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RESEARCH ARTICLE

Historical knowledge, richness and relative representativeness of the avifauna of the largest native urban rainforest in the world

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ABSTRACT. Stretching for more than 10,000 ha in the Metropolitan Area of São Paulo, southeastern Brazil, Serra da Cantareira comprises the largest native urban rainforest in the World, harboring a rich and diverse Atlantic Forest avifauna. Despite its closeness to major urban areas, few bird surveys have been conducted there. In this article we present an updated compilation of all bird species recorded for Serra da Cantareira, including personal records from the authors. A total of 326 species have been recorded for Serra da Cantareira since 1901; of these, nine have not been sighted there for the last two decades. The number of bird species endemic to the Atlantic Forest is high (80), and seven of its species are globally threatened. According to multivariate analyses the species diversity at Serra da Cantareira is similar to other regions of the Atlantic Forest, such as Carlos Botelho and Intervales state parks, where the vegetation is also ombrophilous dense forest. We discuss local changes in the avifaunal composition over the last decades and suggest the incorporation of large forest remnants to the Cantareira State Park to mitigate the impact of the northern section of Rodoanel Mário Covas, a highway (SP-21) that will soon be operational and will negatively impact the biodiversity of Serra da Cantareira.

KEY WORDS. Atlantic Forest, bird conservation, hierarchical cluster analysis, principal coordinate analysis, Serra da Cantareira.

INTRODUCTION

The Atlantic Forest (AF) is the second largest rainforest in South America and has a rich and diverse avifauna (900 species, 24% of which are endemic to the AF; Lima 2013). New bird species are still being discovered in this forest, even near large urban areas (Buzzetti et al. 2013), demonstrating that the local avifauna is not completely known, and reinforcing the importance of bird surveys there. Despite the high levels of species richness and endemism, only ~12% of the AF forest remains, and as a result, a large number of its component taxa are at imminent risk of extinction (Marini and Garcia 2005, Ribeiro et al. 2009). In addition to the importance of the AF for bird conservation, its forest remnants provide several ecosystem services for human populations, such as guaranteeing water supply near major urban areas (Dean 1995).

After 1893, due to a water collapse in the city São Paulo, the government started to expropriate farms at Serra da Cantareira for reforestation, to ensure the recovery of the streams and river that supply the city with water (Vilar 2007). Considered the central piece in the São Paulo City Green Belt Biosphere Reserve by UNESCO and an Important Bird Area by BirdLife International (IBA SP03), Serra da Cantareira still provides water and other ecosystem services to the city, and houses a significant portion of the AF biodiversity, including several threatened and endemic species (Bencke et al. 2006, Whately and Cunha

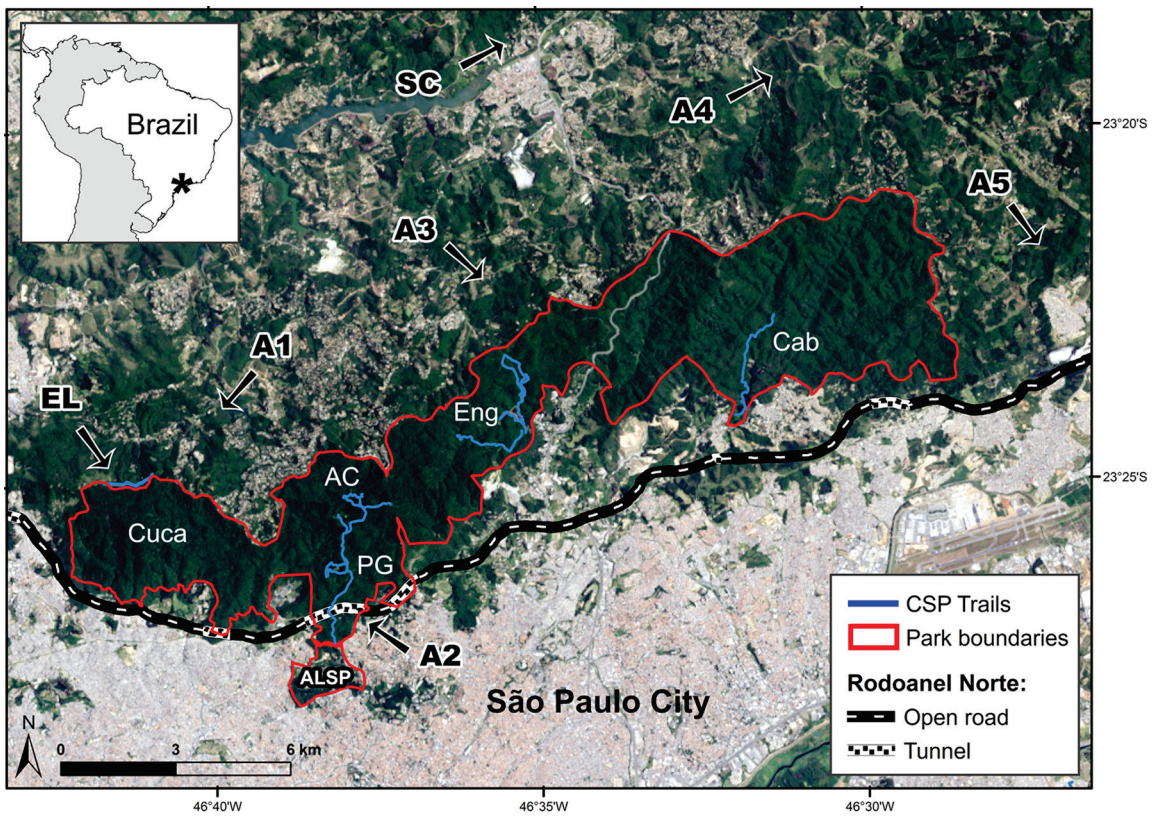

Figure 1. Serra da Cantareira locations surveyed in this study. In the urban slope are Cantareira State Park admnistrative zones and their trails: AC = Águas Claras; PG = Pedra Grande; Eng = Engordador; Cab = Cabuçu; EL = Estrada do Lenhador; Alberto Löfgren State Park (ALSP) and A2. In the inner slope are A1, A3, A4, A5 and SC = Sítio Capuavinha private reserve.

2007, Ayres 2008). Serra da Cantareira stretches for more than 10,000 ha in the Metropolitan Area of the city of São Paulo, the most populated and urbanized region in South America, and currently comprises the largest native urban rainforest in the world (Ayres 2008). The main impacts to the biodiversity of Serra da Cantareira are urban expansion and large infrastructure projects in nearby towns (Bencke et al. 2006, Fig. 1).

Although Serra da Cantareira is continuous with one of the largest cities in the world and near several research institutions and universities, few ornithological studies have been performed there. Museum collectors were the first to survey these mountains in the end of the XIX century (see Pinto 1938, 1944, Paynter and Traylor 1991). Graham (1992) published the only comprehensive bird inventory of the region, more than 20 years ago. Other than museum specimens and Graham's article, there have been few ornithological studies and bird surveys. They range from comparison of communities in different vegetation types (Graham 1991, Antunes et al. 2009; frugivory (Fonseca and Antunes 2007, Ikuta and Martins 2013); new species records (Antunes et al. 2008a), plumage anomaly (Cavarzere and Tonetti 2015); nest description (V.R. Tonetti et al. unpublished data), studies on species ecology (Tonetti and Pizo 2016), technical reports (Antunes and Eston 2009, 2012, DERSA 2010) and records provided by birdwatchers (WikiAves 2016, Xeno-Canto 2016).

In this article, we present an updated compilation of all bird species recorded for Serra da Cantareira, including our personal records. We compare the avifauna between Serra da Cantareira and other regions of AF using multivariate analysis, discuss changes in avifaunal composition during the last decades, and provide additional information on some threatened and/or uncommon species. Lastly, we focus on specific localities and measures for bird conservation in our study area.

MATERIAL AND METHODS

Serra da Cantareira ranges from 750 to 1,250 m asl. The vegetation there is predominantly montane ombrophilous dense forest. The climate is mesothermal and humid, with rainy summers and dry winters (CWA Köppen), and annual temperature and rainfall averaging 20 °C and 1,500 mm, respectively (Bencke et al. 2006). The slope facing the urban area comprises the most preserved area, with continuous forests, which is mostly

protected by Cantareira (7,900 ha; hereafter CSP) and Alberto Löfgren state parks (187 ha; ALSP). CSP is divided into four administrative zones: Águas Claras, Cabuçu, Engordador and Pedra Grande (Fig. 1). Patches in the inner slope have variable sizes (~1 to 100 ha) and are at different stages of regeneration. In this study we considered bird records from CSP, ALSP, neighboring patches in the inner slope, including the 20-ha private reserve Sítio Capuavinha (Lemos 2014) and records that indicated only "Serra da Cantareira" as a location, without any further detail.

We obtained species records over the last decade during systematic and unsystematic bird surveys. In unsystematic surveys, samplings consisted of recording all aurally or visually detected birds at unlimited distance, while walking on trails (Ribon 2010). Surveys were performed during the morning in different seasons and were mostly concentrated on the available trails of the four CSP administrative zones and a dirt road named "estrada do lenhador", at the park's boundaries (Fig. 1). Birds were recorded with the aid of binoculars and song recordings and photographs were occasionally taken during surveys.

VRT performed a systematic survey using point-counts. In this study, 100 fixed-points were established in the four CSP administrative zones and visits lasted 10 minutes during the morning. Each point was visited six times on different days between May and December 2014, resulting in a total of 600 samples, which include only birds detected within a 50-m radius (Vielliard et al. 2010, Tonetti and Pizo 2016). MAR, along with other researchers (see names in acknowledgements), performed another systematic study using line transects (80 h of sampling effort) and mist-nets (2,600 net-hours) in five different areas (A1 to A5; Fig. 1). These surveys were conducted during the morning and late afternoon from August 12th 2009 to April 29th 2010. Some netted specimens were collected and deposited in the MZUSP collection (details in DERSA 2010).

