal urban park (Mocambo).

Patrocínio (19°00'S 46°46'W): an adult on 6 February 2009 flew over a marsh surrounded by *cerrado*, pastures and coffee plantations, before perching in the *cerrado*.

Presidente Olegário (18°09'S 46°30'W): on 20 January 2007 one was observed hunting unsuccessfully at Vereda Grande Ecological Station.

These records augment the known range of *F. peregrinus* in Minas Gerais and add nine new localities for the species in the state. These records were expected, since Sick¹¹ already suggested that records of *F. peregrinus* are increasing in Brazil. However, because relatively few records of Peregrine Falcon have been published from the

country^{9,11-13} additional observations are needed to improve our understanding of the species' occurrence in the country.

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Registros inusuales de aves costeras en lagunas Altoandinas de Ecuador

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We present noteworthy records of seven coastal birds at two high-Andean lakes in northern and central Ecuador. The lakes of Yahuarcocha and Limpiopungo are situated in the inter-Andean valley. At least some of the seven (mainly coastal) species recorded at these lakes—Brown Pelican *Pelecanus occidentalis*, Tricoloured Heron *Egretta tricolor*, White-necked Heron *Ardea cocoi*, Chilean Flamingo *Phoenicopterus chilensis*, Black-necked Stilt *Himantopus mexicanus*, Sanderling *Calidris alba* and Laughing Gull *Leucophaeus atricilla*—perhaps remained at these unusual locations due to the availability of food.

Los registros de aves marino-costeras en zonas montañosas han sido previamente reportados como eventos aleatorios ocasionados por fenómenos climáticos como vientos alisios⁸, huracanes¹, o la dispersión de individuos vagrantes⁴⁻⁶. Sin embargo, en algunos casos los individuos vagrantes o dispersados pueden establecerse en sitios donde existen recursos suficientes para su subsistencia, al menos en forma temporal⁵. Aquí presentamos una reseña de avistamientos de aves costeras y marinas en dos lagunas altoandinas de Ecuador, donde en algunos casos se establecieron temporalmente. Gracias a la ejecución de censos mensuales en la laguna de Yahuarcocha (prov. Imbabura, 00°22'N 78°06'O) y a los Censos Neotropicales de Aves Acuáticas en la Laguna de Limpiopungo (prov. Cotopaxi, 00°40'S 78°30'O) se efectuaron observaciones entre marzo del 2008 y febrero del 2010. La laguna de Yahuarcocha se encuentra en los valles interandinos secos al norte de Ecuador a 2.210 m de altitud. Es un lago permanente de 230 ha, de origen glacial, poco profundo (9 m), de agua dulce alcalina, con un alto grado de eutrofización. La laguna se encuentra rodeada por vegetación acuática emergente conocida como totora *Scirpus* sp.¹⁰. La laguna de Limpiopungo se encuentra ubicada al pie del nevado del volcán Cotopaxi. Este lago se ubica dentro del Parque Nacional Cotopaxi a 3.800 m de altura y tiene una extensión aproximada de una hectárea. Es un lago de agua dulce, permanente, de 65 cm de profundidad máxima. En las proximidades se aprecian características glaciales pero el lago no es de origen glacial. Hay extensas áreas de pradera inundada por el deshielo de las nieves y bordes de nevado en el páramo que lo circunda¹⁰. En el siguiente recuento de especies presentamos los detalles de cada registro, fotos de baja resolución están disponibles para algunas especies si se las requieren a los autores.

Pelicano Pardo *Pelecanus occidentalis*

El 14 de agosto del 2009 fue la primera vez que TM & KT observaron al Pelicano Pardo en Yahuarcocha. Solamente existe un registro previo el 7 de julio de 2009⁹. A partir de ese momento se observó al pelicano todos los meses hasta febrero del 2010. Se trataba de un individuo subadulto por el plumaje principalmente gris pardo con algo de blanco en cabeza y cuello. En dos oportunidades fue observado nadando cerca de la mitad de la laguna mientras que en las otras el pelicano se encontraba descansando en la orilla entre la totora, en algunos casos junto a los cormoranes *Phalacrocorax brasilianus*. Durante la visita de enero se lo observó sobrevolando predios particulares al sur este de la laguna.

Garceta Tricolor *Egretta tricolor*

El 16 de diciembre del 2009 TM & KT observaron dos individuos, un adulto y un subadulto entre las 08h30–10h45, a 20 m del río Tahuando que alimenta la laguna de Yahuarcocha. Un segundo avistamiento ocurrió el dos de febrero del 2010 cuando además se fotografió un individuo adulto en el mismo sector de la laguna donde ocurrió el primer registro y dentro del mismo periodo del día. Durante las dos oportunidades los individuos se encontraban buscando alimento (peces) en una zona fangosa con abundante totora. La especie ha sido reportada mayormente en la región sur-oeste de Ecuador, en las provincias de Guayas y El Oro y en menor número hacia el norte en la provincia de Esmeraldas⁷. Dentro de nuestro conocimiento, estos registros representan los únicos para la especie en zonas alejadas de la costa. Estos registros sugieren también que al menos una pareja de individuos pudo haberse establecido temporalmente en la laguna.

Garzón Cocoi *Ardea cocoi*

La primera observación del Garzón Cocoi se realiza el 29 de agosto de 2008 cuando un individuo fue

registrado durante los censos mensuales que se llevan a cabo en la laguna, el ave se observa nuevamente el siguiente mes el 22 de septiembre del 2008. Posteriormente se detecta nuevamente la especie después de 14 meses, el 25 de noviembre y el 16 de diciembre del 2009. En esta última oportunidad se observaron dos individuos en la totora al filo de la laguna en el sector sur este, cerca de la planicie del poblado conocido como San Miguel de Yahuarcocha. Finalmente, la última observación corresponde al 2 de febrero del 2010 cuando un individuo se encontraba en el sector norte también en la totora al borde de la laguna. En todas las oportunidades el ave levantó el vuelo al acercarse la lancha.

Flamenco Chileno *Phoenicopterus chilensis*

El cinco de marzo del 2008 entre las 11h00 y 17h00 CL fotografió un individuo en la laguna de Limpiopungo. El individuo permaneció en la parte más superficial de la laguna forrajeando y realizando ocasionalmente vuelos cortos. De acuerdo a observaciones previas de guardaparques el ave permaneció en la laguna por lo menos una semana antes de las observaciones de CL (M. Jácome com. pers.). Este registro corresponde al primero que se obtiene de esta especie en una laguna altoandina de Ecuador.

Cigüeñela Cuellinegra *Himantopus mexicanus*

TM & KT fotografiaron (Fig. 1) un individuo adulto (probablemente hembra) el 2 de febrero del 2010 en la orilla norte de laguna de Yahuarcocha. El individuo fue observado a 15 m de una estación de bomberos ubicada en las inmediaciones de la laguna, en una orilla sobresaliente mientras buscaba alimento en una zona fangosa de poca profundidad. De acuerdo con la información presentada en Ridgely y Greenfield⁷, y dentro de nuestro conocimiento, este registro representa el único obtenido para esta especie en un humedal ubicado a más de 100 m de elevación.

Playero Arenero *Calidris alba*

El 5 de noviembre del 2009, EAG fotografió (Fig. 2) un individuo adulto con plumaje no reproductivo⁹ en la laguna de Yahuarcocha. El ave se encontraba forrajeando en las orillas de la laguna, en una zona arenosa con escasa vegetación. Otras especies playeras que forrajeaban en las cercanías: Patiamarillo Menor *Tringa flavipes*, Andarriós Coleador *Actitis macularius* y Playero Pectoral *Calidris melanotos*. La observación se prolongó por aproximadamente 15 minutos en los que el ave permaneció alimentándose en el mismo sector de la laguna. Además de los registros de Tallman y Tallman¹¹ realizados en Limoncocha (prov. Napo), este registro representa uno de los pocos avistamientos de la especie lejos de las zonas costeras en Ecuador.



Figura 1. Cigüeñela Cuellinegra *Himantopus mexicanus*, laguna de Yahuarcocha, prov. Imbabura, Ecuador, 2 de febrero del 2010 (Karen Terán)



Figura 2. Playero Arenero *Calidris alba*, laguna de Yahuarcocha, prov. Imbabura, Ecuador, 5 de noviembre del 2009 (Esteban A. Guevara)



Figura 3. Gaviota Reidora *Leucophaeus atricilla*, laguna de Yahuarcocha, prov. Imbabura, Ecuador, 11 de febrero del 2010 (Tatiana Santander G.)

Gaviota Reidora *Leucophaeus atricilla*

Durante el censo de aves acuáticas en la laguna de Yahuarcocha el 11 de febrero del 2010, TM, KT, EAG & TSG observamos y fotografiamos seis individuos de Gaviota Reidora (Fig. 3). Esta es una de las especies de gaviotas más comunes a lo largo de la costa de Ecuador, sin embargo es rara tierra adentro, existiendo solamente reportes en tres lagunas altoandinas, en la laguna de Colta

(prov. Chimborazo)^{3,7}, en la laguna de Yambo (prov. Cotopaxi)³ y en Papallacta⁷. Los individuos observados presentaban un plumaje de primer invierno con la parte posterior del cuello, dorso y pecho gris, las alas pardas y una banda terminal en la cola oscura⁹. Uno de los individuos sobrevoló la lancha, desde donde se realizaron las observaciones, en algunas oportunidades.

Durante nuestras observaciones, todos los individuos de las especies descritas, mostraron plumaje completo y un comportamiento elusivo a la presencia humana, por lo que descartamos que se trate de individuos escapados de cautiverio. Jahn *et al.*⁵ propusieron tres posibles rutas por la cual el Pelicano Occidental pudo haber alcanzado la laguna de Yahuarcocha. La opción que sigue el valle del río Mira, hasta alcanzar los valles interandinos ubicados al norte de Ecuador, en un trayecto que conecta las costas del Océano Pacífico con los Andes del país en no más de 150 km pensamos que también se podría aplicar para especies como el Garzón Cocoli, la Cigüeñela Cuellinegra, la Garceta Tricolor y la Gaviota Reidora. El avistamiento de estas especies en la laguna hace pensar que al menos temporalmente el sitio puede proveer de recursos para la subsistencia de estos individuos. Dumont² señala la gran población de tilapias (*Oreochromis niloticus* y *Tilapia mossambica*) cuya introducción ha sido deliberada en la laguna. Este hecho puede haber favorecido el asentamiento de especies de aves pescadoras no registradas previamente en el humedal como el Pelicano Occidental⁵ o el incremento en los números de otras ya registradas como el Cormorán Neotropical *Phalacrocorax brasilianum* (Guevara *et al.* en prep.). Por otro lado, el registro del Flamenco Chileno en la laguna de Limpiopungo puede corresponder a un individuo dispersado desde el golfo de Guayaquil que alcanzó los valles interandinos ubicados hacia el sur del Ecuador, donde la cordillera de los Andes tiene menor elevación, trasladándose desde ahí hacia el norte por el callejón interandino. El caso del Playero Arenero registrado en la laguna de Yahuarcocha puede ser el de un individuo extraviado durante la migración de otoño.

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Noteworthy records of Parulidae on Cayo Coco, Cuba

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Se documentan las adiciones de la Bijirita de Canadá *Wilsonia canadensis* y la Bijirita de Nashville *Vermivora ruficapilla* para las avifaunas del Archipiélago de Sabana-Camagüey y Cayo Coco, Cuba, respectivamente. También se comentan otras observaciones de otras especies de parúlidos realizadas durante los períodos de residencia invernal del 2005–06.

Cayo Coco (22°30'N 78°27'W; 370 km²) is the fourth largest of Cuba's offshore islands and forms part of the Archipiélago de Sabana-Camagüey (ASC) off Ciego de Ávila province, northern Cuba. Historically, Cayo Coco was separated from the main island of Cuba by the Bahía Los Perros, a shallow lagoon, but, since 1988, they have been connected by a 17-km causeway. The region experiences mean annual temperatures of 25.6°C. Easterly winds (mean 16 km/h) prevail and mean annual precipitation is 1,076 mm³. The island is flat (elevation <5 m) and dominated by forests on thin soils covering limestone bedrock subject to flooding in the wet season³⁶. Major vegetation types include mangrove, semi-deciduous and evergreen microphyllic forests, and coastal xeromorphic scrub, but halophytic communities, rocky and sandy vegetation complexes, and patches of swamp forest, grassland and secondary vegetation also occur²¹.

Bond⁴ first described the avifauna of Cayo Coco. More intensive work has been conducted since the 1990s, including several multi-year censuses of forest-dwelling birds^{27,35,39}, which recorded 62 additional species²⁴. Currently, its avifauna comprises 221 species; the island is one of the best surveyed in the ASC²⁸, as well as one of the most diverse regions of Cuba in terms of avian richness^{11,36,37}. The Parulidae is one of the most numerous passerine families on Cayo Coco, being represented by 80% and 100% of all species (44) and genera (14) reported in Cuba, respectively²⁴. Most are regular migrants, but rarities such as Black-throated Grey Warbler *Dendroica nigrescens* and Kirtland's Warbler *D. kirtlandii*, reported in October 1997³⁷ and November 2004²³, respectively, have also occurred.

In three habitats (coastal scrub, semi-deciduous forest and mixed mangrove) on the island, 12 sites were chosen to examine the influence of holiday resorts on avian communities. Data were collected during two early-winter seasons and one late-winter season in 2005–06 (30 October–4 December 2005; 4 February–23 March 2006; 28 October–23 December 2006)³⁸. Mist-nets were always placed in pairs and scattered within study sites, and were opened on at least two consecutive days at each site.

Coastal scrub was defined as any non-mangrove forest habitat dominated by tree species such as *Coccoloba diversifolia*, *C. uvifera*, *Coccothrinax littoralis*, *Pseudophoenix sargentii* and *Bursera simaruba*. Mixed mangrove was dominated by four species (*Rhizophora mangle*, *Avicennia germinans*, *Conocarpus erecta* and *Langularia racemosa*) which occurred in distinct zones defined by increasing distance from the ocean. Semi-deciduous forest was inland of mixed mangrove and / or coastal scrub. We report a new species of warbler for the ASC and provide records of other rare species. We also discuss the possible reasons for the extreme diversity of this family on Cayo Coco.

Nashville Warbler *Leiothlypis ruficapilla*

A vagrant⁹ or very rare transient¹⁷ in Cuba, we trapped an adult female on 10 November 2006 in coastal scrub at the Centro de Investigaciones de Ecosistemas Costeros (CIEC; 22°32'17.00"N 78°22'2.10"W). This is the second report in the ASC, following one on Cayo Paredón Grande on 13 March 2002¹³. Other Cuban records are mainly from the western mainland (La Habana and Matanzas provinces). We agree with Kirkconnell & Kirwan¹³ that this species is a rare but regular visitor to Cuba.

Orange-crowned Warbler *Leiothlypis celata*

Vagrant to Cuba^{9,17} with six records, all of them recent. First recorded at Las Tumbas, Guanahacabibes Peninsula, on 11 November 1989¹⁴, followed by Cayo Santa María on 21 October 1994 and Cayo Coco on 29 November 1996³⁷. Other records are available from the Zapata Peninsula on 2 May 2003¹⁹, on Cayo Coco on 13 November 2003²⁰ as well as on Cayo Guillermo on 23 March 2008¹⁵. We trapped a first-year male in a narrow coastal mangrove (*Rhizophora mangle*) 2 km east of Casasa (22°29'26.66"N 78°19'14.12"W) on 14 December 2006. This is the fifth record in the ASC and the latest winter record in Cuba of this species.

Tennessee Warbler *Leiothlypis peregrina*

An uncommon transient¹⁷ in Cuba and on the Isle of Pines. In the ASC, it was previously reported on Caiman del Faro⁷, Guajaba¹ and Cayo Coco, the

latter based on singles trapped on 28 October 1992 and 18 April 1993²⁷. We trapped an adult female at CIEC on 3 November 2005 and a first-year (sex unknown) in a mixed mangrove abutting the westernmost tip of Ensenada de Bautista (22°31'29.50"N 78°21'28.00"W) on 12 November 2005. We consider it a rare transient in the northern cays of Ciego de Ávila.

Chestnut-sided Warbler *Dendroica pensylvanica*

Uncommon transient^{9,17} in Cuba. ASC reports are available from Cayo Paredón (one trapped, 12–15 October 1991)³¹, one seen on Cayo Santa María³⁰ and another on Cayo Coco on 20 January 2001¹⁶. We observed an adult male on 22 September 2006, foraging with a group of Palm Warblers *D. palmarum* beside the road connecting the Cuatro Caminos and Los Almácigos roundabouts on Cayo Coco.

Canada Warbler *Wilsonia canadensis*

Very rare transient^{9,17} in Cuba. On 14 September 2005, an adult male was observed in coastal scrub at the CIEC. This is the first sight record on any of Cuba's offshore islands and the earliest autumn migration date in the country.

Yellow-breasted Chat *Icteria virens*

Very rare transient in Cuba^{9,17}. In the northern cays of Ciego de Ávila, it was reported on Cayo Coco on 5 May 1974 (two)⁸ and an immature female was trapped and photographed on 22 November 1995³⁷. On Cayo Paredón Grande one was seen on 8–11 October 1991³¹. We trapped an adult of unknown sex in sandy coastal scrub with abundant palmetto *Coccothrinax litoralis* at Playa Prohibida (22°33'09.00"N 78°23'58.01"W) on 4 March 2006.

These observations raise the number of species of Parulidae to 36, and along with recent additions from Cayo Paredón Grande (A Parada *et al.* unpubl.) the species totals on the northern cays of Ciego de Ávila (Cayos Coco, Guillermo and Paredón Grande) to 232, or 63% of the Cuban avifauna. Many factors contribute to the high number of warbler species found on Cayo Coco including its geographical location, the landscape and ecosystem composition, and the island's terrestrial habitat heterogeneity. In general, warblers represent the majority of North American passerine migrant species to Cuba^{2,5,9}.

Five of the six species reported above were in either mangrove or coastal scrub, which two habitats are well represented on Cayo Coco²⁷. Since the 1990s, tourism development has been stated to pose threats to coastal scrub and its avian biodiversity³⁷ and it may be contributing to processes such as habitat reduction and fragmentation, and the introduction of exotic species (ornamentals).

Thus, the protection of coastal habitats appears to be particularly important for both migrant and resident bird communities.

In general, warblers are fairly well represented in disturbed habitats of Cayo Coco (near resorts). Research into dietary composition and microhabitat usage in such habitats during winter may be important for this family, as Parulidae are known to utilise a wide variety of food items including fruits by *D. pensylvanica*¹¹, *I. virens*¹², *O. celata*^{25,29,33} and *O. peregrina*^{10,18}. Although the grounds of coastal resorts often harbour many flowering ornamental plants, which presumably offer a food source (nectar)^{6,22,26,32,34}, we did not study movements between forest and such areas. Nonetheless, our field data suggest that a large number of birds used both habitats. Targeted observations on the foraging behaviour of these species should assist our understanding of the particular food resources utilised, and, through more intensive trapping, the limiting factors.

Re-sighting rates within the same study season were very low (<8%)³⁸ despite mist-netting for several months at the same locations. Therefore, although a diverse assemblage of warblers uses Cayo Coco, usage may be ephemeral and birds caught in autumn may be moving to either mainland Cuba or even South America to spend the bulk of the winter.

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La Golondrina Tijerita *Hirundo rustica* sigue expandiendo su área de nidificación en Argentina

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Barn Swallow *Hirundo rustica* was first recorded nesting in Argentina in the early 1980s, when just a few pairs were found in central-east Buenos Aires province. Since then, the species appears to have spread. Here we present new records from a locality in central Buenos Aires province, providing further evidence of the extension of its breeding range, as well as data concerning parasitism by Shiny Cowbird *Molothrus bonariensis* on this species and nest occupancy by Grey-breasted Martins *Progne chalybea*.

A principios de la década de 1980 Martínez⁴ halló a la Golondrina Tijerita *Hirundo rustica* nidificando en la localidad de Mar Chiquita, sureste de la provincia de Buenos Aires, siendo esos los primeros datos de nidificación de la especie en América del Sur. Este fenómeno, que inicialmente involucró a un escaso número de individuos, fue expandiéndose durante las últimas décadas siguiendo principalmente la línea de la costa atlántica bonaerense^{2,3,6}. Recientemente han sido mencionados nidos hallados en el interior de la provincia en el partido de Puán⁵. Además, Petracci & Delhey⁷ mapean como área de nidificación localidades cercanas a la Bahía de Samborombón, sin dar detalles precisos de los sitios. En este trabajo presentamos nuevos datos y comentarios sobre la reproducción de la Golondrina Tijerita en la zona centro norte de la provincia de Buenos Aires.

Resultados

Durante una recorrida el 28 de diciembre de 2004 por la ruta 63, en las cercanías del paraje La Campana, partido de Saladillo (35°44'S 59°39'O), prov. Buenos Aires (Fig. 1), fueron hallados cuatro

nidos de la Golondrina Tijerita debajo de una alcantarilla de concreto, rectangular situada debajo de la ruta provincial 91 que une Saladillo con las Flores. Esta alcantarilla tenía c.1,5 m de altura y de 12,5 m de ancho, y debajo de la misma no corría agua. Al momento del hallazgo sólo uno de los nidos se encontraba ocupado, con tres pichones crecidos (Fig. 2). En este nido no se observaban restos fecales en el exterior, pero sí en el suelo, mientras que en otro los restos fecales se observaban también en el borde, por lo que se supone que éste ya había sido abandonado. De los tres nidos restantes al momento del hallazgo sólo uno se observaba en construcción, ya que parte de la pared estaba todavía con barro fresco. Otro de los nidos se encontraba a medio construir, aunque no se observaban señas de que los adultos continuaran con el trabajo. El tercero de éstos aparentemente ya había sido abandonado por lo que no se observaban rastros de actividad reciente, ni fueron observados adultos cerca en las visitas posteriores.

El área fue visitada nuevamente el 3 y 4 de enero de 2005, y durante estos días no se observaron cambios sustanciales en la situación de la colonia,

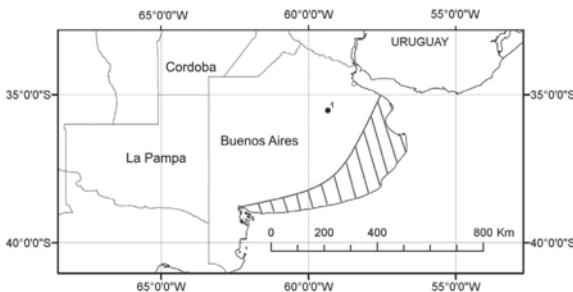


Figura 1. Mapa que muestra la región aproximada de donde existen menciones de nidificación de la Golondrina Tijerita *Hirundo rustica*, basados en Narosky y Di Giacomo⁶, Fiameni², Petracci y Delhey⁷ y Morici⁵. El círculo negro (1) representa el área donde fueron hallados los nidos presentados en este trabajo.



Figura 2. Individuo adulto alimentando los pichones fotografiado en uno de los nidos (Miguel Ángel Roda)

aunque pudo apreciarse un cierto avance en el nido que se encontraba en construcción. Fueron observados en los alrededores de la alcantarilla cinco individuos adultos sobrevolando la zona.

En una nueva visita, realizada el 15 de enero, se halló que el nido que tenía los pichones ya se encontraba vacío, y el que había sido observado en construcción tenía en su interior tres huevos ya incubados y otro roto. El 23 de enero los tres huevos habían eclosionado. Las últimas dos visitas fueron realizadas el 2 y 5 de febrero, momento en el cual las crías ya se encontraban crecidas y aparentemente cercanas a abandonar el nido, considerando que el tiempo de permanencia de las crías en el mismo es de 17 a 27 días⁸. A partir del 15 de enero en cada visita fueron observados solamente tres adultos, sin embargo, aparentemente, sólo dos de ellos alimentaban a las crías que se encontraban aún en el nido.

Características de los nidos y huevos.—Los nidos se encontraban a un promedio de 5,3 cm del techo de la alcantarilla y a 1,35 m del piso ($n=4$). En una de las paredes de la alcantarilla se encontraban dos nidos separados por 7,2 m, mientras que en la otra pared los tres nidos restantes estaban separados por c.2,5 m. Ningún nido se hallaba a menos de 2 m de los límites exteriores de la alcantarilla. El ancho desde la pared de la alcantarilla hasta el límite externo del nido era en promedio de 9,62 cm, la altura externa era en promedio de 11,3 cm y el diámetro externo promedio fue de 13,25 cm ($n=4$). Las primeras dos medidas se ven algo exageradas debido a que uno de los nidos medidos era marcadamente mayor a los demás. Este nido tal vez haya sido construido sobre un nido anterior o simplemente puede haber sido un nido anómalo. Dos de los nidos estaban tapizados interiormente por plumas blancas y los dos restantes se encontraban tapizados por palitos y raíces o solamente por raíces. Sólo se midió la profundidad del nido que tenía crías el 23 de febrero y era de c.8 cm.

Los huevos eran ovoidales, de color blanco con máculas castañas y lila grisáceo distribuidas en toda su superficie pero más abundantes en el polo obtuso. Su medida promedio era de 19,00 × 13,75 mm ($n=4$). El huevo encontrado roto el 15 de enero fue conservado y depositado en la colección privada de M. A. Roda.

Conclusiones

Las medidas y características de los nidos son en general similares a las descriptas en la bibliografía para Argentina^{3,4}, salvo por las medidas del nido extremadamente grande hallado por nosotros. Tampoco coincide la profundidad de los nidos descriptos, sin embargo solamente medimos uno de los nidos hallados, lo que no permite una buena comparación.

Bent¹ menciona que los nidos están construidos con barro en forma de bolitas, entremezclado con abundante cantidad de restos vegetales (predominando raicillas, láminas foliares de gramíneas, hojas de pino y también algunas espigas de *Lolium multiflorum* y *Bromus* sp.); algunos pelos de ganado, pero no hace referencia a que alguno de estos materiales sea empleado en el revestimiento interno del nido. Martínez⁴ describe que son revestidos con plumas, que curiosamente y coincidiendo con las apreciaciones de Bent¹, son todas de color blanco. Dos de los nidos hallados por nosotros estaban también tapizados por plumas blancas, sin embargo el recubrimiento interno realizado con palitos y raíces que hallamos en otros dos de los nidos nunca había sido mencionado^{1,3,4}.

Teniendo en cuenta el mapa presentado por Petracci & Delhey⁷ los datos presentados aquí significarían una extensión en el área de nidificación de 150 km hacia el interior de la provincia, ya que todos los registros anteriores corresponden al sector costero (Fig. 1).

Es interesante mencionar que el 1 de enero de 2005 hallamos un nido con similares características a los anteriormente descriptos, en otra alcantarilla situada a pocos kilómetros de distancia de la colonia, sin embargo se encontraba siendo utilizado por una pareja de Golondrinas Domésticas *Progne chalybea*. En el interior fueron hallados crías de esta especie. El nido difería de los anteriormente descriptos solamente en la forma de las camadas de barro, siendo estas un poco más asimétricas y de mayor tamaño que los de la colonia. Las características de este sitio de nidificación difiere notablemente de los nidos conocidos para *P. chalybea*³, por lo que es llamativo el hecho de que la especie pudiera estar utilizando nidos abandonados de *H. rustica*.

