

Birds of Sítio Piraquara, São Paulo, Brazil: an inventory combining citizen science data and ornithological sampling

Fabio Schunck, Marco Aurélio Galvão da Silva, Matheus de Moraes dos Santos, Clarissa de Oliveira Santos, Martin Kunze, Thomas Kunze and Erika Hingst-Zaher

Received 13 November 2023; final revision accepted 29 April 2024

Cotinga 46 (2024): 57–72

Published online 6 July 2024

A Região Metropolitana de São Paulo (RMSP), localizada no sudeste do Brasil, possui 22 milhões de habitantes e muitas informações ornitológicas produzidas por ornitólogos e observadores de aves ao longo dos últimos 200 anos. Entretanto, muitas localidades ainda permanecem pouco conhecidas com relação a sua avifauna. O presente estudo realizou um inventário ornitológico de campo, e analisou os dados produzidos por observadores de aves para o Sítio Piraquara, uma propriedade particular de 246 ha localizada na RMSP. Foram considerados dados de um período de cinco anos de atividade de observação de aves e dois anos de pesquisas científicas, totalizando 271 espécies de aves, sendo 75 endêmicas da Mata Atlântica e nove ameaçadas de extinção. O Sítio Piraquara ainda possui uma comunidade de aves com espécies de ambientes preservados, devido à presença de uma floresta nativa pouco alterada, a qual está cercada e conectada com outras florestas e próxima de uma reserva ambiental com mais de 10 mil ha, possibilitando conexões e visitas frequentes entre as comunidades de aves da região. Esses resultados mostram a importância da observação de aves e da pesquisa científica na produção de conhecimento ornitológico básico, sendo atividades complementares que precisam ser incentivadas através de eventos e atividades de observação de aves com a comunidade local, estudantes e observadores.

The state of São Paulo is home to 793 bird species³⁰, and the Metropolitan Region of São Paulo (MRSP), located in the state's eastern part and within the Atlantic Forest domain, stands out as one of the better-studied regions, based on ornithological information generated during the last 200 years³⁵. This knowledge dates back to the early 19th century, when the first European naturalists explored the region and amassed records of more than 600 species of birds, with several endemic taxa³⁵. The presence of various research institutions, non-governmental organisations, universities and independent researchers in the state of São Paulo results in the uninterrupted and long-term generation of ornithological data in different locations, primarily within the city of São Paulo. The largest of the 39 municipalities in the MRSP, São Paulo, has approximately 530 bird species reported to date^{6,12, 23,35}.

The MRSP is highly valued by both national and international birdwatchers who visit landscapes surrounding the urban area, such as the Serra do Mar (to the south), the Serra da Cantareira (to the north), the floodplains of the Tietê River (to the east) and the Reserva Florestal do Morro Grande (to the south-west). They often seek endemic and rare bird species, such as São Paulo Antwren *Formicivora paludicola* and Southern Bristle-Tyrant *Phylloscartes eximius*^{10,19,32,34}. Data generated by birdwatchers and uploaded to citizen science platforms have contributed not only to the production of basic knowledge about the natural history, occurrence and migration of birds in the

MRSP, but also to the direct application of this knowledge in conservation efforts.

The south-western part of the MRSP, including the municipalities of Cotia, Itapeberica da Serra and São Lourenço da Serra, has been relatively underexplored ornithologically in recent decades compared to its other regions, such as the municipality of São Paulo³⁵. The most significant systematic study of the birds in this region was made in the Reserva Florestal do Morro Grande³, a protected area that harbours part of the watershed that provides water to the MRSP. This reserve is also the largest remaining forest fragment in the MRSP, covering 10,870 ha. Some 198 bird species have been reported from Morro Grande, including endemic, rare and threatened taxa, alongside species that were considered locally extinct at the time⁸.

