

An ornithological survey of Serra do Caraça, Minas Gerais, Brazil

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A região da Serra do Caraça é um trecho da porção meridional da Cadeia do Espinhaço que compreende uma grande variedade de ambientes. No presente levantamento, realizado entre os anos de 1993 a 1999, através de trabalhos de campo e consulta a uma coleção ornitológica, foram encontradas 264 espécies de aves na região. Destas, 47 são endêmicas da mata atlântica, além da ocorrência de três endemismos da Cadeia do Espinhaço. Apesar da presença de espécies endêmicas e ameaçadas, a região vem sofrendo impactos da atividade mineradora, e os incêndios criminosos também são uma séria ameaça à flora e à fauna dos campos rupestres. Além disto, a soltura de aves provenientes do comércio ilegal também representa um grave problema, uma vez que foram detectadas espécies que não ocorrem naturalmente na região da Serra do Caraça.

Introduction

Serra do Caraça is located in the southern Espinhaço range (Endemic Bird Area 073)³², Minas Gerais state, south-east Brazil (see Melo Júnior *et al.*¹⁵ and Vasconcelos³⁵). The majority of this massif is within a reserve (RPPN–Caraça). Although famous naturalists, such as G. H. von Langsdorff, A. Saint-Hilaire, J. B. von Spix, C. F. P. von Martius, P. E. Gounelle and A. A. da Silveira, visited this region in the past^{19,22,24,25,27,28,31,41,42,43}, a number of interesting ornithological discoveries have recently been made at Serra do Caraça^{15,17,33,34}.

Carnevali³ presented a preliminary checklist of birds at Serra do Caraça, but more detailed studies of the general composition of the avifauna, and the distribution of species within different habitats and at different elevations, have not previously been made. Here, we present a bird checklist of the Serra do Caraça region, reporting altitudinal range and habitat use for each species, and adding notes on some endemic and threatened species.

Material and methods

Ninety-six days fieldwork was conducted within Reserva Particular do Patrimônio Natural do Caraça (RPPN–Caraça) (20°05'S 43°28'W, municipality of Catas Altas), in 1993–1999, studying all environments and elevations, during all seasons. In addition, 62 days fieldwork was undertaken at Fazenda Bocaina (19°58'S 42°57'W, municipality of Santa Bárbara), at the base of the massif, 4 km from the reserve, in 1996–1999.

RPPN–Caraça comprises of 11,233 ha, at 850–2,072 m⁴². Native vegetation within the reserve consists of montane Atlantic Forest at lower altitudes and along water courses, and *campos rupestres* and high altitude grasslands (*campos de altitude*) in higher and rocky areas. A number of small reservoirs provide aquatic habitats such as marshes and lakes. At some points inside the reserve there are patches of pastures. Fazenda Bocaina is located at 750–900 m elevation and con-

sists of second-growth Atlantic Forest and pastures, as well as marshes at Sumidouro village. Both sites have small areas of fields, orchards and buildings.

Surveys were undertaken at different times of day and night, by transects of many localities in the Serra do Caraça, comprising all habitats and elevations. Species were identified by observation with binoculars or according to their vocalisation. Some mist-netting was also performed. Several species were tape-recorded and others photographed or collected. Specimens have been deposited in the Zoology Department of Federal University of Minas Gerais (DZUFMG). Habitat and elevation of each individual were recorded. An altimeter was used to obtain the elevation of each area surveyed. In our analysis of altitudinal ranges, elevations were grouped in classes of 50 m.

Additionally, we searched for other specimens collected in the Serra do Caraça region in DZUFMG. Localities marked on specimen labels were visited and their coordinates and elevation recorded. These were: Quebra-Ossos (20°03'S 43°26'W, 850 m), Fazenda do Engenho and Riacho Pacheco (20°02'S 43°29'W, 850 m). Systematics follow Sick²⁴ except Scissor-tailed Nightjar *Hydropsalis torquata*, which follows Pacheco & Whitney¹⁶, and Itatiaia Spinetail *Oreophylax moreirae*, which follows Cory & Hellmayr⁶.

Accounts are presented for some poorly known, threatened or endemic species (following Cracraft⁴, Collar *et al.*⁵, Machado *et al.*¹⁰, Ridgely & Tudor^{20,21}, Sick²⁴, Silva²⁶ and Stattersfield *et al.*³²). These species are classified as follows:

- V = Vulnerable
- NT = Near-threatened
- MG = Threatened in Minas Gerais state
- AF = Endemic to Atlantic Forest
- CE = Endemic to cerrado
- ER = Endemic to Espinhaço range