Por último, es destacable que en uno de los nidos a medio construir fue hallado un huevo de Tordo Renegrado *Molothrus bonariensis*, lo que representa que *H. rustica* sea un nuevo hospedador de esta especie (R. Fraga com. pers.).

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First record of Brown Noddy *Anous stolidus* for the South American Pacific coast

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Un juvenil de *Anous stolidus* fue observado, fotografiado y filmado en La Chocolatera, Santa Elena, Ecuador, el 17 de febrero de 2009. Con base en el tamaño y otros caracteres morfológicos del ave, pudieron descartarse las otras especies del género. La localización y características del plumaje indican que probablemente se trataba de un individuo perteneciente a la subespecie endémica de Galápagos. *A. stolidus* es un ave colonial de distribución pantropical, aunque se encuentra altamente restringida a islas, por lo que este trabajo documenta el primer registro de esta especie en regiones no insulares de las costas occidentales del continente sudamericano.

On 17 February 2009 we observed a juvenile Brown Noddy *Anous stolidus* at La Chocolatera (02°11'S 81°00.37'W), Santa Elena, Ecuador, the westernmost point on, and one of the most biodiverse areas of, the Ecuadorian coast⁴. The bird was seen at 11h40 from a rocky cliff using binoculars and a telescope. We could approach the bird to within 10 m enabling the diagnostic features for species identification to be noted, and the sighting to be documented with photographs and video.

Description

The following is based on our field notes, and photographs taken by CC. *Size and structure*.—Mid-sized tern, approximately the same size as Sandwich Tern *Sterna sandvicensis*, with a slender, sleek appearance and uniformly dark brown plumage in flight. *Head*.—Greyish-brown crown, with paler but not well-defined forehead. Eyes black with prominent bright grey lower edge to incomplete eye-ring. *Wings*.—Long and narrow;

underwing slightly paler than blackish upperparts, except brown greater coverts. Photographs revealed that the bird had some pale fringes to primary-coverts. *Tail*.—Long, wedge-shaped and darker than tail-coverts. *Bare parts*.—Legs, feet and nails greyish black, and the deep-based but pointed and slightly curved bill was dark. *Behaviour*.—It flew parallel to the shore on deep wingbeats, 'skipping' sideways above the waves for 3–5 minutes before perching on a rock. Waves forced the bird to take flight, whereupon it remained in the area for at least five minutes before departing from view.

Identification

We identified the bird as a juvenile of the endemic Galápagos subspecies of Brown Noddy based on the identification criteria in Harrison⁷ and Gochfeld & Burger³.

Noddies (*Anous*) are tropical seabirds of worldwide distribution characterised by uniformly dark plumage and a wedge-shaped tail, a feature unique among terns and gulls that occur regularly



Figures 1–2. Brown Noddy *Anous stolidus*, La Chocolatera, Santa Elena, Ecuador, 17 February 2009 (Carlos Camacho)

in mainland Ecuador¹². *Anous* comprises three species: Brown Noddy, Black Noddy *A. minutus* and Lesser Noddy *A. tenuirostris*, which differ in distribution, size, bill shape and general colour tone^{3,7} making species identification feasible in the field. Of the three species, only Brown Noddy is known to occur near the Ecuador mainland, on the Galápagos¹⁵. Lesser Noddy is mainly sedentary³ and is primarily restricted to a few inshore and oceanic islands in the Indian Ocean, including western Australia, while non-breeders also occur off East Africa^{3,8}. Based on this distribution, our record is very unlikely to have involved Lesser Noddy. In contrast, Black Noddy occurs worldwide in tropical and subtropical seas, and is often sympatric with Brown Noddy³. However, Brown Noddy is noticeably larger than Black Noddy, although field identification based solely on body size would be difficult without direct comparison. Therefore, it is necessary to take into account subtle differences in tail and bill shape, as well as plumage coloration. Brown Noddy has a shorter heavier bill, and a longer tail^{3,7}. This combination was clearly observed in the Ecuadorian individual, thereby excluding other species. Furthermore, the poorly defined cap and pale fringes to the primary-coverts are consistent with the plumage of a juvenile.

Brown Noddy is widespread with five subspecies—*A. s. plumbeigularis*, *A. s. pileatus*, *A. s. galapagensis*, *A. s. ridgwayi* and *A. s. stolidus*—currently recognised³. Two of these occur throughout the tropical Pacific, with *A. s. ridgwayi* on offshore islands from Mexico to Central America⁷ and *A. s. galapagensis* endemic to the Galápagos^{7,14}. They differ in size and general colour, with *A. s. galapagensis* being the darkest, almost black³. The bird's location, at the closest mainland site to the Galápagos (540 nautical miles west of the Santa Elena Peninsula), and its general coloration (dark brown, almost blackish) suggest that our record probably involved *A. s. galapagensis* rather than a more distant population.

Distribution and occurrence of Brown Noddy

Brown Noddy ranges worldwide across the tropics, in both inshore to pelagic waters³. It largely breeds on islands³ and mainland reports are few throughout its range. There have been very few observations off the west coast of the Americas^{5,11,13,14}, and mainland sightings are especially scarce. Wetmore¹⁴ reported the first, in August 1934 at Puerto Obaldía, Panama (08°41'N 77°22'W) and the second and only subsequent record involved one in Sinaloa, Mexico (23°54'N 106°58'W) in 2006¹⁰. Reports of Brown Noddy from mainland South America are completely lacking. To our knowledge, there has only been one record

of the genus *Anous* from there, at Rocha, Uruguay (34°40'S 54°09'W) in 2004¹, which was not identified to species. Both of these mainland records involved birds incapable of flight found after a tropical storm had passed.

This association with hurricanes suggests that noddies seen on mainland coasts are probably vagrants blown off course by strong winds. However, the juvenile we observed appeared to be in good condition, suggesting that juvenile Brown Noddies occasionally visit Ecuador's inshore waters. Seasonal or other movements are still poorly documented for several pelagic species in the Neotropics⁹, including noddies, whose oceanic ranges remain largely unknown^{3,6,7}. Our sighting thus augments our knowledge of juvenile dispersal patterns in this species.

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Primer registro de la Golondrina de las Cavernas *Petrochelidon fulva* para Venezuela y Sur América

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We present the first records of Cave Swallow *Petrochelidon fulva* for Venezuela. Two individuals were photographed, on 11 January 2010, on the east shore of Lake Maracaibo, municipality of Santa Rita, in Zulia, western Venezuela. Four were subsequently observed in the same place on 12 February 2010. Cave Swallows are rare visitors to the southern Caribbean, and this constitutes the first record for South America.

La Golondrina de las Cavernas *Petrochelidon fulva* fue avistada en la costa oriental del lago de Maracaibo, municipio Santa Rita, Zulia (11°67'N 22°24'O; Fig. 1). El primer avistamiento se realizó de manera casual el 11 de enero de 2010 a las 11h00 h. A ojo desnudo y con la ayuda de binoculares, FE pudo observar una pareja de *P. fulva* en las riberas del lago, posadas en el cableado que surte de electricidad al muelle de la empresa Pralca, este muelle mide aproximadamente 900 m. En este primer avistamiento las golondrinas estaban muy quietas lo que hizo posible que fueran identificadas y fotografiadas (Fig. 2). Posteriormente, el día 12 de febrero de 2010, se realizó una vista al muelle para realizar nuevas observaciones. En esta segunda visita, a las 10h40, se pudieron observar cuatro individuos, los cuales, mostrando mayor actividad que durante la visita anterior, se posaron en el cableado y volaron sobre las aguas del lago de Maracaibo.

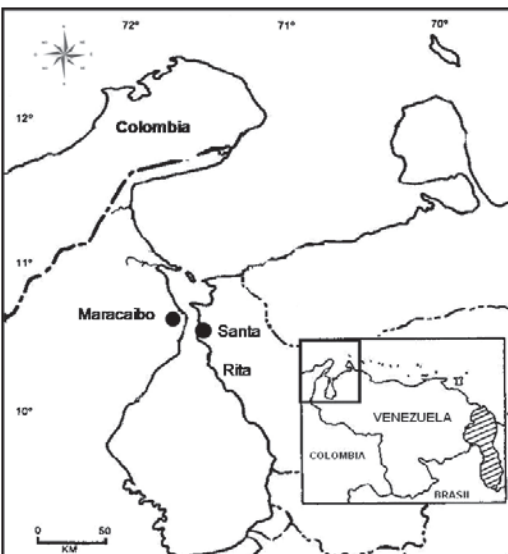


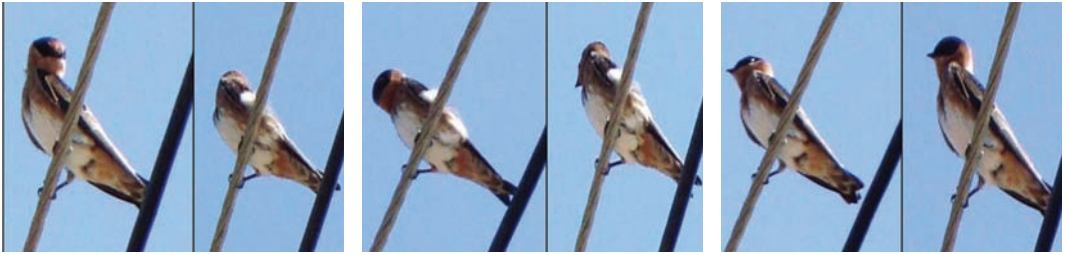
Figura 1. Ubicación del municipio Santa Rita, área de avistamiento de *Petrochelidon fulva*.

En las dos visitas un total de seis avistamientos de la especie fueron realizados, en los cuales, dos individuos mostraron un comportamiento que evidenciaba que estaban alimentándose, también se les pudo ver interactuando con la Golondrina de Agua *Tachycineta albiventer* y Golondrina Urbana *Progne chalybea*.

Identificación.—A pesar que *P. pyrrhonota* (*P. p. pyrrhonota* y *melanogaster*) pueden tener la frente color canela^{1,6} en general la tienen de color ante o rufo blanquecino⁶ a diferencia de *P. fulva* que presenta la frente de color rojo ladrillo. Aunado a lo anterior, *P. fulva* presenta la coloración ante o rufo en la parte superior del pecho y flancos más marcada y extendida que *P. pyrrhonota*¹ (Figs. 3–4). La cola ligeramente ahorquillada de *P. fulva* (Fig. 5) la diferencia de *P. pyrrhonota* que la presenta cuadrada⁶. La taxonomía para varias poblaciones de Golondrina de las Cavernas ha cambiado en los últimos años, sugiriendo la necesidad de estudios adicionales². Restall *et al.*⁶ señala dos subespecies, *P. f. pallida* y *P. f. cavicola*, diferenciadas en que ésta última es más pequeña con una corona azul intenso, mejillas y garganta rufas y rabadilla



Figura 2. Sitios de avistamiento de *Petrochelidon fulva* a lo largo del cableado del muelle de la empresa Pralca, municipio Santa Rita, Zulia, Venezuela.



Left to right:

Figura 3. Golondrinas de las Cavernas *Petrochelidon fulva* avistadas en el muelle de la empresa Pralca, municipio Santa Rita, Zulia, Venezuela; se observa la frente y garganta de color rojo ladrillo y la parte superior del pecho y flancos coloreados de ante o rufo y de manera marcada (Fidel Escola)

Figura 4. Golondrinas de las Cavernas *Petrochelidon fulva* avistadas en el muelle de la empresa Pralca, municipio Santa Rita, Zulia, Venezuela; se observa la corona azul oscura, y parte de la nuca rojo ladrillo similar a la garganta (Fidel Escola)

Figura 5. Golondrinas de las Cavernas *Petrochelidon fulva* avistadas en el muelle de la empresa Pralca, municipio Santa Rita, Zulia, Venezuela; se observa la cola ligeramente ahorquillada (Fidel Escola)

rufo oscuro. En este reporte fue imposible llegar a identificar la subespecie.

Esta ave se distribuye desde el sureste de Nuevo México, Texas, Florida, Cuba, Puerto Rico, Hispaniola, Jamaica, Aruba, Curazao y Bonaire³⁻⁶. Se conoce poco de su rango migratorio, con algunos avistamientos ocasionales para el sur de Panamá⁵. Restall *et al.*⁶ la señala como un hipotético errante para Aruba, Curazao y Bonaire, en base al único reporte documentado de la especie para Curazao correspondiente al año 1952. Prins *et al.*⁵, no presenta reportes para Aruba y Bonaire, sin embargo, la señala como visitante casual en Curazao, haciendo referencia al trabajo de Voous, en 1983, quien registra el avistamiento de un individuo inmaduro (por parte de F. H. Ansingh) en la Bahía de Bullenbaai el 6 de octubre de 1952. Igualmente, un espécimen de *P. f. pallida* proveniente de Curazao de 1952 se encuentra depositado en el Zoological Museum de Amsterdam⁵. Este se trata del primer registro de esta especie en Venezuela y Sur América, y el segundo registro documentado para el sur del Caribe.

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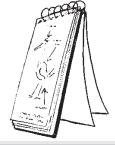
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Short Communications



Nuevos registros de *Columbina minuta*, *Pionus senilis* y *Basileuterus culicivorus* en el estado de Yucatán, México

El grupo de las aves ha sido uno de los más estudiados en la Península de Yucatán con trabajos efectuados principalmente en zonas de fácil acceso y bien comunicadas. Recientemente, muchos estudios se han enfocado en zonas reconocidas de alta prioridad para la conservación biológica como las Áreas Naturales Protegidas (ANP)^{1,3}. Aún así, existen zonas o ambientes particulares que por su lejanía y difícil acceso no han sido ampliamente estudiadas y requieren de mayor esfuerzo de muestreo para contar con un inventario más completo. Un ejemplo de ello es el sur del estado de Yucatán, dentro de la región conocida como punto PUT (punto de unión territorial entre los estados de Yucatán, Campeche y Quintana Roo), donde no existe ningún ANP. Su lejanía de los principales centros poblacionales y relativo aislamiento ha permitido condiciones de baja perturbación con grandes extensiones de selvas medianas y altas².

Las aportaciones de este trabajo son resultado de diversos proyectos de investigación realizados por el departamento de Zoología de la Facultad de Medicina Veterinaria y Zootecnia (FMVZ) de la Universidad Autónoma de Yucatán (UADY) en la zona sur del estado. Las técnicas empleadas para el registro de especies incluyeron redes de niebla (12,0 m × 2,6 m), registros visuales y auditivos a través de transectos en banda (sin límite de distancia o con ancho de banda fijo) y puntos de conteo con radio de observación variable. Para proponer un nuevo registro se consideró primero que la especie no se encuentre en los mapas de distribución propuestos por Howell y Webb⁴, y posteriormente se realizó una revisión exhaustiva de

literatura publicada de manera formal sobre las especies.

La tórtola pecho liso *Columbina minuta*, se distribuye en México desde el sur en los estados de Veracruz, Tabasco, Chiapas y Campeche. En la costa Pacífico en los estados de Guerrero y Chiapas⁴. El 4 de junio de 2000, capturamos por medio de redes un ejemplar macho en el municipio de Tzucacab, Yucatán (20°00'N 89°01'O), el cual fue fotografiado y posteriormente liberado². Recientemente, el 27 de agosto de 2010 retornamos al sitio, capturando dos individuos adultos (macho y hembra). Los ejemplares se encuentran depositados en la Colección Ornitológica Regional de la UADY (COZORE-UADY-121 y 122). Estos ejemplares significan el registro más norteño de la especie en la Península y el primer reporte confirmado de su presencia en el estado de Yucatán. Se registró también actividad reproductiva de la especie, con individuos cantando de manera permanente y la presencia de dos nidos activos. El nido con forma de plato plano (12 × 11 cm) y compuesto de pastos delgados, estaba colocado a una altura de 1.1 m encima de una leguminosa *Havardia albicans*. Se midieron también dos huevos aún sin incubar con dimensiones de 2,5 × 1,6 cm y un peso de 3 g cada uno. El sitio donde se registraron los individuos y nidos corresponde a un pastizal inducido con presencia de abundantes arbustos de leguminosas con altura promedio de 2,5 m y que es utilizado de manera activa para pastoreo de ganado vacuno y equino.

El loro corona blanca *Pionus senilis*, es considerada una especie amenazada⁵ y en México se distribuye a través de la costa del Atlántico, desde el sur de Tamaulipas y este de San Luis Potosí hasta la Península de Yucatán (en los estados de

Campeche y Quintana Roo)⁶. Este loro es común en el sur de Quintana Roo, pero no había sido registrado para el estado de Yucatán. En la literatura solo se encontró un reporte sugerente de su presencia mencionando un grupo de probablemente 15 individuos que fue escuchado en la localidad de Sayil en diciembre de 2007⁷. El 21 de septiembre de 2007, colectamos un ejemplar macho adulto en el Municipio de Tzucacab, Yucatán (19°42'N 89°02'O). El ejemplar fue capturado vivo por niños de la localidad Tigre Grande con ayuda de una resortera. Tres días después de su captura, el ave murió a causa de lesiones en el pico que le impidieron alimentarse. Pobladores locales indicaron conocer a la especie y es considerada un ave muy rara que reconocen con el nombre coloquial de 'La pimienta'. El ejemplar se encuentra depositado en la Colección Ornitológica Regional de la UADY (COZORE-UADY-51) y representa el primer registro confirmado para el estado.

El Chipe corona dorada *Basileuterus culicivorus*, se distribuye en México en las vertientes del Golfo y del Pacífico, así como en base de la Península de Yucatán en los estados de Campeche y Quintana Roo⁴. El 26 de julio de 2007 observamos tres individuos (19°41'N 89°02'O) y el 20 de mayo de 2008, volvimos a observar otros dos individuos siempre en la misma zona. El sitio corresponde a vegetación de selva mediana subcaducifolia dentro de los límites del municipio de Tzucacab, Yucatán. El mapa de distribución de la especie⁴ indica una estrecha relación con la distribución de las selvas medianas y altas de la Península. Los individuos fueron observados moviéndose de manera activa en el sotobosque. Estas aves suelen moverse dentro de su territorio en

parejas o grupos pequeños de 3–5 individuos⁸.

La presencia de estos nuevos registros, así como de 21 especies dentro de alguna categoría de riesgo⁹, particularmente de aquellas estrechamente relacionadas con las selvas medianas y altas como son el mosquero pico chato *Platyrhynchus canrominus* y el mosquero real *Onychorhynchus coronatus*², demuestran la importancia de la zona sur del estado para la conservación de aves estatales, así como la necesidad de implementar en la región algún área sujeta a protección legal (ANP), que asegure la permanencia de estas especies en Yucatán.

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La Tangara Aliamarilla *Thraupis abbas* en Costa Rica, historia y dos nuevos registros

La Tangara Aliamarilla *Thraupis abbas* es una especie que habita zonas abiertas con árboles aislados y áreas urbanas, distribuyéndose desde el centro de México hasta el sur de Nicaragua^{1,4,5,11}. Aunque Munera-Roldán *et al.*⁵ mencionan la posible existencia de esta especie en Costa Rica a la fecha no se han realizado registros dentro del país que permitan incluirlo dentro de las listas o guías de aves de Costa Rica^{2,3,6,10}. Nuestro objetivo es dar a conocer dos registros de Tangara Aliamarilla para Costa Rica. Además hacemos un comentario sobre la primera observación publicada de esta especie en el país.

Ambas observaciones se realizaron en el comedero para aves del Restaurante de Aventuras Arenal en Los Chiles, prov. Alajuela, Costa Rica (11°01'N 84°42'O). Este sitio se ubica en el área urbana de Los Chiles, que se caracteriza por poseer amplias zonas verdes. Además el sitio está ubicado a 16 km del sitio más cercano donde se ha observado esta especie en Nicaragua (LS obs. pers.). La primera observación ocurrió el 9 de enero de 2010, cuando observamos un adulto en dos ocasiones: una por la mañana a las 11h15 cuando el ave llegó directamente al comedero y la segunda a las

14h33, cuando observamos el ave desplazarse hacia un árbol de guayaba cerca del comedero del restaurante en el cual estuvo aproximadamente durante un minuto, para posteriormente volar al comedero para alimentarse de banano durante cerca de 45 segundos (Fig. 1). A este individuo se le observó alimentándose cerca de varios individuos de el Picudo Pata Roja *Cyanerpes cyaneus*, el Rey de Mar *Chlorophanes spiza*, el Sargento *Ramphocelus passerinii*, la Tangara Sietecolores *Tangara larvata*, la Viuda *Thraupis episcopus*, la Viuda de la Costa *T. palmarum* y el Yigüirro *Turdus grayi*. La segunda observación la realizamos el 31 de enero de 2010 en el mismo sitio, en esta ocasión el ave llegó directamente al comedero a alimentarse por c.40 segundos. Además estuvo acompañada de individuos de la Tangara Sietecolores y el Yigüirro.

La primera observación de la Tangara Aliamarilla publicada para Costa Rica ocurrió en enero de 1986 en el Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), Turrialba (09°53'N 83°39'O), cuando se observaron tres individuos⁹. Posteriormente ese mismo año, en marzo y abril se observó un individuo y en mayo una pareja⁹. Pese a estas observaciones sucesivas la especie no fue incluida de forma oficial en la guía de aves de Costa Rica¹⁰, ni en ninguna de las listas^{2,6} o guías realizadas posteriormente³. La causa de esto puede ser que los autores de estos trabajos han seguido lo mencionado por Stiles y Skutch¹¹: 'Given the distance to the species' normal range (Mexico to E-C Nicaragua) and the number of visitors to the institute from other Central American countries, the birds might have been escapees rather than strays'. Nosotros creemos poco probable que las observaciones de Sánchez y Campos Ramírez correspondan a aves introducidas debido a que no es un ave que se tenga comúnmente como mascota en Centroamérica (LS pers. obs.). Sino creemos que se trató de un evento de dispersión discreto desde



Figura 1. *Thraupis abbas* en el comedero de aves del Restaurante de Aventuras Arenal en Los Chiles, prov. Alajuela, Costa Rica, el 9 de enero de 2010 (Andrés Zuñiga)

las poblaciones más sureñas de ese entonces (centro de Nicaragua)⁹. Ese patrón se ha observado con algunas de las especies de recientemente registradas e incluidas en las lista del país como: *Vanellus chilensis* observada en Trinidad, río Sarapiquí, prov. Heredia¹⁰ a 130 km al noreste de la frontera de Panamá, o *Accipiter poliogaster* que se observó en la Estación Biológica La Selva, Sarapiquí, prov. Heredia⁷ a 600 km del Darién, Panamá, que representan las poblaciones más cercanas para esas especies⁸. Por lo tanto creemos que esta especie debió de ser incluida desde la primera observación en la lista de aves de Costa Rica, aunque no se haya establecido¹⁰. Creemos que es muy probable que *T. abbas* logre establecerse en el país debido a la cercanía del área donde registramos esta especie, con las poblaciones de Nicaragua (LS obs. pers.), y la existencia de amplias zonas abiertas y árboles aislados que favorecen a esta especie⁴.

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Deadly intra-specific aggression in Collared Aracari *Pteroglossus torquatus*

Aggressive interactions have been reported in many species of Rhamphastidae^{1–3}. These encounters frequently have involved the aggressors holding the victims using their large bills^{1,2}. In all reported instances, however, the aggressive event was interrupted and abruptly ended. Here we report one such encounter that resulted in death. On 26 May 2007 at La Selva Biological Station (10°26'N 84°00'W), La Heredia province, Costa Rica, at 07h42 we were alerted to the presence of a group of Collared Aracari *Pteroglossus torquatus* by their loud vocalisations, which were heard for >4 minutes before we saw the group, suggesting that the interaction had been ongoing for some time. We first observed



Figure 1. A group of Collared Aracaris *Pteroglossus torquatus* attack (top, centre) a conspecific, resulting in its death (bottom), La Selva Biological Station, prov. La Heredia, Costa Rica, May 2007 (Jeffrey D. Ritterson)

the group of four individuals in a tree at the edge of a clearing c.6 m above ground. One bird attempted to fly but was obviously injured and flew into the wall of an office building. The rest of the group immediately mobbed the bird; at this point we began recording time. One of the mobbing birds seized the injured individual by the neck with its bill while the others took turns pecking and biting its head, body and feet. The individual holding the bird in its bill vigorously shook the victim at regular intervals. As the attack ensued, several of the individuals retreated to the branch on which they were first observed, occasionally returning to deliver more pecks. After 18 minutes, only the individual restraining the victim by the neck remained. The aggressor continued to hold the victim by the neck for 12 more minutes until the bird expired, and then held the dead individual

for another two minutes before releasing it. The aggressor was visibly exhausted and remained near the victim until it had recovered. Following an additional two minutes the aggressor flew off and eventually joined the other flock members. A total of 34 minutes elapsed between when we began recording and the last aggressor had flown off.

Our observation begs the question: what benefits accrue from killing a conspecific to outweigh costs to the aggressor, including energy expenditure and elevated risk of injury or predation? Aracaris live in small groups of c.4–6 individuals. Group members roost collectively in tree cavities to aid thermoregulation and predator avoidance⁴. Juvenile males disperse from their natal group and attempt to join an unrelated group. This is a dangerous period in a juvenile's life because they are not always welcomed into the new group. If a juvenile is not accepted, it faces higher thermoregulation costs and greater predation risk at night. If these costs are high, the juvenile may continue its attempts to join a group, despite the risk of group rejection and attack. If a juvenile makes repeated attempts to join a group, the group can either accept the juvenile or repeatedly reject it through aggression. Perhaps one extremely aggressive encounter, like that reported here, is more cost effective to the group than many repeated but less aggressive encounters.

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First record of Sungrebe *Heliornis fulica* on Bonaire, Netherlands Antilles

On 15 November 2010, I was visiting the Washington-Slagbaai National Park on Bonaire, together with my wife, when at a small pool just north-west of Rincon my attention was drawn to a 'waterbird' swimming below some trees. Using binoculars, identification was straightforward. The bird was smaller than the nearby Blue-winged Teals *Anas discors*, with olive-brown upperparts, greyish-brown underparts, a white chin and



Figure 1. Adult male or non-breeding female Sungrebe *Heliornis fulica*, Washington Slagbaai Natural Park, Bonaire, 15 November 2010 (Peter J. Rozemeijer)

breast, and bold black and white stripes over the head and neck. The bill was rather small, pointed and pale-coloured, whilst the wings were short and pointed. It was clearly an adult male or non-breeding female Sungrebe *Heliornis fulica*.