With the aim of contributing to the ornithological knowledge of the south-western MRSP, we conducted field ornithological inventories, and compiled and analysed citizen science data, for Sítio Piraquara, a farmstead and significant biodiversity hotspot adjacent to the largest urban area in South America.

Study area

Sítio Piraquara is a farmstead situated in the north-western part of the municipality of São Lourenço da Serra (23°50'34.51''S, 46°57'57.16''W; 785m), São Paulo, Brazil. It lies within the domain of the Atlantic Forest and in the boundaries of the Serra do Mar (Fig. 1), c.40 km from the Atlantic Ocean. Sítio Piraquara is located in a region that

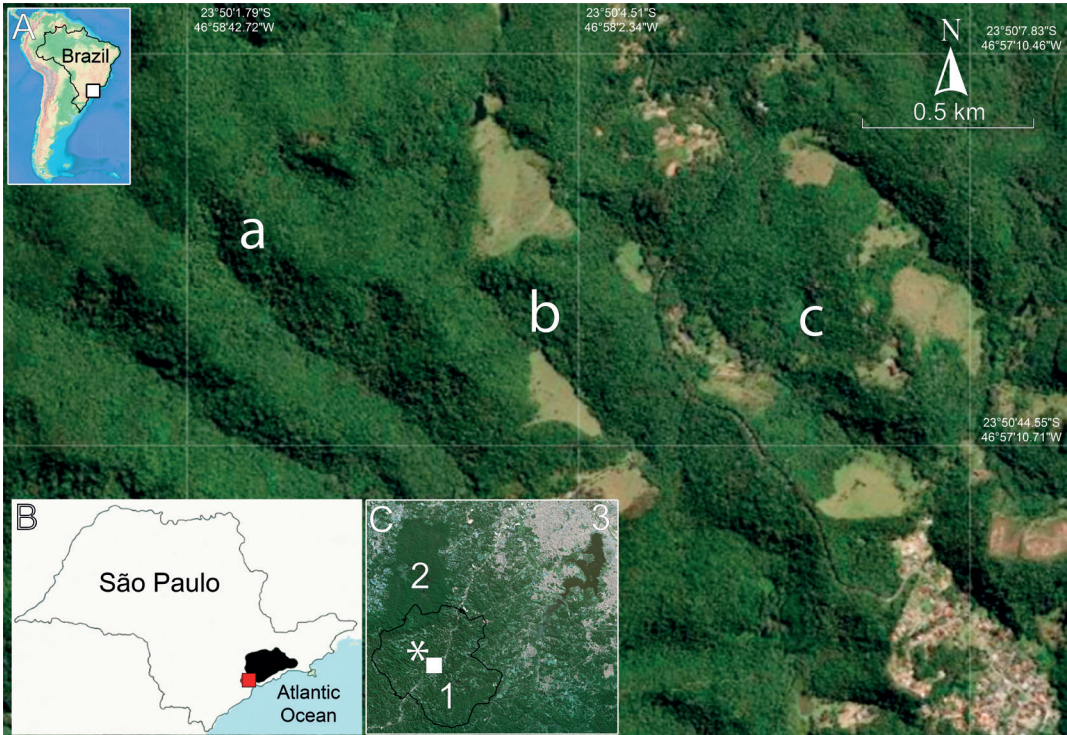


Figure 1. Location of Sítio Piraquara: inset **A** shows the location of São Paulo state in Brazil and South America (white square); inset **B** shows the Metropolitan Region of São Paulo (MRSP) in the state of São Paulo in black and São Lourenço da Serra municipality (red square); inset **C** shows the outline of São Lourenço da Serra municipality (1), with the city of São Lourenço da Serra (white square), Sítio Piraquara (white asterisk), Reserva do Morro Grande (2) and the south and south-west part of the urban area of São Paulo (3). In the main satellite image: **a** indicates the best-preserved forest area (Trilha da Mica/ Mica Trail); **b** indicates the intermediate forest area; and **c** regenerating forests. Images **A** and **B** are from OpenStreetMap Foundation contributors (<https://www.openstreetmap.org/export#map=6/-22.172/-47.138> and <https://www.openstreetmap.org/> copyright) and uses data available under the Open Database License. Image **C** is from Planet Labs Inc. Satellite image © Esri. (Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, UPR-EGP and the GIS User Community.) Map prepared by F. Schunck.