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| <p>1. Partial view of Serra do Caraça, with Atlantic Forest at lower elevations and <i>campos rupestres</i> on the highest peaks (Marcelo Ferreira de Vasconcelos)</p> <p>2. Band-winged Nightjar <i>Caprimulgus longirostris</i> (Tadeu Artur de Melo Júnior)</p> <p>3. Biscutate Swift <i>Streptoprocne biscutata</i> (Marcelo Ferreira de Vasconcelos)</p> | <p>4. Dusky-throated Hermit <i>Phaethornis squalidus</i> (Marcelo Ferreira de Vasconcelos)</p> <p>5. Large-tailed Antshrike <i>Mackenziaena leachii</i> (Tadeu Artur de Melo Júnior)</p> <p>6. Ferruginous Antbird <i>Drymophila ferruginea</i> (Marcelo Ferreira de Vasconcelos)</p> <p>7. Ochre-rumped Antbird <i>Drymophila ochropyga</i> (Marcelo Ferreira de Vasconcelos)</p> |
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- 8. Velvety Black-tyrant *Knipolegus nigerimus* (Marcelo Ferreira de Vasconcelos)
- 9. Brassy-breasted Tanager *Tangara desmaresti* (Marcelo Ferreira de Vasconcelos)
- 10. Pale-throated Serra-finch *Embernagra longicauda* (Marcelo Ferreira de Vasconcelos)
- 11. Maned Wolf *Chrysocyon brachyurus* (Tony Quinn)
- 12. Brazilian Ruby *Clytolaema rubricauda* (Tony Quinn)

Results and discussion

We recorded 264 bird species in the Serra do Caraça (Appendix 1). Twelve (4.5%) are globally threatened or near-threatened⁵, eight (3.0%) are threatened in Minas Gerais state¹⁰, 47 (17.8%) are restricted to the Atlantic Forest region^{4,20,21,24,32}, four (1.5%) are endemic to cerrado²⁶, and three species (1.1%) are endemic to *campos rupestres* within the Espinhaço range²⁶ (Appendix 1). Saffron Finch *Sicalis flaveola*, Double-collared Seedeater *Sporophila caeruleascens*, Ultramarine Grosbeak *Passerina brissoni*, Campo Troupial *Icterus jamaicaii* and Chestnut-capped Blackbird *Agelaius ruficapillus* are not commonly recorded in the Serra do Caraça, and have been introduced locally by forest police from Minas Gerais state, who often release illegally traded birds inside the reserve. Other introduced species are House Sparrow *Passer domesticus* and Common Waxbill *Estrilda astrild*.

The Carnevalli³ checklist contained 180 species, 29 of which were not encountered during our survey (Table 1). Some of these are wide-ranging or were recorded in nearby localities, and may be present in the Serra do Caraça (Least Grebe *Tachybaptus dominicus*, Striated Heron *Butorides striatus*, Peach-fronted Parakeet *Aratinga aurea*, Barn Owl *Tyto alba*, Amazon Kingfisher *Chloroceryle amazona*, Blond-crested Woodpecker *Celeus flavescens*, Firewood-gatherer *Anumbius annumbi*, Vermilion Flycatcher *Pyrocephalus rubinus*, Pale-bellied Tyrant-manakin *Neopelma pallescens*, Cinereous Warbling-finch *Poospiza cinerea* and Blue Finch *Porphyrospiza caeruleascens*^{13,14,38}). However, other species possibly do not occur as their ranges do not appear to reach Serra do Caraça, and we have not recorded them in the southern Espinhaço range. The following species in Carnevalli's list may relate to misidentifications: Yellow-legged Tinamou *Crypturellus noctivagus*, Long-tailed Potoo *Nyctibius aethereus*, Yellow-fronted Woodpecker *Melanerpes flavifrons*, Barred Antshrike *Thamnophilus doliatus*, White-flanked Antwren *Myrmotherula axillaris*, White-collared Foliage-gleaner *Anabazenops fuscus*, Black-capped Foliage-gleaner *Philydor atricapillus*, Plain-winged Woodcreeper *Dendrocincla turdina*, Red-billed Scythebill *Campylorhamphus trochilirostris*, Grey-hooded Attila *Attila rufus*, Rufous-crowned Greenlet *Hylophilus poicilotis*, River Warbler *Phaeothlypis rivularis*, and Green Honeycreeper *Chlorophanes spiza*. We do not compare our survey to the checklist presented by Forrester⁹, as he combined the list of Serra do Caraça with that of Estação Ambiental de Peti. Our field experience suggests that many species known from Peti do not occur at Serra do Caraça and vice versa.

Species accounts

Mantled Hawk *Leucopternis polionota* (NT, MG, AF)

One was observed perched and vocalising in February 1993. In February 1996, another was observed over a forest. In February 1997, one was observed singing in flight.

Dusky-legged Guan *Penelope obscura* (MG)

Flocks of 6–15 were observed on various occasions, foraging on the ground and in treetops, in forests and forests borders. During one observation, some were feeding on fruits of embaúba (*Cecropia* sp.).

Spot-winged Wood-quail *Odontophorus capueira* (MG, AF)

Heard (perhaps two individuals) at dusk in November 1998 in montane forest (see Vasconcelos³⁴).

Scale-throated Hermit *Phaethornis eurynome* (AF)

Generally observed within forest and its borders between 1,250 to 1,500 m. Recorded visiting flowers of various bromeliads (mainly *Neoregelia bahiana*, *Nidularium* sp. and *Vriesia friburguensis*) and performing typical trapline feeding behaviour⁸. The use of bromeliad flowers by this species has been reported elsewhere in south-east Brazil^{23,29,30}.

Dusky-throated Hermit *Phaethornis squalidus* (AF)

One record, in May 1998, when a single was mist-netted within forest at Fazenda Bocaina. Observations at Estação Ambiental de Peti demonstrated that this species visits flowers of a species of Acanthaceae, very common in forests at Serra do Caraça.