I immediately realised that this was perhaps the first record for Bonaire and the former Netherlands Antilles, so I tried to take some photographs of the bird. Because it stayed some distance, usually close to the pool's edge under cover, I managed just one photograph that clearly identifies the bird (Fig. 1). The Sungrebe swam to and fro at the pool's edge, bobbing its head like a Moorhen *Gallinula chloropus*; behaviour typical of the species. Once it climbed onto the bank (which was quite steep), then returned to the water. Eventually, the bird disappeared into some floating vegetation and was not seen again.

Sungrebe is a not uncommon breeding resident in Middle and South America, from Tamaulipas, in north-east Mexico, to south-east Paraguay and north-east Argentina¹. Its range includes Venezuela, the closest point of its range to Bonaire, as well as the Guianas¹. No migrations are known, but Williams *et al.*³ suggested that the species is expanding its range in north-east Mexico. There are several records from Trinidad but none since 1991² and one from the USA, in New Mexico⁴: a female at Bosque del Apache National Wildlife Refuge, on 13–18 November 2008, a remarkably similar date to the bird on Bonaire.

During our stay on Bonaire southerly winds prevailed, which could have brought birds from the South American continent to the Caribbean. Based on Prins *et al.*³, our record is the first for the former Netherlands Antilles.

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The nest and eggs of Yellow-throated Bush Tanager *Chlorospingus flavigularis*

The genus *Chlorospingus* contains at least seven species of medium-sized oscine passerines of uncertain affinity⁸. Most are inhabitants of mossy and epiphyte-laden montane forests throughout Central and South America, often traveling in noisy groups of 4–8 individuals⁶. Yellow-throated Bush Tanager *C. flavigularis* is typical of the genus, occurring at elevations of 300–2,000 m (mostly below 1,400 m)^{5,6,9}. In Ecuador it occurs on both slopes of the Andes, with the nominate subspecies on the east and the distinctive *C. f. marginatus* on the west⁹. Hilty⁴ described the nest of *C. f. marginatus* as a cup nest embedded in moss 5 m above ground, but no complete description of the species' nest has been published to date. Here we describe the eggs and two nests of the nominate subspecies from Napo province, north-east Ecuador.

We discovered both nests along the Coca–Narupa road

at elevations of 1,100–1,200 m (c.00°43'S 77°46'W). We found the first nest on 22 December 2006, when we observed an adult adding moss to the well-formed cup. We were unable to return until 1 February, by which time the nest was empty but intact. There were a few white faecal stains along the rim, suggesting it had held nestlings. We measured and collected the nest. We found the second nest on 28 August 2008, when it contained two partially incubated eggs. Both were white with dark markings, heaviest at the larger end. One was heavily blotched cinnamon, entirely coloured at the larger end (Fig. 1a), whilst the second was lightly freckled cinnamon and lavender (Fig. 1b). They measured 24.4 × 16.6 and 24.6 × 15.9 mm, respectively.

Both nests were bulky moss cups partially or entirely covered by a roof of naturally growing moss that afforded them a domed appearance. The first was 8 m above ground in a c.35-cm diameter clump of epiphytes on the side of a 3.5-cm diameter, vertical, dead trunk near the edge of relatively intact forest. The second was 3 m above ground embedded in a c.30-cm diameter

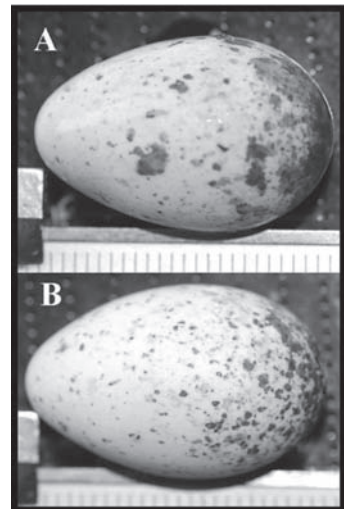


Figure 1. Complete clutch of Yellow-throated Bush Tanager *Chlorospingus flavigularis* Chontayacu, prov. Napo, Ecuador, 22 December 2006 (Harold F. Greeney)

clump of epiphytes above a small river. Both were mossy cups bound together with interwoven ferns, twigs and rootlets, and lined with thin, pale fibres and pale, delicate fern parts with a few scattered dark red-brown *Cyathea* sp. tree-fern scales. After drying the nest for three months at ambient conditions we carefully separated the lining from the rest of the cup and took each portion apart, separating them into their various components and weighing them. The outer portion consisted of moss (6.5 g), sticks (2.3 g), green fern parts (1.1 g), dicot leaf parts (0.8 g), dried pale fern parts (0.6 g), rootlets (0.6 g), bark strips (0.4 g) and tree-fern scales (0.02 g). The inner lining consisted of dried pale fern parts (1.2 g), pale fibres and rootlets (0.7 g), moss (0.2 g), tree-fern scales (0.1 g), thin twigs (0.1 g), bark strips (0.1 g), dicot leaf parts (0.1 g) and dark rootlets (0.1 g). The first nest was open on one side but otherwise concealed by naturally growing vegetation. It was slightly oblong, measuring 15 cm wide by 11 cm front to back and 7.5 cm tall. Inside, the cup was 6.0 × 5.5 cm wide by 6.0 cm deep. The second nest was circular and more deeply embedded in the surrounding vegetation such that it was well concealed but approachable from two directions. It measured 12.5 cm wide by 7.5 cm tall externally and 6.5 cm wide by 5 cm deep internally, and was built on top of a 6-cm high, loosely piled mound of moss which had apparently been stuffed into the opening to provide a platform for the nest.

In addition to these nests, we observed adults with dependent fledglings at the Bilsa Biological Station (prov. Esmeraldas) on 14 December 2007 and in the same area as the above nests on 20 December 2007. We also saw an adult carrying moss at 1,600 m near Mindo (prov. Pichincha) on 2 December 2008. Other than mention of fledglings in north-west Ecuador by Solano-Ugalde *et al.*¹¹, these are the first published breeding data for Ecuador.

Whilst the breeding of Common Bush Tanager *C. ophthalmicus*

has been fairly well studied^{1,10}, the nesting habits of most *Chlorospingus* are poorly known apart from scattered nest descriptions^{2-4,12}. Most species lack complete descriptions of their nests and require further studies of their reproductive behaviour before comparisons can be made. With what few data exist, however, the nest, eggs and nest placement in Yellow-throated Bush Tanager appear consistent with other *Chlorospingus*^{1-4,12}.

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The nest and eggs of Blue-and-black Tanager *Tangara vassorii*
 Blue-and-black Tanager *Tangara vassorii* inhabits subtropical to temperate forests in the Andes from Venezuela to Bolivia^{3,4,6} and



Figure 1. Complete clutch of Blue-and-black Tanager *Tangara vassorii*, prov. Napo, Ecuador, 10 June 2008 (Jose Simbaña)



Figure 2. Nest of Blue-and-black Tanager *Tangara vassorii*, prov. Napo, Ecuador, 10 June 2008 (Jose Simbaña)

is one of c.45 species in the genus⁵. Despite its large geographical range and relative abundance, little has been published on the species' breeding biology. Hilty & Brown³ mentioned nests and fledglings from Colombia but provided no details and the only Ecuadorian data involve fledglings in September in the north-west⁷. Here we provide the first description of the species' nest and eggs based on two nests found in Napo province, north-east Ecuador.

We found the first nest near Yanayacu Biological Station & Center for Creative Studies (00°35.9'S 77°53.4'W) at 2,200 m. On 10 June 2008, at 17h30, we flushed an adult from a nest containing two eggs. Both were very pale blue with cinnamon blotches and speckling, heaviest at the larger end (Fig. 1). They measured 20.2 × 14.1 and 20.3 × 14.5 mm, and weighed 2.1 and 2.2 g, respectively. When we returned on 18 June we again flushed an adult from the nest, which still held two eggs, but on 23 June it was empty. The nest was 5 m above ground and supported by multiple upright forks of a small

Alchornea sp. (Euphorbiaceae) tree. The cup-shaped nest comprised a thin outer 'shell' of moss and interwoven rootlets densely lined with dried *Chusquea* sp. bamboo leaves. Inside was a sparse lining of pale fibres and a few dark animal hairs (Fig. 1). The nest was 8 cm wide by 7 cm tall externally and 6 cm wide by 3.5 cm deep internally. The nest tree was located in a cattle pasture which had lain fallow for one year and was in the early stages of re-growth.

We discovered the second nest at Termas Papallacta (00°36.3'S 78°15.0'W) at 3,350 m on 24 May 2009. The nest was similar in form and sited 3.8 m up in a 5.0-m tall tree overhanging a small river. It contained two eggs which both measured 20.0 × 15.0 mm and were similar in appearance to those described at the first nest. We were unable to gather further data at this nest.

While there are partial nest descriptions and data available concerning various aspects of reproduction for many species of *Tangara*¹⁻⁴, relatively few detailed descriptions of nests have been published. Detailed nest descriptions are needed if nest architecture is to be used for testing phylogenetic hypotheses⁸ and we encourage others to publish further information for this and other Neotropical species.

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First record of Blue Grosbeak *Passerina caerulea* in western Ecuador

Blue Grosbeak *Passerina caerulea* is a boreal migrant that winters primarily in Middle America, where it usually reaches as far south as western and central Panama, in which country it is considered rare and local in early October to late March⁴. Although the species' southernmost breeding areas are in western Costa Rica (*P. c. lazula*), birds occurring further south are believed to belong to the eastern North American migrant nominate subspecies¹. Blue Grosbeak is a vagrant to South America with apparently only three published records: a specimen collected on 4 April 1942 in the Sierra de Perijá, south-east of Codazzi, dpto. Cesar, Colombia²; a female collected on 1 December 1964 along the río Napo in the eastern lowlands, prov. Napo, Ecuador⁵; and a male observed on 18 April 1973 in the western lowlands east of Buenaventura, dpto. Valle, Colombia¹.

On 1 August 2009 we photographed an adult male Blue Grosbeak at the edge of the Río Canandé Reserve, Hoja Blanca, prov. Esmeraldas, Ecuador (00°31'N 79°16'W; c.300 m). It was in breeding plumage and it perched atop a tree in secondary woodland (Fig. 1).

To our knowledge this is only the fourth published record of Blue Grosbeak in South America and the first for western Ecuador^{3,5}. The date is remarkable assuming it was a boreal migrant, but there have been previous records of North American migrant passerines in South America during the northern summer³,

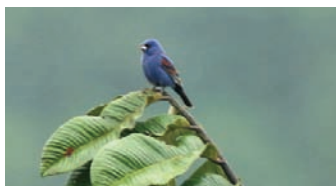


Figure 1. Blue Grosbeak *Passerina caerulea*, Río Canandé Reserve, Hoja Blanca, prov. Esmeraldas, Ecuador, 1 August 2009 (José Ardaiz Ganuza)

albeit mostly involving common winter visitors to the continent. Records of accidental species during the boreal summer in South America are exceedingly few³.

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First photographs of Black Tinamou *Tinamus osgoodi* in Ecuador with notes on subspecific identity and occurrence

On 11 December 2008 we photographed a Black Tinamou *Tinamus osgoodi* on one of the lower ridges of the Cordillera de Huacamayos, prov. Napo, eastern Ecuador (00°40'25"S 77°49'41"W). The bird was on a trail beside the oil pipeline at 1,450 m and was watched for three minutes at c.10 m before it entered the understorey. The plumage appeared uniform dark slaty grey (lacking the freckled head and neck, and dark vermiculated upperparts of Grey Tinamou *T. tao*^{10,13,14}). The upperparts were unmarked with the primaries darkest. There was a brownish hue to the lower breast, belly and thighs, becoming almost rufous at the vent. It had a pale bill, dark brownish irides and pale grey legs. We did not hear the bird vocalise.

Black Tinamou is a rare, local and poorly known species of montane forest in the eastern Andes of Colombia, southern Peru and recently in Ecuador^{3,10,12,14}. Records in Ecuador known to us are as follows: (1) a tape-recording made on the Loreto Road, Napo,



Figure 1. Black Tinamou *Tinamus osgoodi*, Cordillera de Huacamayos, prov. Napo, Ecuador, 11 December 2008 (Dušan M. Brinkhuizen)

at 1,350 m, in June 1998¹¹; (2) a bird seen and heard on the Shishicho Ridge, Sucumbios, at 1,400 m, on 7 August 2001¹²; and (3) several sightings from Narupa Reserve, along the Loreto Road, Napo, at c.1,000 m, in 2009. The latter records concern digital photographs taken by camera traps along trails inside this recently established reserve (G. Vásquez Varela pers. comm.). Furthermore, there are undocumented reports of birds heard at the base of Volcán Sumaco (J. Nilsson pers. comm.).

Two subspecies are recognised: *T. o. osgoodi* in south-east Peru and *T. o. hershkovitzi* in south-central Colombia⁴⁻⁷. Differences are subtle, with the nominate having brownish wing-coverts (uniform black in *hershkovitzi*) while the undertail-coverts of *osgoodi* are ochraceous buff vermiculated dark (chestnut-rufous and much less patterned in *hershkovitzi*)^{4,5,8}. Those in Ecuador are probably *hershkovitzi* as our bird had rather uniform slaty grey upperparts including the wing-coverts. In addition, the rufous vent seems unmarked on the photographs. The species' song is a simple descending whistle, similar to the first note of the song of White-throated Tinamou *T. guttatus*¹⁴. Very few sound-recordings are available and it is unclear if the subspecies differ vocally^{1,9,11}.

The species primarily occurs in lower subtropical and foothill forest. Altitudinal range in Peru is 600–1,500 m^{2,14}; in Colombia the species is known to 2,100 m¹⁰. It prefers heavy humid forest with abundant epiphytes, tree ferns, bromeliads and mosses, and may require primary forest^{4,3,6,8}. In Ecuador, all records are from mainly undisturbed habitats at 1,000–1,400 m.

Our observation represents the first photographic documentation of Black Tinamou in Ecuador. The records in Ecuador fill a significant gap in the species' distribution and suggest that it is more widespread in the Andes than thought. The species' range may reach even further south wherever there is suitable habitat.

Mature humid forest in the lower subtropics and foothills is preferred in Ecuador. Its rarity, shy behaviour and preference for often-remote areas mean that the species is very probably under-recorded. Documentation of future observations should assist in providing new data on its range, ecology, vocalisations and subspecies.

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Primer registro de hibridación entre la variación melánica y no melánica de la subespecie *Pyrocephalus rubinus obscurus*
El Turtupilín *Pyrocephalus rubinus* es un tiránido ampliamente distribuido en el continente americano^{2,4,5}. Peru tiene tres subespecies de las 12 descritas, donde *P. r. obscurus* es una de las subespecies residentes de la parte oeste de los Andes peruanos^{4,5}. Sin embargo existe un caso sumamente particular en la costa central del Perú. Distintivamente, en la ciudad de



Figura 1. Pareja de *Pyrocephalus rubinus obscurus* en nido; izquierda, hembra melánica, derecho macho no melánico (Eveling Tavera Fernández)



Figura 2(a) Hembra de coloración melánica en el nido alimentando a los pichones; 2(b) Macho en plumaje reproductivo de *Pyrocephalus rubinus obscurus* alimentando a los mismos pichones (Eveling Tavera Fernández)



Figura 3. Apariencia de los pichones en el primer día de su avistamiento; edad aproximada de 2-4 días de nacidos (Eveling Tavera Fernández)



Figura 4. Aspecto de los pichones en la segunda fecha de su avistamiento (11 de noviembre del 2009); notorio cambio a plumaje juvenil a través de la primera muda pre-básica (Eveling Tavera Fernández)

Lima, se halla una alta ocurrencia de la variación melánica en la subespecie *P. r. obscurus*⁴, con más de un 60% de individuos melánicos frente a no melánicos ($n_{\text{total}}=598$) en la cuenca del río Rímac. Dato que decrece hacia zonas más extremas de la ciudad como en la cuenca del río Lurín en el extremo sur, donde sólo un 7% corresponde a la variación melánica ($n_{\text{total}}=75$) (S. Nolzco datos no publicados y colectados en el año 2009). Según Zimmer⁷ la variación melánica se encuentra distribuida comúnmente en el departamento de Lima, desde Huaral por el norte hasta Cocachacra por el sur, sin embargo en la actualidad es común observar esta variación un poco más al sur (Lurín, Pachacámac). Casos de ocurrencia más alejados pueden ser muy escasos, como en el Valle de Mula (inmediaciones de Azpitia) donde se logró observar casualmente un individuo (S. Nolzco dato no publicado y colectado en febrero del 2010).

La alta ocurrencia de la variación melánica en la ciudad de Lima ha generado muchas interrogantes y entre ellas la posibilidad del entrecruzamiento con la variación no melánica, lo cual no había sido confirmado hasta la publicación del presente documento. De esta manera, aquí se corrobora la reproducción de individuos melánicos con no melánicos, y se presenta la primera fase de muda que los pichones realizan mientras están en el nido.

El 3 de noviembre del 2009 fueron observados sobre un nido una hembra adulta melánica y un macho adulto no melánico (Fig. 1), en la ciudad de Lima, distrito de Villa el Salvador (12°11'S 76°56'O). El sitio del registro era una zona altamente perturbada por edificaciones adyacentes así como por el continuo paso de un tren eléctrico. El nido consistía en una estructura en forma de taza y fue construido en un árbol de Molle costero *Schinus molle*, encontrándose a una altura de 2,4 m respecto al suelo. Su construcción se había realizado en la intersección de una de las ramas principales del árbol y estaba constituido, principalmente, de estructuras vegetales secas (finas fibras, ramas delgadas a los contornos, fragmentos de hojas) y un poco de material sintético (rafia y nylon), revestido por tela de araña.

Las primeras observaciones de los individuos confirmaron el comportamiento de pareja y se pudieron divisar tres pichones que eran alimentados principalmente, por la hembra (Fig. 2a) y ocasionalmente por el macho (Fig. 2b), quien de vez en cuando también alimentaba a la hembra³. El nido nunca se encontraba sin guardia, coincidiendo con lo descrito en otros estudios de la especie, en la que ambos sexos defienden el nido^{1,3,6}. Se asumió que los pichones tenían al menos de 2-4 días de nacidos cuando se les registró por primera vez, aproximado en base a su apariencia y al notorio esfuerzo de la hembra en el cuidado parental realizado en esta etapa¹ (Fig. 3).

El 11 de noviembre del 2009, el nido fue nuevamente revisado y se encontraron a los pichones ya más desarrollados, cambiando las plumas tanto del cuerpo como de la cabeza. Los plumones estaban mudando a ser las primeras plumas de vuelo, pasando así por la primera muda pre-básica, obteniendo de esta manera el plumaje juvenil (Fig. 4). Observando la coloración de este nuevo plumaje en las crías, se nota una alta cantidad de melaninas, con predominancia de

faeomelanina sobre eumelanina. Inclusive en un individuo (Fig. 4) se nota claramente este patrón en la parte ventral, en un segundo individuo no pudo verse claramente toda esta zona pero parte del contorno sugiere que se trata del mismo caso, y en el tercer individuo sólo se logró ver la corona (Fig. 4). Esta coloración difiere de la coloración típica de los juveniles no melánicos que presentan mucho menos intensidad de faeomelanina en la parte dorsal y la zona ventral del cuerpo es muy clara (blanco-grisáceo), sólo con algunas franjas oscuras discontinuas similares a la de estos individuos. Esta observación sugiere la dominancia del carácter melánico sobre el no melánico, pero se requieren nuevas observaciones para llegar a una conclusión confiable bajo un análisis apropiado. Una semana después de esta última observación, tras volver al lugar del hallazgo, no se encontraron las crías, ni los adultos, ni el nido, lo cual sugiere una predación que impidió un mayor seguimiento a los individuos. Las observaciones registradas generan muchas más interrogantes que respuestas:

¿Predomina el apareamiento asortativo?, ¿Existe mayor riesgo de predación en nidos cuando hay padres no melánicos?, ¿Existe diferencia entre las tasas de supervivencia de los individuos melánicos frente a los no melánicos?, ¿El grado de urbanización tiene influencia distintiva sobre la supervivencia de las variaciones?

Espero que el presente documento forme parte de una serie de nuevos reportes e investigaciones que ayuden a dilucidar estas grandes interrogantes que vuelven este caso de variación fenotípica tan especial.

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Lowest-elevation record of Lyre-tailed Nightjar *Urospalis lyra* in Peru

At dusk on 16 October 2010 a male Lyre-tailed Nightjar *Urospalis lyra* sang at a cliff close to the Mirador de Itahuania, in the Cordillera de Pantiacolla, dpto. Madre de Dios, south-east Peru (12°38'S 71°16'W; 920 m). The bird sang again next morning at c.04h40–05h00, when I recorded it (www.xeno-canto.org/70224). In Peru *U. lyra* occurs along the east slope of the Andes at 1,300–2,800 m^{2,3}. In Ecuador it has been reported as low as 800 m¹. The record from the Cordillera de Pantiacolla constitutes the lowest known occurrence of *U. lyra* in Peru.

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Nuevos registros de *Coccyzus melacoryphus* en la costa del Perú

El Cuculillo grisáceo *Coccyzus melacoryphus* es una especie con un amplio rango de distribución en América del Sur, incluyendo las islas Galápagos⁸. En el Perú, es considerada una especie migratoria del sur, poco común⁹. Habita en los

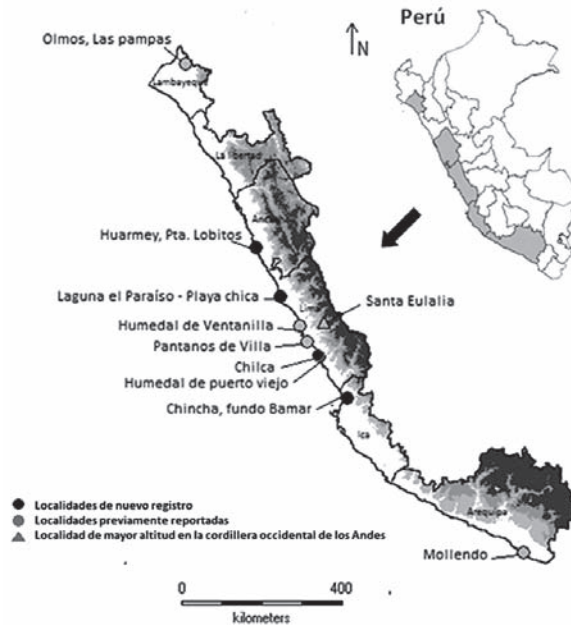


Figura 1. Registros de *Coccozyus melacoryphus* en la costa del Perú.

bosques húmedos de tierras bajas, raramente hasta 2.800 msnm en los valles semiáridos del este de los Andes^{4,5}. Ha sido registrado a 3.600 msnm en Cusco⁵.

En la vertiente occidental de los Andes existen pocos registros de esta especie a lo largo de la costa y su condición migrante en esta área es incierta⁹. Los primeros registros de *C. melacoryphus* en la costa del Perú son de la costa central, en la ciudad de Lima^{2,3,10}, al sur en Mollendo, Arequipa⁶, y al norte en Olmos, Lambayeque (LSUMZ 113781). El registro de mayor altitud en la vertiente occidental de los Andes se dio en Huinco, Santa Eulalia, Lima, a 1.950 msnm (LSUMZ 89633). En años recientes, *C. melacoryphus* ha sido reportado de diferentes humedales¹ (data in eBird) y bosques ribereños (J. Barrio com. pers.) de la costa central del Perú, incluso en meses fuera de su presumido periodo de migración (data in eBird).

Basados en la revisión de especímenes, reportes y observaciones propias, reportamos cinco nuevas localidades para *C. melacoryphus* en los

departamentos de Ancash, Lima e Ica.

Huarney, Ancash (10°07.0'S 78°07.0'W).—Durante el estudio 'Aves en la forestación de Puerto Punta Lobitos y Áreas circundantes' de la compañía minera Antamina, llevado a cabo en abril y septiembre del 2008, J. Barrio, F. Angulo y T. Valqui registraron a *C. melacoryphus* en ambos meses. *C. melacoryphus* fue registrado dentro de las plantaciones de Puerto Punta Lobitos, en el humedal al sur del río Huarney y en el área de bosque ribereño a lo largo del río Huarney. Durante la evaluación se colectó un espécimen CORBIDI-AVE 4001.

Laguna el Paraíso, Playa Chica, Lima (11°11.8'S 77°35'W).—Durante evaluaciones mensuales de la avifauna del humedal realizadas desde abril del 2009 a marzo del 2010, ASQ realizó tres nuevos registros de *C. melacoryphus* para esta localidad. El primer registro, realizado el 16 de julio del 2009, consta de dos individuos de *C. melacoryphus* observados entre carrizales (*Arundo donax*) contiguos a un

canal de agua en la zona norte del humedal. En siguientes evaluaciones realizadas el 14 de julio y 7 de agosto del mismo año, ASQ volvió a registrar a la especie en la misma área. En estas dos ocasiones observó un solo individuo.

Chilca, Lima (12°31'S 76°44'W).—Especimen (CORBIDI-AVE-3108) colectado por J. A. Otero, en abril del 2008.

Humedal de Puerto Viejo, Lima (12°34'S 76°42'W).—Durante evaluaciones sobre la avifauna del humedal desde 1995, AT realizó cuatro nuevos registros de *C. melacoryphus* para esta localidad. El primer registro consta de un individuo de *C. melacoryphus* observado entre los totorales (*Scirpus californicus*) al sur del humedal en la laguna 'Negruzca', en noviembre del 2007. El 20 de diciembre del 2008, registró un individuo en la zona aldeaña al humedal. El año siguiente dos individuos fueron registrados entre los totorales el 8 de enero y dos más en la zona agrícola el 21 de marzo.

Chinchá, Ica (13°30'S 76°03'W).—Especimen (CORBIDI-AVE-3157) colectado por L. Mejía en abril del 2008. La localidad exacta corresponde al 'Fundo Bamar' ubicado en el km 205 de la Panamericana Sur.

Estos nuevos registros, indican que la distribución actual de *C. melacoryphus* abarca la costa norte, centro y sur del país (Fig. 1). Además, sugieren que es una especie poco conspicua y comúnmente encontrada en áreas con abundante vegetación y humedales de la costa del Perú. Los registros en casi todos los meses del año (excepto mayo) así como en años consecutivos, sugieren dos potenciales estatus estacionales para las poblaciones de *C. melacoryphus* en la costa del Perú. El primero sugiere que podrían ser residentes, tal y como lo indican Fjeldsá y Krabbe⁵. El segundo, que realizan 'migración parcial', es decir, que existan tanto poblaciones migrantes como residentes. Similares patrones han sido observados en otras especies migratorias en el Perú⁹



Figura 2. Especímenes de *Coccyzus melacoryphus* depositados en la colección ornitológica John O'Neill del Centro de Ornitología y Biodiversidad (CORBIDI) procedentes de la costa del Perú: (a) CORBIDI-AVE-4001: Ancash, ♂; (b) CORBIDI-AVE-3108: Chilca, ♀; y (c) CORBIDI-AVE-3157: Chincha, sexo indeterminado.