extends south-west to the state of Paraná in the ‘Paranapiacaba continuum’, which embraces large protected areas such as Parques Estaduais Jurupará, Carlos Botelho, Intervalos and Turístico do Alto Ribeira. São Lourenço da Serra is a part of the MRSP, which includes the city of São Paulo, c.50 km away.

Sítio Piraquara is a privately owned area covering 246 ha, of which approximately 84% is covered in dense ombrophilous forest in advanced, intermediate and initial stages of ecological succession. Additionally, the site has open areas such as pasture, agricultural fields (mainly sugar cane and eucalyptus plantations) and residential areas, as well as several creeks, small artificial reservoirs and wetlands (Fig. 1). The region underwent economic cycles of deforestation and charcoal production until the 1940s. In the forest within Sítio Piraquara, endemic plant species and those threatened at the state or national

levels can still be found, including *Micropholis crassipedicellata* (family Sapotaceae), *Copaifera trapezifolia* (family Fabaceae), *Duguetia salicifolia* (family Annonaceae), *Syagrus hoehneii* (family Arecaceae) and *Euterpe edulis* (family Arecaceae)²¹.

To the south-east, the property borders São Lourenço da Serra, a town with 16,000 inhabitants. In other directions, it borders forest fragments on privately owned land. In the northern region, these forests are connected to the Reserva Forestal do Morro Grande, a fragment of primary forest in the western and south-western parts of MRSP (Fig. 1). A major national highway, BR 116 (Regis Bittencourt), crosses the municipality of São Lourenço da Serra, acting as an important barrier for wildlife coming from the Serra do Mar. The elevation of Sítio Piraquara ranges from 750–910 m above sea level.

The owners of Sítio Piraquara aim to encourage scientific research in various animal and plant



Figure 2. Some species recorded at Sítio Piraquara: **A** Dusky-throated Hermit *Phaethornis squalidus* (Fabio Schunck); **B** Rusty-breasted Nunlet *Nannula rubecula* (Marco Silva); **C** Blue-bellied Parrot *Triclaria malachitacea* (Marco Silva); **D** Bare-throated Bellbird *Procnias nudicollis* (Thomas Kunze); **E** Shrike-like Cotinga *Laniisoma elegans* (Marco Silva); **F** Atlantic Royal Flycatcher *Onychorhynchus swainsoni* (Igor Alvarenga); **G** Buffy-fronted Seedeater *Sporophila frontalis* (Marco Silva); **H** Temminck's Seedeater *Sporophila falcirostris* (Matheus Santos) and **I** Black-backed Tanager *Stilpnia peruviana* (Martin Kunze).

groups; since 2018, they have also been actively promoting birdwatching activities, such as bird walks, birdwatching tours and festivals. Birdwatching activities involve a diverse audience, including amateur and professional birdwatchers.

Data collection

During 2021–23, we conducted four field surveys to inventory bird species, totaling 20 days in the field. We undertook non-systematic observations using Leica 10x42, Bushnell 10x42 and Swarovski 8x42 binoculars, plus mist-nets (10 nets, 12x2 m, with five pockets and 36 mm mesh). Mist-nets were opened from 05h30–10h00 and

15h00–18h00, with effort totalling 1,000 hours per net. We collected the following information from mist-netted birds: moult stage, presence of incubation patch, presence of ectoparasites, body mass and morphological measurements. Specimens were collected, prepared as vouchers and deposited in the ornithological collection at the Museum of Zoology of the University of São Paulo (MZUSP). Our taxonomy follows the Brazilian Ornithological Records Committee²⁰. Species lists compiled during field research were uploaded to eBird (<https://www.ebird.org/>).