In order to compile our data, we searched for museum specimens collected from "Cantareira State Park", "Parque Estadual da Cantareira", "Cantareira Mountains", "Serra da Cantareira", "Cantareira", "Alberto Löfgren State Park", "Parque Estadual Alberto Löfgren", "Horto Florestal", "Cuca, Horto Florestal" and "Parque Florestal". We surveyed the collections of the following museums: Museum of Zoology of the University of São Paulo (MZUSP, Brazil), Museum of Zoology of the Campinas University (MUNICAMP, Brazil), and the Field Museum of Natural History (FMNH, USA). The localities cited above correspond to CSP, ALSP or not specified sites at Serra da Cantareira (Paynter and Traylor 1991). Using the same terms as outlined above, we searched for indexed articles potentially containing bird records in the citation databases Web of Science, Google Scholar and SciELO. Additionally, we used Google to search for non-indexed articles and "gray" literature, such as technical reports and theses. We also compiled records from the WikiAves (www.wikiaves.com; WA) and Xeno-canto (www.xeno-canto.org; XC) databases. All searches were performed until June 1st 2016. We discarded erroneous or doubtful records – i.e. misidentified pictures and song records, as well as species pending confirmation of their occurrence in our study area according to the literature. We followed the nomenclature of the CBRO (Brazilian Ornithological Records Committee) (Piacentini et al. 2015).

We used Mountford's dissimilarity index (Wolda 1981) to perform a hierarchical cluster analysis (HCA) and a Principal Coordinate Analysis (PCoA) to compare the bird communities from Serra da Cantareira with other AF regions. After calculating the Mountdord's index using presence/absence data with the *vegdist* function in the R package *vegan* (Oksanen et al. 2016), we performed the HCA using the Ward's minimum variance criterion as the objective function, the results of which define which clusters merge at each step (Ward Jr 1963). The HCA and the PCoA were performed using the *hclust* and *ordiplot* functions (Oksanen et al. 2016, R Core Team 2016). We also calculated the Jaccard dissimilarity index using the function *vegdist* (Oksanen et al. 2016). The Jaccard coefficient ranges from 0 (identical pairwise) to 1 (totally different pairwise) and it is a robust index to ascertain similarity among groups (Krebs 1999).

We compared bird communities between Serra da Cantareira and the following AF regions that also have dense ombrophilous forest: Boraceia Biological Station (Cavarzere et al. 2010), Carlos Botelho State Park (Antunes 2013), Intervales State Park (Antunes et al. 2008b), Morro Grande Reserve (Develey and Martensen 2006), Municipality of Ilha Comprida (Gussoni 2010), Municipality of Ubatuba (Simpson et al. 2012), and in Serra da Mantiqueira, where the vegetation is predominantly mixed ombrophilous forest: Campos do Jordão (composed by the Mananciais de Campos do Jordão and Campos do Jordão State Parks; Willis and Oniki 1981) and Itatiaia National Park (Barreto et al. 2013), as well as regions of semi-deciduous forest: Barreiro Rico Ecological Station (Antunes 2005), Caetetus Ecological Station (Tabanez et al. 2005, Cavarzere et al. 2009), Mata dos Godoy State Park (Anjos 2001), Morro do Diabo State Park (Uezu and Metzger 2016), Porto Ferreira (composed by Porto Ferreira and Vassununga State Parks, Uezu and Gaban-Lima 2003) and Rio Claro Farm (Donatelli et al. 2004). In addition to the references cited above, to complement lists of birds from those regions, we also used records from WikiAves and Xeno-Canto databases (WikiAves 2016, Xeno-Canto 2016). Most of those regions are or incorporate large conservation areas (reserves) where bird richness is high. Additionally, whenever possible, we also compiled records from patches surrounding the parks and reserves, to better characterize the avifauna, in the same manner that we did for Serra da Cantareira. These regions are ~230 km distant from our study area (50 km the nearest and 600 km the farthest; Fig. 2). For comparisons, we ignored seabirds records for Boracéia Biological Station and municipalities of Ilha Comprida and Ubatuba (e.g. the Magnificent Frigatebird *Fregata magnificens* [Mathews, 1914]) as well as exotic species, such as the House Sparrow *Passer domesticus* (Linnaeus, 1758), and birds from other regions in Brazil that escaped or were intentionally released from captivity (e.g. the Yellow-rumped Cacique *Cacicus cela* [Linnaeus, 1758]).

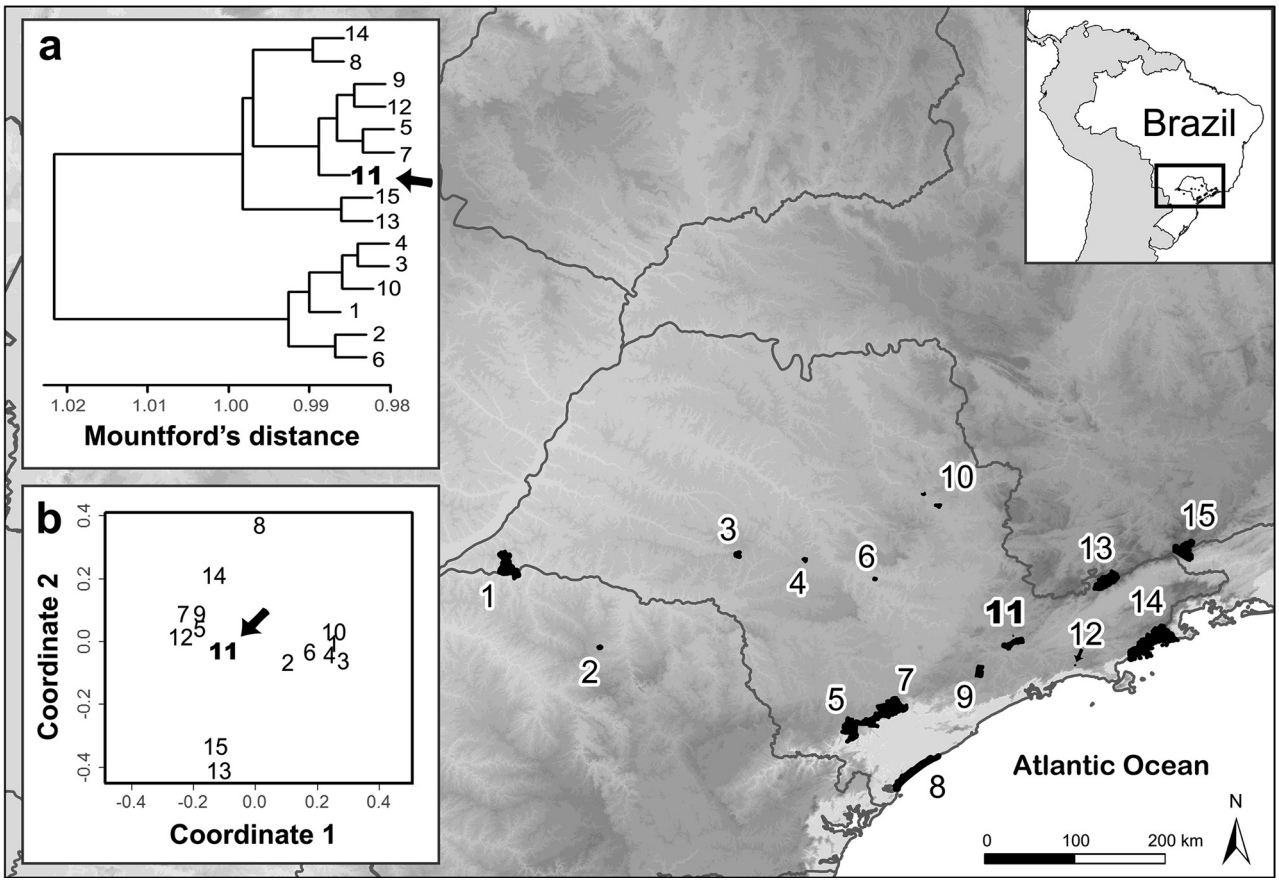

Figure 2. Dendogram with Atlantic Forest regions based on their bird community using Hierarchical Cluster Analysis (Mountford's distance coefficient; a) and the Principal Coordinate Analysis of these areas (b). 1 = Morro do Diabo State Park; 2 = Mata dos Godoy State Park; 3 = Caetetus Ecological Station; 4 = Rio Claro Farm; 5 = Intervales State Park; 6 = Barreiro Rico Ecological Station; 7 = Carlos Botelho State Park; 8 = Ilha Comprida; 9 = Morro Grande Reserve; 10 = Porto Ferreira (Porto Ferreira and Vassununga State Parks); 11 = Serra da Cantareira; 12 = Boracéia Biological Station; 13 = Campos do Jordão (composed by Mananciais de Campos do Jordão and Campos do Jordão State Parks); 14 = Ubatuba; 15 = Itatiaia National Park.

RESULTS

Overall, 326 species were found at Serra da Cantareira, including seven exotic species, e.g. the Rock Pigeon *Columba livia* (Gmelin, 1789), or species that may have escaped from captivity, such as the Red-cowled Cardinal *Paroaria dominicana* (Linnaeus, 1758). For nine species with previous records for Serra da Cantareira there have been no further records for the last two decades, and 55 species records are not adequately documented (through either museum specimen, photograph or song record; Appendix 1). Additionally, nine questionable literature records of bird species, for instance the Vinaceous Parrot *Amazona vinacea* (Kuhl, 1820), were not included in this report (Appendix 2). Non-passerines accounted for 138 species in 32 families and passerines are represented by 188 species in 34 families (Piacentini et al. 2015). Tyrannidae was the most representative family (35 species), followed by Thraupidae (33) and Furnariidae (18). AF endemics accounted for 24.5% of the records according to Lima's (2013) classification and 227 are forest birds (Parker et al. 1996). Seven species recorded in our study area are globally threatened (BirdLife 2016); five are threatened in Brazil (MMA 2014) and 17 in the state of São Paulo (São Paulo 2014). The ornithological knowledge of Serra da Cantareira has increased significantly since Graham's study. Only 71 birds were reported before 1992, all represented by museums specimens (Fig. 3). Records exclusively from the authors of this study contributed to add four species (Appendix 1). Species in the urban slope accounted for most records (Table 1).