(por ejemplo *Elaenia albiceps*). Concluimos que la realización de estudios sobre el estado poblacional y de distribución de *C. melacoryphus* contribuirán a esclarecer el estatus migratorio de esta especie.

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Two new localities for Red-faced Parrot *Hapalopsittaca pyrrhops* in northern Peru

Red-faced Parrot *Hapalopsittaca pyrrhops* is restricted to high-Andean cloud forests (2,500–3,500 m) of central and southern Ecuador to north-west Peru^{2,4,11}. In Peru it is considered rare to uncommon and local on the east slope of the Andes, north and west of the Marañón Valley¹². The species is threatened by habitat loss and is categorised as Vulnerable². Although this parrot inhabits fragmented forests, it is uncertain how tolerant it is of habitat degradation⁶.

New records

Nueva York (Huancabamba, dpto. Piura; 3,080 m).—During field work on 21–22 April 2006, groups of 1–7 individuals were seen in flight by M. Ugarte-Lewis. In mornings and evenings the parrots perched close to roosting cavities above a narrow creek. In October 2006 one was seen and heard in flight at the same site, which is in the headwaters of the río Blanco and is dominated by secondary shrubby vegetation 5–10 m tall.
Aguingas (Ayabaca, dpto. Piura; 2,960 m).—During a four-day survey, on the morning

Table 1. Sites for Red-faced Parrot *Hapalopsittaca pyrrhops* in Peru.

Site	Coordinates	Sources
Cerro Chinguela (dpto. Piura)*	05°07'S 79°23'W	Collar <i>et al.</i> ⁴
La Cocha (dpto. Cajamarca)	05°38'S 79°11'W	BirdLife International ³
Lagunas Arrebatadas (dpto. Cajamarca)**	05°14'13"S 79°16'49"W	Barrio ¹ , Eckhardt ⁵
Nueva York (dpto. Piura)	04°53'58"S 79°22'18"W	Present work
Aguamingas (dpto. Piura)***	04°51'10"S 79°26'42"W	Present work

* First record for Peru

** Within Tabaconas Namballe National Sanctuary

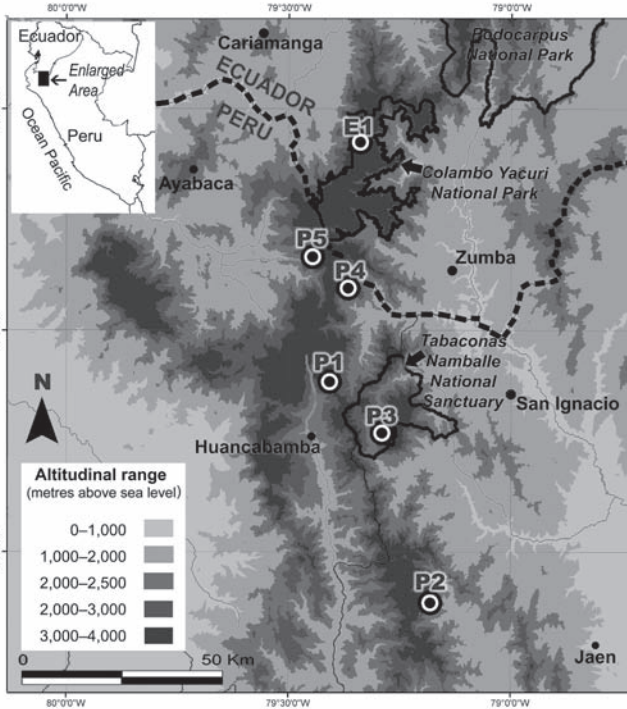


Figure 1. Known sites for Red-faced Parrot *Hapalopsittaca pyrrhops* in northern Peru: P1 = Cerro Chinguela, P2 = La Cocha, P3 = Lagunas Arrebatadas, P4 = Nueva York, P5 = Aguamingas, and E1 = Columbo Yacuri.

of 8 September 2010, one was photographed by AM perched in the subcanopy (10 m) in the high part of this forest. Later the same day, three were seen in the same area in flight. The patch of cloud forest at Aguamingas (c.500 ha) continues south to the Cerro Negro area where the habitat is more extensive and intact.

Discussion

The present report adds two new localities for the species in Peru, and the first in the western Andes of the country (Table 1).

The closest known sites are Colombo Yacuri National Park in Ecuador⁸ and Cerro Chinguela in Huancabamba¹¹, which are c.30 km north-east of Aguamingas and 25 km south of Nueva York, respectively. Our localities are separated by the main ridge of the northernmost Peruvian Andes and by just 10 km. This region, also known as the Cordillera Real de Huamani⁷, presents a corridor of cloud forest and páramo (2,500–4,000 m) from southernmost Ecuador to the Huancabamba Andes and Tabaconas-Namballe

National Sanctuary. This corridor includes parts of two Endemic Bird Areas (EBA)¹³: Central Andean Páramo and Southern Central Andes. The region has been recognised as a priority for biodiversity conservation and lies in the headwaters of important rivers^{7,9,10,14}. Although these forests were once part of a near-continuous strip, only relicts persist now¹⁴.

Despite that more sites are now known for *H. pyrrhops* in Peru, its tiny range in the country appears increasingly threatened. On Cerro Chinguela, where a seven-day survey in 1996 yielded no *H. pyrrhops*⁶, a road was constructed in the late 1990s (J. Flanagan pers. comm.), while intense slash-and-burn farming and cattle ranching are reducing the forests of Ayabaca and Huancabamba, and mining concessions cover most of these areas. *H. pyrrhops* appears to persist only on high, remote slopes and near ridgetops, like Aguamingas–Cerro Negro and Nueva York.

The population of *H. pyrrhops* in Peru remains unknown. In Tabaconas-Namballe National Sanctuary, the only site where the species is formally protected in Peru, *H. pyrrhops* has been reported as rare to uncommon, based on a three-day survey¹. More field work is required to improve knowledge of its population and range. The Peruvian list of threatened species treats *H. pyrrhops* as Vulnerable, but with just five known sites, an estimated range of only 1,200 km² (D. Brightsmith *in litt.* 2010) and a highly threatened and fragmented habitat, the category Endangered

would more appropriately reflect its current national status.

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Tiny Hawk *Accipiter superciliosus* attacking a Golden-green Woodpecker *Picus chrysochloros* in central Amazonian Brazil

Tiny Hawk *Accipiter superciliosus* is one of the smallest raptors, measuring 24–27 cm and weighing just 61.5–86.2 g (males) and 116–152 g (females)^{2,6}. It ranges from Nicaragua south to Bolivia, Paraguay and northern Argentina, in forests and their edges⁸. A secretive, poorly known species, it is easily overlooked. Very few data exist on its diet but, like most *Accipiter*, Tiny Hawk primarily hunts birds, mainly hummingbirds and small passerines^{7,8}, either by still-hunting or checking perches used by displaying hummingbirds^{7,8}, its long legs and toes being an important tool for this⁷.

On 17 September 2008, between 1200h and 12h35, we observed a Tiny Hawk attack a female Golden-green Woodpecker *Picus chrysochloros* at a primary forest reserve of the Biological Dynamics of Forest

Fragments Project (BDFFP), c.80 km north of Manaus in central Amazonian Brazil (02°30'S 60°00'W; see Bierregaard *et al.*¹ and Laurance *et al.*³ for detailed site descriptions). The woodpecker was in a large mixed-species flock, including Cinereous Antshrike *Thamnomanes caesius*, Dusky-throated Antshrike *T. ardesiacus*, Chestnut-rumped Woodcreeper *Xiphorhynchus pardalotus*, Buff-checked Greenlet *Hylophilus muscipalinus* and Fulvous Shrike-Tanager *Lanius fulvus*. During the attack, the shrike-tanagers vocalised loudly and repeatedly. The attack drew our attention through the loud calls emitted by the hawk while holding the prey. It was perched on a horizontal branch, holding the woodpecker in one foot and using the other to strike the woodpecker, while holding its wings partially open covering the prey—a behaviour called 'mantling display', common in raptors⁸—and moved them whenever it called. The calls were tape-recorded and copies will be deposited at the Arquivo de Sons da Amazônia (ASA), Coleção de Aves, Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, Brazil. The hawk did not use its bill during the attack. The woodpecker did not react, either by calling or moving, loosely dangling its head and neck. We observed the hawk and woodpecker closely for c.8 minutes. Finally, the woodpecker escaped, badly injured, on a short, descending flight, which was unexpected because we assumed the bird was almost dead. The hawk remained c.5 minutes silent but alert on the same branch, while a White-necked Jacobin *Florisuga mellivora* flew close by, watched by the hawk but without sudden movement. Thereafter, the hawk called and flew in the same direction as the woodpecker, and was not seen subsequently.

Although *A. superciliosus* is thought to specialise in taking hummingbirds based on a few observations of Rufous-tailed Hummingbird *Amazilia tzacatl* and Bronze-tailed Plumbeater *Chalybura urochrysis* being taken

in Costa Rica⁷, small passerines and rodents have also been reported as prey^{8,10}. The capture of a relatively large non-passerine (88 g)², as observed here, has not previously been reported, but an adult Great Kiskadee *Pitangus sulphuratus* was hunted in Iguazú National Park, Argentina⁴. Golden-green Woodpecker would represent a higher caloric reward than hummingbirds. Although apparently unsuccessful, the attack observed suggests that Tiny Hawk may hunt larger birds, some even of its own weight and size. Predation by small raptors on large bird prey is also reported for *Micrastur*, with which Tiny Hawk exhibits clear convergent traits and appearance⁸. Predation by Barred Forest Falcon *Micrastur ruficollis* on birds such as Brown Tinamou *Crypturellus obsoletus*⁵, Plumbeous Pigeon *Patagioenas plumbea*⁵ and Black-fronted Piping Guan *Aburria jacutinga* (A. Whittaker pers. comm.) has been reported in the Atlantic Forest, and a Collared Forest Falcon *Micrastur semitorquatus* took an Ocellated Turkey *Meleagris ocellata* in Guatemala⁹.

Spreading wings over the prey may help maintain balance during the attack and serve as a 'mantling display', also observed in other accipitrids⁸, which hide food from other predators, and may be accompanied by threat calls⁸, as observed here.

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New records of Sulphur-breasted Parakeet *Aratinga maculata* in Pará and Amapá states, Brazil

Sulphur-breasted Parakeet *Aratinga maculata* is known from just a few localities in northern South America^{5,7,8}. Long confused with Sun Parakeet *A. solstitialis*, only recently has it been recognised specifically, based on subtle but consistent morphological characters^{6,8}. *A. maculata* is a brightly plumaged bird of savannas and other open areas, gathers in large flocks and roosts in tree cavities^{2,3,8}. However, very few data exist concerning its distribution, habits and natural history, making it one of the most poorly known of all Neotropical psittacids.

On 29–30 October 2006 at 17h30 FO & JFP observed a flock of nine *A. maculata* flying low over a matrix of pasture and second growth beside the rio Jari, in the municipality of Laranjal do Jari (00°50'31"S 52°30'57"W), Amapá. The diagnostic features were seen clearly. Despite extensive work further east, between Laranjal do Jari and Macapá, no further records were made. On 2–31 October 2009, TVVC & CBA recorded several groups of the species during surveys on the border between Pará and Amapá states. Flocks were observed in flight or perched in open areas and strips of forest, including

individuals flying over the village of Monte Dourado (01°31'22"S 52°34'55"W), in the municipality of Almeirim, Pará, and over Laranjal do Jari, on the other side of the rio Jari. They were observed mostly in open areas, but also flying over primary and second-growth forests, including *Eucalyptus* plantations. The species was also recorded near habitation, where they were seen resting, copulating and consuming fruits of species such as *Euterpe oleracea*, *Anacardium occidentale*, *Inga* sp. and *Laetia* sp. During our bird censuses in Monte Dourado, we observed seven groups, the sizes of which varied from two to 14, with a mean of eight individuals.

Flock sizes observed are similar to those reported by Silveira *et al.*⁸ at Monte Alegre (2–10 individuals), although groups of up to 30 have been recorded³. The species vocalises much more frequently in flight than perched, when birds usually emit only short calls and rarely 'sing'. Its vocalisations recall those of Sun Parakeet, as already noted by Silveira *et al.*⁸, and its vocal repertoire primarily comprises the *kew* 'song' given both in flight and perched (XC 57212–213), and a short weak *krek*, which resembles calls of *Brotogeris* spp. (XC 57522) and is given only when perched.

The range of *A. maculata* in Brazil was thought to be restricted to the vicinity of Monte Alegre and Alenquer, Pará⁸. Our records appear to be the species' easternmost, extending its range c.250 km north-east and confirming its presence in the state of Amapá. The presence of a member of the *A. solstitialis* group in Amapá, a region with extensive savanna enclaves, was initially suggested by Forshaw¹, who alleged that the north-west of the state may be occupied, as did Milensky *et al.*⁴. However, these authors did not mention any evidence for its occurrence there.

Elsewhere in northern South America, *A. maculata* is known from Surinam and French Guiana. Records in southern Surinam, from the Sipaliwini savanna, previously attributed to *A. solstitialis*, were

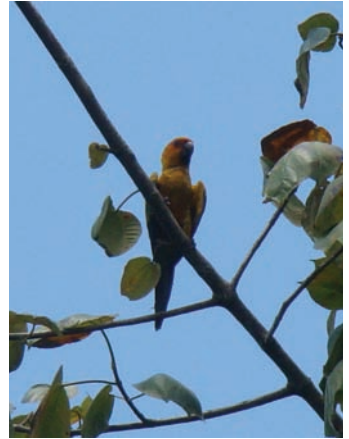


Figure 1. Sulphur-breasted Parakeet *Aratinga maculata*, Monte Dourado, Pará, Brazil, October 2009 (T. V. V. Costa)

recently proven to involve *A. maculata*^{5,7,8}, and the species is considered fairly common there by O'Shea⁷. In adjacent French Guiana, early records listed in Tostain *et al.*⁹ as *A. solstitialis* probably concern *A. maculata*, but no specimen or other evidence exists as confirmation. Records in that country are from the upper Maroni River at the border with Surinam, where available habitat appears unsuitable for the species and where trading wild birds is common practice among local people, meaning that these records may pertain to escapees (O. Claessens pers. comm.). Further studies are needed to confirm its natural occurrence in that country. Other historical records of *A. maculata* in Brazil from the south bank of the Amazon appear erroneous and were discussed by Silveira *et al.*⁸.

Our records demonstrate that *A. maculata* occupies a much broader range (to western Amapá) than previously thought. Furthermore, our data suggest that the species is perhaps benefiting from the deforestation that characterises the study region, given that *A. maculata* prefers open areas and roosts in tall dead trees. Based on this, we expect that it may even expand its range to recently deforested regions beyond the current range, and further studies

may verify that it reaches even further north-east than the municipality of Laranjal do Jari.

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Marsh Seedeater *Sporophila palustris* and Tawny-bellied Seedeater *S. hypoxantha* recorded in Tocantins state, Brazil

Marsh Seedeater *Sporophila palustris* is a globally threatened species that migrates between its nesting areas in Argentina (Corrientes, Entre Ríos and possibly Buenos Aires), Brazil



Figure 1. Adult male Tawny-bellied Seedeater *Sporophila hypoxantha*, Monumento Natural Árvores Fossilizadas do Tocantins, Tocantins, Brazil, 5 July 2005 (Fábio Olmos)

(Rio Grande do Sul), Uruguay (rio Uruguay basin and the south-east wetlands) and possibly south-east Paraguay^{1,3} and its wintering grounds in Brazil and, perhaps, north-east Paraguay^{2,3}. In Brazil it has been recorded mostly in the *cerrados* of Minas Gerais, Goiás, Mato Grosso, Mato Grosso do Sul, São Paulo and Paraná^{2,3,6–8}. Its presence in Tocantins and Santa Catarina has to date been considered probable².

On 5 July 2005, during a four-day bird survey in the Monumento Natural Árvores Fossilizadas do Tocantins⁴, municipality of Filadélfia, Tocantins, we found a flock of *Sporophila* seedeaters foraging for seeds on a pasture (07°29'16"S 47°46'30"W; 255 m) mostly of *Andropogon gayanus*, an introduced African grass. Another species of *Andropogon* used by seedeaters (*A. bicornis*) is a common invasive in disturbed areas such as roadsides throughout Tocantins.

Using binoculars the flock was found to comprise several tens of undetermined females or juveniles, five adult male Capped Seedeaters *S. bouvreil*, 15 male Tawny-bellied Seedeaters *S. hypoxantha*, several male Plumbeous Seedeaters *S. plumbea* and an adult male Marsh Seedeater. The latter was observed for several minutes and identified by its unmistakable white face, breast and upper belly contrasting

with the grey cap, wings and mantle, and rufous belly.

This record seems to be the first for Tocantins and extends the wintering range a minimum of 1,000 km from the previous northernmost localities of Poconé, Mato Grosso (c.16°S 57°W), Emas National Park, Goiás (18°08'S 52°53'W) and Pirapora, Minas Gerais (17°23'S 44°56'W)^{3,5}.

The presence of several Tawny-bellied Seedeaters (Fig. 1) in the same flock is noteworthy as this species is also a migrant from the same general region as Marsh Seedeater^{8,9} and there was only one previous record from Tocantins, a specimen collected at Tocantinia in the 1960s⁵. This observation suggests that Marsh and Tawny-bellied Seedeaters may use the remaining savannas and pastures of the northern Cerrado as wintering grounds. It would be worthwhile to check for the presence of migrant seedeaters in other habitats, such as the seasonal grasslands in the floodplains of the Tocantins and Araguaia rivers.

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First records of Blue-billed Black Tyrant *Knipolegus cyanirostris* for Goiás, Brazil

Blue-billed Black Tyrant *Knipolegus cyanirostris* is usually found in humid and gallery forests, principally in southern and south-eastern Brazil, as well as the central west (Mato Grosso do Sul) and parts of Argentina, Paraguay and Uruguay^{5–7}. In Brazil, it is considered migratory in the states of Espírito Santo, Rio de Janeiro⁷ and Mato Grosso do Sul⁶.

The only known record in central Brazil is a specimen collected on 1 July 1963 deposited at the Museu de Zoologia da Universidade de São Paulo (MZUSP 54764) from Planaltina, Distrito Federal (DF)⁹. Here, we report the first records in Goiás^{2,4}.

During regional surveys of the Serra do Facão Hydroelectric Dam, in the rio São Marcos basin, in south-east Goiás, we twice found individuals of *K. cyanirostris*. Vegetation is typical of the Cerrado, with a mosaic of dry forest and gallery forest, savanna (*cerrado sensu stricto*) and grasslands (*campo sujo* and *campo limpo*), as well as pastures and plantations (especially soya, bean and *Eucalyptus*), bogs, rivers and degraded areas. Description of the



Figure 1. Male Blue-billed Black Tyrant *Knipolegus cyanirostris* mist-netted in the municipality of Catalão, south-east Goiás, Brazil, 10 August 2008 (Sandro Barata Berg)

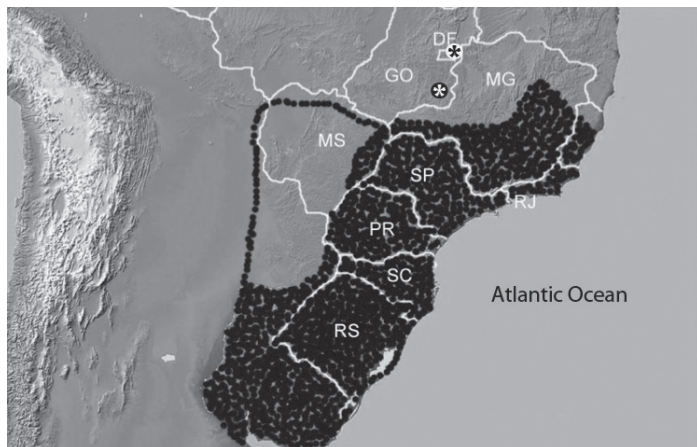


Figure 2. Range of Blue-billed Black Tyrant *Knipolegus cyanostris* based on Ridgely & Tudor⁶. The black asterisk marks the record at Planaltina, in Distrito Federal, and the white asterisk our records in south-east Goiás.

Cerrado's physiognomies follows Oliveira-Filho & Ratter³.

On 10 August 2008 a male Blue-billed Black Tyrant was mist-netted (Fig. 1) in a gallery forest (17°56'22"S 47°39'33"W; 750 m) flanking a small affluent of the rio São Marcos, Pires Belo district, Catalão municipality. It had red irides, a bluish-grey bill and black plumage. The bird was collected and deposited in the Coleção Ornitológica Marcelo Bagno (COMB 2961) at the Universidade de Brasília. On 16 August 2008, we observed a pair in scrub at the edge of dry forest (17°45'02"S 47°41'45"W; 772 m).

These records extend the range of *K. cyanostris* to central Brazil (Fig. 2) and 260 km south-west (from the Distrito Federal) and 130 km north (from the Triângulo Mineiro, Minas Gerais). Occasional records of other *Knipolegus* spp. in localities distant from their main ranges are also available^{1,7,9}, probably because of their partially migratory habits^{7,8}. Thus, the occurrence of Blue-billed Black Tyrant in south-east Goiás is expected, although further data are needed to understand its spatial and temporal occurrence there.

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New data on the breeding biology of Gilt-edged Tanager *Tangara cyanoventris*

Gilt-edged Tanager *Tangara cyanoventris* is endemic to the Brazilian Atlantic Forest³. Despite its relative abundance^{2,3}, little is known of the species' breeding biology beyond the contributions of Sick³ and Isler & Isler¹. Here, we provide new data concerning the species' nest and parental care.

On 17 October 2010, at the Augusto Ruschi Biological Reserve, above Santa Teresa, Espírito Santo (19°52'S 40°32'W) we found a nest of *T. cyanoventris* on a dry leaf of *Chrysalidocarpus lutescens*, an exotic palm frequently used as an ornamental plant. The tree was near the reserve's accommodation and the nest (Fig. 1) was c.3 m above ground and was constructed of dry leaves, thin dry twigs, thin roots and fragments of lichens and green mosses. It was not possible to measure the nest, but it could be described as a low cup/base/lateral (*sensu* Simon & Pacheco⁴). The two nestlings were fed by two adults, each of which remained several minutes after feeding the young until the other arrived with food. No vocalisation was heard from the nestlings, which were estimated to be a few days old.

According to Isler & Isler¹, a nest of Gilt-edged Tanager was found in Rio de Janeiro state, c.12 m above ground in a tree fork. It was apparently constructed of dry bamboo leaves by two adults. It differed both in height above ground and in support substrate from the nest found by us. As already observed by Sick³, more than one adult feeds the nestlings. This October nest unsurprisingly extends the species' known breeding season, as the only previous records were in November.

Acknowledgements

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Primeiro registro do criticamente ameaçada pica-pau-do-parnaíba *Celeus obrieni* no Estado do Mato Grosso (Brasil) e comentários sobre distribuição geográfica e conservação

O pica-pau-do-parnaíba *Celeus obrieni* é uma espécie endêmica do Brasil e considerada globalmente ameaçada de extinção. Coletada inicialmente em 1926 em Uruçuí, Estado de Piauí, foi descrita como uma subespécie do pica-pau-lindo *C. spectabilis* na década de 1970¹². Após 80 anos sem registros publicados a espécie foi redescoberta em 2006, em Goiatins, nordeste do estado de Tocantins⁸. Entretanto, anteriormente a este redescobrimto já existiam três indivíduos de *C. obrieni* coletados nas décadas de 1960 y 1980 no estado de Goiás cujos registros não haviam sido reportados e um indivíduo com a vocalização gravada em 2004 no Estado do Maranhão^{1,10}.

De qualquer forma, posteriormente a 2006, uma série de novos registros de *C. obrieni*



Figure 1. Nest of Gilt-edged Tanager *Tangara cyanoventris*, Augusto Ruschi Biological Reserve, Espírito Santo, Brazil, 17 October 2010 (Carlos Otávio Gussoni)

foram realizados nos estados do Maranhão¹⁰, Tocantins^{5,7} e Goiás⁶ (neste dois últimos, autores dados não publicados). Uma consequência direta destes novos registros foi à rápida ampliação da área de distribuição da espécie, sempre dentro do bioma Cerrado, salvo o registro de São Pedro da Água Branca, no Maranhão, localizado ligeiramente fora dos limites do bioma Cerrado. Os registros históricos em Guapó, no centro-sul de Goiás, indicam a presença de *C. obrieni* a mais de 1.200 km ao sul de sua localidade tipo^{1,2}, o que permite presumir a existência da espécie na área central do Cerrado.

Diante desta possibilidade, realizamos uma expedição de busca de novos indivíduos de *C. obrieni* na porção leste do Estado do Mato Grosso. Entre os dias 27 e 31 de novembro de 2009 percorremos os municípios de Barra do Garça, General Carneiro, Nova Xavantina, Água Boa e Cocalinho. Em cada município visitamos fragmentos potenciais a presença da vegetação requerida pela espécie, selecionados a partir de imagens de satélites (Google Earth). Em cada localidade previamente escolhida examinamos a estrutura da vegetação e naqueles lugares onde achamos cerradão, (fitofisionomias florestal do Cerrado) ou mata ciliar entremeada com bambú *Guadua* cf. *paniculata*, reproduzimos as manifestações sonoras da espécie sempre na ordem: canto, chamado e tamborilar. Este procedimento foi realizado durante 15 minutos, reproduzindo as três vocalizações durante três minutos e esperávamos dois minutos sem reproduzir. Este procedimento se repetiu em três intervalos de cinco minutos. Quando o tamanho do fragmento nos permitiu, realizamos novas tentativas a distâncias de aproximadamente 500 m. Não havendo resposta, se repetia o mesmo procedimento em outro local com vegetação apropriada e assim sucessivamente.