Secondary data were obtained from citizen science platforms. Observations were conducted

independently or during specific events, accumulating a total of 287 bird checklists. The data produced by other birders, including lists, images and audio recordings, have been shared on online ornithological platforms such as WikiAves (<https://www.wikiaves.com.br/>), Xeno-canto (<https://xeno-canto.org/>), iNaturalist (<https://www.inaturalist.org/>) and eBird, including the Macaulay Library (ML), and were collected up to 30 October 2023. Secondary data were filtered and analysed to remove doubtful and erroneous records—i.e., species that were unexpected in the MRSP and species without documentation.

Results

Combined data from the field inventory and from citizen science platforms resulted in 273 bird species being recorded (Appendix 1; <https://ebird.org/hotspot/L8105169>), encompassing 21 orders and 58 families that represent 34% of the bird species found in the state of São Paulo³⁰. Of the total species recorded, 215 are documented (190 with photographs, 60 with audio recordings and 44 with voucher specimens). The most diverse families included Tyrannidae (32 species), Thraupidae (32 species), Trochilidae (16 species), Thamnophilidae (15 species) and Rhynchocyclidae (12 species). In terms of habitat types, 225 species were associated with forests, 31 with open fields and anthropogenic areas, and 18 with flooded areas (forests and open fields), swamps and other wetlands. Of the total 273 species recorded, 45 were detected only through mist-netting carried out by the authors, notably including Atlantic Royal Flycatcher *Onychorhynchus swainsoni* (Fig. 2F).

A total of 74 bird species endemic to the Atlantic Forest³³ were identified (e.g., Bare-throated Bellbird *Procnias nudicollis*: Fig. 2D), along with five species classified as globally threatened¹⁴, three species included in the national Red List¹⁸ and eight in the state Red List²² (some species occur in more than one list). Additionally, four species are boreal migrants and 27 are partially migratory in Brazil³¹. Just one taxon, a swift in the genus *Cypseloides*, was identified only to genus.

Five species typical of the lowland rainforests of the Serra do Mar³⁵ were recorded: Glittering-throated Emerald *Chionomesa fimbriata*, White-necked Hawk *Amadonastur lacernulatus*, Spot-breasted Antvireo *Dysithamnus stictothorax*, White-bearded Manakin *Manacus manacus* and Red-rumped Cacique *Cacicus haemorrhous*. Additionally, seven species uncommon in the fragmented highland forests were observed: Solitary Tinamou *Tinamus solitarius*, Dusky-throated Hermit *Phaethornis squalidus* (Fig. 2A), Rusty-breasted Nunlet *Nonnulla rubecula* (Fig. 2B), Blue-bellied Parrot *Tricharia malachitacea* (Fig. 2C), Tufted Antshrike *Mackenziaena severa*,

Spotted Bamboowren *Psilorhamphus guttatus* and Green-backed Becard *Pachyrhamphus viridis*. Four species that have recently colonised the Serra do Mar of MRSP were identified: Green Ibis *Mesembrinibis cayennensis*³, White-eyed Parakeet *Psittacara leucophthalmus*¹², Curl-crested Jay *Cyanocorax cristatellus*²⁴ and Crested Oropendola *Psarocolius decumanus*²⁴. Additionally, one species introduced to the MRSP was also recorded: Red-cowled Cardinal *Paroaria dominicana*⁴.

Noteworthy species

The following observations relate to species threatened at the global¹⁶, national²¹ or state²⁴ levels.