Hyacinth Visorbearer *Augastes scutatus* (NT, CE, ER)

Recorded year-round in *campo rupestre* and occurs on the region's highest peaks (above 2,000 m), visiting flowers of a wide variety of plant species. Males defend territories and visit grouped flowering resources. Females were not observed defending territories and always visited more sparse flowers. For further details see Vasconcelos³⁵.

Red-breasted Toucan *Ramphastos dicolorus* (AF)

Rare at Serra do Caraça. Once observed foraging in mid-strata forest, at 1,350 m.

White-browed Woodpecker *Piculus aurulentus* (NT, AF)

Singles observed foraging in mid-strata forest in April 1996 and December 1998.

Serra Antbird *Formicivora serrana* (NT, AF)

Very common, mainly at forest borders. Recorded foraging principally in mid-strata, occasionally being intensely vocal.

Bertoni's Antbird *Dryophila rubricollis* (AF)

Rare. The first record in Serra do Caraça was reported by Parrini & Pacheco¹⁷. Our records were made in forests with bamboo at 1,750–1,950 m, at the base of Pico do Sol.

Ochre-rumped Antbird *Dryophila ochropyga* (NT, AF)

Very common in forests at Serra do Caraça over a wide altitudinal range (800–2,000 m), even reaching cloud forest on the highest peaks. Commonly observed foraging in forest understorey, perching in tangles and thin bamboos (mainly *Merostachys* sp.). Occasionally observed foraging near the ground and in leaves of a terrestrial bromeliad (*Bromelia* sp.).

Itatiaia Spinetail *Oreophylax moreirae* (AF)

Common on the highest peaks of Serra do Caraça (Pico do Sol, Pico do Inficionado and Pico da Canjerana)¹⁵. Principally forages in *campos rupestres* and high-altitude grasslands, using shrubs, bamboo (*Chusquea* sp.) and canelas-de-ema (*Vellozia* cf. *compacta*). Groups of 2–3 were observed foraging together at Pico do Inficionado.

Red-eyed Thornbird *Phacellodomus erythrophthalmus ferrugineigula* (AF)

One on a forest border near a swamp, foraging in the mid- and upper strata, in December 1998.

Grey-backed Tachuri *Polystictus superciliaris* (NT, CE, ER)

Common in *campos rupestres* and abandoned pastures, and very common in a natural grassland known as Campo de Fora. It principally forages in shrubs and low trees, taking small insects. For further details see Vasconcelos³⁵.

Drab-breasted Pygmy-tyrant *Hemitriccus diops* (AF)

Recorded year-round, principally foraging in forest understorey and at forest borders, generally with bamboo (*Merostachys* sp.).

Hangnest Tody-tyrant *Hemitriccus nidipendulus* (NT, AF)

Common and recorded year-round in forest and its borders, usually in singles, but occasionally two forage together.

Shear-tailed Grey-tyrant *Muscipipra vetula* (NT, AF)

Common at forest borders and in the canopy, catching insects in aerial sallies, but once recorded foraging on the ground.

Shrike-like Cotinga *Laniisoma elegans* (V, MG)

This species' vocalisation was heard in montane forest, on one morning in February 1996.

Swallow-tailed Cotinga *Phibalura flavirostris* (NT, MG)

Occasionally easy to find in forests and their borders within the reserve. In December 1996, two (an adult and one young) were observed on a forest border. The young lacked the yellow throat, while its facial mask was not wholly black and the tail not deeply forked.

Cinnamon-vented Piha *Lipaugus lanioides* (V, MG, AF)

Usually recorded in mid- and upper-strata forest. In December 1998, one was observed feeding on fruits of a Lauraceae tree, together with a Swallow-tailed Cotinga (M. Rodrigues & M. M. Coelho pers. comm. 1998).

Red-ruffed Fruitcrow *Pyroderus scutatus* (MG)

Heard in July 1998 within forest, at 1,050 m, near Fazenda do Engenho³³.

Curl-crested Jay *Cyanocorax cristatellus* (CE)

Usually observed in flocks within deforested areas in lower parts of the range. Its presence in once forested areas suggests that *C. cristatellus* may be extending its range through deforestation. This phenomenon has been observed elsewhere in south-east Brazil^{1,36}.

Brassy-breasted Tanager *Tangara desmaresti* (AF)

Common in flocks in the canopy of montane forest and its edges, feeding on fruits, frequently with individuals of Gilt-edged Tanager *Tangara cyanoventris*. In January 1997, some were recorded feeding on capororoca fruits (*Rapanea* sp.) in *campo rupestre*. Pineschi¹⁸ reported it feeding on fruits of *Rapanea* spp. in high-altitude grassland at Itatiaia.

Gilt-edged Tanager *Tangara cyanoventris* (AF)

Common in forest, principally occupying middle and upper strata. Recorded feeding on fruits within forest (*Miconia* sp., *Palicourea* sp.) and in *campos rupestres* (*Erythroxylum* sp., *Rapanea* sp.). The use of fruits from *campos rupestres* has also been observed at another locality in the southern Espinhaço range³⁷.