No dia 28 de novembro de 2009, entre às 13h45 e às 14h00, na rodovia federal BR-070,

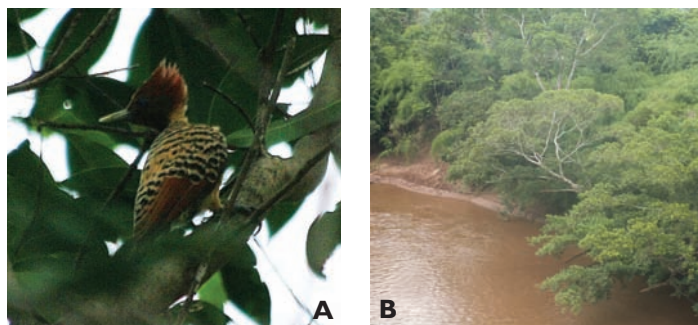


Figura 1A. Fêmea de *Celeus obrieni* no rio Barreiro, Mato Grosso, 28 de novembro de 2009 (Gabriel Leite); B. Aspecto da vegetação marginal do rio Barreiro; nota-se a grande abundância de bambú junto a mata ciliar (Túlio Dornas)

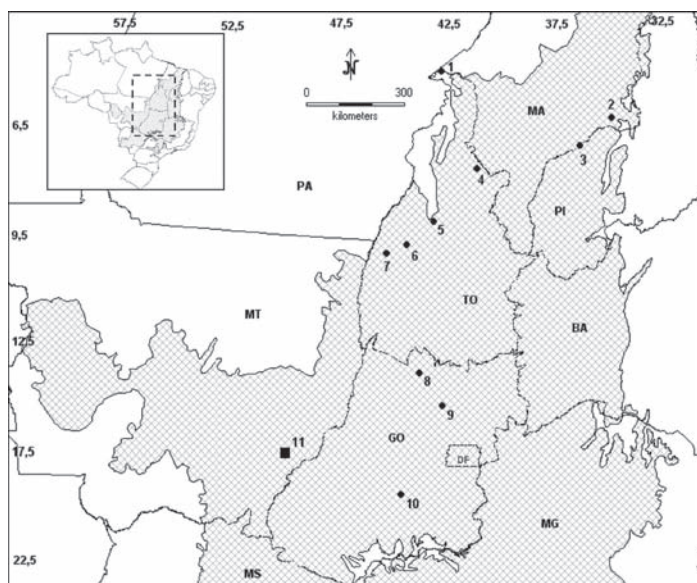


Figura 2. Mapa com todos os registros publicados de *Celeus obrieni* (círculos negros), mostrando a distribuição da espécie dentro do bioma Cerrado (área quadriculada em cinza). 1 e 2. São Pedro da Água Branca (único registro fora do Cerrado) e São João dos Patos, respectivamente¹⁰; 3. Uruçuil²; 4. Goaitins⁸; 5, 6 e 7. Miranorte, Divinópolis do Tocantins e Pium, respectivamente⁷; 8. Porangatu⁶; 9 e 10. Niquelândia e Guapó, respectivamente¹; 11. Registro inédito no rio Barreiro (quadrado). Estados do Brasil: BA. Bahia; DF. Distrito Federal; GO. Goiás; MG. Minas Gerais; MS. Mato Grosso do Sul; MT. Mato Grosso, PA. Pará; PI. Piauí; TO. Tocantins.

às margens do rio Barreiro (15°42'17"S 52°44'16"W), na divisa dos municípios de Barra do Garça e General Carneiro, extremo leste do Mato Grosso, obtivemos o primeiro registro de *C. obrieni* para o estado. Depois de reproduzir as três vocalizações, um casal da espécie respondeu ao estímulo. O casal vocalizava e

voava cruzando o rio, pousando sempre nas árvores mais altas, observando e procurando pela fonte emissora das vocalizações. A fêmea foi fotografada (Fig. 1A) e a vocalização do casal foi gravada (XC 65481–82 / www.xeno-canto.org). A mata ciliar do rio Barreiro possui um porte considerável, com árvores de copas acima dos 20 m

de altura e sub-bosque dominado por *Guadua cf. paniculata* (Fig. 1B). Este é o hábitat preferido pela espécie tal como se verifica através de outros registros no bioma Cerrado^{4-7,10}.

Nesta mesma região constatou-se a presença de bambuzais nas margens do rio Índio, um afluente do rio Garças, o qual também é transposto pela BR-070, a pouco menos de 20 km a leste do local do registro (15°44'31"S 52°37'23"W). Segundo relatos dos habitantes locais, a presença de bambuzais mesclados à mata ciliar e 'cerradões' é constante no rio Barreiro, alcançando inclusive sua desembocadura com o rio Garças. A busca da espécie no rio das Mortes, entre os municípios de Nova Xavantina, Água Boa e Cocalinho nos dias posteriores ao registro no rio Barreiro não resultou em nenhum novo registro.

Este novo registro apresentado para o Estado do Mato Grosso representa uma grande extensão da distribuição geográfica de *C. obrieni*, desenhando um novo limite oeste de ocorrência da espécie (Fig. 2). Esta nova localidade de ocorrência do pica-pau-do-parnaíba está aproximadamente 360 km a oeste de Guapó (localidade mais meridional da distribuição geográfica da espécie até agora conhecida) e pouco mais de 1.300 km distante de Uruçuí, Piauí (localidade tipo da espécie, Fig. 2).

Contudo, ainda que não tenhamos efetuado mais registros na região, existem algumas áreas potencialmente favoráveis para presença de *C. obrieni*. Merecem destaque os rios Garças e Barreiro e seus respectivos afluentes que atravessam ou limitam a Terra Indígena de Merure, que possui uma área de 82.301 ha. Nesta porção leste do estado do Mato Grosso, as terras indígenas são as principais áreas responsáveis pela conservação dos grandes remanescentes do bioma Cerrado, existindo grande probabilidade de ocorrência de *C. obrieni* no interior das mesmas. Na Terra Indígena de Areões (situada em Nova Xavantina, tendo como um de seus

limites o rio Areões, afluente do rio das Mortes) constatamos uma grande abundância de bambuzais entremeados a mata ciliar e 'cerradão' adjacentes.

Todavia, a escassez de Unidades de Conservação de Proteção Integral (UCPI) de responsabilidade dos governos federal e estadual na região¹¹, oferece poucas garantias de proteção legal à espécie nesta parte do estado do Mato Grosso. O Parque Estadual de Serra Azul, com 11.500 ha e situado próximo da desembocadura dos rios Araguaia e Garças, na cidade de Barra do Garça é a única UCPI inserida na bacia hidrográfica do rio Garças, o que nos permite suspeitar que em seus limites haja habitat potencial para a presença de *C. obrieni*.

Nenhum registro conhecido para a espécie procedeu dentro dos limites de uma UCPI. Situação preocupante tratando-se de uma espécie criticamente ameaçada de extinção e virtualmente endêmica do Cerrado (Fig. 2), bioma atualmente também ameaçado e que já perdeu mais da metade de sua vegetação original⁹. Por outro lado, o estabelecimento de unidades de conservação com objetivo de conservar esta espécie deve ser uma prioridade ao longo de toda sua área de distribuição geográfica (Fig. 2). Com este achado inédito a porção oriental do estado do Mato Grosso em especial, passa a ser importante região postulante a criação de uma UCPI com o propósito de conservação deste emblemático pica-pau brasileiro bem como também, oportunadamente de outras espécies de aves do bioma Cerrado.

Agradecimentos

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Hybridisation between *Lanio cucullatus* and *L. pileatus* in central Brazil

Lanio (*Coryphospingus*) *cucullatus* and *L. pileatus* were recently reclassified as Thraupidae (tanagers), and still lack revised English names, but here we avoid referring to them as finches (Emberizidae)^{3,4}. With 11 species in Brazil, *Lanio* species occupy biomes such as the Amazon and Atlantic forests, Cerrado and Caatinga^{1,6,7,9,10}. Some occur in forests, in the canopy and subcanopy (e.g. White-winged Shrike-Tanager *L. versicolor* and Flame-crested Tanager *L. cristatus*) and others in open and semi-open habitats, e.g. *L. cucullatus* and *L. pileatus*^{6,7,9,10}. *L. cucullatus* and *L. pileatus* are endemic to South America and considered common or locally abundant in scrubby agricultural areas, forest edges, roadsides and open woodland^{2,5,6,7,9}. They are broadly allopatric^{5,9}, with *L. cucullatus* generally replacing *L. pileatus* in central and western Brazil. Nevertheless, there are

narrow contact zones in central Brazil, in western Minas Gerais, Goiás and Mato Grosso states^{5,6,9} (Fig. 1).

Marcondes-Machado⁵ listed western Minas Gerais as a region where hybrids between these species had been observed in the wild, whilst Sick^{8,9} confirmed the existence of captive hybrids from the Distrito Federal and Minas Gerais, the latter possibly from the north-west of the state. Thraupidae hybrids are common in captivity, e.g. among *Tangara*, but inter-generic hybrids have also been recorded (Red-legged Honeycreeper *Cyanerpes cyaneus* × Masked Tanager *Tangara nigrocincta*, Brazilian Tanager *Ramphocelus bresilius* × Ruby-crowned Tanager *Tachyphonus coronatus*)⁹, although data on wild hybrids are scarce^{6,9}.

Here, we present four cases of hybridisation between these tanagers, in north-west Minas Gerais and the Distrito Federal, both in central Brazil and the Cerrado biome¹. Three refer to

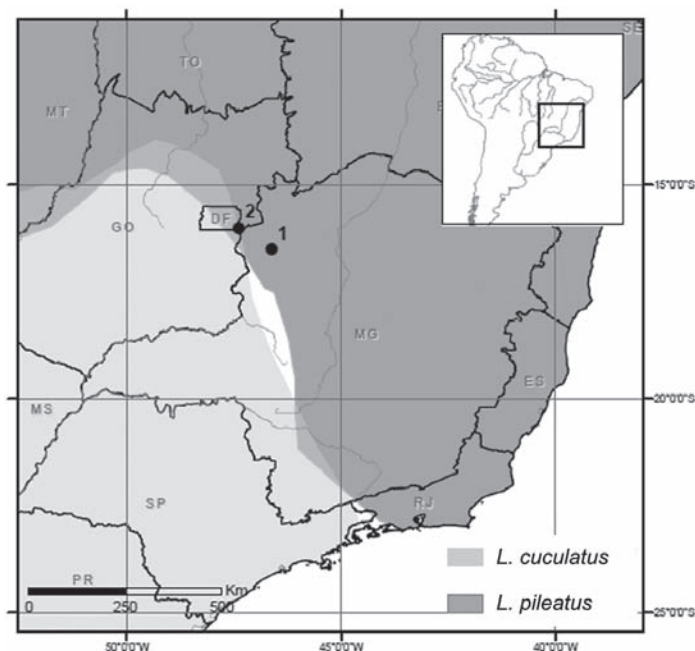


Figure 1. Ranges of *Lanio cucullatus* and *L. pileatus* in eastern and central Brazil: (1) Paracatu, Minas Gerais, where the hybrid was mist-netted; (2) locality in the Distrito Federal, where hybrid individuals were observed; (3) Universidade de Brasília (Distrito Federal) campus, where the hybrid was collected in 1966 (MNRJ 47985). Distribution map adapted from Ridgely & Tudor⁶.



Figure 2. Underparts of the mist-netted hybrid (*Lanio cucullatus* × *L. pileatus*) captured in Paracatu municipality, Minas Gerais, Brazil (Carlos E. Benfica)



Figure 3. The reddish rump of the mist-netted hybrid (*Lanio cucullatus* × *L. pileatus*) captured in Paracatu municipality, Minas Gerais, Brazil (Carlos E. Benfica)

birds observed in the field and the other to a museum specimen. All were diagnosed using plumage characters, considering each species' singular patterns.

During a study conducted in Paracatu municipality (16°51'S 46°58'W), Minas Gerais, a hybrid was mist-netted on 13 June 2008. The habitat where this individual was trapped is cerrado *sensu stricto* (with trees of 2–7 m) surrounded by riparian forests and agricultural fields. The bird's plumage possessed characters of both species, it being predominantly grey, but the belly and rump were notably reddish (Figs. 2–3). Two similar hybrids were observed on 6 October 2004 and 15 October 2007 in the Distrito Federal (16°00'S 47°22'W), c.60 km north-west of Paracatu. Adults of both species were recorded in the surveyed areas, but never side by side, even in areas where they occupied the same habitat.

After examining several museum collections and a total of 640 specimens (Museu de Zoologia Universidade de São Paulo, São Paulo; Museu Nacional Universidade Federal do Rio de Janeiro, Rio de Janeiro; Museu Paraense Emílio Goeldi, Belém; Museu de Zoologia Universidade Federal de Minas Gerais, and



Figure 4. Dorsal view of hybrid *Lanio cucullatus* × *L. pileatus* collected at the Universidade de Brasília (Distrito Federal) campus (MNRJ 47985) (Piero Ruschi)



Figure 5. Ventral view of hybrid *Lanio cucullatus* × *L. pileatus* collected at the Universidade de Brasília (Distrito Federal) campus (MNRJ 47985) (Piero Ruschi)

Museu de Ciências Naturais Pontifícia Universidade Católica de Minas Gerais, both in Belo Horizonte), we found just one hybrid (MN47985) (Figs. 4–5) with plumage similar to those we observed in the field. The hybrid male was collected on the Universidade de Brasília (Distrito Federal) campus (c.15°45'S 47°52'W) on 9 December 1966, and sustains the hypothesis of a hybrid zone, rather than these taxa representing a single polymorphic species. Polymorphic specimens occur throughout a species' range, e.g., in White-tailed Hawk *Geranoaetus albicaudatus* and Crested Eagle *Morphnus guianensis*, respectively^{4,9}, although they can be uncommon in some regions. The Brasília specimen was collected 150 km from the trapped bird and 70 km from our sight records of hybrids.

Our findings confirm the occurrence of both species in

north-west Minas Gerais and the Distrito Federal, and that the area is a contact zone for these tanagers^{5,6,9}. This zone may sustain fertile hybrids⁵, but more studies are required to confirm this and to find any additional areas where hybrids occur.

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New specimens extend the range of Serra Antwren *Formicivora serrana*

Serra Antwren *Formicivora serrana* is endemic to part of the Brazilian Atlantic Forest biome. It generally inhabits dry scrub and low shrubby secondary woodland areas, especially in semi-deciduous forests⁶. Two subspecies are recognized: *F. s. serrana* and *F. s. interposita*. Restinga Antwren *F. littoralis* was originally described as a subspecies of *F. serrana* but has been treated recently as a species^{1,3,5}. The known range of *F. serrana* includes south-west Espírito Santo and south-east Minas Gerais, up to 1,550 m, as well as northern Rio de Janeiro to 700 m^{2,3,5}.

Label data of specimens housed in Brazilian collections (Museu de Zoologia, Universidade de São Paulo [MZUSP]; Museu Nacional [MN]; Laboratório de Bioacústica /

[UFRJ]; Departamento de Zoologia da Universidade Federal de Minas Gerais [DZUFMG]; Museu de Zoologia Professor Mello Leitão [MBML]; Museu de Zoologia João Moojen de Oliveira, Universidade Federal de Viçosa [MZUFV]; specimens examined by DHF), North American collections (the latter retrieved from ORNIS ornithological information system, http://olla.berkeley.edu/ornisnet/, accessed 27 May 2010), and records compiled by Venturini & Paz⁴ indicate the municipality of São Gonçalo do Rio Preto (18°23'S 43°23'W; DZUFMG 4267) as the northernmost documented limit of *F. serrana*.

During recent ornithological surveys in north-east Minas Gerais, FRA & HBF collected four *F. serrana* at two localities north of the species' previously known range. After being attracted using recordings of *F. serrana*, a pair was collected between Almenara and Pedra Grande (16°06'S 40°46'W; MZUSP pending number, field numbers BA09 and BA10, Fig. 1). In addition, two males were collected near Poté (17°43'S 41°49'W; MZUSP pending numbers, field numbers MG31 and MG37, Fig. 1). The entire region falls within the ranges of two similar congeners, Black-bellied Antwren *F. melanogaster* and White-fringed Antwren *F. grisea*⁵. Notwithstanding the similarity of *F. serrana* to the latter (especially in males), the individuals collected are diagnosable as *F. serrana* due to the much more rufous crown, back and tertial fringes, as well as the dark mask of the female (Fig. 1). The specimens reported here extend the northernmost limit of *F. serrana* c.200 km further north than previously known (Fig. 2). Further field research is needed to determine if the specimens collected in Almenara belong to an isolated population, or if the species is continuously distributed in areas of suitable habitat.

Notwithstanding it not being globally threatened, agricultural expansion and loss of habitat might threaten Serra Antwren. This range extension for a



Figure 1. Specimens of *Formicivora* spp. From left to right: two male Serra Antwrens *F. serrana* from Poté (MZUSP pending numbers, field numbers MG31 and MG37); male and female *F. serrana* from Almenara (MZUSP pending numbers, field numbers BA10 and BA09); male and female Black-bellied Antwrens *F. melanogaster* (MZUSP 77742, MZUSP 81853); and male and female White-fringed Antwrens *F. grisea* (MZUSP 83868, MZUSP 83423).

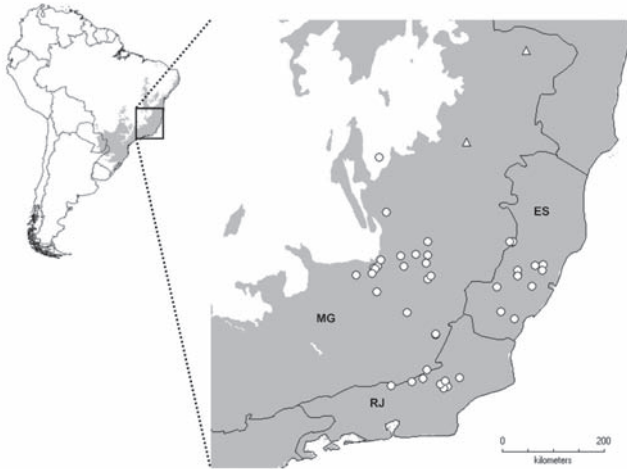


Figure 2. Map showing geographical records of *Formicivora serrana*. Circles indicate previously known records, while white triangles indicate new records (for specimens, see Fig. 1 and Appendix 1). The grey area represents the limits of the Atlantic Forest biome. MG = Minas Gerais, RJ = Rio de Janeiro, ES = Espírito Santo.

conspicuous and locally common bird reflects our scarce knowledge of the avifauna of parts of the Atlantic Forest biome, in this case the Jequitinhonha Valley region and areas in neighbouring southern Bahia. Additional field surveys of these areas will be important to better understand the distribution of the still poorly known local avifauna, and to improve conservation strategies for this biologically important area.

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Appendix 1. Voucher specimens examined in Brazilian collections.

Formicivora serrana: **Minas Gerais**: near Rio Doce: MZUSP 25243–245 (males), 25247 (male); Araçuaia: MZUFV 1412 (male); Poté: MZUSP pending, field numbers MG31 (male), 37 (male); Almenara: MZUSP pending, field numbers BA09 (female), 10 (male); Boa Esperança: MZUSP 25246 (male); Brumal: UFRJ 0346 (female), 0348 (male); Catas Altas: MN 44413–414 (males), 44416–418 (males); Ferros: MZUFV pending, field numbers CRMA210 (male), 211 (female); Mariana: MN 16980 (male), 16988–989 (males), DZUFMG 4275 (male), 4358 (male); Marliéria: MN 38595 (male); Rio Acima: MN 38592 (male); Rio Matipó: MZUSP 10384 (female); Rio Sacramento: MZUSP 10385 (female); Santa Bárbara: MN 38590 (male), DZUFMG 1047–1048 (males), 1049 (female), 3624, 3955 (males); São Gonçalo do Rio Abaixo: DZUFMG 3679–3680 (males); São Gonçalo do Rio Preto: DZUFMG 4267 (male); São Paulo de Muriaé: MN 16979, 16982, 16986 (males); Vargem Alegre: MZUSP 1563 (male); Viçosa: MN 38591 (male), MZUFV 823 (female), 839 (male), 840 (female); Volta Grande: MN 23989 (male); **Espirito Santo**: Baixo Gandú: MN 16978, 16983 (males); Jatiboca: MN 27247 (male); Santa Teresa: MN 26316, 27249, 44043, 44073 (males), MBML 6980 (male), 7268 (female); **Rio de Janeiro**: Carmo: MN 44424, 44611–612 (males); Macuco: MN 44423, 44387 (males); Santa Maria Madalena: MN 44403 (male); São Sebastião do Alto: MN 44422, 44613 (males); Sapucaia: MN 44438–439, 44610 (males); Trajano de Moraes: MN 36750, MN 44404 (males), UFRJ 0813 (male), 0814 (female); Três Rios: MN 44440 (male).

Formicivora melanogaster: **Piauí**: Parque Nacional Serra das Confusões: MZUSP 77742 (female); **Bahia**: Muquém do São Francisco: MZUSP 81853 (male).

Formicivora grisea: **Alagoas**: Fazenda Horizonte, Pilar: MZUSP 83423 (female); **Pará**: Santana do Araguaia: MZUSP 83868 (male).

Appendix 2. Label data

retrieved from ORNIS. (LSUMZ = Louisiana State University Museum of Zoology, Baton Rouge; and LACM = Los Angeles County Museum.)

Formicivora serrana: **Minas Gerais**: Dom Joaquim: LSUMZ 65176; Raul Soares: LACM 30154, 30155, 30224.

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First documented record of Veery *Catharus fuscescens* in southern Brazil

Parts of Amazonia, the eastern Andes and sometimes even Central America have been considered within the winter range of Veery *Catharus fuscescens*. However, Remsen³ demonstrated that most winter records are from north and centre-west Brazil. Further south, it has been recorded in São Paulo, by Pereira *et al.*², who collected a male in 1985 and a female in 1986, in Salesópolis and Iguape municipalities, respectively, whilst Willis & Oniki⁷ and E. O. Willis *in* Remsen³ observed 13 individuals, on 12 dates, at altitudes of 250–1,000 m, between late November–early March. In Rio de Janeiro, there is a record by D. F. Stotz in January 1992, at Praia Seca, and another by T. Sigrist, in November, at Tingua⁶. The southernmost record is from Serranía San Luis National Park, in Paraguay⁵.

On 11 February 2009, during an ornithological inventory of Fazenda Santa Alice, Rio Negrinho municipality, Santa Catarina (26°29'22.7"S 49°29'40.3"W) a *C. fuscescens* was mist-netted at c.09h00. It was a first-year, sex unknown, and was ringed, measured and photographed (Fig. 1). Its measurements were as follows: bill (exposed culmen) 14.0 mm; tarsus 24.8 mm; wing (max.) 90.0 mm; tail 68.3 mm; total length 175.0 mm; mass 30 g. The bird was not moulting any feathers.

Fazenda Santa Alice lies at 800–1,100 m¹⁴. The area where the Veery was trapped



Figure 1. Veery *Catharus fuscescens*, Fazenda Santa Alice, Santa Catarina, 11 February 2009 (Nicholas Kaminski)

is a *capoeira* of *Baccharis dracunculifolia*, with many pioneer species such as *Myrsine coriacea*, *Schinus therebentifolius*, *Zanthoxylum rhoifolium*, *Rhamnus sphaeosperma*, *Matayba elaeagnoides*, *Drymis brasiliensis* and some Melastomataceae. The general environment is a matrix of primary forest and much old secondary forest, but dominated by a vast monoculture of *Pinus taeda*.

This record brings not only an expansion of the area of wintering (*sensu* Remsen³), but also a new vegetation typology with maximum and minimum temperatures very different from Amazonia and the Cerrado³, and even from the Atlantic Forest⁷. However, only with further observations, and preferably continued use of mist-nets, will it be possible to determine if *C. fuscescens* is regular in this region of Brazil.

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El Mirasol Grande *Botaurus pinnatus* en el sur de la provincia de Buenos Aires

El Mirasol Grande *Botaurus pinnatus* se distribuye desde México hasta el norte y centro de Argentina^{8,11,15}. No ha sido hallado en Bolivia^{13,14}, reúne escasos registros en Paraguay^{9,13,14}, y en Argentina ha sido escasamente reportado^{2,12}. En la provincia de Buenos Aires se lo encuentra en bañados, pantanos y pajonales palustres del este, donde es residente, nidificante y raro^{5,10}. Narosky y Di Giacomo¹⁰ menciona un registro en el partido de Tres



Figura 1. Distribución austral del Mirasol Grande *Botaurus pinnatus*. Modificado a partir de Canevari et al.⁴ y Narosky y Di Giacomo¹⁰. 1: cita histórica dudosa en Tres Arroyos; 2: cita entre los partidos de Balcarce y General Pueyrredón. La nueva localidad reportada se indica con un triángulo.

Arroyos (Fig. 1), correspondiente a una piel procedente de la Biblioteca y Museo Sarmiento de dicho partido y posteriormente ingresada en la colección del Museo de Ciencias Naturales de La Plata el 13 de septiembre de 1944 (P. Grilli com. pers.). Sin embargo, tras consultar las respectivas fuentes, no hemos

podido corroborar fehacientemente el origen de captura de este espécimen. No existen menciones sobre su presencia actual en el centro y sur de la provincia.

Según la UICN¹ el estatus de conservación de esta especie a nivel mundial es de 'preocupación menor' y la última categorización de las aves argentinas la clasifica como 'no amenazada'⁷. Sin embargo, varios autores la consideran poco conocida^{6,8}.

El 5 de agosto de 2009 a las 11h30, observamos un ejemplar del Mirasol Grande y escuchamos otro vocalizando a corta distancia, oculto entre la vegetación. El punto de avistaje (38°55'23.15"S 60°34'20.60"O) se localizó 3 km al oeste de Marisol, partido de Coronel Dorrego, y su distancia al mar en línea recta se estimó en 1,6 km. El individuo observado era un adulto que se encontraba camuflado entre la vegetación. Pudo ser observado a una distancia mínima de 10 m y fotografiado en su típica postura con el cuello estirado, apuntando el pico hacia arriba (Fig. 2), y luego en vuelo. Ambos ejemplares se encontraban en un sitio topográficamente bajo dentro del sistema de dunas, cubierto en un 100% por vegetación herbácea nativa de tipo higrófilo (Fig. 3). El lugar de avistaje coincidía con el límite de contacto entre dos comunidades vegetales indicadoras de suelo inundable y salobre: un hunquillar cerrado de *Juncus acutus*, con una altura



Figura 2. Ejemplar de Mirasol Grande *Botaurus pinnatus* hallado en pajonales interdunales de la costa marina del partido de Coronel Dorrego, Buenos Aires, Argentina, 5 de agosto de 2009 (Daniel Mac-Lean)



Figura 3. Vista general de la vegetación en el sitio de avistaje: hunquillar de *Juncus acutus* (atrás) y pajonal de *Schoenoplectus americanus* en estado invernal (frente). El mirasol observado se encuentra en el centro (Daniel Mac-Lean)

máxima de 1,5 m y un pajonal de *Schoenoplectus americanus* en estado invernal, con partes aéreas secas, de 0,7 m de alto.

El sitio de detección de ambos individuos está ubicado en un área que se destaca por su riqueza biológica y su buen estado de conservación, motivos por los cuales se ha propuesto su declaración como reserva natural. El paisaje general se compone de dunas activas y vegetadas, y depresiones interdunales donde se intercalan distintos tipos de vegetación, desde estepas psamófilas de *Panicum urvilleanum* y *Senecio bergii* hasta pajonales anegados de *Typha* sp., pasando por pastizales de *Imperata brasiliensis* y *Cortaderia selloana*, y matorrales de *Senecio subulatus*, *Hyalis argentea* y *Schinus johnstonii*. La vegetación conforma un mosaico altamente heterogéneo al cual se suman como importantes elementos del paisaje numerosos arroyos y lagunas interdunales de carácter temporario o permanente. En el momento del avistaje el terreno presentaba un nivel de anegamiento inusualmente alto. Las características estructurales de esta vegetación coinciden con lo reportado previamente por otros autores^{9,10}. Sin embargo, resulta novedoso el dato de su presencia en ambientes costero-marinos, ya que no existían hasta el momento referencias publicadas de esta especie en los sistemas de dunas costeras bonaerenses.