Black-and-white Hawk-Eagle *Spizaetus melanoleucus*

Endangered at the state level. A forest species found throughout the state of São Paulo with most records in the east, particularly in the Serra do Mar and Serra da Mantiqueira, the largest forested massifs in the state^{34,35}. Primary threats to the species include habitat loss, human persecution (hunting), and the trafficking of eggs and chicks¹³. One individual was heard on 18 September 2020, in a medium-sized forested area in the central part of Sítio Piraquara. This species has not been recorded in the Reserva Forestal do Morro Grande⁸ and is considered rare in the MRSP^{9,34}.

White-necked Hawk *Amadonastur lacernulatus*

Vulnerable at the global, national and state levels. Found in tall, humid, well-preserved forests, within São Paulo, this species occurs only in the east, in the Serra do Mar and Serra da Mantiqueira^{34,35}. The main threats it faces include habitat loss and forest fragmentation due to property speculation, particularly in the coastal plain and lowland forests¹. Solitary individuals were observed on four occasions: in September 2019, February 2022 (ML423590051), and March and September 2023. This species is known from the Reserva Forestal do Morro Grande⁸, but is considered uncommon in the MRSP^{9,34}.

Shrike-like Cotinga *Lanius elegans*

Vulnerable at the state level. This species is typical of tall, humid, well-preserved forests, but has occasionally occurred in fragmented regions and urban woodlands¹⁵. It has disappeared from the interior of São Paulo due to deforestation and habitat fragmentation, and is currently found only in the Serra do Mar and Serra da Mantiqueira^{34,35}. The main threats it faces are habitat loss and forest fragmentation²⁵. A solitary individual was observed and photographed (Fig. 2E) on 24 May 2023, on the Trilha da Mica (Mica Trail), the best-preserved forest in our study area. This species was recorded

by Rene Santos in the Reserva Forestal do Morro Grande during 2022 (<https://ebird.org/checklist/S102395593>) but was not recorded there during previous studies⁸.

Atlantic Royal Flycatcher *Onychorhynchus swainsoni*

Vulnerable at the global and state levels. This species is typical of humid, well-preserved forests. Having disappeared from the interior of São Paulo due to deforestation and habitat fragmentation, it currently occurs only in the Serra do Mar and Serra da Mantiqueira^{34,35}. The main threats it faces are habitat loss and forest fragmentation²⁶. On 8 September 2021, an adult male crossing two micro-watersheds in the Trilha da Mica sector was mist-netted and photographed (Fig. 2F). This species was not recorded in the Reserva Forestal do Morro Grande⁸ and is considered rare in the MRSP^{9,34}.

Sao Paulo Tyrannulet *Phylloscartes paulista*

Vulnerable at the state level. This species is typical of humid, well-preserved forests. Having disappeared from the interior of São Paulo due to deforestation and habitat fragmentation, it currently occurs only in the Serra do Mar^{10,34,35}. It is uncommon in the higher areas of the plateau, with current records concentrated in slope and lowland forests^{34,35}. The main threats it faces are habitat loss and forest fragmentation, particularly in lowland forests²⁷. One individual was observed and sound recorded (ML465764551) on 17 October 2021 in a well-preserved forest area on the Trilha da Mica. This species was not recorded in the Reserva Forestal do Morro Grande⁸ and is considered rare in the MRSP^{9,34}.

Buffy-fronted Seedeater *Sporophila frontalis* and **Temminck's Seedeater** *Sporophila falcirostris*

Both species are globally and nationally Vulnerable; additionally, *S. falcirostris* is Endangered at the state level. These species are typical of humid, well-preserved forests. Buffy-fronted Seedeater is rare in the interior of São Paulo, occurring mainly in the Serra do Mar and Serra da Mantiqueira^{34,35}, but Temminck's Seedeater is absent from this region. Both species feed exclusively on the seeds of native bamboo species and make regional movements in search of food, often in large mixed flocks²⁹. The main threats they face include habitat loss and capture for the illegal bird trade^{16,17}. Buffy-fronted Seedeater was recorded at Sítio Piraquara in July 2020, and later in October, November and December 2021 (Fig. 2G), with groups of up to eight individuals observed when bamboo (*Chusquea* spp.) was in seed. In October and December, a single Temminck's Seedeater was observed within the group (Fig. 2H). A Buffy-

fronted Seedeater was also recorded in July 2021 at the Reserva Forestal do Morro Grande (FS and MS pers. obs.), where it had not been detected in previous studies⁸; it is considered rare in the MRSP^{9,34}.