Uniform Finch *Haplospiza unicolor* (AF)

A male was observed foraging in the lower forest stratum, with bamboo, in April 1996. In December 1999, a female was mist-netted in high-altitude grassland. Andrade & Andrade² reported it at nearby localities.

Saffron Finch *Sicalis flaveola* (MG)

Common, during our fieldwork, around Caraça monastery. This population is probably the result of introductions, as the species has not been recorded elsewhere in Serra do Caraça, and forest police frequently release birds here taken from the illegal trade (Pe. C. M. Dell' Amore pers. comm. 1998).

Pale-throated Serra-finch *Embernagra longicauda* (NT, CE, ER)

Very common in *campos rupestres*, even on the highest peaks. Though considered endemic to *campos rupestres* in the Espinhaço range²⁶, it was frequently observed in deforested areas, outside *campos rupestres*, at Fazenda Bocaina. This may be related to the geographic expansion of *E. longicauda*; through deforestation it is now able to occupy formerly forested areas¹¹.

Conservation

Serra do Caraça is a unique area in South America, as it protects species endemic to cerrado (particularly those restricted to *campos rupestres* in the Espinhaço), as well as Atlantic Forest endemics. For some of the latter, Serra do Caraça and adjacent areas represent the most interior points of their geographic distribution at this latitude, e.g. Speckle-breasted Antpitta *Hylopezus nattereri*, Serra do Mar Tyrant-manakin *Neopelma chrysolophum* and Itatiaia Spinetail *Oreophylax moreirae*^{15,39,40}. Furthermore, the altitudinal range of Serra do Caraça covers a variety of habitats, including montane forest, cloud forest, *campos rupestres* and high-altitude grasslands, which explains the occurrence of a high number of bird species.

Mining activities near Serra do Caraça increase annually, and some parts of the range outside the reserve have already been adversely affected. Furthermore, fire presents a grave threat to *campos rupestres* and high-altitude grasslands in the region. In the 1997 dry season a man-made fire affected much of these habitats, and subsequently these burnt areas were colonised by invading plants from pastures near the massif, at the expense of many endemic plant species. Similar events have been observed elsewhere in montane south-east Brazil, where invasive plants have out-competed native and endemic species¹².

Another problem is the release of species, inside the reserve, taken from the illegal trade in birds, by the Minas Gerais forest police. Several

species not otherwise known from the region can easily be observed around Caraça monastery. Some of these species may hybridise with species native to the region. One example is Double-collared Seedeater *Sporophila caerulescens*, introduced in this area, which may hybridise with Yellow-bellied Seedeater *S. nigricollis*²⁴.

Serra do Caraça is an area of high conservation priority in Minas Gerais, because of the many endemic and threatened species of flora and fauna, and extreme richness of vertebrate species⁷. We suggest the regional implementation of a conservation programme for Serra do Caraça, designed to create new protected areas in parts of the massif outside RPPN-Caraça, which are critically threatened by mining activities. In addition, an environmental education programme aimed at residents in the surroundings of the reserve and tourists to the region, and designed to demonstrate the importance of biodiversity in the Serra do Caraça, and minimise the risk of man-made fires, for which a regional fire service to combat this threat is urgently required. Fortunately, in recent years, an education programme has been initiated within the reserve by Associação Mineira de Defesa do Ambiente (AMDA), which has had a positive effect on visitor and local people's knowledge of the fauna and threats to it. Finally, we strongly criticise the release of non-native birds and suggest that these activities should be terminated immediately.

Table 1. Species recorded by Carnevali³ in the Serra do Caraça not recorded during the present survey.

<i>Crypturellus noctivagus</i>
<i>Tachybaptus dominicus</i>
<i>Butorides striatus</i>
<i>Spizaetus tyrannus</i>
<i>Aratinga aurea</i>
<i>Tyto alba</i>
<i>Nyctibius aethereus</i>
<i>Chaetura cinereiventris</i>
<i>Chloroceryle amazona</i>
<i>Celeus flavescens</i>
<i>Melanerpes flavifrons</i>
<i>Thamnophilus doliatus</i>
<i>Myrmotherula axillaris</i>
<i>Anumbius annumbi</i>
<i>Anabazenops fuscus</i>
<i>Philydor atricapillus</i>
<i>Dendrocincla turdina</i>
<i>Campylorhamphus trochilirostris</i>
<i>Myiornis auricularis</i>
<i>Pyrocephalus rubinus</i>
<i>Attila rufus</i>
<i>Neopelma pallescens</i>
<i>Hylophilus poicilotis</i>
<i>Phaeothlypis rivularis</i>
<i>Euphonia violacea</i>
<i>Tangara seledon</i>
<i>Chlorophanes spiza</i>
<i>Poospiza cinerea</i>
<i>Porphyrosiza caerulescens</i>

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Appendix 1. Bird species recorded in the Serra do Caraça region, Minas Gerais, Brazil.

Key:

Habitat types: 1 = forest; 2 = campo rupestre and high-altitude grassland; 3 = pasture; 4 = area subject to human use; 5 = marsh; and 6 = lake.