Además, en el área donde realizamos la observación fueron observadas otras especies de interés haciendo uso del mismo hunquillar, entre ellas: Espartillero Pampeano *Asthenes hudsoni*, cachirla *Anthus* sp., Loica Común *Sturnella loyca*, Verdón *Embernagra platensis* y una bandada numerosa de Cachilo Canela *Donacospiza albifrons*.

Por lo tanto, el presente registro constituye una nueva localidad para el Mirasol Grande y representa el punto más austral reportado de su presencia en estado silvestre. Asimismo, actualiza el conocimiento sobre la presencia de la especie en el

sur de Buenos Aires. Por otro lado, contribuye a fundamentar la importancia de conservación del área, en cuanto a su potencial como refugio de biodiversidad, y se suma a otra cita novedosa de fauna previamente reportada para la misma zona⁹.

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First confirmed nesting record of Andean Flamingo *Phoenicoparrus andinus* in Catamarca, Argentina, and remarks on its breeding ecology

Andean Flamingo *Phoenicoparrus andinus*, currently classified as Vulnerable based on IUCN criteria, is the rarest flamingo in the world. With a population currently estimated at 38,600¹⁴, it uses limited breeding areas and the species' reproductive output has been very low in the past decade.

On 24 January 2010, during the fourth simultaneous flamingo census in South America,

organised by the Grupo para la Conservación de Flamencos Altoandinos (GCFA)¹³, we found *P. andinus* nesting at Laguna Purulla, in the Lagunas Altoandinas y Puneñas de Catamarca Ramsar site, Catamarca, north-west Argentina (26°40'26"S 67°51'15"W; 3,500 m). This site is a shallow hyper-saline lake of 119.7 ha. Six microhabitats are present at Laguna Purulla: salt flats, mud shores, mud with a film of water, shallow water (<1 m depth), deep water (>1 m depth) and *vegas*⁸.

We recorded three nesting groups, two of them—A ($n=57$ nests) and B ($n=40$)—in the centre of Laguna Purulla, and group C ($n=3$) in the southern part. Observations were made from the shore using telescopes for one hour. Group A was c.70 m from the shore, and 30% of the nests had adults incubating and c.20% adults standing by the nest. We counted 26 nests with one egg each. Group B was further away, c.200 m from the shore, and many birds were walking, standing and flying in the vicinity; 90% of nests had adults incubating, although no eggs were seen. At C, the three nests had adults incubating constantly. We took a number of images (Fig. 1) and video.

Laguna Purulla was censused by the GCFA in January / February of 1998, 2000, 2001, 2005 and in 2007–10^{10,14,20,21}. During each census, we recorded three species of flamingos: *P. andinus*, James' Flamingo *P. jamesi* and Chilean Flamingo *Phoenicopterus chilensis*. Andean Flamingo was

always the most abundant of the three, although this is the first record of nesting at the lake. The total number of *P. andinus* recorded during the 2010 census was 461 individuals, or more than 1% of the global population^{10,14}. We recorded 126 James' Flamingos and 20 Chilean Flamingos at the same time on the lake.

Andean Flamingo nests in shallow to deep hyper-saline lakes⁸ at 2,305 m (Salar de Atacama, Chile) to 4,325 m (Salar de Surire, Chile). The most successful nesting sites for the species prior to 2006 were in Chile³. Since then smaller numbers of chicks have been reported at several sites in Chile^{1,2,4,7}. In contrast, Andean Flamingo has been reported in increasing numbers and breeding at Reserva Eduardo Avaroa, in Bolivia, since 2006^{3,6}.

In Argentina there are only two previous nesting records of Andean Flamingo: in December 1986 at Laguna Mar Chiquita, Córdoba¹¹ within a colony of *P. chilensis* (of c.700 nests an estimated 100 were *P. andinus*), and at Laguna Brava, La Rioja, in 1998⁹. The latter record we consider doubtful due to the lack of documentation and because it does not match other records from the same place and period^{10,18}. Also, two adult Andean Flamingos were recorded in a huge colony of more than 27,000 Chilean Flamingos at Laguna Llananelo, Mendoza, in February 2010¹⁹, although it is unclear if they were actually nesting or just resting within the colony.

Of the 13 breeding sites in Chile just five were occupied in 2010 and only one was successful (Salar de Tara, 80 chicks fledged). In Bolivia, of 1,812 chicks unidentified to species during the summer census, >500 were confirmed as Andean Flamingos during the 2010 ringing effort¹⁶. We consider Laguna Purulla to be important to the species' survival given its currently low reproductive output^{10,15,17}. Furthermore, in the regional context of pressures on high-Andean wetlands, Laguna Purulla becomes even more significant. Mining activity has increased at Andean Flamingo



Figure 1. Colony of Andean Flamingos *Phoenicoparrus andinus*, Laguna Purulla, Catamarca, Argentina, January 2010 (Amelia Clark)

nesting areas in Chile during recent years, and new mining projects and a huge geothermal development are imminent at the Bolivian sites¹². Although mining exploration is intense in Argentina, particularly in Catamarca, Laguna Purulla has been unaffected to date. The lake forms part of the Parinas wetland complex in Catamarca, one of 22 priority sites in the High Andean Flamingos Wetland Network¹³. The GCFA will continue monitoring the wetland to determine whether the site supports regular nesting events.

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Neotropical Notebook

Neotropical Notebook contains two sections. The first summarises records published elsewhere in the literature, following the format previously established in *Cotinga*. The second lists unpublished and undocumented records. Photographs are published where appropriate.

PUBLISHED RECORDS FROM THE LITERATURE

CARIBBEAN

Antigua

Following Barbados, the second island in the Caribbean (and second locality in the Western Hemisphere) to host breeding **Little Egrets** *Egretta garzetta* has proven to be Antigua⁸⁹.

Aruba (Netherlands Antilles)

Mlodinow¹¹⁶ reports two first records for the island—**Cinnamon Teal** *Anas cyanoptera* and **Bay-breasted Warbler** *Dendroica castanea*—along with records of four other species for which fewer than ten previous reports are available for Aruba.

Bahamas

Hayes *et al.*⁷⁷ demonstrate that **Chuck-will's-widow** *Caprimulgus carolinensis* is considerably more widespread and numerous on the large northern islands of the archipelago than previously considered, and that the species is not just a winter visitor to the region but also breeds there.

Cuba

Mitchell¹¹⁵ places on record the first Cuban sighting of **Dark-eyed Junco** *Junco hyemalis*, a bird on Cayo Guillermo in November 2002, as well as several other records of species generally considered rare in Cuba. The latest addition to the island's avifauna comes in the form of an escapee /

introduction: **Orange Bishop Euplectes franciscanus**⁶⁵. Rather more interesting is the recently reported discovery of the globally threatened **Zapata (Cuban) Sparrow** *Torreornis inexpectata* on Cayo Romano¹²⁷.

Dominican Republic

The first island record of **Great-tailed Grackle** *Quiscalus mexicanus* involved an individual at Las Calderas de Baní, in December 2007, which was only the third record for the entire West Indies¹⁰⁶. The first modern-day breeding record of **Greater Flamingo** *Phoenicopterus ruber* on Hispaniola has been documented in the country recently⁶⁴.

Puerto Rico

The first record of **Aplomado Falcon** *Falco femoralis* from anywhere in the West Indies involved a well-documented bird in the south-west of the island in January 2008¹⁰⁵. Additionally, three sight records of **Cedar Waxwing** *Bombycilla cedrorum* on the island, dating from 1981, 1982 and 2007, have been published recently¹³¹.

MIDDLE AMERICA

Costa Rica

The Costa Rican bird list was updated in the online journal *Zeledonia* (see www.avesdecostarica.org) at the end of 2010, with five species being newly accepted as part of the country's avifauna¹²³. The second and third records of **Long-tailed Skua** *Stercorarius longicaudus* have been reported recently, both on the country's Caribbean coast⁵⁴. Sandoval *et al.*¹⁴³ report the first country records of **Great Shearwater** *Puffinus gravis* and **Savanna Hawk** *Buteogallus meridionalis*, as well as observations of 15 other species for which few Costa Rican records

previously existed, some of which are, however, colonising rapidly. The first Costa Rican records (all since 2009) of **Veraguan Mango** *Anthracothorax veraguensis* have been formally documented¹³⁵. A **Uniform Crake** *Amaurolimnas concolor*, photographed in May 2010, was an unexpected new record for the Monteverde region⁸⁴. Breeding data for **Black-cowled Oriole** *Icterus prosthemelas*¹⁵⁵ and **Spot-breasted Oriole** *I. pectoralis*⁸² have been published.

Honduras

Honduran Emerald *Amazilia luciae*, which is considered Critically Endangered, has been rediscovered in the west of the country, in three different political departments¹⁵.

Mexico

A recent study that employed modelling techniques, as well as other methods, to compare the historical and modern-day distribution of **Yellow-headed Parrot** *Amazona oratrix* on the Pacific coast of the country has found evidence for a c.80% decline in the species' numbers¹¹⁹. The first detailed breeding data for **Yucatán Wren** *Campylorhynchus yucatanicus* have been published¹⁶⁰, while the same is also true for the poorly known **Mexican Sheartail** *Doricha eliza*⁵². Among new state records reported recently, **Crested Guan** *Penelope purpurascens* has been added to the avifauna of Guanajuato⁹², six species to that of Hidalgo¹⁵⁹, 12 species new to Querétaro¹³⁴, and **Prothonotary Warbler** *Protonotaria citrea* and **Fan-tailed Warbler** *Euthlypis lachrymosa* have been recorded for the first time in the state of México⁴⁸. A further 29 species were added to the state list for Querétaro during surveys for aquatic birds¹³³. **Scrub Euphonia** *Euphonia affinis* is an

addition to the avifauna of Nuevo León¹¹⁷, as is **Black-headed Nightingale-Thrush** *Catharus mexicanus*¹⁵⁸. **Yellow-winged Tanager** *Thraupis abbas* appears to be expanding its range in the north-east of Mexico¹³⁷. The first record of **Barred Parakeet** *Bolborhynchus lineola* in central Veracruz for c.2 decades has been reported⁷⁹. New breeding data for **Long-tailed Wood Partridge** *Dendrortyx macroura* have been published³³.

SOUTH AMERICA

Argentina

Pearman *et al.*¹²⁸ have confirmed the presence of **Sooty Swift** *Cypseloides fumigatus* in the north-east of the country. The third record for Argentina of **Masked Water Tyrant** *Fluvicola nengeta* was made recently¹¹³. Noteworthy is a 'probable' record of the globally threatened **Brazilian Merganser** *Mergus octosetaceus* in eastern Misiones¹¹⁴, while a rare bird in Argentina, the **Scaled Pigeon** *Patagioenas speciosa* was re-found at several localities in the same province²¹. Also in north-east Misiones, around Iguazú National Park, several rare species have been observed recently, among them **Buffy-fronted Seedeater** *Sporophila frontalis*¹⁴⁸. Another species previously considered hypothetical for Argentina has now been photographed in Misiones on several occasions, **Palm Tanager** *Thraupis palmarum*¹¹⁸. **Ticking Doradito** *Pseudocolopteryx citreola* has recently been found much further east in the country than previously suspected, in the provinces of Buenos Aires and Entre Ríos⁹⁶. Valuable new evidence for the presence of **Strange-tailed Tyrant** *Alectrurus risora* at a site in south-west Misiones has been published²⁸. Lucero & Chebez⁹⁸ report records of 21 species of birds from the provinces of San Juan, Mendoza and La Rioja, among them the first **Wood Stork** *Mycteria americana* for Mendoza, and 13 first documented records for San Juan. Based on

observations in Argentina, as well as Brazil and Paraguay, Kirwan *et al.*⁸⁷ describe the nest of **Bay-ringed Tyrannulet** *Phylloscartes sylviolus* and discuss the relationships of related species of tyrannids based on our cumulative knowledge of their nest architecture. **Tawny-throated Dotterel** *Oreopholus ruficollis* has been found breeding in Salta (and north-west Argentina) for the first time³⁷. The first record of **Southern Screamer** *Chauna torquata* in Catamarca has been reported, along with other waterbird records from the centre and west of the country⁴⁴. The first record of **Eastern Kingbird** *Tyrannus tyrannus* for Santa Cruz was documented with photographs; this appears to be the southernmost occurrence of the species on record¹¹². **Andean Flamingo** *Phoenicoparrus andinus* has been found breeding at a site in Mendoza¹⁵¹, with **James' Flamingo** *P. jamesi* discovered at three new breeding localities in the north-west of the country⁴⁷, and records of **Magellanic Plover** *Pluvianellus socialis* from La Rioja extend the species' known range some way to the north¹⁵⁰. Cockle & Bodrati³⁵ review the current status of the globally threatened **Black-fronted Piping Guan** *Pipile jacutinga* in Argentina, where there are 18 localities with modern records. New records of **Black-and-chestnut Eagle** *Spizaetus isidori* are available from five localities in Jujuy and Salta³⁶. **Mississippi Kite** *Ictinia mississippiensis* has been recorded in central Santa Fe for the first time¹³. Allende *et al.*¹¹ provide new information on the distribution and abundance of four Argentine endemics—**Steinbach's Canastero** *Asthenes steinbachi*, **White-throated Cachalote** *Pseudoseisura gutturalis ochroleuca*, **Sandy Gallito** *Teledromas fuscus* and **Cinnamon Warbling Finch** *Poospiza ornata*—in the provinces of Catamarca and La Rioja. Surveys between 1994 and 2009 registered a total of 308 bird species in Mburucuyá National Park, Corrientes, among them

nine globally threatened species³². The second **White-throated Hummingbird** *Leucochloris albicollis* record for Córdoba province is reported¹⁶⁷. Lowen & Mazar Barnett³⁷ present new records of rare species in a new Important Bird Area in Buenos Aires province, among them **Hudson's Canastero** *Asthenes hudsoni*, **Bay-capped Wren-Spintail** *Spartonicoa maluroides* and **Bearded Tachuri** *Polystictus pectoralis*. Added to the avifauna of the same province is **Boat-billed Flycatcher** *Megarynchus pitangua*, representing a range extension of >600 km south¹¹⁰. Luna & Manassero⁹⁹ present data on 12 rare or previously unrecorded species in Santa Fe, including **Puna Flamingo** *Phoenicoparrus jamesi*, **Dot-winged Crake** *Porzana spiloptera*, **Buff-breasted Sandpiper** *Tryngites subruficollis* and **Olog's Gull** *Larus atlanticus*. **Orinoco Goose** *Neochen jubatus* has been seen in Catamarca, the first provincial record and only the second recent record in the country¹⁷, while the first documented record for Santiago del Estero of **Andean Condor** *Vultur gryphus* was reported recently³⁸. Maceda & Erro¹⁰¹ mention three new species for La Pampa: **Rufous-browed Peppershrike** *Cyclarhis gujanensis*, **Red-eyed Vireo** *Vireo olivaceus* and **Dark-bellied Cinclodes** *Cinclodes patagonicus*.

Bolivia

A detailed study of nest site selection by the small population of **Swallow-tailed Cotinga** *Phibalura flavirostris boliviana* (sometimes treated specifically) in the country has been published¹³⁹. Vidoz *et al.*¹⁶¹ present noteworthy records from four localities within Parque Nacional Kaa-Iya del Gran Chaco, in dpto. Santa Cruz, among them five new species for the Bolivian Chaco. Data on the nest, eggs and young of the **Carmioli's Tanager** *Chlorothraupis carmioli* have been presented from Bolivia¹⁰⁴.

Brazil

One of the most remarkable records reported recently is that of the first **White-winged Tern** *Chlidonias leucopterus* for Brazil and South America, which involved a bird photographed in Rio Grande do Sul in November 2008⁸. Another first country record was that of a **Lesser Shrike-Tyrant** *Agriornis murinus*, also photographed in Rio Grande do Sul, in April and July 2009⁹⁰.

White-cheeked Tody-Tyrant *Poecilatriccus albifacies* has been confirmed to occur in western Brazil, based on photographs and specimens taken at two sites in Acre¹⁶⁸. In addition, **Sharp-billed Canastero** *Asthenes pyrrholeuca* can be confidently considered part of the Brazilian avifauna based on a road-killed specimen obtained recently in southern Rio Grande do Sul¹²¹. The second Brazilian records of **Eurasian Kestrel** *Falco tinnunculus* and **Little Egret** *Egretta garzetta* were made recently, both on the tiny archipelago of São Pedro e São Paulo, off north-east Brazil¹⁴⁴. Davis⁴⁶ reports the fourth Brazilian record of **Squacco Heron** *Ardeola ralloides*, again on the island of Fernando de Noronha, and further speculates as to the possibility that the species will commence breeding there.

A review of our knowledge of the Brazilian endemic **Golden Parakeet** *Guarouba guarouba* suggests that its range might be contracting westwards presumably in response to increasing deforestation within what was previously considered to be the species' core range⁹². Mestre *et al.*¹¹¹ present a list of the 344 species known from the RESEX Chico Mendes in southern Acre, including several that are still poorly known in Brazil. Separately, Aleixo & Guilherme¹⁰ provide a summary of our knowledge of the avifauna of the Estação Ecológica do Rio Acre in the same state. Lopes *et al.*⁹⁵ present recent records and range extensions for 12 threatened or little-known grassland species: **Ocellated Crake** *Micropygia schomburgkii*, **Sickle-winged**

Nightjar *Eleothreptus anomalus*, **Campo Miner** *Geositta poeciloptera*, **Rufous-sided Pygmy Tyrant** *Euscarthmus rufomarginatus*, **Sharp-tailed Grass Tyrant** *Culicivora caudacuta*, **Cock-tailed Tyrant** *Alectrurus tricolor*, **Cinereous Warbling Finch** *Poospiza cinerea*, **Black-masked Finch** *Coryphasiza melanotis*, **Tawny-bellied Seedeater** *Sporophila hypoxantha*, **Marsh Seedeater** *S. palustris*, **Chestnut Seedeater** *S. cinnamomea* and **Black-bellied Seedeater** *S. melanogaster*.

Recently published new state records include the first **White-bellied Seedeater** *Sporophila leucoptera* for Rio Grande do Sul¹⁹; the first **Blackish-blue Seedeater** *Cyanoloxia moesta* for Goiás⁴⁵; the first **Yellow-nosed Albatross** *Thalassarche chlororhynchos* for Maranhão²⁷; the first records of **Black Noddy** *Anous minutus* and **Grey-headed Gull** *Chroicocephalus cirrocephalus* for São Paulo¹⁶; and the first **Kelp Gull** *Larus dominicanus* for Pernambuco⁹⁴. Furthermore, **Grey-bellied Goshawk** *Accipiter poliogaster* has been added to the avifauna of Paraná⁹⁰ and **Least Sandpiper** *Calidris minutilla* to that of São Paulo⁴⁰. A survey of *cerrado* localities in southern Maranhão yielded the first **Broad-winged Hawk** *Buteo platypterus* for the state¹⁴⁶. Among many records of birds rarely recorded in Santa Catarina are three new for the state: **Tawny-throated Dotterel** *Oreopholus ruficollis*, **Chilean Swallow** *Tachycineta meyeni* and **White-banded Mockingbird** *Mimus triurus*⁶⁶. **White-winged Potoo** *Nyctibius leucopterus* has been found in Espírito Santo, remarkably in the comparatively well-worked Sooretama Biological Reserve³⁹. **Pileated Finch** *Coryphospingus pileatus* appears to be expanding its range southwards³¹; its presence in São Paulo has been documented recently. Godoy⁶⁹ reports a documented record of **Ash-throated Cuckoo** *Coccyua cinerea* in the same state, while Crozariol⁴¹ describes

observations of **Stygian Owl** *Asio stygius*, a species rather poorly known in Brazil, also from São Paulo. Despite many years of observations in the area, the poorly known **Boat-billed Tody-Tyrant** *Hemitriccus josephinae* has recently been found in the *terra firme* forests north of Manaus, Amazonas⁸³. An **Azure Gallinule** *Porphyrio flavirostris* was a remarkable first record for Rio Grande do Sul⁵⁰. Other additions to the avifauna of the same state include the globally threatened **Black-backed Tanager** *Tangara peruviana*¹³⁸, as well as **Least Tern** *Sternula antillarum*⁹ and **Chestnut-eared Aracari** *Pteroglossus castanotis*¹⁰⁷. **Friiled Coquette** *Lophornis magnificus* is an addition to the avifauna of Tocantins⁴², as is **Elegant Mourner** *Laniisoma elegans* to the state of Goiás⁵⁷. **Sooty-fronted Spinetail** *Synallaxis frontalis* has been documented for the first time in the state of Rio de Janeiro²⁰, and **Swainson's Hawk** *Buteo swainsoni* in the municipality of the same name¹⁴⁹. **Rusty-breasted Nunlet** *Nonnula rubecula* has been found in Rio Grande do Sul¹⁰⁸. Girão & Albano⁶⁸ have reviewed our fragmented and relatively poor knowledge of the status and distribution of **Buff-fronted Owl** *Aegolius harrisi* in the country, as well as providing new biological data from north-east Brazil. Knowledge of the range of **Minas Gerais Tyrannulet** *Phylloscartes roquettei*, once thought to be highly circumscribed, continues to improve; the species has now been found at three localities in Bahia¹⁴⁷. Another globally threatened bird, **Orange-bellied Antwren** *Terenura sichi* has been found for the first time in lowland forest, in southern Pernambuco⁵. **Blue-crowned Parakeet** *Aratinga acuticaudata* has been located at a new locality in northern Minas Gerais¹²⁰. **Andean Flamingo** *Phoenicoparrus andinus*, which is apparently only a vagrant to southern Brazil, has been recorded recently at two localities in Santa Catarina, both

in considerable numbers and for prolonged periods, suggesting that the species' status in the country demands renewed consideration⁶⁷. A record of **Yellow-shouldered Grosbeak** *Parkerthraustes humeralis* from Tangará da Serra, Mato Grosso, appears to the southernmost to date for the species¹²⁶. Piacentini *et al.*¹³² document the expansion of **Bare-faced Ibis** *Phimosus infuscatus* into the southern state of Santa Catarina. At a local scale, **Black-bellied Whistling Duck** *Dendrocygna autumnalis* is a recent addition to the list of birds recorded in the municipality of Rio de Janeiro¹²⁴, while the southward expansion in range by **Wing-banded Hornero** *Furnarius figulus* has now reached the city of São Paulo¹⁰⁹, as well as many other parts of the state⁹⁸. **Sooty Grassquit** *Tiaris fuliginosa* has also been recorded for the first time in the city of São Paulo⁷⁰.

Novel breeding data published since our last review include a nest of the globally threatened **Minas Gerais Tyrannulet**⁶, nesting behaviour of **Lesser Nighthawk** *Chordeiles acutipennis* in eastern Amazonia³⁰, of **Lined Seedeater** *Sporophila lineola* in southern Brazil¹²⁵, breeding biology of **White-rumped Tanager** *Cypsnagra hirundinacea*¹⁴⁵, a **Planalto Woodreeper** *Dendrocolaptes platyrostris* nesting in a building⁸¹, and a description of the nest and eggs of **Zigzag Heron** *Zebriulus undulatus* from southern Mato Grosso⁵⁶. Knowledge of nesting and parental care in **White-wedged Piculet** *Picumnus albosquamatus* and **Little Woodpecker** *Veniliornis passerinus* has been improved⁷⁶. A study based in the Serra do Cipó, Minas Gerais, yielded novel data on breeding biology of two species of *Emberizoides* grass finch and the endemic **Pale-throated Serra Finch** *Embernagra longicauda*¹³⁶. A detailed study of breeding behaviour of **Buff-breasted Wren** *Thryothorus leucotis* has been published⁷. **Wilson's Plover** *Charadrius wilsonii* has been found breeding in Todos os

Santos Bay, Bahia¹⁰⁰. In addition, **Bay-capped Wren-Spintail** *Spartonoica maluroides* has been recorded nesting in Brazil for the first time⁴⁹.

Chile

The first **Whistling Heron** *Syrigma sibilatrix* in Chile involved a bird photographed in the Metropolitan Region between December 2009 and January 2010⁵¹. The sighting of a **Lesser Nighthawk** *Chordeiles acutipennis* in the north of the country in September 2009 has now been fully documented⁶⁰ (cf. *Cotinga* 32: 172). Until recently thought to be extinct in the coastal region of central Chile, **Burrowing Parrot** *Cyanoliseus patagonus* has been rediscovered in the region of Bernardo O'Higgins¹⁴. Additionally, **Black-necked Swan** *Cygnus melancoryphus* has been recorded on the coast of central Chile for the first time in 25 years¹⁵⁴. Lara *et al.*⁹¹ have presented a study into the breeding biology of **Wren-like Rushbird** *Phleocryptes melanops*. The endemic **Slender-billed Parakeet** *Enicognathus leptorhynchus* has been discovered nesting further south in the country than previously suspected¹²⁹. Highlight observations from the period late 2009 to early 2010 reported in the online birdwatchers' bulletin, *La Chiricoca*, include the following¹⁸. Both **Fulvous Whistling Duck** *Dendrocygna bicolor* (February 2010) and **White-faced Whistling Duck** *D. viduata* (December 2009) were recorded in the Metropolitan Region (both are considered vagrants in Chile, and both species were photographed), while there were two records involving three individuals of **King Penguin** *Aptenodytes patagonicus* in the far south of the country in December 2009. Further north, a **Blue-footed Booby** *Sula nebouxii* was photographed at Arica in December 2009. Among shorebirds, a **Stilt Sandpiper** *Calidris himantopus* in the north of the country in November 2009 was the most unusual. Rare terns included a **Peruvian Tern**

Sternula lorata in November 2009 and a **Sandwich Tern** *Thalasseus sandvicensis* in December 2009. The Metropolitan Region also produced the first Chilean record of **Spot-winged Pigeon** *Patagioenas m. maculosa* in February 2010 (photographed; *P. m. albipennis* is present in the far north of the country around Putre). A new species for the country was a **Sulphur-bellied Flycatcher** *Myiodynastes luteiventris*, photographed in the far north in November 2009, while other interesting vagrants recorded during in December 2009 included a **Fork-tailed Flycatcher** *Tyrannus savanna*, the first **Swainson's Thrush** *Catharus ustulatus* for the country, and a **Creamy-bellied Thrush** *Turdus amaurochalinus*, all of which were photographed.