Black-backed Tanager *Stilpnia peruviana*

Vulnerable at the global and state levels. This species is typical of humid forests in the coastal plain, such as *restinga* and mangroves, and occasionally occurs in slope and plateau forests^{34,35}. The main threat faced is habitat loss due to coastal property speculation⁷. This species has been recorded eight times at Sítio Piraquara during October 2018, August 2020, December 2021 and March 2023 (Fig. 2I), making it frequent in the region. It is also frequent in the Reserva Forestal do Morro Grande, where in was not reported in previous studies⁸, but number of recent records has notably increased⁹.

Discussion

The bird richness of Sítio Piraquara (273 species) is the highest recorded for a location in the southwestern region of the MRSP. This exceeds the species diversity reported for the Reserva Forestal do Morro Grande⁸, which is much larger (10,870 ha). However, this difference is directly related to two basic factors: sampling effort and methods applied. The study at Morro Grande lasted two years and was conducted by two researchers, in contrast to the data collection at Sítio Piraquara, which combined five years of information from citizen science platforms, involving the contribution of dozens of birdwatchers, plus researchers conducting field inventories over two years. The data obtained at Sítio Piraquara underscores the importance of both citizen science and scientific research in generating basic ornithological knowledge for a locality. These activities are complementary and should be encouraged in other areas within the MRSP, to perform new inventories, monitor threatened species and contribute baseline information to guide conservation efforts in this heavily fragmented and threatened domain.

The bird community at Sítio Piraquara includes species typical of fragmented forests. It also comprises species from well-preserved forests (closed and humid, with large trees) in areas that have not been deforested, revealing that the original structure of some existing environments remains or has been minimally altered. This plays a crucial role in preserving rare species that tend to disappear from isolated and fragmented areas in the plateau, such as Spot-winged Wood-Quail *Odontophorus capueira*, Least Pygmy-Owl *Glaucidium minutissimum*, Spot-billed Toucanet *Selenidera maculirostris*, Black-tailed Flycatcher *Myiobius atricaudus* and White-browed Warbler *Myiothlypis*

leucoblephara. When comparing our current data for the study area with the bird community recorded in the Reserva Forestal do Morro Grande from 2001–03⁸, it becomes evident that some species that were considered rare at the time, due to factors such as hunting, have returned to the region. These include Brown Tinamou *Crypturellus obsoletus* and Dusky-legged Guan *Penelope obscura*, suggesting that hunting activity may have reduced since the early 20th century.

The presence of four threatened species (Atlantic Royal Flycatcher, Sao Paulo Tyrannulet, Buffy-fronted Seedeater and Temminck's Seedeater) indicates a well-preserved environment, as these species tend to disappear from highly urbanised and fragmented areas^{10,29,34,35}. That said, two of the eight threatened species recorded (Buffy-fronted Seedeater and Temminck's Seedeater) exhibit regional movements in search of food²⁹, visiting Sítio Piraquara occasionally or seasonally. The proximity of our study area to natural environments and the Reserva Forestal do Morro Grande, which is c.5 km away, facilitates dispersal by species that require extensive areas and enhances genetic flow between populations²⁹. The two globally threatened species that are not known to make regional movements, Atlantic Royal Flycatcher and Sao Paulo Tyrannulet, were recorded only once so we cannot determine their population status in Sítio Piraquara. These species could represent residents that occur at low abundance, relict populations or birds travelling between forest fragments or establishing new populations. This is a matter that needs further investigation.