Status and endemism (following Cracraft⁴, Collar *et al.*⁵, Machado *et al.*¹⁰, Ridgely & Tudor^{20,21}, Sick²⁴, Silva²⁶ and Stattersfield *et al.*³²): V = Vulnerable (two); NT = Near-threatened (10); MG = Threatened in Minas Gerais state (eight); AF = Endemic to Atlantic Forest (47); CE = Endemic to cerrado (four); ER = Endemic to Espinhaço range (three); I = Introduced by man (seven). Species marked * are represented by specimens deposited in DZUFMG.

Family/Species	Altitudinal range (m)	Habitat	Status and endemism
TINAMIDAE			
<i>Crypturellus obsoletus</i> *	800–1,500	1	
<i>Crypturellus parvirostris</i> *	750–1,300	3, 4, 5	
<i>Crypturellus tataupa</i>	800	1, 3, 4	
PODICIPEDIDAE			
<i>Podilymbus podiceps</i>	750	6	
ARDEIDAE			
<i>Bubulcus ibis</i>	750	5, 6	
CATHARTIDAE			
<i>Sarcorampus papa</i>	1,150–1,300	1, 2	
<i>Coragyps atratus</i>	750–1,350	1, 2, 3, 4	
<i>Cathartes aura</i>	750–2,000	1, 2, 3, 4	

ANATIDAE			CAPRIMULGIDAE		
<i>Dendrocygna viduata</i>	750	5, 6	<i>Lurocalis semitorquatus</i>	800–1,000	1
<i>Amazonetta brasiliensis</i>	750	5, 6	<i>Nyctidromus albigollis</i> [*]	750–1,300	1, 3, 4, 5
ACCIPITRIDAE			<i>Nyctiphrynus ocellatus</i>	1,300	1, 4
<i>Elanus leucurus</i>	750–800	3, 5	<i>Caprimulgus longirostris</i> [*]	1,150–1,950	2
<i>Leptodon cayanensis</i>	1,300	1, 2	<i>Hydropsalis torquata</i>	750–1,100	1, 2, 4
<i>Accipiter striatus</i> [*]	850–1,250	1	APODIDAE		
<i>Geranoaetus melanoleucus</i>	1,300–2,050	1, 2, 3	<i>Streptoprocne zonaris</i> [*]	750–1,800	1, 2, 3, 4
<i>Buteo albicaudatus</i>	750–1,300	1, 2, 3, 4	<i>Streptoprocne biscutata</i> [*]	1,250–2,050	1, 2
<i>Buteo albonotatus</i>	750	1, 3, 4	<i>Chaetura andrei</i>	750–1,300	1, 2, 3, 4
<i>Buteo brachyurus</i>	1,250	1, 2	TROCHILIDAE		
<i>Rupornis magnirostris</i>	750–1,750	1, 2, 3, 4	<i>Phaethornis eurynome</i>	1,250–1,500	1
<i>Leucopternis polionota</i>	1,300	1	<i>Phaethornis squalidus</i>	800	1
<i>Buteogallus meridionalis</i>	800	3	<i>Phaethornis pretrei</i> [*]	750–2,000	1, 2, 3, 4, 5
FALCONIDAE			<i>Phaethornis ruber</i>	1,300	1
<i>Herpetotheres cachinnans</i>	750–1,300	1, 2, 3, 4, 5	<i>Campylopterus</i>		
<i>Micrastur semitorquatus</i>	1,250–1,300	1	<i>largipennis diamantinensis</i> [*]	1,250–2,050	1, 2
<i>Milvago chimachima</i>	750–1,400	1, 2, 3, 4	<i>Eupetomena macroura</i> [*]	750–1,400	1, 2, 3, 4
<i>Polyborus plancus</i>	750–1,300	1, 2, 3, 4	<i>Melanotrochilus fuscus</i>	1,300	1, 2, 3, 4
<i>Falco femoralis</i> [*]	800–1,300	1, 2, 3, 4	<i>Colibri serrirostris</i> [*]	800–2,050	2, 3, 4
<i>Falco sparverius</i>	1,300–1,900	2, 4	<i>Chlorostilbon aureoventris</i>	750–1,400	1, 2, 3, 4
CRACIDAE			<i>Thalania furcata</i>	1,300	1, 2
<i>Penelope superciliaris</i>	750–1,300	1, 4	<i>Thalania glaucopsis</i> [*]	750–1,400	1, 2