HCA showed two major groups of areas, separated according to their bird communities. One is in a macro-region where the vegetation is predominantly ombrophilous dense or ombrophilous mixed forest near the coast, and comprises the

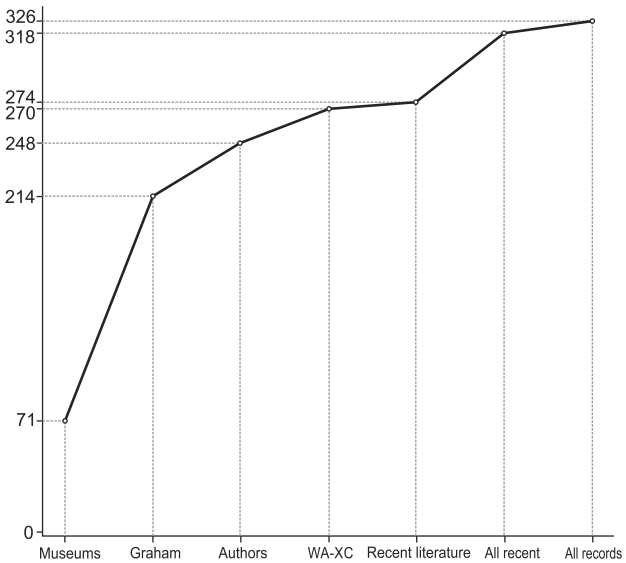

Figure 3. Number of species reported by different sources during different periods in Serra da Cantareira. Museums: specimens deposited in ornithological collections between 1901 and 1992; Graham: Graham 1992; Authors: species recorded by the authors during unsystematic surveys; WA: WikiAves 2016; XC: Xeno-Canto 2016; Recent literature: Figueiredo and Loo 2000, Develey and Endrigo 2004, Fonseca and Antunes 2007, Antunes et al. 2008a, 2008b, 2009, Antunes and Eston 2009, 2012, Minns et al. 2009, Dersa 2010, Ikuta and Martins 2013, Lemos 2014, Cavarzere and Tonetti 2015. All recent encompasses records obtained in recent literature cited above as well as specimens deposited in museuns after the work performed by Graham (1992) and species recorded by the authors.

Table 1. Number of species recorded in the different slopes of Serra da Cantareira. Urban slope corresponds to species recorded in Cantareira and Alberto Löfgren State Parks. Inner slope corresponds to species recorded in the slope faced to inner Atlantic forest in A1, A3, A4, A5 and the private reserve Sítio Capuavinha. In this table we did not take into account species which the location pointed only to Serra da Cantareira.

Locality	Number of recorded species
Urban slope	298
CSP	293
ALSP	207
Inner slope	222
A1, A3, A4 and A5	202
Sítio Capuavinha reserve	98

following areas: Boracéia Biological Station, Campos do Jordão, Serra da Cantareira, Carlos Botelho and Intervales State Parks, Ilha Comprida, Itatiaia National Park, Morro Grande Reserve and Ubatuba. The other group, encompassing more inland areas, has lower rainfall rates with seasonal semi-deciduous forests and includes: Barreiro Rico Biological Station, Caetetus Ecological Station, Mata dos Godoy State Park, Morro do Diabo State Park, Porto Ferreira and Rio Claro Farm (Fig. 2). The bird community of Serra da Cantareira is more similar to a clade composed of Boracéia Biological Station, Carlos Botelho and Intervales state parks and Morro Grande Reserve (Fig. 1a) according to HCA. According to the Jaccard index the bird community of Serra da Cantareira is more similar to Carlos Botelho State Park, while Pontal do Parapanapanema has a more distinct avifauna (Table 2). Although the ombrophilous mixed forests, represented here by Campos do Jordão and Itatiaia National Park, are more related to ombrophilous dense forests according to HCA, they form a separated clade within this major group (composed by areas 13 and 15, Fig. 2a). The PCoA also showed two regions of ombrophilous mixed forests that are more related to ombrophilous dense forests in the first dimension, while in the coordinate 2 they were more distant from other omborphilous dense forest areas (Fig. 2b).

Table 2. Areas compared with Serra da Cantareira in multivariate analysis using presence/absence bird species data. spp. = number of species reported; Distance (km) = distance in kilometers from our study area; Jaccard = Jaccard dissimilarity index, the lower the number, the greater the similarity in avifauna composition with Serra da Cantareira. Areas with avifauna most (Carlos Botelho State Park) and least (Morro do Diabo State Park) similar to Serra da Cantareira are indicated in bold.

Area	Extension (ha)	spp.	Distance (km)	Jaccard
Barreiro Rico Ecological Station	300	198	180	0.557
Boracéia Biological Station	96	313	75	0.392
Caetetus Ecological Station	2,180	290	330	0.491
Carlos Botelho State Park	**38,000**	**333**	**150**	**0.354**
Campos do Jordão	9,000	233	130	0.514
Ilha Comprida	19,200	257	190	0.543
Intervales State Park	42,000	421	190	0.377
Itatiaia National Park	24,000	404	220	0.393
Mata dos Godoy State Park	680	268	470	0.474
Morro Grande Reserve	10,000	194	50	0.498
Morro do Diabo State Park	**34,000**	**215**	**600**	**0.616**
Porto Ferreira	2,700	240	200	0.545
Rio Claro Farm	4,000	219	260	0.566
Ubatuba	71,078,300	377	140	0.407

DISCUSSION

Our results are consistent with other ornithological compilations conducted at Boracéia Biological Station, which is an AF reserve located at Serra do Mar, 75 km distant from Serra da Cantareira, and where the vegetation is also dense mountain rain forest (Fig. 2). Cavarzere et al. (2010) performed transect counts, mist netting and unsystematic surveys at the station, where they recorded 242 bird species. After accounting for

museums specimens, literature records, and records provided by birdwatchers, 323 species were reported for that reserve, 30% of which are endemic to the AF (Cavarzere et al. 2010, Lima 2013). This suggests that ornithological reviews provide a more comprehensive knowledge on the actual bird diversity of a given region than localized surveys, even when using different methodologies and intensive sampling effort.

Some records of species for Serra da Cantareira are based on only one source of information (records from the authors, those provided by birdwatchers, reported in the literature or represented by museums specimens; Fig. 3), e.g. the Gray-bellied Hawk *Accipiter poliogaster* (Temminck, 1824). This bird was only recently spotted by the authors and had not been previously recorded there. Despite its broad-range distribution (north Colombia to south Brazil, and more recently found in Costa Rica and Panama), this species is considered uncommon and is sparsely found throughout its range (Bierregard et al. 2016). VRT first recorded a juvenile at Cabuçu (a CSP administrative zone; Fig. 1) on May 5, 2014. On that day, the birds' vocalization was recorded.

The high number of species recorded by birdwatchers (76% of all species compiled in this study, ten of which reported only by them; Appendix 1) highlights the importance of public websites where digital vouchers can be deposited, such as WikiAves (http://www.wikiaves.com) and Xeno-Canto (http://www.xeno-canto.org). Among the records provided only by these databases is the Shrike-like Cotinga *Laniisoma elegans* (Thunberg, 1823) (WA1076770). This frugivorous bird, found mostly in old-growth forests, was photographed in a forest edge at the Engordador administrative CSP zone. Birds recorded only in the literature accounted for 13 species, such as the Rufous-tailed Attila *Attila phoenicurus* Pelzeln, 1868, song-recorded at Cabuçu (Minns et al. 2009). The Rufous-tailed Attila breeds in southeast Brazil during the austral winter, and is found in greater numbers in Serra do Mar (Walther 2016), being uncommon in our study area (pers. obs.).

Although museum records until 1992 did not account for 80% of the species in Serra da Cantareira, some relevant birds were reported only until that year. The most noticeable is the Purple-winged Ground-Dove *Claravis geoffroyi* (Temminck, 1811) collected in 1937 at a CSP site named "Cuca" (MZUSP 17040; Fig. 1). It was once a fairly common and widely distributed species (occurring from Bahia [Brazil] south through eastern Brazil to northern Argentina and eastern Paraguay). During the last three decades, however, there have beeen only a few non-documented records of this globally "Critically Endangered" AF endemic species (MMA 2014, BirdLife 2016). *Claravis geoffroyi* feeds on bamboo seeds (*Guadua* sp.), and most likely travels far in search for flowering events (Sick 1997, Areta et al. 2009). *Guadua* spp. have synchronous masting events in cycles of ~30 y, attracting birds that eat their seeds, such as the Buffy-fronted Seedeater *Sporophila frontalis* (Verreaux, 1869) and the Temminck's Seedeater *S. falcirostris* (Temminck, 1820), both registered at Serra da Cantareira and globally threatened (Areta et al. 2009, BirdLife 2016). As *Guadua* sp. bamboo tickets are common in several parts of Serra da Cantareira (Bencke et al. 2006; pers. obs.), we suggest that those searching for the Purple-winged Ground-Dove should try to locate flowering events of that bamboo.

Due to severe forest loss and human intervention at Serra da Cantareira, it is possible that local extinctions have occurred, but they are difficult to document. For example, Cavarzere et al. (submitted) recorded the Squamate Antbird *Myrmoderus squamosus* (Pelzeln, 1868) after a 190-y time span from the last confirmed record at the Ipanema National Forest, an AF reserve 100 km from our study area. This is a good example of imperfect detection and insufficient sampling effort (Mackenzie et al. 2003). The Spot-billed Toucanet *Selenidera maculirostris* (Lichtenstein, 1823) is an example of a species recently recorded at Serra da Cantareira after 45 y without records. Six specimens were collected in 1965 (MZUSP 60592 to 60597), and after it, the only confirmed record was provided by MAR and his team in A5 (Fig. 1).