Colombia

Several first country records have been published recently. The first **Cory's Shearwater** *Calonectris diomedea* for the country involved an individual of the form *C. d. borealis* found dead in May 2009 on the Caribbean coast¹⁴². Off the Pacific coast, a **Westland Petrel** *Procellaria westlandica* was photographed at sea in February 2007⁵⁵. Another 'first' involved a male **Yellow-faced Siskin** *Carduelis yarrellii* photographed in dpto. Casanare in September 2006, although the possibility exists the bird was an escapee²⁹. Furthermore, Naranjo¹²² has recently drawn attention to, and validated, two seabird records for Colombia that were originally published in relatively 'obscure' publications, namely **Black-browed Albatross** *Thalassarche melanophris* and **Least Tern** *Sternula antillarum*. The so-called **Todd's Parakeet** *Pyrrhura picta caeruleiceps* has been rediscovered in dpto. Norte de Santander, following more than 60 years without records¹⁵⁶. The globally threatened **Blue-billed Curassow** *Crax alberti* has recently been found in dry tropical forest in the Sierra Nevada de Santa Marta¹⁵². Cadena-López & Naranjo²⁵ have published

details of a seabird survey on Gorgona Island, which yielded 20,000 breeding individuals, of which by far the most numerous was **Blue-footed Booby** *Sula nebouxi*. Among recently published breeding records, the descriptions of the nests of the endemic **Black-fronted Wood Quail** *Odontophorus atrifrons*¹⁵³ and **Gold-ringed Tanager** *Bangsia aureocincta*⁶¹, and the first breeding records of the isolated population in Colombia of **Horned Lark** *Eremophila alpestris* are the most noteworthy²³.

Ecuador

Camacho & Wilson²⁶ report a new documented record of **Cinnamon Teal** *Anas cyanoptera* from the western lowlands and review the species' status in Ecuador. The country's fourth record of **Pearly-breasted Cuckoo** *Coccyzus euleri* involves a previously overlooked early-20th-century specimen³⁴. Freile *et al.*⁶² present a detailed resumé of our knowledge of **Royal Sunangel** *Heliangelus regalis* in the south-east of the country. Among recent novel breeding data for the country, mention must be made of the first descriptions of the nests of **Flammulated Thrupadectes** *Thrupadectes flammulatus* and **Striped Treehunters** *T. holostictus*¹⁶⁹, and the nest and eggs of **Chestnut-headed Crane** *Anuroilmnas castaneiceps*²⁴. Karubian *et al.*⁸⁶ have provided the first breeding data for the globally threatened **Brown Wood Rail** *Aramides wolfi*. Further interesting breeding observations include only the second-ever nest of **Brown Nunlet** *Nonnula brunnea* to be discovered⁷⁴, the first nests of **Undulated Antpitta** *Grallaria squamigera*⁷³ and **Jocotoco Antpitta** *G. ridgelyi*⁷², breeding biology notes for **Esmeraldas Woodstar** *Chaetocercus berlepschi*⁸⁵, **Smoke-coloured Pewee** *Contopus fumigatus*⁵³ and **Beautiful Jay** *Cyanolyca pulchra*⁹³, and a study of the nesting of the globally threatened **Galápagos Petrel** *Pterodroma phaeopygia*⁴³. Greeney *et al.*⁷⁵ have also furnished notes

on breeding for highland birds in northern Ecuador.

French Guiana

Ingels *et al.*⁸⁰ describe the first two records of **White Wagtail** *Motacilla alba* in the country, in September and October 2009, one of which was photographed, as well as discussing other records of the species on Barbados and Trinidad. Another new species for French Guiana is **Pearly-breasted Cuckoo** *Coccyzus euleri*, which has been recorded twice recently, being documented with photographs and sound-recordings³⁴.

Peru

Broad-billed Prion *Pachyptila vittata* has recently been recorded for the second time in the country⁷⁸. Two active nests of the globally threatened **Peruvian Plantcutter** *Phytotoma raimondii* were discovered recently, substantially amplifying our knowledge of this species' breeding biology¹⁴⁰. Other breeding data published based on studies in Peru include information on the nest and eggs of **Ochraceous-breasted Flycatcher** *Myiophobus ochraceiventris*¹³⁰. Based on reports by local people, Mark¹⁰³ discusses the possibility that an isolated population of **White-winged Guan** *Penelope albipennis* persists in the upper Marañón Valley. **Yellow-crowned Night Heron** *Nyctanassa violacea* appears to be expanding its range in the country, with recent records from three coastal departments virtually throughout the country¹⁵⁷. The breeding biology of the globally threatened **Peruvian Tern** *Sternula loricata* has been subject to a detailed study at two sites in the northern half of Peru⁸⁸. New breeding data for **Slender-billed Finch** *Xenospingus concolor* have been made available⁴. A new northernmost breeding site in the country for **Kelp Gull** *Larus dominicanus* has been discovered⁵⁹. Two new breeding localities for **Oilbird** *Steatornis caripensis* have been found in dpto. Puno¹⁶⁴. A **Marbled Godwit**

Limosa fedoa was photographed at Ite, dpto. Tacna, in February 2010¹⁶⁶, from which site Vizcarra¹⁶³ has provided a recent summation of interesting ornithological records. In the same region, two subspecies of **Black-faced Ibis** *Theristicus melanopus* have been found in sympatry¹⁶², and an altitudinal and geographical range extension for **Giant Hummingbird** *Patagona gigas* has been reported¹⁶⁵.

Uruguay

The first record of **Trindade Petrel** *Pterodroma arminjoniana* in the country's waters involved a bird photographed at sea in April 2007³. Other recently published 'firsts' for Uruguay include a **Cape Gannet** *Morus capensis* photographed in October 2008⁶³, and an exhausted **noddy** *Anous* sp. photographed in December 2004², while a **Boat-billed Flycatcher** *Megarhynchus pitangua* was photographed and sound-recorded in December 2008¹.

Venezuela

Marantz *et al.*¹⁰² report the first records from Venezuela of **White-winged Nyctibius** *leucopterus* and **Rufous Potoos** *N. bracteatus*, both of which species were documented with sound-recordings. Breeding notes on **Slate-throated Whitestart** *Myioborus miniatius*¹⁴¹, **Fawn-breasted Tanager** *Pipraeidea melanonota*¹² and **Golden-faced Tyrannulet** *Zimmerius chrysops*⁷¹ have been published.

OTHER RECORDS RECEIVED

Brazil

On 26 July 2010 an adult male **Dark-throated Seedeater** *Sporophila ruficollis* and a **White-tailed Hawk** *Buteo albicaudatus* were observed at the Cerrado enclave of Fazenda Açua, Canutama municipality, Amazonas. Also present there were **Plumbeous Seedeater** *Sporophila plumbea*, **Black-masked Finch** *Coryphaspsiza*

melanotis, **White-rumped Tanager** *Cypsnagra hirundinacea* and **Sharp-tailed Grass Tyrant** *Culicivora caudacuta* (FO, ER, SR). In São Paulo, a **Willet** *Tringa semipalmata* was photographed at Perequê-Açu, Ubatuba, on 11 March 2011 (ES, RS), which is apparently the first record for the state. Furthermore, between 16 and 18 April 2011, a female / immature **Patagonian Negrito** *Lessonia rufa* was photographed at Ubatuba airfield (RS); this is the second state record and the northernmost ever in Brazil.

Cuba

Potentially the fifth Cuban record, a **Masked Booby** *Sula dactylatra* was claimed off La Habana on 12 February 2010 (ME & JS). A male **Cerulean Warbler** *Dendroica cerulea* was at Los Sabalos, Zapata, on 2 April 2009 (HL) and two **Dunlins** *Calidris alpina* were at La Salina, Zapata, on 7 February 2010 (ME *et al.*); both species are rarely recorded in Cuba. The following records are all from 2011. At least 40 **American Avocets** *Recurvirostra americana* were observed on Cayo Coco on 10 March (AGi; Fig. 1) and up to eight were present during the late winter at La Salina, Zapata, with two still there on 27 March (AK, GMK *et al.*). Rare migrants included a **Pectoral Sandpiper** *Calidris melanotos* on Cayo Guillermo on 1 April (SC, RJJ, SJ, GMK, JL), with a partial summer plumage **Dunlin** digiscoped there on 16 April (Fig. 2), an **Orchard Oriole** *Icterus spurius* at La Güira on 13 April, and a **Black-billed Cuckoo** *Coccyzus erythrophthalmus* at Bermejas, Zapata, on 18 April (GMK *et al.*). There are only two previous spring records of the last-named, while the Dunlin photographs represent the first documented record of the species for the island. An earlier record from Cayo Coco (cf. Wallace *et al.*, 1999, *Florida Field Natur.* 27: 37–51; see also *Cotinga* 14: 106), which too was photographed, is not in fact identifiable from the image (AK pers. comm. to GMK). Up to two **Bananaquits** *Coereba flaveola* were present on Cayo



Figure 1. Flock of American Avocets *Recurvirostra americana*, Cayo Coco, Cuba, 10 March 2011 (Ann Gifford)



Figure 2. Partial summer-plumaged Dunlin *Calidris alpina*, Cayo Guillermo, Cuba, 16 April 2011 (Guy M. Kirwan)



Figure 3. House Crow *Corvus splendens*, Cayo Guillermo, Cuba, 25 November 2007 (Richard Ford; www.digitalwildlife.co.uk)

Cayo Coco on 10 March (AGi) to at least 5 April (JH; <http://www.flickr.com/photos/sequella/5623601225/in/set-72157626501654848>), and what was presumably a separate individual was seen on Cayo Paredón Grande on 11 March (AM). There are still surprisingly few Cuban records of this species, which is widespread and common through much of the rest of the West Indies. At least the Cayo Coco birds pertained to the subspecies *C. f. bahamensis*, and it is probable that most, if not all, Cuban records involve this taxon. The presumably ship-assisted **House Crow** *Corvus splendens*, originally reported on Cayo Guillermo in March 2008 (cf.

Cotinga 30: 92) but in fact first seen as long ago as 25 November 2007 (RF; Fig. 3), was still present on the same island in mid-April 2011 at least (AK, GMK *et al.*).

Curaçao

On 26 October 2010 two **Greater Anis** *Crotophaga major* were photographed in mangrove near the island's harbour of Curaçao, which is apparently the first record for the island (EN; <http://www.flickr.com/photos/55364434@N05/5137814252/>).

Falkland Islands

Recent bird sightings on the islands are posted by resident birder AH at <http://surfbirds.com/blog/falklandbirder/>. One of the few records of **Neotropic Cormorant** *Phalacrocorax brasilianus* in the islands involved two birds photographed on Big Pond, Pebble Island, on 13 November 2010 (AW per AH). A **Patagonian Mockingbird** *Mimus patagonicus* was present at Shallow Harbour, West Falkland, on at least 21–23 July 2010 (AH); this was the first record since 1992 and apparently only the fourth ever. Another rare vagrant, a **Wilson's Phalarope** *Phalaropus tricolor* was present at Cape Pembroke, East Falkland, for about a week in early October 2010, the first record since 2007 (MM, SM, AH).

Grenada

The following records were submitted by AG and all pertain to the period 1–13 October 2010. A **Purple Gallinule** *Porphyryla martinica* was photographed at Grand Anse Lily Pond. There were singles of **Northern Jacana** *Jacana spinosa* at Levera Pond and at the Rex Hotel (the latter photographed). Twenty-five **Willetts** *Catoptrophorus semipalmatus* were seen at Magazine Beach. Up to three **Yellow-billed Cuckoos** *Coccyzus americanus* were present around the airport (photographed). An unidentified **swift** was feeding over Magazine Beach. Single **Cave Swallows** *Petrochelidon fulva* were present at the airport fields and at the Rex Hotel, and a flock

of c.80 **Bobolinks** *Dolichonyx oryzivorus* was also at the airport fields (some photographed). Some of these species appear to be new records for the island.

Mexico

As an addendum to the last issue (cf. *Cotinga* 32: 174), it should be noted that there at least ten well-documented records of **Ruff** *Philomachus pugnax* in Mexico since the mid 1990s, including at least three in Baja California and one in Yucatán (per SNGH).

US Virgin Islands

A **Greater Ani** *Crotophaga major* was photographed at Rust-op-Twist Pond, a brackish wetland on St. Croix, on 26 October 2010, well north of the species' usual range and the first record for the West Indies (CC-B, LY; <http://flic.kr/p/8PwC3e>). See also Curaçao.

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Reviews



Field guide to the birds of Colombia by Miles McMullan, Thomas M. Donegan and Alonso Quevedo, 2010. Bogotá: Intergraficas SA. 244 pp, 225 colour plates and many distribution maps. Softback. ISBN 978-0-9827615-0-2-52995. US\$29.95.

When I first visited Colombia 18 years ago, I used the guide by Hilty & Brown¹. This superb book was my introduction to the birds of the Neotropics and I spent many hours preparing for my visit, 'drooling' over the plates 'dripping' with Guy Tudor's antbirds and tanagers. Since then, my beloved copy has become progressively more battered and annotated, and so it was with interest that I came across this new guide when researching my latest visit in 2010.

In recent years it has become the norm for Neotropical guides to be published in two volumes: a 'field guide' and a volume covering taxonomy, behaviour, etc. The sheer size of Neotropical avifaunas lend themselves well to such a treatment, but for some users the size of these guides is a genuine problem. This new book, published in association with the Colombian conservation NGO ProAves, takes a radically contrasting approach. The single volume weighs in at <400 g, a whole kilogram lighter than Hilty and Brown's guide. How was this achieved and more importantly at what cost to the information available?

With any guide, the plates are key. Given that Colombia's avifauna comprises over 1,880 species, fitting all those birds in becomes a tricky task. For the most part, the guide achieves this admirably. Many of the plates cover ten or more species including the figures, maps, elevational ranges, conservation status and supporting text! The plates of *Tangara* tanagers, for example, show 20 species over a double-page spread, leading to easy comparison and identification of what are generally distinctive birds. Most pages do not appear 'cramped' yet there is little 'wasted' space. Inevitably, such limited space causes more problems with other groups—woodcreepers, for example, are hard to cover adequately in this format. Most of the figures are perfectly adequate, although their style is not always to my taste. The contrast between the bold, 'blocky' illustrations in Hilty & Brown¹ and these is strong—some, such as the hummingbirds and fruiteaters have a 'scrappy' feel to my eyes. Other species are especially poorly served. In life, the stunning

Azure-naped Jay *Cyanocorax heilprini* certainly looks nothing like its bright turquoise picture here, while Hoary Puffleg *Haplophaedia lugens* and Greenish Puffleg *H. aureliae* are more distinctive than they appear on the plate, and White-browed Spinetail *Hellmayrea gularis* is too long-tailed. White-throated Crake *Laterallus albigularis* is depicted with the feature for which it is named, but no mention is made that the subspecies over much of the country has a uniform rufous head and throat. A plateful of 15 species of tapaculo shows many species as being misleadingly distinctive, although at least the header warns they should never be identified 'by sight alone'. You might struggle to identify tyrant flycatchers using the figures alone, but a nice addition is a summary of each main genus, describing features such as wing-lifting by *Phyllomyias* and *Leptopogon* species.

The taxonomy is extremely up to date, incorporating many fresh discoveries (e.g. Alto Pisones Tapaculo *Scytalopus* sp.), recently described species (Gorgeted Puffleg *Eriocnemis isabellae*, Chestnut-capped Piha *Lipaugus weberi*, Parker's Antbird *Cercomacra parkeri* and the controversial Fenwick's Antpitta *Grallaria fenwickorum*) and splits (e.g. Chestnut-winged Cinclodes *Cinclodes albidiventris*, the warbling antbirds *Hypocnemis* sp. and Colombian Brush Finch *Arremon basilicus*). The latter is one of the splits included in the book yet to be accepted by the South American Classification Committee, although a proposal was pending at the time of writing. Many of these various 'new' species are illustrated for the first time. Scientific names are mostly correct, although all of the *Scytalopus* are labelled '*Scytolopus*' and the same misspelling is used in the introduction to the genus.

The text itself is necessarily brief consisting mostly of an indication of abundance (should Stipple-throated Antwren *Epinecrophylla haematonota* really qualify as rare, given that it is locally common in the east of the country?) and habitat summaries. For some species, vignettes or notes describe behaviour. For example, the distinctive wing-flicking of Long-tailed Antwren *Myrmotherula longipennis* is mentioned although not the tail 'switching' of the confusable Grey Antwren *M. menetriesii*. Vocal descriptions are presented for some species, although the choice occasionally seems arbitrary. The primary songs of most *Scytalopus* are described, although not those of Alto Pisones, Perijá *Scytalopus* sp. or



Paramillo Tapaculos *S. canus*. The vocalisation of Rusty-margined Flycatcher *Myiozetetes cayanensis* is mentioned, but not that of some other tyrant flycatchers, such as the distinctive call of Yellow-throated Spadebill *Platyrinchus flavigularis*. Bafflingly, White-eyed Tody-Tyrant *Hemitriccus zosterops* and Johannes's Tody-Tyrant *H. iohannis* are both accompanied by the mysterious 'must know call' with no indication as to what either vocalisation might be. Some indication of vocalisations would be useful for other groups too, such as trogons and antbirds.

The distribution maps are presented alongside the illustrations. They are generally up to date and considerable effort has clearly been expended to incorporate the explosion of recent field work in the country. Mapping is mostly excellent, although that for the east is less comprehensive, partly reflecting the relative lack of observer coverage. White-tipped Swift *Aeronautes montivagus* and Brown-throated Parakeet *Aratinga pertinax* both occur in Guainía for example (pers. obs.) although some of us are guilty of not publishing as much as we should! Perhaps the greatest shortcoming of this guide is the method in which ranges are demarcated. A mid green shading represents the range of resident species. Although clear for widespread birds, this approach hits serious problems with others. Those with local and restricted ranges and those occurring over narrow altitudinal bands often possess maps that are unclear at best and in the worst cases appear completely blank. On my recent trip, I struggled to find any evidence of colour on the map for Dusky Starfrontlet *Coeligena orina*. Some ranges (Rufous-headed Chachalaca *Ortalis erythroptera*, Plain-tailed Wren *Pheugopedius euophrys*, Alto Pisones Tapaculo and Bicoloured Antvireo *Dysithamnus occidentalis*) are revealed only if the book is tilted under a bright light! Revised colour or depth of shading or the use of arrows for restricted-range species would improve the maps enormously, which ideas have already been mooted

for the Spanish edition. Interestingly, the maps in Restall *et al.*² are of an almost identical size but are much clearer. Compare the ranges of Dark-backed Wood Quail *Odontophorus melanonotus* in the two volumes as just one example. The introduction also states that four cities are marked on each map, presumably to assist orientation. That for Bogotá, at least, is visible on some but the other three eluded me in most cases, unless using a magnifying glass. It should be stated that there are excellent, larger maps in the introduction covering physical and political divisions, vegetation and rainfall, as well as Endemic Bird Areas, protected areas and reserves. These are a real 'plus' in attempting to understand the country's complex biogeography and the huge resultant biodiversity.

The index is restricted to a list of 'English genus names'. Given the number of species per plate, this generally works well in the field, although it is much easier to track down a specific piha than tyrannulet for obvious reasons. Finally, the book includes appendices of Colombian endemics and near-endemics, as well as the avifaunas of San Andrés and the other principal offshore islands.

So is this guide really suitable for its stated market: for the 'birder and the bird-watcher, from international listers to Colombians with an interest in their garden birds'? As a slim lightweight guide to use in the field, then its size belies a wealth of content sufficient to identify most species. Problems inevitably arise when you need more information than a single small illustration and two lines of text can provide. Faced with a difficult woodcreeper or female hummingbird, a more detailed volume such as Restall *et al.*², Ridgely & Tudor³ or Hilty & Brown¹ will be necessary to nail the identification. Despite this, this book shows how much can be packed into a tiny format and, what's more, all profits go towards conservation and education in Colombia. The country is finally taking off as a mainstream birding destination, reflecting the improved security and the efforts of local birding organisations. There has never been a better time to visit. Get a copy, book a flight and as they say in Colombia, "listo el pollo!". Just nail down that Sooty-capped Puffbird *Bucco noanamae* for me.

Jonathan Newman

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Wildlife Conservation Society birds of Brazil: the Pantanal and Cerrado of central Brazil by John A. Gwynne, Robert S. Ridgely, Guy Tudor and Martha Argel, 2010. Ithaca, NY: Cornell University Press. 322 pp, 142 colour plates, and many colour photographs and maps. Softback. ISBN 978-0-8014-7647-4. UK£22.95.

As most readers of this journal will be aware, within the last decade (and especially five years) there has been a ‘rash’ of field guides designed to tackle the enormous ‘breach’ that is the Brazilian avifauna, the most recent being van Perlo’s⁷ (reviewed in these pages by Alexander Lees, *Cotinga* 32: 186–187). While the last-named guide is arguably the pick of the bunch, it still leaves much to be desired, with the most practical fault for inexperienced users probably being its wholly inappropriate dimensions. That the book’s author and artist had scarcely even minimal exposure to Brazilian birds must also be remembered.

The authors of the work under review here certainly cannot be accused of the same failing. Artist John Gwynne has joined forces with the redoubtable duo of Bob Ridgely and Guy Tudor, whose names surely need no introduction, and long-standing student of Brazilian birds, Martha Argel, who also has been responsible for producing a Portuguese edition of the same book. On top of this, an advisory panel of 20 distinguished names (listed opposite the title page) was assembled to guide the project, and an additional six artists (other than Gwynne and Tudor) were responsible for the plates for this volume.

This volume marks the introduction to a planned five-strong series of guides covering the entire Brazilian avifauna, published under the auspices of the Wildlife Conservation Society (WCS) of New York, and it covers some 743 species deemed by the authors to have occurred in central Brazil. It must be said at the outset that while most birders probably can identify the location of the Pantanal—that vast watery plain in the heart of South America—on a map, many of them will be distinctly less sure of the boundaries of the Cerrado region, which forms the greater part of the geographical area covered by this book. In sum, the region covered encompasses the states of Mato Grosso do Sul, Goiás, the Distrito Federal and Tocantins in their entirety, with southern Mato Grosso, northern Minas Gerais, westernmost Bahia, south-west Piauí, and southern Maranhão also included. Despite this regional approach making biogeographical sense, it must be remarked that many birders visiting from Europe or North America are quite likely to combine a trip to the Pantanal with the world-renowned Cristalino Jungle Lodge, or the Serra da Canastra National Park, in northern Minas Gerais, with the coastal



endemics of the Atlantic Forest. If you do, then this book will not meet all of your identification ‘needs’!

Following a series of short introductory sections, which are liberally illustrated with attractive colour photographs throughout and which introduce the region, its habitat, conservation—both problems and successes (although to date the latter appear to have been vastly outnumbered by the losses)—come the species accounts and plates. Text, sometimes surprisingly detailed, and colour maps face the plates, with typically five or six species treated in full on a double-page spread, although some deal with as few as three species. Clever use of symbols highlight globally threatened birds and Brazilian endemics and near-endemics. ‘Précis’ texts summarise information on species (not illustrated) with only a toehold in the region (e.g., White-browed Antpitta *Hylopezus ochroleucus* and Minas Gerais Tyrannulet *Phylloscartes roquettei*) or that are known solely as vagrants (e.g., Rosy-billed Pochard *Netta peposaca*) or at least comparatively rare visitors (e.g., Veery *Catharus fuscescens*). This approach works particularly well for the latter group, but a less experienced birder heading for the São Francisco Valley, in northern Minas Gerais, which is considerably less ‘off the beaten track’ than it was two decades ago, might reasonably question the lack of illustrations of species such as the tyrannulet and the antpitta. The rationale for the non-inclusion of an illustration of the globally threatened Black-and-tawny Seedeater *Sporophila nigrorufa* appears even weaker. With the ‘talent’ showcased here, it should come as no surprise that the texts are largely excellent, and that they cover (well) both morphology and vocalisations. Other, ‘rival’ field guides to all or larger parts of Brazil have tended to ‘fall down’ on one or the

other of these facets in the field identification process. Furthermore, the ample space afforded to each main account means that status (spatial and temporal), habitats, and habits are all well covered too, where it is relevant to do so.

As already mentioned, the plates are the responsibility of eight artists, yet any concerns over a potential 'clash' of styles are swiftly allayed. As readers might well expect, the overwhelming majority of the passerines have been 'borrowed' from the recent *Birds of South America: passerines*⁸ (see review, by Huw Lloyd, *Cotinga* 32: 184–185), making their general quality assured. Nevertheless, by far the greater part of the non-passerines meet similar standards, with raptors (flight and perched) and nightbirds (flight images also are included for all nighthawks and nightjars) being among my favourites. Although one can observe occasional weaknesses in the plates, it would be distinctly unreasonable to level significant criticism at them, for, as a whole, they easily represent the best set of illustrations in a Brazilian field guide to date, and have set the bar way above what has come before, with the honourable exception of Eduardo Brettas' plates in the Sigris guides⁹.

A significant failing of all of the other Brazilian field guides published to date has been the quality of the mapping. Gwynne *et al.* make a much better 'stab' at this important aspect than previous works have done. Whereas van Perlo⁷, for example, significantly understated the ranges of (at least locally) common birds in central Brazil such as Whistling Heron *Syrigma sibilatrix*, Giant Wood Rail *Aramides ypecacha* and Golden-collared Macaw *Primolius auricollis*, all of these species, and many others, are far more accurately, although not necessarily perfectly, mapped in the work under review here (pers. obs.). Nonetheless, literature still appears to have been overlooked, rather than simply having 'missed' this book's cut-off point for inclusion. Manu Antbird *Cercomacra manu*, now known from at least three localities in Tocantins¹, does not appear at all, whilst others, e.g., Ringed Woodpecker *Celeus torquatus*, are certainly present around the Ilha do Bananal², or in northern Minas Gerais, e.g. White-necked Thrush *Turdus albicollis*⁵, but are neither mentioned nor mapped for these areas herein. Some ranges seem terribly over-estimated: Great-billed Seed Finch *Oryzoborus (Sporophila) maximiliani* is mapped for much of central Brazil in this guide, but has been surely 'depressingly' rare and confined to a few isolated localities already for more than a decade (pers. obs.). In part, the pace of ornithological discoveries in this region of Brazil has perhaps been simply too fast even for the authors and their advisors to keep pace with, making the failings of previous guides more understandable. There has certainly been a 'hailstorm' of more recent

publications updating our knowledge of avifaunal distribution, in Tocantins especially, which are not reflected in the maps presented herein. In this issue of *Cotinga* alone, several papers augment (sometimes massively) the known ranges of several species within the region covered by the WCS field guide, among them 'flagship' taxa such as the recently rediscovered and Critically Endangered Kaempfer's Woodpecker *Celeus obrieni*, mapped only for the state of Tocantins in this field guide, yet now known from multiple localities in Goiás^{3,6}, and even one in eastern Mato Grosso⁴. Of course, this makes one more good reason for more adventurous birders to head for the Brazilian Planalto! I am certainly aware of several additions to the avifauna of this region awaiting publication, among them at least one apparently new species to science.

Despite these few criticisms, there is no doubt that the WCS guide is the best yet to Brazilian birds, albeit only a geographical selection of them. Anyone contemplating a trip to this region alone need carry nothing else. The guides to the Atlantic Forest and Amazonia, in particular, which must now follow should be eagerly awaited by all those yet to sample the magnificent and dynamic avifauna of Brazil, as well as those contemplating a second, third, etc., visit.