<i>Penelope obscura</i>	1,300	1, 4	<i>Leucochloris albigollis</i> [*]	1,150–2,050	1, 2
PHASIANIDAE			<i>Amazilia lactea</i> [*]	750–1,350	1, 2, 3, 4
<i>Odontophorus capueira</i>	1,250	1	<i>Clytolaema rubricauda</i>	1,300	1, 2
RALLIDAE			<i>Augastes scutatus</i>	1,250–2,050	2
<i>Rallus nigricans</i>	750–1,300	5, 6	<i>Calliphlox amethystina</i>	750–1,400	1, 2, 3
<i>Aramides cajanea</i>	750	5, 6	TROGONIDAE		
<i>Aramides saracura</i>	750–1,300	5, 6	<i>Trogon surrucura aurantius</i>	750–1,550	1
<i>Porzana albigollis</i>	750	5, 6	ALCEDINIDAE		
CARIAMIDAE			<i>Ceryle torquata</i>	1,300	6
<i>Cariama cristata</i>	750–1,550	2, 3, 4	GALBULIDAE		
CHARADRIIDAE			<i>Galbula ruficauda</i>	1,200	1
<i>Vanellus chilensis</i>	750–1,300	2, 3, 4, 5	BUCCONIDAE		
SCOLOPACIDAE			<i>Nystalus chacuru</i>	750	3, 4
<i>Gallinago paraguaiensis</i>	750	5	<i>Malacoptila striata</i> [*]	800	1
COLUMBIDAE			RAMPHASTIDAE		
<i>Columba picazuro</i>	750–800	1, 3, 4	<i>Ramphastos dicolorus</i>	1,250–1,350	1
<i>Columba cayennensis</i>	750–1,300	1, 2, 3	PICIDAE		
<i>Columba plumbea</i>	750–1,750	1	<i>Picumnus cirratus</i>	750–1,550	1, 2, 3, 4
<i>Columbina talpacoti</i> [*]	750–1,300	3, 4	<i>Colaptes campestris</i>	750–2,000	2, 3, 4, 5
<i>Scardafella squammata</i>	750–1,300	3, 4	<i>Colaptes melanochlorus</i>	1,250–1,300	1, 2, 3
<i>Leptotila verreauxi</i>	750–1,300	1, 2, 3, 4	<i>Piculus flavigula</i>	1,300	1
<i>Leptotila rufaxilla</i>	1,300	1	<i>Piculus aurulentus</i>	1,250–1,300	1
PSITTACIDAE			<i>Melanerpes candidus</i>	750–800	3, 4
<i>Diopsittaca nobilis</i>	750–800	1, 3, 4	<i>Veniliornis passerinus</i>	800–1,300	1, 2, 3, 4
<i>Aratinga leucophthalmus</i>	750–2,000	1, 2, 3, 4	<i>Campephilus melanoleucos</i>	1,300	1
<i>Pyrrhura frontalis</i>	1,250–1,300	1	RHYNOCRYPTIDAE		
<i>Forpus xanthopterygius</i>	1,300	1, 4	<i>Scytalopus indigoticus</i>	800	1
<i>Pionus maximiliani</i>	750–1,400	1, 2, 4	<i>Scytalopus sp.</i>	1,250–2,050	1, 2
CUCULIDAE			THAMNOPHILIDAE		
<i>Piaya cayana</i> [*]	750–2,050	1, 2, 4	<i>Mackenziaena leachii</i> [*]	800–2,050	1, 2, 3
<i>Crotophaga ani</i>	750–1,400	2, 3, 5	<i>Mackenziaena severa</i> [*]	800–1,300	1
<i>Guira guira</i>	750–800	3, 4	<i>Taraba major</i>	750–1,300	1, 2, 3
<i>Tapera naevia</i>	750–1,350	1	<i>Thamnophilus caerulescens</i> [*]	750–2,050	1
STRIGIDAE			<i>Thamnophilus ruficapillus</i> [*]	750–1,300	2, 3, 4
<i>Otus choliba</i>	750–1,300	1, 4	<i>Dysithamnus mentalis</i>	800–1,300	1
<i>Speotyto cunicularia</i> [*]	800–1,100	3, 4	<i>Herpilochmus atricapillus</i>	750–1,350	1
NYCTIBIIDAE			<i>Formicivora serrana</i>	750–1,650	1, 2, 3
<i>Nyctibius griseus</i> [*]	1,300	1	<i>Drymophila ferruginea</i> [*]	800–1,300	1
			<i>Drymophila rubricollis</i>	1,750–1,950	1
			<i>Drymophila ochropyga</i> [*]	800–2,000	1
			<i>Drymophila malura</i>	1,050–1,900	1