More important than accounting for local bird extinctions *per se* is identifying functional extinctions and their impact on the ecosystem. Habitat disturbance is one of the main drivers of functional extinctions of sensitive guilds, such as understory insectivorous and large-bodied frugivorous (Martensen et al. 2012, Galetti et al. 2013, Morante-Filho et al. 2015). It is very possible that, of the currently rarest species in our study area – e.g. the Saffron Toucanet *Pteroglossus bailloni* (Vieillot, 1819), a large-bodied frugivorous, and the Speckle-breasted Antpitta *Hylopezus nattereri* (Pinto, 1937), an understory insectivorous – were more abundant in the past, given their presence in museums collections. Declines in the populations of these birds have been recorded in other AF regions due to habitat disturbances (Guix et al. 2000, Anjos 2006), and since they participate in key-ecological processes (e.g. seed dispersal), the consequences of their functional extinctions should be better investigated.

In contrast with the decreasing populations of some species in response to habitat disturbances, species that benefit from altered environments are expected to expand their ranges and increase their abundance. Graham (1992), using point-counts (37 hours of sampling effort) between December 11th 1985 and March 29th 1986, did not record any individual of the White-eyed Parakeet *Psittacara leucophthalmus* (Statius Muller, 1776) within the CSP, although this species has been frequently recorded in our study area over the last decade. The White-eyed Parakeet benefits from deforestation and occupies forest edges and areas of open vegetation, and its presence in AF is an indication of environmental degradation (Sick 1997). Increases in the numbers of generalist bird species, together with decreases in the numbers of sensitive species, have also been reported for other large and protected AF remnants after a 30-y time span – at the Caetetus Ecological Station (Cavarzere et al. 2012; 2,800 ha, Fig. 2).

Biogeographic affinities

Similarly to a study on the plants of Serra da Cantareira, our results indicate that the local avifauna is associated more strongly

with dense ombrophilous forest areas, to a lesser extent to mixed ombrophilous forest and to an even lesser extent to seasonal semi-deciduous forests (Salis et al. 1995; Fig. 2a, Table 2). The Black-backed Tanager *Tangara peruviana* (Desmarest, 1806) and the Olive-green Tanager *Orthogonys chloricterus* (Vieillot, 1819) are typical of the dense omborphilous forest species of Serra da Cantareira that occur predominantly near the coast. However, birds commonly found in seasonal semi-deciduous forests, such as the Southern Antpipit *Corythopis delalandi* (Lesson, 1830), were also recorded. This understory insectivorous species has been song-recorded only once by the MAR team at the administrative zone of Pedra Grande at CSP. In order to maintain the genetic flow and evolutionary processes between these three types of vegetation, the stablishment of forest corridors uniting them is crucial. Forest patches are important in facilitating bird dispersal over landscapes and can help to connect larger AF remnants (Ribeiro et al. 2009).

Conservation

In addition providing information on the bird community of Serra da Cantareira, our results reinforce the relevance of the area for birds. Bencke et al. (2006) estimated an avifauna richness of 250 species for the region and reported 65 AF endemics and four globally threatened species, less than the numbers provided by us (326, 80 and seven respectively). Although located at an urban matrix and composed mostly of secondary forest, Serra da Cantareira accounted for 17% of all species recorded in Brazil (Piacentini et al. 2015) and 36.7% in AF (Lima 2013). Moreover, it is a stronghold for populations of some species that are suffering a sharp decline in several other AF regions, for instance the Solitary Tinamou *Tinamus solitarius* (Vieillot, 1819), currently found mostly in large forest remnants such as those in Serra do Mar (BirdLife 2016) and also an abundant bird in our study area (Bencke et al. 2006, pers. obs.), as well as the Southern Bristle-tyrant *Phylloscartes eximius* (Temminck, 1822), a passerine that was once broadly distributed but now is found only in a few places (Silveira 2009, Tonetti and Pizo 2016).

Despite differences in sampling effort, we found that the avifauna composition of CSP and that of the inner slope patches are similar (Appendix 1), corroborating the hypothesis that even fragmented landscapes with high levels of forest cover can maintain similar species richness to areas of continuous forest (Martensen et al. 2012, Morante-Filho et al. 2015). This supports the idea that forest patches surrounding Serra da Cantareira should be protected, since they can act as corridors between our study area and other large AF remnants, such as those in Serra da Mantiqueira and Serra do Mar (Fig. 2). Since seasonal semi-deciduous forests have been more extensively devastated than ombrophilous and mixed forests, there are only a few seasonal semi-deciduous forest remnants that are larger than 500 ha with weakly connected patches (Ribeiro et al. 2009), which means that genetic flow between Cantareira birds and those that inhabit the inner AF can be seriously compromised.

Similarly to Serra da Cantareira, other large (15,700 ha) urban forests, in the city Rio de Janeiro City, the Tjuca National Forest and the Pedra Branca State Park, have high bird richness (325 species; Lepage 2016), and are also considered Important Bird Areas (IBA RJ07, Bencke et al. 2006), with seven globally threatened species. This highlights the importance of such reserves, which despite the high levels of anthropic pressure, harbor a significant portion of our biodiversity. As in our study area, the main threats to the Tijuca National Forest are urban sprawl, and the impacts of large infrastructure projects in the surrounding cities (Bencke et al. 2006).

When it comes to infrastructure, roads cause one of the largest disturbances in urban forests. Their intense noise can cause changes in the foraging behavior of birds, hinder intra and inter-specific communication, and cause chronic stress. The animals, in turn, become more prone to diseases and their reproductive success is reduced (Ortega 2012). There is one highway (Fernão Dias, BR-116) and tree paved roads with intense traffic crossing CSP (da Silva et al. 2009). In addition to this, the northern section of Rodoanel Mário Covas (SP-21) will be operating soon (DERSA 2010; Fig. 1). This new highway is being built close to the boundaries of CSP and ALSP, crossing the first in some sections via tunnels, and will represent a new threat to the biodiversity of Serra da Cantareira (Ayres 2008, da Silva et al. 2009, DERSA 2010; Fig. 1). As a strategy to mitigate the damage caused by those roads, we suggest the incorporation of forest remnants to the CSP, especially those large patches in the west portion of the Park, and near Cuca (Fig. 1).

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APPENDIX 1

Species recorded in Serra da Cantareira. Bird families are in capital letters and in bold with the number of species in parenthesis. Nomenclature followed the Brazilian Ornithological Records Committee classification (Piacentini et al. 2015); [atl] = Atlantic Forest endemics (Lima 2013); [Fo] = forest species (Parker et al. 1996); [SP] = species threatened in São Paulo state (São Paulo 2014); [BR] = species threatened in Brazil (MMA 2014); [GL] = globally threatened species (BirdLife 2016); * = birds lacking documented records (museum specimen, picture or song record); ‡ = species without recent records (i.e. after Graham 1992); Locality = specific location where each species were recorded; ALSP = Alberto Löfgren State Park; CSP = Cantareira State Park, including the locality "estrada do lenhador"; Patch = species recorded in the inner slope patches (A1, A3, A4, A5 and the private reserve Sítio Capuavinha); Serra Cantareira = species recorded in Serra da Cantareira and where the specific location was not pointed; Source = record source; 1 = authors' records during unsystematic surveys; 2 = systematic surveys (fixed-points[100 h sample effort]) performed by Vinicius R. Tonetti in CSP; 3 = systematic study (line transect [80 h] and mist-nest [2,600 nest-hours]) performed by Marco A. Rego along with other researches (names in Acknowledgements) in A1-A5; 4 = records from literature; 5 = museum specimens; 6 = species in WikiAves and/or Xeno-Canto databases.

Species	English Name	Locality	Source
Tinamidae (3)			
Tinamus solitarius (Vieillot, 1819)	Solitary Tinamou [atl, Fo, SP]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Crypturellus obsoletus (Temminck, 1815)	Brown Tinamou [Fo]	CSP, Patch	1, 2, 3, 4, 6
Crypturellus tataupa (Temminck, 1815)	Tataupa Tinamou [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Anatidae (4)			
Cairina moschata (Linnaeus, 1758)	Muscovy Duck	ALSP, CSP	6
Dendrocygna viduata (Linnaeus, 1766)	White-faced Whistling-Duck	ALSP, CSP	1, 4, 6
Dendrocygna autumnalis (Linnaeus, 1758)	Black-bellied Whistling-Duck	ALSP	4, 6
Amazonetta brasiliensis (Gmelin, 1789)	Brazilian Teal	ALSP, CSP, Patch	1, 3, 4, 6
Cracidae (1)			
Penelope obscura Temminck, 1815	Dusky-legged Guan [Fo]	ALSP, CSP, Patch	1, 3, 4, 6