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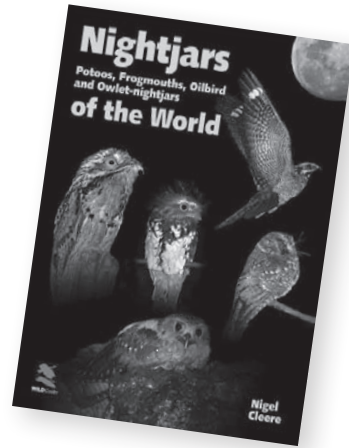
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Nightjars of the world by Nigel Cleere, 2010. Maidenhead: WildGuides & Princeton, NJ: Princeton University Press. 464 pp, 580 colour photos. Hardback. ISBN 978-06-91148-57-1. UK£45.

Nightjars and their allies have long attracted the attention of ornithologists and birders throughout the world. Their secretive habits make them very difficult to study, and their camouflaged plumage renders them almost invisible at rest. There is an element of mystery to them, due to their nocturnal lifestyle, cryptic appearance and strange vocalisations, which mean that they are heard far more than seen. This photographic guide by Nigel Cleere is certainly the single most useful book for identifying nightjars, potoos, frogmouths and owl-nightjars.

It treats no fewer than 135 extant species of the traditional Caprimulgiformes, depicting also many distinctive subspecies. Cleere's new book is more a desktop work than a field guide, but its size (25.0 × 18.0 × 3.5 cm) and weight (c.1.5 kg) are acceptable, and the text and photos are well laid out. A succinct foreword by Nigel Collar opens the book, followed by an introduction to the five avian families covered herein. Distributional information for the main groups is depicted in global maps, followed by illustrated and didactic information on plumage types and patterns, morphological aspects and general biology. There are also short sections on taxonomy, extinct species and alternative English names. The text is very instructive, synthesising a huge quantity of information, meaning that it is not only an identification guide but also a valuable source of information for anyone interested in these groups.

My remarks will be directed towards the Neotropical species included in the book, in which readers of *Cotinga* will be most interested. Just a few 'flicks' into the book you will find a stunning picture of a 'yawning' White-winged Potoo *Nyctibius leucopterus* and this is only the first of hundreds of outstanding images, among them also a flycatching Long-tailed Potoo *N. aethereus*, a perched Lyre-tailed Nightjar *Uropsalis lyra* and a flying Pennant-winged Nightjar *Macrodipteryx vexillarius*. Each species account presents its subject in no fewer two pages, with range maps, excellent photographs and accompanying text presented consistently and clearly, more than any other book on these families (e.g. Cleere¹, Holyoak²) and even photo guides for other avian groups.



Within each account, English and scientific names are followed by the main morphological aspects of the birds, key markings, similar species, vocals, habitat, breeding and conservation status, as well as the large-sized range maps. Most attractive though are the high-quality and well-sized photos. Many poorly known species, for which until recently no photos were available, are depicted, like White-winged Potoo and Roraiman Nightjar *Caprimulgus whitelyi*, among others. Very few photos can be considered below 'par', e.g. some of Great Potoo *N. grandis*. Others are not precisely identified subspecifically, e.g. the female Ladder-tailed Nightjar *Hydropsalis climacocerca*, which is probably not the nominate form. For a few species of which no good images were available, specimen photographs were used; however, their rigid appearance may bear little resemblance to a live bird and their value for identifying birds in the field is not always clear. Nonetheless, their use is sometimes interesting from a historical perspective, notably Cayenne Nightjar *Caprimulgus maculosus*, which is still unknown in life. Bearing in mind that many species are very hard to see and, thus, to photograph, it is easy to agree that Nigel has achieved the best possible book and one that greatly eases the task of identifying these species.

Voice descriptions are provided for each species. Although I am not familiar with the range of vocalisations of all species, at least for Neotropical taxa the orthography appears to be the best possible in most cases. However, sometimes the descriptions are hard to understand. It is difficult to put into 'words' the large extent of sounds made by birds, but some efforts are difficult to associate, even knowing well the species' voice (e.g. Band-tailed Nighthawk *Nyctiprogne leucopyga*, Ocellated Poorwill *Nyctiphrynus ocellatus* and Lyre-tailed Nightjar). Songs of some birds or other components of their vocal repertoire are also omitted, despite being known (e.g. Plain-tailed

Nighthawk *Nyctiprogne vielliardi*, *Hydropsalis climacocerca* flight-call and *Nyctibius leucopterus* contact-call). For those especially interested in vocalisations, the CD provided by Ranft & Cleere⁴ is an essential companion to this and the other works on these groups.

The maps are generally accurate, and show political and some physical boundaries, making them easy to use. Two maps are included for each species, one a global map and the second showing the known range in detail, including resident, wintering and breeding areas in some cases. Apparently, the author often decided to show ranges based only on known records, using question marks or leaving blank other regions where the species probably occurs. In such cases, the result is range maps suggesting isolated or disjunct populations for widespread species, leaving the reader confused as to what is a real distributional gap and what is simply a gap in our knowledge. For instance, Spot-tailed Nightjar *Caprimulgus maculicaudus* occurs throughout flooded forest along main rivers and in marshy areas in northern Brazil more widely than is shown. The same is true of Rufous Potoo *Nyctibius bracteatus* and the Amazonian population of *N. leucopterus*, which are more widespread in *terra firme* throughout the Amazon than indicated here. However, in some cases, published records exist for the areas left blank and in others the depicted range is otherwise incorrect. The range map of Long-tailed Potoo shows central Brazil as most of the range of the nominate form, where it is definitely absent, rather than the Atlantic Forest of Paraguay, Argentina and south-east Brazil north to southern Bahia (the type locality!). The distribution of Silky-tailed Nightjar *Caprimulgus sericocaudatus mengeli* comprises most of southern Amazonia, including south-east Peru, as described in the text and proven by the photo on p. 141, but not shown on the map. Lesser Nighthawk *Chordeiles acutipennis* seems also to occur across the Brazilian Amazon more widely than shown, albeit sporadically or as a migrant. The range of some species in northern South America can be extended further south, e.g. White-tailed Nightjar *Caprimulgus cayanensis*, which occurs in central Roraima (Brazil), and Todd's Nightjar *C. heterurus*, which occurs on the Rupununi savanna in south-west Guyana³. On the other hand, the range of some species that seems to be restricted to specific localities in the Amazon basin (e.g. Least Nighthawk *Chordeiles pusillus esmeraldae*) or in riverine habitats along major rivers (e.g. Ladder-tailed Nightjar *Hydropsalis climacocerca*, Band-tailed Nighthawk) are shown over much larger areas, including many habitats in which these species probably do not occur. In sum, however, the maps are generally accurate and it must be stated that it is often difficult to decide

the best means of plotting distribution on a map, although a 'hybrid' scheme using shading and dots is perhaps best.

Perhaps the most contentious element is the systematic rearrangement of some taxa. For example, the inclusion of some *Eurostopus* within the genus *Lyncornis*, resurrection of *Antrostomus* for some Neotropical *Caprimulgus*, inclusion of traditional *Uropsalis* within *Macropsalis*, synonymization of *Hydropsalis climacocerca intercedens* (not *intercedans*) under *H. c. pallidior*, elevation of some subspecies of *C. longirostris* to specific status, among many others. Many of these changes are recommended and even mandatory based on available data, and I am sure that Cleere has good reason for most of them. However, even though some changes are mere reversals of unjustified former arrangements, it is still strongly recommended to publish their rationale in peer-reviewed publications, rather than merely stating that relevant literature, vocalisations and specimens have been examined. Splits and novel systematic arrangements should perhaps better have been treated like many others as 'needing further studies', which would not have compromised this work's quality.

Despite my minor criticisms, this book deserves to be owned by every Neotropical birder or nightjar fan. Any reader interested in good bird images will be enthralled by the photographs of these strange and wonderful birds. For identifying nightjars and their relatives this book can hardly be improved, given that it covers all Caprimulgiformes and it greatly enhances our expanding knowledge of these birds. Those not yet 'switched on' to nightjars will surely find this fabulous compendium of images the best stimulus yet to an interest in these superb creatures. The photographers are to be congratulated for permitting use of their terrific images, and Nigel, a brilliant specialist on these birds, deserves our gratitude for putting together this work, which sets a new standard for avian photographic guides. Highly recommended!

Thiago V. V. Costa

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Birds of Brazil: songs, calls and photos, volume 1: Atlantic Forest, Cerrado, Caatinga, Pantanal, savannas and coast by Jeremy Minns, Dante Buzzetti, Ciro Albano, Arthur Grosset, Andrew Whittaker and Ricardo Parrini, 2009. Vinhedo: Ed. Avis Brasilis. DVD-ROM covering 1,501 species with 3,559 photographs, 7,324 sound-recordings and 1,048 maps. €89.50.

This ambitious project, originally conceived principally as a sound-only production, has, like many similar 'grand designs' before it with an ornithological flavour, taken far longer to reach fruition than its authors doubtless hoped, but has certainly been worth it. That the first author, Minns, not only digitised and organised the audio collections of three of his co-authors, and was instrumental in the design of the software speaks further volumes as to just how 'gargantuan' it became for him at least. But, with the hard work now behind him, the bare facts, outlined above, concerning its contents can now, justly, speak for themselves.

The present *Birds of Brazil* follows relatively 'hot on the heels' of a clutch of other commercial sound-recordings published recently that cover some or all of the country, among them Peter Boesman's MP3 CD *Birds of Brazil* (2006, which treats the whole country, albeit relatively minimalistically), Marantz & Zimmer's *Bird voices of Alta Floresta and southeastern Amazonian Brazil* (2006), and Naka et al.'s *Voices of the Brazilian Amazon*, vol. 1 (2008, which covers birds of *terra firme* forests in the Brazilian portion of the Guianan Shield). Those with a strong interest in avian sounds will want to own all of these, and will be eagerly awaiting further volumes in the last-named project, which aims to cover the remainder of the major Brazilian Amazonian interfluvia (M. Cohn-Haft pers. comm.).

It is as well to mention from the outset, given that the present project is not a 'mere' CD or collection thereof, but something of a multi-media extravaganza, that even a complete technophobe (which I largely consider myself to be) can navigate

the software easily and within minimum 'fuss'. Throughout, the instructions and text are in both English and Portuguese. Once loaded, and with the DVD in situ, you are ready to begin. Within a bar on the left are all of the families treated in the publication. Clicking on these will bring up a list of those species covered, and a further click the data for the species in question. Centre screen are the photographs, usually several per species. Three icons below the photograph enable you to view a map showing where all of the images were taken (not always within the covered region), then data concerning each image (photographer, locality, date, etc.), and finally the means to view it full screen. On the right of the screen are the vocalisations, each of which can be played separately. Again there is an information icon, permitting the user to access data concerning the date, locality, recordist, recording context (which is also given on the main screen), subspecies concerned, and other species audible in the background. The software possesses its own internal volume control, although on my computer this didn't seem very loud.

Anyone heading for Brazil and intending to bird the Atlantic Forest, Cerrado or Pantanal without the aid of a birding guide should seriously consider this DVD-ROM as part of their pre-trip planning. The price might seem relatively high, but there is a wealth of hard-won photographs and recordings here, many of them of impeccable quality. While it might seem easier and a whole lot cheaper just to 'crib' the sounds you need free of charge from www.xeno-canto.org, the reviewed collection of recordings is very complete, witness 22 songs and calls for Short-tailed Antthrush *Chamaeza campanisona*, as just one wholly random example. The brief sleeve notes do describe how to import the sounds into MP3 format for use in the field, but a seemingly easier method is outlined at <http://www.birdsounds.nl/index.php?pg=newarticlesitem&id=1074>. For anyone with a serious interest in vocals, this publication is not just recommended, it will be a mandatory purchase.

I would like to highlight one other potential use of this publication, to introduce the natural world, through birds, to children and young adults especially. I know two young teenagers who 'played' happily with my copy for hours, questioning me about the different birds. As mentioned already, the software is easy to use and the text is bilingual; it would make a marvellous tool in Brazilian schools to stimulate a greater interest in the environment and its conservation.

Observant readers will already have noticed that the production under review is billed as volume 1. A second volume, to all of Amazonian Brazil, is planned, and despite the availability of the superb above-mentioned works to the bird sounds of this complex region, another one, especially with the

added value of photographs, will still be very welcome. I just hope that Jeremy Minns has the energy and tenacity to see it through.

Guy M. Kirwan

A birdwatchers' guide to Cuba, Jamaica, Hispaniola, Puerto Rico and the Caymans by Guy Kirwan, Arturo Kirkconnell and Mike Flieg, 2010. *Cley next the Sea: Prion Ltd.* 198 pp, several maps and line drawings. Softback. ISBN 978-1-871104-12-7. UK£16.99.

Boasting a combined bird list of just over 550 species, the islands of the Greater Antilles have much to interest the visiting birder. With at least 105 single-island endemics and two unique families (Palmchat *Duculus dominicus* and Todidae) the region is famed for its birds and is an essential destination for anyone wishing to 'collect' all the families. Combine this with the world-renowned sun, sea and sand, and there are more than enough reasons to attract the keen and casual birder alike.

Despite the obvious ornithological attractions, there has previously been no comprehensive site guide for the region and most birders have had to use the time-honoured approach of collecting the available trip reports and following the advice contained therein. However, this gap has been ably plugged by this latest publication in the popular Prion series of site guides. The formula for these guides is a tried and tested one, and there is no reason to deviate from a successful format here. The expected introductory sections cover Pre-tour Information, Travel Information, Staying in the Greater Antilles, Climate and Clothing, General Health, Safety and Medical Facilities, Books and Maps, and When to Go. These sections provide much useful advice and sensibly concentrate on information of greatest interest to the birding visitor, but for more comprehensive general tourist

information a Lonely Planet guide or similar will still be required.

The bulk of the book comprises the site accounts. Each island is well covered, and includes sufficient sites to enable the visitor to find all (or almost all) of the specialities. That Cuba has significantly more sites (48) included perhaps reflects the authors' interests and familiarity with that island, as much as the larger size of the island. Ten sites in the Dominican Republic are covered with two for Haiti, 12 for Puerto Rico, six for Jamaica, five for Grand Cayman and single entries for the other Cayman Islands. Where reasonable birding possibilities exist, an attempt has been made to include sites which could usefully be visited by anyone whose main purpose for visiting the region is not necessarily birding, and is thus not visiting the usual sites on the main birding circuits. For all the sites I am familiar with, the accounts are accurate and where included the maps are clear. A number of attractive line drawings are scattered throughout.

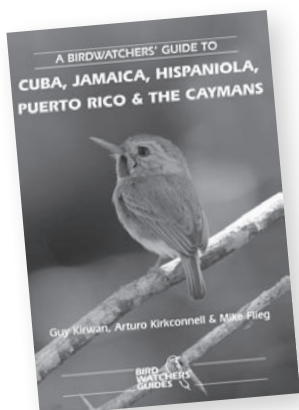
The Selected Species Accounts section provides useful summaries of where to find the species of greatest interest although for Cuban Kite *Chondrohierax wilsonii* there is little practical help, despite the fact that all three authors have seen the species. These summaries also include some useful brief taxonomic comments where relevant. The book concludes with a full species list for each of the countries covered, a list of mammals, Useful Addresses, Societies and Clubs, and a Selected Bibliography.

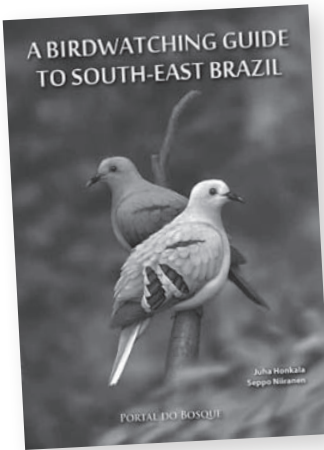
The authors can be congratulated for producing an excellent site guide and I am sure this publication will become an essential purchase for any birder visiting the region.

Chris Bradshaw

A birdwatching guide to south-east Brazil by Juha Honkala and Seppo Niiranen, 2010. *Penedo: Portal do Bosque.* 416 pp, 960 colour photographs and 30 maps. Softback. ISBN 978-952-92-7192-4. UK£28.99.

This innovative and extremely well-illustrated book is ambitious in scope, encompassing both site and identification guides. The first third of the work introduces productive birding locales in the states of Rio de Janeiro (24), São Paulo (14), Espírito Santo (six) and Minas Gerais states (nine), while over 230 pages are devoted to a photographic guide to the birds of the Agulhas Negras region of westernmost Rio de Janeiro. Given the still chronic lack of any field guide even remotely close to perfect for any part of Brazil and that the only site guide, by the late Bruce Forrester¹, published in 1993 and covering the whole country, is now well out of date,





this dual approach initially appears commendable. In practice, however, it is probably unsurprising that the authors do not really 'hit the mark' in respect of either aim.

The work opens with an introduction to south-east Brazil, its habitats and birds, along with some useful general tips and recommendations for would-be visitors. These could have been more exhaustive. Also included is a résumé of recent 'splits' and 'lumps', not all of which appear to follow modern trends. For example, the authors consider that Atlantic Royal Flycatcher *Onychorhynchus swainsoni* and Eastern Striped Manakin *Machaeropterus regulus* are now more usually considered to be subspecies, but the opposite seems more likely to be true. On the other hand, Squamate Antbird *Myrmeciza squamosa* is stated to be a 'recent' split from White-bibbed Antbird *M. loricata*, yet the vast majority of authors over the past 50+ years have treated them separately².

The site guide, which is also liberally illustrated with colour photos, then follows. As already intimated, the states of Rio de Janeiro and São Paulo receive rather better (but still far from comprehensive) coverage than either Espírito Santo or Minas Gerais. Even so there are caveats and, amazingly, you won't find information concerning the popular lodges of Serra dos Tucanos and REGUA in this book! Sites within the Agulhas Negras region (around the famous Itatiaia National Park) are subject to really detailed coverage, which is unsurprising given that the Finnish authors were based there during their respective sojourns in Brazil. This part will be genuinely useful to birders keen to leave the beaten track without travelling far. In contrast, those visitors attempting to cover as much ground (and as many endemics) as possible would probably have preferred fewer sites with more detail devoted to each. As soon as

one 'leaves' the Agulhas Negras region, the site accounts become much weaker. The uninitiated will get next to no real help as to where to find the specialities at Ubatuba, the descriptions for all of the sites in Espírito Santo are so brief as to offer little more than Wheatley's very general guide to all of South America⁶, and many other locality details, e.g., those for Intervalles State Park, Serra da Canastra National Park, Itirapina, etc., are also weak, and it's rather unclear how well the authors really know them. Most sites are mapped, and these are clear and should prove very helpful (they are certainly a massive improvement on those in Forrester¹), while the text always contains boxed instructions concerning access. Some of the longer accounts would arguably benefit from a more formulaic approach, whereby the information therein was clearly structured and perhaps presented under section headings.

Each account features a selected species list, although these are deliberately very far from exhaustive, and in some cases potentially misleading. For Pirapora, in northern Minas Gerais, Rufous-capped Nunlet *Nonnula ruficapilla* is listed, but it is Rusty-breasted Nunlet *N. rubecula* that occurs here (the former is exclusively Amazonian), while Forbes's Blackbird *Curaeus forbesi* has occurred more recently than 1999. The authors seem confused as to which genus Plain-tailed Nighthawk *Nyctiprogne vielliardi* belongs, while both Least Nighthawk *Chordeiles pusillus* and Stripe-necked Tody-Tyrant *Hemitriccus striaticollis* are erroneously listed twice, and it's unclear why Mouse-coloured Tyrannulet *Phaeomyias murina* is mentioned at all. For the Serra da Canastra, the authors list species such as Dwarf Tinamou *Taoniscus nanus*, Grey-and-chestnut (Rufous-rumped) Seedeater *Sporophila hypochroma* and Upland Sandpiper *Bartramia longicauda* for the grassland areas, but the first two are outstandingly rare here and incredibly unlikely to be seen by anything other than the very frequent visitor, and the last is unquestionably a scarce migrant, which again is not likely to be seen. At the very least, readers should have been made aware of such caveats. For the nearby woodlands they mention Crowned Eagle *Harpyhaliaetus coronatus*, which instead should be searched for on the plateau, and Black-and-white Hawk-Eagle *Spizaetus melanoleucus*, which must be stunningly rare here given that there are very few published records in the entire state⁵. It might also be mentioned that you will find few detailed tips as to where to find the area's real speciality, the Critically Endangered Brazilian Merganser *Mergus octosetaceus*.

What follows constitutes the bulk of the book, the photographic guide to the birds of the Agulhas Negras region. Almost 500 species are treated, typically four to a double-page spread,

and the photographs are almost universally of an enviable quality. The short texts for each species cover identification features, subspecies, voice, and separate sections on status in the region in question as well as further afield in south-east Brazil generally. This well-researched section will unquestionably assist far beyond the environs of Itatiaia, but, if you do plan to cover widespread sites within the entire region, will not permit visitors to jettison other identification literature. I wish that the authors had informed the reader as to where and when all (not just some) of the photographs were taken. Many interesting records from a state perspective are mentioned herein (presumably the authors' own), especially from the Resende wetland, e.g. Black-necked Swan *Cygnus melancoryphus*, and Spectacled Tyrant *Hymenops perspicillatus*³, which merit publication in the periodical literature.

Closing the book are a glossary, bibliography, lists of further reading, sound-recordings, useful contacts and websites, and finally a checklist of the region's birds by state. Errors are minor, although Honkala & Niiranen list 646 species for Espírito Santo, whereas the most recent 'official' inventory totals 654⁴. Overall, the book is creditably well written and edited given that neither author's first language is English (only the bibliography suffers from any obvious lack of attention) and it will be of assistance to the majority of users. Even most 'old hands' will learn something from it, but outside the Itatiaia region the book's usefulness is much less than it might initially appear. Ultimately, it fails through trying to do too much and, consequently, does nothing thoroughly.

Guy M. Kirwan

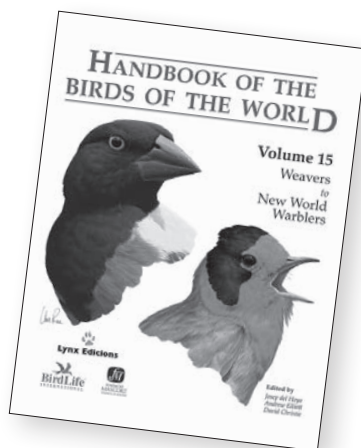
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Handbook of the birds of the world volume 15 edited by Josep del Hoyo, Andrew Elliott and David A. Christie, 2010. Barcelona: Lynx Edicions. 880 pp, 61 colour plates, 495 colour photographs and 614 colour maps. Hardback. ISBN 978-84-96553-68-2. UK£185.

Most readers of *Cotinga* are probably familiar with the *Handbook of the birds of the world (HBW)* and this is the 15th volume in this essential series since the first was published in 1992. Each volume commences with a lengthy foreword on a particular ornithological topic and then presents information on different bird families illustrated using spectacular photographs, followed by beautiful paintings of all species and individual species accounts complete with distribution maps. Volume 15 maintains the high standards of previous volumes.

The 55-page foreword addresses the important topic of bird conservation, and does so well. It presents an excellent synthesis of the global state the challenge and summaries of the principal threats to birds. Much of the foreword is heavily influenced by BirdLife International, which helps sponsor the *HBW* series. The portion on site protection focuses on Important Bird Areas (IBAs), a BirdLife priority, but neglects the most important subset of IBAs—those sites identified by the Alliance for Zero Extinction (AZE) as the last refuges of endangered birds. Protecting AZE sites must be a top priority for bird conservationists as these places are where birds will be lost if not protected, and present excellent conservation opportunities. The foreword continues with recommendations to address threats and secure bird populations, including some success stories to remind us that birds can recover from tiny populations on the brink, if we make the effort.



As the second to last volume planned for the series, volume 15 covers eight 'families' near the end of the passerine arrangement. I use the term 'family' loosely, because many of these groupings include taxonomic anomalies that probably belong elsewhere. The family chapters start with the weavers (Ploceidae) which are some of the most accomplished nest builders among birds. Next are the whydahs and indigobirds (Viduidae) of Africa and the more broadly distributed waxbills (Estrildidae). The latter family includes some of the most common cagebirds in the pet trade, such as Zebra Finch *Taeniopygia guttata*. The vireos (Vireonidae) follow, including Red-eyed Vireo *Vireo olivaceus*, which may be one of the most abundant species in the Western Hemisphere. Some 144 species of finches (Fringillidae) are covered, including the Neotropical siskins. These are followed by the Hawaiian honeycreepers (Drepanidae), a group devastated by modern extinctions. This chapter features extra illustrations of extinct Drepanids not covered in Volume 7's foreword to extinct birds. Olive Warbler *Peucedramus taeniatus* features as the sole member of the family Peucedramidae. The volume closes with the New World Warblers (Parulidae), including chats, Wrenthrush *Zeledonia coronata* and Caribbean warblers that taxonomically belong elsewhere and are noted to so do.

For those interested in evolution, volume 15 covers some of the most rapidly evolving groups of birds today. The Hawaiian honeycreepers represent one of the most amazing radiations among all birds, while Red Crossbill *Loxia curvirostra* pushes the limit of what we classify as species, with multiple forms featuring bills co-evolved with specific conifers and unique vocal types. Viduids are brood parasites, and the nestlings of some have co-evolved colourful mouth markings to mimic the nestlings of their Estrildid hosts. Furthermore, the indigobirds appear to be a rare case of sympatric speciation among birds, as they have perhaps diversified in sympatry by specialising on different host species within the same area, and adults even mimic their hosts' songs.

The *HBW* series, including volume 15, is a must have for those individuals or institutions interested in birds who can afford it in their library. Now we must look forward to the last volume which will cover four 'families' with strong Neotropical contents: the tanagers (Thraupidae), cardinals (Cardinalidae), buntings and New World sparrows (Emberizidae) and New World Blackbirds (Icteridae). In the meantime, 'three cheers' for the publishers at Lynx Edicions.

Daniel J. Lebbin

The wildlife of Costa Rica: a field guide by Fiona A. Reid, Twan Leenders, Jim Zook and Robert Dean, 2010. Ithaca, NY: Cornell University Press. 287 pp, 600+ illustrations, 40 photographs. ISBN 978-0-8014-4905-5 (cloth) / ISBN 978-0-0814-7610-5 (paper). US\$29.95 (cloth) / US\$65 (paper).

With only a quarter of Costa Rica's large avifauna illustrated within its pages, this general wildlife guide is unlikely to satisfy any but the most casual of Neotropical birders. In the hands of a gap-year student or Central American cruise participant, however, it might pique an interest in the natural world. Following a brief introduction to the country and its habitats, the book provides identification and life history details for 74 mammals, 226 birds, 59 reptiles, 43 amphibians and 42 arthropods, each of which is illustrated in colour. Interspersed among these are 24 short photographic essays which focus on various natural history topics and which are easily the book's most interesting pages.

Megan Crewe



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