<i>Pyriglena leucoptera</i>	750–1,550	1	AF	<i>Gubernetes yetapa</i>	800–900	3	
<i>Myrmeciza loricata</i>	850–1,300	1	AF	<i>Satrapa icterophrys</i>	750	3, 4, 5	
FORMICARIIDAE				<i>Hirundinea ferruginea</i>	1,300–1,400	2, 3	
<i>Chamaeza meruloides</i>	1,250–1,300	1	AF	<i>Machetornis rixosus</i>	750	3, 4, 5	
<i>Hyllopezus nattereri</i>	1,500	1	AF	<i>Muscipipra vetula</i>	800–1,350	1, 2	NT, AF
CONOPOPHAGIDAE				<i>Syrstes sibilator</i>	1,100–1,300	1	
<i>Conopophaga lineata</i>	750–1,950	1		<i>Myiarchus ferax</i>	750–1,700	1, 2, 3, 4, 5	
FURNARIIDAE				<i>Myiarchus tyrannulus</i>	750–1,300	1, 2, 3, 4	
<i>Furnarius rufus</i>	750–1,300	3, 4, 5		<i>Myiarchus swainsoni</i>	1,300	1, 2, 3, 4	
<i>Furnarius figulus</i>	1,250	1, 5		<i>Pitangus sulphuratus</i>	750–1,600	1, 2, 3, 4	
<i>Oreophylax moreira</i>	1,900–2,050	2	AF	<i>Megarynchus pitangua</i>	750–1,400	1, 2, 3, 4	
<i>Synallaxis spixi</i>	750–2,000	1, 2, 5	AF	<i>Myiozetetes cayanensis</i>	750	4, 5	
<i>Synallaxis ruficapilla</i>	800–1,400	1	AF	<i>Myiozetetes similis</i>	750–1,400	1, 2, 3, 4	
<i>Synallaxis frontalis</i>	1,250–1,400	1		<i>Myiodynastes maculatus</i>	750–1,300	1, 3, 4	
<i>Synallaxis albescens</i>	750	5		<i>Empidonomus varius</i>	750–1,300	1, 2, 3	
<i>Synallaxis cinerascens</i>	800–1,400	1	AF	<i>Tyrannus savana</i>	750	3, 4, 5	
<i>Certhiaxis cinnamomea</i>	750	5		<i>Tyrannus melancholicus</i>	750–1,900	1, 2, 3, 4, 5	
<i>Cranioleuca pallida</i>	1,250–1,300	1, 2		<i>Pachyrhamphus polychapterus</i>	800–1,400	1	
<i>Phacellodomus rufifrons</i>	750–1,350	3, 4, 5		<i>Tityra cayana</i>	850	1	
<i>Phacellodomus erythrophthalmus ferrugineigula</i>	1,250	1	AF	PIPRIDAE			
<i>Syndactyla rufosuperciliata</i>	1,250–1,400	1		<i>Chiroxiphia caudata</i>	800–1,550	1	AF
<i>Philydor rufus</i>	800–1,550	1		<i>Ilicura militaris</i>	800–1,450	1	AF
<i>Automolus leucophthalmus</i>	800–1,450	1		<i>Manacus manacus</i>	850	1	
<i>Xenops rutilans</i>	800–1,550	1		<i>Neopelma chrysolophum</i>	1,250	1	AF
<i>Sclerurus scansor</i>	850	1		<i>Schiffornis virescens</i>	750–1,300	1	
<i>Lochmias nematura</i>	850–2,000	1		COTINGIDAE			
DENDROCOLAPTIDAE				<i>Lanisoma elegans</i>	1,250	1	V, MG
<i>Sittasomus griseicapillus</i>	750–1,500	1		<i>Phibalura flavirostris</i>	1,250–2,000	1	NT, MG
<i>Dendrocolaptes platyrostris</i>	1,300	1		<i>Lipaugus lanioides</i>	1,250–1,300	1	V, MG, AF
<i>Lepidocolaptes angustirostris</i>	750–1,300	2, 3		<i>Pyroderus scutatus</i>	1,050	1	MG
<i>Lepidocolaptes squamatus</i>	1,250–1,300	1		HIRUNDINIDAE			
<i>Lepidocolaptes fuscus</i>	1,250	1		<i>Notochelidon cyanoleuca</i>	750–2,050	1, 2, 3, 4	
<i>Campylorhamphus falcularius</i>	1,300	1	AF	<i>Stelgidopteryx ruficollis</i>	750–1,300	1, 2, 3, 4, 5	
TYRANNIDAE				CORVIDAE			
<i>Phyllomyias fasciatus</i>	750–1,400	1, 4		<i>Cyanocorax cristatellus</i>	750–800	3, 4	CE
<i>Camptostoma obsoletum</i>	750–1,800	1, 2, 3, 4		TROGLODYTIDAE			
<i>Phaeomyias murina</i>	750–1,300	1, 2, 3		<i>Donacobius atricapillus</i>	750	5, 6	
<i>Myiopagis viridicata</i>	800	1		<i>Troglodytes aedon</i>	750–2,050	2, 3, 4	
<i>Myiopagis caniceps</i>	1,500–1,900	1		MUSCICAPIDAE			
<i>Elaenia flavogaster</i>	750–1,300	1, 2, 3, 4		<i>Platycichla flavipes</i>	750–1,350	1	
<i>Elaenia mesoleuca</i>	1,250	1		<i>Turdus subalaris</i>	800–1,300	1	AF
<i>Elaenia obscura</i>	750–2,000	1, 2		<i>Turdus rufiventris</i>	750–2,050	1, 4	
<i>Elaenia chiriquensis</i>	1,400	2, 3		<i>Turdus leucomelas</i>	750–2,000	1, 2, 3, 4	
<i>Serpophaga subcristata</i>	850–1,300	1, 2		<i>Turdus amaurochalinus</i>	750–1,300	1, 5	
<i>Polystictus superciliosus</i>	1,250–2,000	2, 3	NT, CE, ER	<i>Turdus albicollis</i>	750–1,250	1	
<i>Mionectes rufiventris</i>	800–1,950	1	AF	MIMIDAE			
<i>Leptopogon amaurocephalus</i>	800–1,350	1		<i>Mimus saturninus</i>	750–1,400	2, 3, 4, 5	
<i>Phylloscartes ventralis</i>	1,250–1,800	1		VIREONIDAE			
<i>Capsiempis flaveola</i>	1,300–1,550	1		<i>Cyclarhis gujanensis</i>	750–2,000	1, 2	
<i>Hemitriccus diops</i>	850–1,250	1	AF	<i>Vireo chivi</i>	800–1,250	1	
<i>Hemitriccus nidipendulus</i>	800–1,400	1	NT, AF	<i>Hylophilus amaurocephalus</i>	800–1,500	1	
<i>Todirostrum paliocephalum</i>	750–1,350	1	AF	EMBERIZIDAE			
<i>Todirostrum plumbeiceps</i>	800–1,800	1		<i>Geothlypis aequinoctialis</i>	750–1,950	2, 5	
<i>Tolmomyias sulphurescens</i>	750–1,500	1		<i>Basileuterus flaveolus</i>	800–1,300	1	
<i>Platyrinchus mystaceus</i>	750–1,300	1		<i>Basileuterus culicivorus hypoleucus</i>	750–1,650	1	
<i>Myiobius barbatus</i>	1,250–1,300	1		<i>Basileuterus leucoblepharus</i>	1,250–1,550	1	AF
<i>Myiophobus fasciatus</i>	750–1,950	2, 3, 4, 5		<i>Coereba flaveola</i>	750–2,000	1, 2, 3, 4	
<i>Contopus cinereus</i>	1,250–1,300	1		<i>Schistochlamys ruficapillus</i>	750–2,050	1, 2, 4	
<i>Lathrotriccus euleri</i>	800–1,350	1		<i>Cissopis leveriana</i>	750–1,500	1, 4	
<i>Cnemotriccus fuscatus bimaculatus</i>	1,300	1		<i>Thlypopsis sordida</i>	1,300	1	
<i>Xolmis cinerea</i>	850	2, 3		<i>Hemithraupis ruficapilla</i>	800–1,500	1	AF
<i>Xolmis velata</i>	750–1,300	3		<i>Nemosia pileata</i>	750–1,300	1, 2, 4	
<i>Knipolegus lophotes</i>	750–1,400	2, 3		<i>Tachyphonus coronatus</i>	750–1,350	1, 4	AF
<i>Knipolegus nigerrimus</i>	1,250–2,050	2		<i>Trichothraupis melanops</i>	800–1,550	1	
<i>Knipolegus cyanirostris</i>	1,300	2, 4		<i>Piranga flava</i>	1,300–1,500	1, 2, 3	
<i>Fluvicola nengeta</i>	750–1,300	4, 5					
<i>Arundinicola leucocephala</i>	750	5, 6					
<i>Colonia colonus</i>	750–1,300	1, 2, 3, 4					