Species	English Name	Locality	Source
Odontophoridae (1)			
Odontophorus capueira (Spix, 1825)	Spot-winged Wood-Quail [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Podicipedidae (2)			
Tachybaptus dominicus (Linnaeus, 1766)	Least Grebe	ALSP, CSP	1, 4, 6
Podilymbus podiceps (Linnaeus, 1758)	Pied-billed Grebe	ALSP, CSP	1, 4, 6
Phalacrocoracidae (1)			
Nannopterum brasilianus (Gmelin, 1789)	Neotropic Cormorant	ALSP, CSP	1, 4, 6
Anhingidae (1)			
Anhinga anhinga (Linnaeus, 1766)	Anhinga	CSP	1, 6
Ardeidae (7)			
Nycticorax nycticorax (Linnaeus, 1758)	Black-crowned Night-Heron	ALSP, CSP	1, 4, 6
Butorides striata (Linnaeus, 1758)	Striated Heron [Fo]	ALSP, CSP	1, 4, 6
Bubulcus íbis (Linnaeus, 1758)	Cattle Egret	ALSP, Patch	3, 6
Ardea cocoi Linnaeus, 1766	Cocoi Heron	ALSP, CSP	1, 4, 6
Ardea alba Linnaeus, 1758	Great Egret	ALSP, CSP, Patch	1, 3, 4, 6
Syrigma sibilatrix (Temminck, 1824)	Whistling Heron*	CSP	1, 4
Egretta thula (Molina, 1782)	Snowy Egret	ALSP, CSP, Patch	1, 3, 4, 6
Threskiornithidae (1)			
Mesembrinibis cayennensis (Gmelin, 1789)	Green Ibis [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Cathartidae (3)			
Cathartes aura (Linnaeus, 1758)	Turkey Vulture [Fo]	CSP	1, 4, 6
Coragyps atratus (Bechstein, 1793)	Black Vulture [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Sarcoramphus papa (Linnaeus, 1758)	King Vulture [Fo, SP]	CSP	6
Accipitridae (17)			
Leptodon cayanensis (Latham, 1790)	Gray-headed Kite [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Chondrohierax uncinatus (Temminck, 1822)	Hook-billed Kite [Fo]	CSP	1, 5
Elanoides forficatus (Linnaeus, 1758)	Swallow-tailed Kite [Fo]	CSP	1, 6
Harpagus diodon (Temminck, 1823)	Rufous-thighed Kite [Fo]	ALSP, CSP	1, 4, 6
Accipiter poliogaster (Temminck, 1824)	Gray-bellied Hawk [Fo]	CSP	1, 2
Accipiter striatus Vieillot, 1808	Sharp-shinned Hawk [Fo]	ALSP, CSP	1, 4, 6
Ictinia plumbea (Gmelin, 1788)	Plumbeous Kite [Fo]	CSP	1, 2, 4, 6
Rostrhamus sociabilis (Vieillot, 1817)	Snail Kite *	CSP, Patch	1, 3
Geranospiza caerulescens (Vieillot, 1817)	Crane Hawk [Fo]	CSP	6
Heterospizias meridionalis (Latham, 1790)	Savanna Hawk *	CSP	1
Amadonastur lacernulatus (Temminck, 1827)	White-necked Hawk [atl, Fo, SP, BR, GL]	ALSP, CSP	1, 4, 5, 6
Rupornis magnirostris (Gmelin, 1788)	Roadside Hawk [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Parabuteo unicinctus (Temminck, 1824)	Harris's Hawk [Fo, SP] * ‡	Serra Cantareira	4
Parabuteo leucorrhous (Quoy & Gaimard, 1824)	White-rumped Hawk [Fo] *	CSP	1, 4
Geranoaetus albicaudatus (Vieillot, 1816)	White-tailed Hawk	CSP, Patch	1, 3, 4, 6
Buteo brachyurus Vieillot, 1816	Short-tailed Hawk [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Spizaetus tyrannus (Wied, 1820)	Black Hawk-Eagle [Fo, SP]	CSP, Patch	1, 3, 4, 6
Rallidae (5)			
Aramides cajaneus (Statius Muller, 1776)	Gray-necked Wood-Rail	CSP	1, 6
Aramides saracura (Spix, 1825)	Slaty-breasted Wood-Rail [atl]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Laterallus melanophaius (Vieillot, 1819)	Rufous-sided Crake *	ALSP, CSP	1, 4
Pardirallus nigricans (Vieillot, 1819)	Blackish Rail	ALSP, CSP	1, 4, 6
Gallinula galeata (Lichtenstein, 1818)	Common Gallinule	ALSP, CSP	1, 4, 6
Charadriidae (1)			
Vanellus chilensis (Molina, 1782)	Southern Lapwing	ALSP, CSP, Patch	1, 3, 4, 6
Scolopacidae (1)			
Tringa solitaria Wilson, 1813	Solitary Sandpiper	CSP	1, 6

Species	English Name	Locality	Source
Jacanidae (1)			
Jacana jacana (Linnaeus, 1766)	Wattled Jacana	ALSP, Patch	1, 3, 4, 6
Columbidae (12)			
Columbina talpacoti (Temminck, 1811)	Ruddy Ground-Dove	ALSP, CSP, Patch	1, 3, 4, 6
Columbina squammata (Lesson, 1831)	Scaled Dove *	ALSP	4
Claravis pretiosa (Ferrari-Perez, 1886)	Blue Ground-Dove [Fo]	CSP	1, 6
Claravis geoffroyi (Temminck, 1811)	Purple-winged Ground-Dove [atl, Fo, SP, BR, GL] ‡	CSP	5
Columba livia Gmelin, 1789	Rock Pigeon [Ex°]	ALSP, CSP, Patch	1, 4, 6
Patagioenas picazuro (Temminck, 1813)	Picazuro Pigeon [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Patagioenas cayennensis (Bonnaterre, 1792)	Pale-vented Pigeon [Fo] *	CSP, Patch	1, 2, 4
Patagioenas plumbea (Vieillot, 1818)	Plumbeous Pigeon [Fo]	CSP, Patch	1, 2, 3, 4, 6
Zenaida auriculata (Des Murs, 1847)	Eared Dove *	CSP, Patch	1, 3, 4
Leptotila verreauxi Bonaparte, 1855	White-tipped Dove [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Leptotila rufaxilla (Richard & Bernard, 1792)	Gray-fronted Dove [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Geotrygon montana (Linnaeus, 1758)	Ruddy Quail-Dove [Fo]	CSP, Patch	1, 2, 3, 4, 6
Cuculidae (8)			
Piaya cayana (Linnaeus, 1766)	Squirrel Cuckoo [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Coccyzus melacoryphus Vieillot, 1817	Dark-billed Cuckoo [Fo] *	CSP	4
Coccyzus americanus (Linnaeus, 1758)	Yellow-billed Cuckoo [Fo]	CSP	1, 4, 6
Coccyzus euleri Cabanis, 1873	Pearly-breasted Cuckoo [Fo]	CSP	4, 6
Crotophaga ani Linnaeus, 1758	Smooth-billed Ani	ALSP, CSP, Patch	1, 3, 4, 5, 6
Guira guira (Gmelin, 1788)	Guira Cuckoo *	ALSP, CSP, Patch	1, 4
Tapera naevia (Linnaeus, 1766)	Striped Cuckoo *	CSP, Patch	3
Dromococcyx pavoninus Pelzeln, 1870	Pavonine Cuckoo [Fo] *	CSP, Patch	1, 2, 3
Tytonidae (1)			
Tyto furcata (Temminck, 1827)	American Barn Owl *	ALSP, CSP	1, 4
Strigidae (6)			
Megascops choliba (Vieillot, 1817)	Tropical Screech-Owl [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Pulsatrix koeniswaldiana (Bertoni & Bertoni, 1901)	Tawny-browed Owl [atl, Fo]	ALSP, CSP, Patch	1, 3, 4, 5, 6
Strix hylophila Temminck, 1825	Rusty-barred Owl [atl, Fo] *	CSP	1, 3
Strix virgata (Cassin, 1849)	Mottled Owl [Fo]	ALSP, CSP, Patch	1, 3, 4, 5
Athene cunicularia (Molina, 1782)	Burrowing Owl *	ALSP, Patch	1, 3, 4
Asio clamator (Vieillot, 1808)	Striped Owl	ALSP, CSP	4, 5, 6
Nyctibiidae (1)			
Nyctibius griseus (Gmelin, 1789)	Common Potoo [Fo] *	CSP	1, 4
Caprimulgidae (7)			
Nyctiphrynus ocellatus (Tschudi, 1844)	Ocellated Poorwill [Fo]	CSP, Patch	1, 3
Lurocalis semitorquatus (Gmelin, 1789)	Short-tailed Nighthawk [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Nyctidromus albicollis (Gmelin, 1789)	Pauraque [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Hydropsalis parvula (Gould, 1837)	Little Nightjar [Fo] *	Patch	1, 3
Hydropsalis longirostris (Bonaparte, 1825)	Band-winged Nightjar	CSP	6
Hydropsalis torquata (Gmelin, 1789)	Scissor-tailed Nightjar [Fo] *	CSP, Patch	1, 3, 4
Hydropsalis forcipata (Nitzsch, 1840)	Long-trained Nightjar [atl, Fo] *	CSP, Patch	3, 4
Apodidae (2)			
Streptoprocne zonaris (Shaw, 1796)	White-collared Swift [Fo] *	ALSP, CSP, Patch	1, 4
Chaetura meridionalis Hellmayr, 1907	Sick's Swift [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Trochilidae (14)			
Phaethornis pretrei (Lesson & Delattre, 1839)	Planalto Hermit [Fo] *	ALSP, CSP, Patch	1, 3, 4
Phaethornis eurynome (Lesson, 1832)	Scale-throated Hermit [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Eupetomena macroura (Gmelin, 1788)	Swallow-tailed Hummingbird	ALSP, CSP, Patch	1, 4, 6

Species	English Name	Locality	Source
Aphantochroa cirrochloris (Vieillot, 1818)	Sombre Hummingbird [Fo]	ALSP, CSP, Patch	1, 4, 5, 6
Florisuga fusca (Vieillot, 1817)	Black Jacobin [Fo]	ALSP, CSP, Patch	1, 2, 4, 5, 6
Anthracothorax nigricollis (Vieillot, 1817)	Black-throated Mango [Fo]	CSP	6
Lophornis chalybeus (Vieillot, 1822)	Festive Coquette [Fo]	ALSP, CSP	1, 4, 6
Chlorostilbon lucidus (Shaw, 1812)	Glittering-bellied Emerald [Fo]	ALSP, CSP, Patch	1, 3, 4, 5, 6
Thalurania glaucopis (Gmelin, 1788)	Violet-capped Woodnymph [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Leucochloris albicollis (Vieillot, 1818)	White-throated Hummingbird [Fo]	ALSP, CSP, Patch	1, 4, 6
Amazilia versicolor (Vieillot, 1818)	Versicolored Emerald [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Amazilia fimbriata (Gmelin, 1788)	Glittering-throated Emerald [Fo]	CSP	1, 2, 4, 6
Amazilia lactea (Lesson, 1832)	Sapphire-spangled Emerald [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Heliodoxa rubricauda (Boddaert, 1783)	Brazilian Ruby [atl, Fo]	ALSP, CSP	1, 4, 5, 6
Trogonidae (2)			
Trogon viridis Linnaeus, 1766	White-tailed Trogon [Fo]	ALSP, CSP	5, 6
Trogon surrucura Vieillot, 1817	Surucua Trogon [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Alcedinidae (3)			
Megaceryle torquata (Linnaeus, 1766)	Ringed Kingfisher	ALSP, CSP, Patch	1, 3, 4, 6
Chloroceryle amazona (Latham, 1790)	Amazon Kingfisher	ALSP, CSP	1, 3, 4, 6
Chloroceryle americana (Gmelin, 1788)	Green Kingfisher	ALSP, CSP, Patch	1, 3, 4, 6
Momotidae (1)			
Baryphthengus ruficapillus (Vieillot, 1818)	Rufous-capped Motmot [Fo] *	Patch	1, 3
Bucconidae (1)			
Malacoptila striata (Spix, 1824)	Crescent-chested Puffbird [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Ramphastidae (5)			
Ramphastos toco Statius Muller, 1776	Toco Toucan	ALSP, CSP	6
Ramphastos vitellinus Lichtenstein, 1823	Channel-billed Toucan [Fo, GL]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Ramphastos dicolorus Linnaeus, 1766	Red-breasted Toucan [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Selenidera maculirostris (Lichtenstein, 1823)	Spot-billed Toucanet [atl, Fo, SP]	Patch	1, 3, 5
Pteroglossus bailloni (Vieillot, 1819)	Saffron Toucanet [atl, Fo, SP]	ALSP, CSP	1, 4, 5, 6
Picidae (11)			
Picumnus cirratus Temminck, 1825	White-barred Piculet [Fo] *	Patch	1
Picumnus temminckii Lafresnaye, 1845	Ochre-collared Piculet [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Melanerpes candidus (Otto, 1796)	White Woodpecker *	ALSP, CSP, Patch	1, 3, 4
Melanerpes flavifrons (Vieillot, 1818)	Yellow-fronted Woodpecker [Fo]	CSP	1, 3, 4, 5
Veniliornis spilogaster (Wagler, 1827)	White-spotted Woodpecker [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Piculus aurulentus (Temminck, 1821)	Yellow-browed Woodpecker [atl, Fo]	CSP, Patch	1, 3, 4, 6
Colaptes melanochloros (Gmelin, 1788)	Green-barred Woodpecker [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Colaptes campestris (Vieillot, 1818)	Campo Flicker *	ALSP, CSP, Patch	1, 3, 4
Celeus flavescens (Gmelin, 1788)	Blond-crested Woodpecker [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Dryocopus lineatus (Linnaeus, 1766)	Lineated Woodpecker [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Campephilus robustus (Lichtenstein, 1818)	Robust Woodpecker [atl, Fo] *	CSP, Patch	1, 2, 3, 4
Cariamidae (1)			
Cariama cristata (Linnaeus, 1766)	Red-legged Seriema *	CSP, Patch	1, 3, 4
Falconidae (6)			
Caracara plancus (Miller, 1777)	Southern Caracara	ALSP, CSP, Patch	1, 3, 4, 6
Milvago chimachima (Vieillot, 1816)	Yellow-headed Caracara	ALSP, CSP, Patch	1, 3, 4, 6
Herpetotheres cachinnans (Linnaeus, 1758)	Laughing Falcon [Fo]	CSP, Patch	1, 2, 3, 4, 6
Micrastur ruficollis (Vieillot, 1817)	Barred Forest-Falcon [Fo]	CAP, Patch	1, 2, 3, 4, 6
Micrastur semitorquatus (Vieillot, 1817)	Collared Forest-Falcon [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Falco femoralis Temminck, 1822	Aplomado Falcon	CSP	1, 6
Psittacidae (8)			
Diopsittaca nobilis (Linnaeus, 1758)	Red-shouldered Macaw [Exo, Fo, SP]	ALSP, CSP	1, 4, 6

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Psittacara leucophthalmus (Statius Muller, 1776)	White-eyed Parakeet [Fo] *	CSP, Patch	1, 2, 3, 4
Pyrrhura frontalis (Vieillot, 1817)	Maroon-bellied Parakeet [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Forpus xanthopterygius (Spix, 1824)	Blue-winged Parrotlet [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Brotogeris tirica (Gmelin, 1788)	Plain Parakeet [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Pionopsitta pileata (Scopoli, 1769)	Red-capped Parrot [atl, Fo]	ALSP, CSP	1, 4
Pionus maximiliani (Kuhl, 1820)	Scaly-headed Parrot [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Amazona aestiva (Linnaeus, 1758)	Blue-fronted Parrot [Exo]	ALSP, CSP	1, 2, 4, 6
Thamnophilidae (15)			
Rhopias gularis (Spix, 1825)	Star-throated Antwren [atl]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Dysithamnus stictothorax (Temminck, 1823)	Spot-breasted Antvireo [atl, Fo] ‡	–	5
Dysithamnus mentalis (Temminck, 1823)	Plain Antvireo [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Herpsilochmus rufimarginatus (Temminck, 1822)	Rufous-winged Antwren [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Thamnophilus doliatus (Linnaeus, 1764)	Barred Antshrike	ALSP	4, 6
Thamnophilus ruficapillus Vieillot, 1816	Rufous-capped Antshrike	ALSP, CSP, Patch	4, 6
Thamnophilus caerulescens Vieillot, 1816	Variable Antshrike [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Hypoedaleus guttatus (Vieillot, 1816)	Spot-backed Antshrike [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Batara cinerea (Vieillot, 1819)	Giant Antshrike [Fo]	CSP, Patch	1, 2, 3, 4, 6
Mackenziaena leachii (Such, 1825)	Large-tailed Antshrike [atl, Fo] *	CSP, Patch	1, 3, 4
Mackenziaena severa (Lichtenstein, 1823)	Tufted Antshrike [atl, Fo] *	Patch	3
Myrmoderus squamosus (Pelzeln, 1868)	Squamate Antbird [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Pyriglena leucoptera (Vieillot, 1818)	White-shouldered Fire-eye [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Drymophila ferruginea (Temminck, 1822)	Ferruginous Antbird [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Drymophila ochropyga (Hellmayr, 1906)	Ochre-rumped Antbird [atl, Fo, SP]	CSP, Patch	1, 2, 3, 4, 5, 6
Conopophagidae (1)			
Conopophaga lineata (Wied, 1831)	Rufous Gnateater [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Grallariidae (2)			
Grallaria varia (Boddaert, 1783)	Variegated Antpitta [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Hylopezus nattereri (Pinto, 1937)	Speckle-breasted Antpitta [atl, Fo] ‡		5
Rhinocryptidae (2)			
Eleoscytalopus indigoticus (Wied, 1831)	White-breasted Tapaculo [atl, Fo] *	CSP	1
Scytalopus speluncae (Ménétriès, 1835)	Mouse-colored Tapaculo [atl, Fo] *	CSP	1, 4
Formicariidae (2)			
Chamaeza campanisona (Lichtenstein, 1823)	Short-tailed Antthrush [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5
Chamaeza meruloides Vigors, 1825	Such's Antthrush [atl, Fo]	CSP, Patch	1, 2, 3, 4, 5, 6
Scleruridae (1)			
Sclerurus scansor (Ménétriès, 1835)	Rufous-breasted Leaftosser [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Dendrocolaptidae (6)			
Sittasomus griseicapillus (Vieillot, 1818)	Olivaceous Woodcreeper [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Xiphorhynchus fuscus (Vieillot, 1818)	Lesser Woodcreeper [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Lepidocolaptes falcinellus (Cabanis & Heine, 1859)	Scalloped Woodcreeper [atl, Fo]	CSP, Patch	1, 3, 4, 5, 6
Dendrocolaptes platyrostris Spix, 1825	Planalto Woodcreeper [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Xiphocolaptes albicollis (Vieillot, 1818)	White-throated Woodcreeper [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Xenopidae (2)			
Xenops minutus (Sparrman, 1788)	Plain Xenops [Fo]	CSP, Patch	1, 2, 3, 4, 6
Xenops rutilans Temminck, 1821	Streaked Xenops [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Furnariidae (18)			
Furnarius figulus (Lichtenstein, 1823)	Wing-banded Hornero	ALSP, CSP	1, 6
Furnarius rufus (Gmelin, 1788)	Rufous Hornero	ALSP, CSP, Patch	1, 3, 4, 6
Lochmias nematura (Lichtenstein, 1823)	Sharp-tailed Streamcreeper [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Automolus leucophthalmus (Wied, 1821)	White-eyed Foliage-gleaner [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Anabazenops fuscus (Vieillot, 1816)	White-collared Foliage-gleaner [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6