<i>Thraupis sayaca</i> ¹	750-1,300	1, 2, 3, 4		<i>Embernagra platensis</i>	750	5	
<i>Thraupis ornata</i> ²	750-1,300	1, 4	AF	<i>Embernagra longicauda</i> ³	750-2,050	2, 3, 4	NT, CE, ER
<i>Thraupis palmarum</i> ⁴	750-1,300	1, 2, 3, 4		<i>Volatinia jacarina</i> ⁵	750-1,300	3, 4, 5	
<i>Pipraeidea melanonota</i> ⁶	800-2,000	1, 2		<i>Sporophila nigricollis</i> ⁶	750-1,600	2, 3, 4, 5	
<i>Euphonia chlorotica</i>	750-1,400	1, 2, 4		<i>Sporophila caerulescens</i> ⁷	750-1,300	4	I
<i>Euphonia cyanocephala</i>	1,350	1		<i>Arremon flavirostris</i>	1,300	1	
<i>Chlorophonia cyanea</i>	1,250-1,400	1, 2		<i>Coryphospingus pileatus</i> ⁸	750-1,300	3, 4, 5	
<i>Tangara desmaresti</i> ⁹	1,250-2,050	1, 2	AF	<i>Saltator similis</i> ⁹	750-1,750	1, 2	
<i>Tangara cyanoventris</i>	800-1,700	1, 2	AF	<i>Saltator atricollis</i>	1,250-1,800	2	
<i>Tangara cayana</i> ¹⁰	750-2,050	1, 2, 3, 4		<i>Passerina brissoni</i> ¹⁰	1,300	4	I
<i>Dacnis cayana</i> ¹¹	750-1,700	1, 2, 4		<i>Psarocolius decumanus</i> ¹¹	750-1,350	1, 2, 3, 4	
<i>Conirostrum speciosum</i>	1,300	1		<i>Icterus jamaicai</i>	1,300	4	I
<i>Tersina viridis</i>	1,250-1,350	1, 2		<i>Agelaius ruficapillus</i>	1,300	4	I
<i>Zonotrichia capensis</i> ¹²	750-2,050	1, 2, 3, 4, 5		<i>Gnorimopsar chopi</i> ¹²	750-1,300	3, 4, 5	
<i>Ammodramus humeralis</i>	750	5		<i>Molothrus bonariensis</i> ¹³	800-1,300	4	
<i>Haplospiza unicolor</i> ¹⁴	1,300-2,000	1	AF				
<i>Donacospiza albifrons</i>	1,300	3		FRINGILLIDAE			
<i>Sicalis citrina</i> ¹⁵	750-2,050	2, 3, 4		<i>Carduelis magellanicus</i> ¹⁵	800-1,300	3	
<i>Sicalis flaveola</i>	1,300	4	MG, I				
<i>Emberizoides herbicola</i> ¹⁶	750	5					