Species	English Name	Locality	Source
Anabacerthia amaurotis (Temminck, 1823)	White-browed Foliage-gleaner [atl, Fo]	CSP, Patch	1, 2, 3, 4, 6
Philydor atricapillus (Wied, 1821)	Black-capped Foliage-gleaner [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Philydor rufum (Vieillot, 1818)	Buff-fronted Foliage-gleaner [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Heliobletus contaminatus Berlepsch, 1885	Sharp-billed Treehunter [atl, Fo]	CSP, Patch	1, 2, 3, 4, 6
Syndactyla rufosuperciliata (Lafresnaye, 1832)	Buff-browed Foliage-gleaner [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Phacellodomus erythrophthalmus (Wied, 1821)	Orange-eyed Thornbird [atl, Fo]	CSP, Patch	1, 2, 3, 6
Phacellodomus ferrugineigula (Pelzeln, 1858)	Orange-breasted Thornbird [atl]	CSP, Patch	1, 3, 4, 6
Certhiaxis cinnamomeus (Gmelin, 1788)	Yellow-chinned Spinetail	ALSP, Patch	1, 3, 4, 6
Synallaxis ruficapilla Vieillot, 1819	Rufous-capped Spinetail [atl, Fo]	CSP, Patch	1, 2, 3, 4, 5, 6
Synallaxis cinerascens Temminck, 1823	Gray-bellied Spinetail [Fo]	CAP, Patch	1, 2, 3, 4, 5, 6
Synallaxis spixi Sclater, 1856	Spix's Spinetail	ALSP, CSP, Patch	1, 2, 3, 4, 6
Cranioleuca pallida (Wied, 1831)	Pallid Spinetail [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Pipridae (4)			
Neopelma chrysolophum Pinto, 1944	Serra do Mar Tyrant-Manakin [atl, Fo] ‡	Serra Cantareira	5
Manacus manacus (Linnaeus, 1766)	White-bearded Manakin [Fo] ‡*	Serra Cantareira	5
Ilicura militaris (Shaw & Nodder, 1809)	Pin-tailed Manakin [atl, Fo]	CSP	1, 2, 4, 6
Chiroxiphia caudata (Shaw & Nodder, 1793)	Swallow-tailed Manakin [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Oxyruncidae (1)			
Oxyruncus cristatus Swainson, 1821	Sharpbill	CSP	1, 4, 6
ONYCHORHYNCHIDAE (1)			
Myiobius atricaudus Lawrence, 1863	Black-tailed Flycatcher [Fo] ‡	Serra Cantareira	5
Tityridae (6)			
Schiffornis virescens (Lafresnaye, 1838)	Greenish Schiffornis [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Laniisoma elegans (Thunberg, 1823)	Shrike-like Cotinga [atl, Fo, SP]	CSP	6
Tityra cayana (Linnaeus, 1766)	Black-tailed Tityra	ALSP, CSP	1, 4, 6
Pachyramphus castaneus (Jardine & Selby, 1827)	Chestnut-crowned Becard [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Pachyramphus polychopterus (Vieillot, 1818)	White-winged Becard [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Pachyramphus validus (Lichtenstein, 1823)	Crested Becard [Fo]	ALSP, CSP	1, 2, 4, 6
Cotingidae (4)			
Phibalura flavirostris Vieillot, 1816	Swallow-tailed Cotinga [atl, Fo]	CSP	1, 4
Pyroderus scutatus (Shaw, 1792)	Red-ruffed Fruitcrow [Fo, SP]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Lipaugus lanioides (Lesson, 1844)	Cinnamon-vented Piha [atl] *	CSP	1
Procnias nudicollis (Vieillot, 1817)	Bare-throated Bellbird [atl, Fo, SP, GL]	ALSP, CSP	1, 4, 6
Platyrinchidae (1)			
Platyrinchus mystaceus Vieillot, 1818	White-throated Spadebill [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Rhynchocyclidae (13)			
Mionectes rufiventris Cabanis, 1846	Gray-hooded Flycatcher [Fo]	CSP, Patch	1, 2, 3, 4, 5, 6
Leptopogon amaurocephalus Tschudi, 1846	Sepia-capped Flycatcher [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Corythopis delalandi (Lesson, 1830)	Southern Antpipit [Fo]	CSP	3
Phylloscartes eximius (Temminck, 1822)	Southern Bristle-Tyrant [atl, Fo, SP]	CSP, Patch	1, 2, 3, 4, 6
Phylloscartes ventralis (Temminck, 1824)	Mottle-cheeked Tyrannulet [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Tolmomyias sulphurescens (Spix, 1825)	Yellow-olive Flycatcher [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Todirostrum poliocephalum (Wied, 1831)	Yellow-lored Tody-Flycatcher [atl, Fo]	ALSP, CSP	1, 2, 4, 5, 6
Todirostrum cinereum (Linnaeus, 1766)	Common Tody-Flycatcher	ALSP, CSP	1, 2, 4, 6
Poecilotriccus plumbeiceps (Lafresnaye, 1846)	Ochre-faced Tody-Flycatcher [Fo]	CSP, Patch	1, 2, 3, 4, 6
Myiornis auricularis (Vieillot, 1818)	Eared Pygmy-Tyrant [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Hemitriccus diops (Temminck, 1822)	Drab-breasted Pygmy-Tyrant [atl, Fo]	CSP, Patch	1, 2, 3, 4, 5, 6
Hemitriccus orbitatus (Wied, 1831)	Eye-ringed Tody-Tyrant [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Hemitriccus nidipendulus (Wied, 1831)	Hangnest Tody-Tyrant [atl, Fo]	CSP, Patch	1, 2, 3, 4, 5
Tyrannidae (35)			
Hirundinea ferruginea (Gmelin, 1788)	Cliff Flycatcher *	CSP, Patch	4

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Tyranniscus burmeisteri (Cabanis & Heine, 1859)	Rough-legged Tyrannulet [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Camptostoma obsoletum (Temminck, 1824)	Southern Beardless-Tyrannulet	ALSP, CSP, Patch	1, 2, 3, 4, 6
Elaenia flavogaster (Thunberg, 1822)	Yellow-bellied Elaenia	ALSP, CSP, Patch	1, 4, 6
Elaenia parvirostris Pelzeln, 1868	Small-billed Elaenia [Fo] *	CSP	1, 4
Elaenia mesoleuca (Deppe, 1830)	Olivaceous Elaenia [Fo]	CSP, Patch	1, 3, 4, 5, 6
Elaenia obscura (d'Orbigny & Lafresnaye, 1837)	Highland Elaenia ‡	Serra Cantareira	5
Myiopagis caniceps (Swainson, 1835)	Gray Elaenia [Fo] *	Patch	3
Phyllomyias virescens (Temminck, 1824)	Greenish Tyrannulet [atl, Fo]	CSP	1, 6
Phyllomyias fasciatus (Thunberg, 1822)	Planalto Tyrannulet [Fo]	ALSP, CSP, Patch	1, 3, 4
Phyllomyias griseocapilla Sclater, 1862	Gray-capped Tyrannulet [atl, Fo]	CSP, Patch	1, 2, 3, 4
Serpophaga subcristata (Vieillot, 1817)	White-crested Tyrannulet [Fo] *	ALSP, CSP, Patch	1, 3, 4
Attila phoenicurus Pelzeln, 1868	Rufous-tailed Attila [Fo]	CSP	4
Attila rufus (Vieillot, 1819)	Gray-hooded Attila [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Legatus leucophaius (Vieillot, 1818)	Piratic Flycatcher [Fo]	ALSP, CSP, Patch	1, 2, 4, 6
Ramphotrigon megacephalum (Swainson, 1835)	Large-headed Flatbill [Fo]	CSP, Patch	3, 6
Myiarchus swainsoni Cabanis & Heine, 1859	Swainson's Flycatcher [Fo]	CSP, Patch	1, 2, 3, 4, 6
Myiarchus ferox (Gmelin, 1789)	Short-crested Flycatcher [Fo]	ALSP, CSP, Patch	1, 3, 4, 5, 6
Myiarchus tyrannulus (Statius Muller, 1776)	Brown-crested Flycatcher *	Serra Cantareira	4
Pitangus sulphuratus (Linnaeus, 1766)	Great Kiskadee	ALSP, CSP, Patch	1, 2, 3, 4, 6
Machetornis rixosa (Vieillot, 1819)	Cattle Tyrant *	ALSP, CSP, Patch	1, 3, 4
Myiodynastes maculatus (Statius Muller, 1776)	Streaked Flycatcher [Fo]	ALSP, CSP	1, 2, 4, 6
Megarynchus pitangua (Linnaeus, 1766)	Boat-billed Flycatcher [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Myiozetetes similis (Spix, 1825)	Social Flycatcher [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Tyrannus melancholicus Vieillot, 1819	Tropical Kingbird	ALSP, CSP, Patch	1, 2, 3, 4, 6
Tyrannus savana Vieillot, 1808	Fork-tailed Flycatcher *	ALSP, CSP, Patch	4
Empidonomus varius (Vieillot, 1818)	Variegated Flycatcher [Fo]	ALSP, CSP, Patch	1, 4, 6
Colonia colonus (Vieillot, 1818)	Long-tailed Tyrant [Fo]	CSP	1, 4, 6
Myiophobus fasciatus (Statius Muller, 1776)	Bran-colored Flycatcher	CSP, Patch	1, 3, 4, 6
Fluvicola nengeta (Linnaeus, 1766)	Masked Water-Tyrant	ALSP, CSP, Patch	1, 3, 4, 6
Cnemotriccus fuscatus (Wied, 1831)	Fuscous Flycatcher [Fo]	CSP, Patch	3, 4, 6
Lathrotriccus euleri (Cabanis, 1868)	Euler's Flycatcher [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Contopus cinereus (Spix, 1825)	Tropical Pewee [Fo]	CSP	1, 2, 4, 6
Knipolegus cyanirostris (Vieillot, 1818)	Blue-billed Black-Tyrant *	CSP	4
Muscipipra vetula (Lichtenstein, 1823)	Shear-tailed Gray Tyrant [atl, Fo]	CSP, Patch	1, 3
Vireonidae (3)			
Cyclarhis gujanensis (Gmelin, 1789)	Rufous-browed Peppershrike [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Hylophilus poicilotis Temminck, 1822	Rufous-crowned Greenlet [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Vireo chivi (Vieillot, 1817)	Chivi Vireo [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Corvidae (1)			
Cyanocorax cristatellus (Temminck, 1823)	Curl-crested Jay	Patch	1, 3, 6
Hirundinidae (4)			
Pygochelidon cyanoleuca (Vieillot, 1817)	Blue-and-white Swallow	ALSP, CSP, Patch	1, 2, 3, 4, 6
Stelgidopteryx ruficollis (Vieillot, 1817)	Southern Rough-winged Swallow	ALSP, CSP, Patch	1, 3, 4, 6
Progne tapera (Vieillot, 1817)	Brown-chested Martin *	CSP	1, 3
Tachycineta leucorrhoa (Vieillot, 1817)	White-rumped Swallow *	CSP, Patch	1, 3
Troglodytidae (1)			
Troglodytes musculus Naumann, 1823	Southern House Wren	ALSP, CSP, Patch	1, 2, 3, 4, 6
Donacobiidae (1)			
Donacobius atricapilla (Linnaeus, 1766)	Black-capped Donacobius *	ALSP	4
Polioptilidae (1)			
Polioptila dumicola (Vieillot, 1817)	Masked Gnatcatcher *	ALSP	4

Species	English Name	Locality	Source
Turdidae (6)			
Turdus flavipes Vieillot, 1818	Yellow-legged Thrush [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Turdus leucomelas Vieillot, 1818	Pale-breasted Thrush [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Turdus rufiventris Vieillot, 1818	Rufous-bellied Thrush [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Turdus amaurochalinus Cabanis, 1850	Creamy-bellied Thrush [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Turdus subalaris (Seebohm, 1887)	Eastern Slaty Thrush [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Turdus albicollis Vieillot, 1818	White-necked Thrush [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Mimidae (1)			
Mimus saturninus (Lichtenstein, 1823)	Chalk-browed Mockingbird	ALSP, CSP, Patch	1, 3, 4, 6
Passerellidae (2)			
Zonotrichia capensis (Statius Muller, 1776)	Rufous-collared Sparrow	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Arremon semitorquatus Swainson, 1838	Half-collared Sparrow [atl, Fo]	CSP	1, 2, 4, 6
Parulidae (5)			
Setophaga pitiayumi (Vieillot, 1817)	Tropical Parula [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Geothlypis aequinoctialis (Gmelin, 1789)	Masked Yellowthroat	ALSP, CSP, Patch	1, 3, 4, 6
Basileuterus culicivorus (Deppe, 1830)	Golden-crowned Warbler [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Myiothlypis leucoblephara (Vieillot, 1817)	White-browed Warbler [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Myiothlypis rivularis (Wied, 1821)	Neotropical River Warbler [atl, Fo]	CSP	6
Icteridae (6)			
Psarocolius decumanus (Pallas, 1769)	Crested Oropendola [Fo] *	CSP	1, 4
Cacicus chrysopterus (Vigors, 1825)	Golden-winged Cacique [Fo]	ALSP, CSP	1, 2, 4, 6
Cacicus haemorrhous (Linnaeus, 1766)	Red-rumped Cacique [Fo]	ALSP, CSP	1, 4, 6
Cacicus cela (Linnaeus, 1758)	Yellow-rumped Cacique [Ex◇, Fo]	CSP	1, 6
Chrysomus ruficapillus (Vieillot, 1819)	Chestnut-capped Blackbird	ALSP, Patch	4, 6
Molothrus bonariensis (Gmelin, 1789)	Shiny Cowbird	ALSP, CSP	1, 4, 6
Mitrospingidae (1)			
Orthogonys chloricterus (Vieillot, 1819)	Olive-green Tanager [atl, Fo]	CSP	1, 4, 6
Thraupidae (33)			
Orchesticus abeillei (Lesson, 1839)	Brown Tanager [atl, Fo]	CSP	1, 2, 4, 6
Pipraeidea melanonota (Vieillot, 1819)	Fawn-breasted Tanager [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Schistochlamys ruficapillus (Vieillot, 1817)	Cinnamon Tanager [Fo] ‡	ALSP	4, 5
Paroaria dominicana (Linnaeus, 1758)	Red-cowled Cardinal [Ex◇]	CSP	6
Thlypopsis sordida (d'Orbigny & Lafresnaye, 1837)	Orange-headed Tanager	ALSP, CSP, Patch	1, 3, 4, 6
Tangara seledon (Statius Muller, 1776)	Green-headed Tanager [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Tangara cyanoventris (Vieillot, 1819)	Gilt-edged Tanager [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Tangara desmaresti (Vieillot, 1819)	Brassy-breasted Tanager [atl, Fo]	ALSP, CSP, Patch	1, 2, 4, 5, 6
Tangara sayaca (Linnaeus, 1766)	Sayaca Tanager	ALSP, CSP, Patch	1, 2, 3, 4, 6
Tangara palmarum (Wied, 1823)	Palm Tanager	ALSP, CSP, Patch	1, 2, 3, 4, 6
Tangara ornata (Sparrman, 1789)	Golden-chevroned Tanager [atl, Fo]	ALSP	6
Tangara peruviana (Desmarest, 1806)	Black-backed Tanager [atl, Fo, SP, BR, GL]	CSP, Patch	4, 6
Tangara preciosa (Cabanis, 1850)	Chestnut-backed Tanager [Fo] *	CSP, Patch	3, 4
Tangara cayana (Linnaeus, 1766)	Burnished-buff Tanager	ALSP, CSP, Patch	1, 3, 4, 5, 6
Nemosia pileata (Boddaert, 1783)	Hooded Tanager [Fo]	ALSP, CSP	1, 6
Conirostrum speciosum (Temminck, 1824)	Chestnut-vented Conebill [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Sicalis flaveola (Linnaeus, 1766)	Saffron Finch	CSP	4, 6
Haplospiza unicolor Cabanis, 1851	Uniform Finch [atl, Fo]	CSP, Patch	1, 3, 4, 5, 6
Hemithraupis ruficapilla (Vieillot, 1818)	Rufous-headed Tanager [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Volatinia jacarina (Linnaeus, 1766)	Blue-black Grassquit	ALSP, CSP, Patch	1, 3, 4, 6
Trichothraupis melanops (Vieillot, 1818)	Black-goggled Tanager [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Tachyphonus coronatus (Vieillot, 1822)	Ruby-crowned Tanager [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Ramphocelus bresilius (Linnaeus, 1766)	Brazilian Tanager [atl, Fo]	ALSP, CSP	6

Species	English Name	Locality	Source
Tersina viridis (Illiger, 1811)	Swallow Tanager [Fo]	ALSP, CSP, Patch	1, 3, 4, 6
Dacnis cayana (Linnaeus, 1766)	Blue Dacnis [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Coereba flaveola (Linnaeus, 1758)	Bananaquit	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Sporophila lineola (Linnaeus, 1758)	Lined Seedeater *	ALSP, Patch	4
Sporophila frontalis (Verreaux, 1869)	Buffy-fronted Seedeater [atl, Fo, SP, BR, GL]	CSP, Patch	1, 2, 3, 4, 6
Sporophila falcirostris (Temminck, 1820)	Temminck's Seedeater [atl, Fo, SP, BR, GL]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Sporophila caerulescens (Vieillot, 1823)	Double-collared Seedeater *	ALSP, CSP, Patch	1, 3, 4
Sporophila leucoptera (Vieillot, 1817)	White-bellied Seedeater *	Patch	4
Saltator similis d'Orbigny & Lafresnaye, 1837	Green-winged Saltator [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Saltator fuliginosus (Daudin, 1800)	Black-throated Grosbeak [atl, Fo]	CSP	1, 4, 6
Cardinalidae (1)			
Habia rubica (Vieillot, 1817)	Red-crowned Ant-Tanager [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Fringillidae (6)			
Spinus magellanicus (Vieillot, 1805)	Hooded Siskin *	ALSP, CSP, Patch	1, 3, 4
Euphonia chlorotica (Linnaeus, 1766)	Purple-throated Euphonia [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 6
Euphonia violacea (Linnaeus, 1758)	Violaceous Euphonia [Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Euphonia cyanocephala (Vieillot, 1818)	Golden-rumped Euphonia [Fo]	CSP	1, 6
Euphonia pectoralis (Latham, 1801)	Chestnut-bellied Euphonia [atl, Fo]	ALSP, CSP, Patch	1, 2, 3, 4, 5, 6
Chlorophonia cyanea (Thunberg, 1822)	Blue-naped Chlorophonia [Fo]	CSP, Patch	1, 2, 3, 4, 6
Estrildidae (1)			
Estrilda astrild (Linnaeus, 1758)	Common Waxbill [Exo]	ALSP, CSP, Patch	4, 6
Passeridae (1)			
Passer domesticus (Linnaeus, 1758)	House Sparrow [Exo] *	CSP, Patch	1, 4

APPENDIX 2

Species reported for Serra da Cantareira and pending confirmation. * = Birds pending confirmation according to Graham (1992); ‡ = Species only reported in Figueiredo and Loo (2000) and without any further mention, possibly escaped or intentionally released from captivity; CSP = Cantareira State Park; ALSP = Alberto Löfgren State Park.

Species	English Name	Locality
Crypturellus parvirostris *	Small-billed Tinamou	CSP
Elanus leucurus *	White-tailed Kite	ALSP
Aratinga auricapillus ‡	Golden-capped Parakeet	CSP
Amazona vinacea ‡	Vinaceous Parrot	Urban area near CSP
Hymenops perspicillatus *	Spectacled Tyrant	ALSP
Cyanocorax caeruleus *	Azure Jay	CSP
Gnorimopsar chopi *	Chopi Blackbird	CSP
Sporophila angolensis *	Chestnut-bellied Seed-Finch	CSP
Cyanoloxia brissonii *	Ultramarine Grosbeak	CSP

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