The presence of four migratory species and 27 partial migrants in the study area underscores its importance for such birds. Some of these species have been recorded breeding in the region, such as Streaked Flycatcher *Myiodynastes maculatus*, Tropical Kingbird *Tyrannus melancholicus* and Creamy-bellied Thrush *Turdus amaurochalinus*. Some of the species classified as partially migratory at the national level³¹ are residents in the region (e.g., Great Kiskadee *Pitangus sulphuratus*), while others have an undetermined status due to the lack of basic data on seasonality or reproduction.

The fact that some bird species typical of the lowland forests of the Serra do Mar have been recorded at altitudes above 700 m may be associated with the location of the study area, situated less than 15 km from the north-eastern limit of the Ribeira de Iguape river basin, an area with gentle relief that follows highway BR116, connecting the coastal plain to the plateau. Different species have been recorded at lower altitudes in this region³⁵. These species might be reaching the plateau because of the less rugged terrain that facilitates their movement as compared to steeper sections of the Serra do Mar, as has been proposed for the

seasonal migration of Black Skimmer *Rynchops niger* in south-eastern Brazil². The number of records of lowland species in specific parts of the MRSP has been increasing in recent years, which is probably due to an increase in ornithological and birding efforts in the area^{9,34}. Studies such as the one we conducted at Sítio Piraquara can help us understand whether the records represent isolated populations, vagrant birds, new colonisers or birds undergoing seasonal altitudinal movements, in a migratory pattern that is still poorly described for the Serra do Mar range²⁸.

Records of colonising and introduced species are also interesting as they help to map their range expansion towards natural areas of the MRSP and their potential adaptation to new environments. Notably, the lack of records in our study area of the three main introduced species in Brazil (Rock Pigeon *Columba livia*, Common Waxbill *Estrilda astrild* and House Sparrow *Passer domesticus*), which occur in the urban area of São Lourenço da Serra, indicate that these species do not find favourable environments at Sítio Piraquara.

Sítio Piraquara is highly suitable for birdwatching and scientific studies. It is located near the city of São Paulo, provides research accommodation, access to most areas of the property through trails and roads, and contains a wide range of natural environments. This makes it an excellent location for scientific studies and to undertake mid- to long-term projects. Data collected to date highlight the importance of citizen science and scientific research in advancing ornithological knowledge about the birds of São Lourenço da Serra, the MRSP and the state of São Paulo. These actions are essential to support initiatives in the economic (e.g., training birding guides, birdwatching events), educational (e.g., field activities, lectures about the region's birds, educational projects) and conservation (e.g., public protected areas) fields.

Acknowledgments

We express our gratitude to all birdwatchers and ornithologists who have visited Sítio Piraquara, contributing to this study with their time, knowledge and data; Guilherme Brandão do Amaral and Eduardo Hortal for collecting and identifying botanical species; and Vitor Piacentini for his help in identifying the *Cyanocorax cristatellus* feather. Our appreciation goes to the Instituto Butantan and SAVE Brasil for their support and collaboration in this endeavour. Thanks to Paulo Rogerio and Marco A. Rego for their help with map images. We thank Igor Alvarenga for the use of his photograph. The owners of Sítio Piraquara also wish to express their most grateful thanks to Guto Carvalho, who back in 2018 started this marvellous journey by encouraging friends, birders and nature lovers to visit their farmstead and shared so many great moments and experiences together with

them. Research was conducted under ICMBio/MMA research permission (N°28198-16).

References

- Amaral, F. S. R. (2009) *Leucopternis lacernulatus* (Temminck, 1827). In: Bressan, P. M., Kierulff, M. C. M & Sugieda, A. M. (eds.) *Fauna ameaçada de extinção no estado de São Paulo—vertebrados*. São Paulo: Fundação Parque Zoológico de São Paulo e Secretaria do Meio Ambiente.
- Antas, P. T. Z., Carrara, L., Kulaif-Ubaid, F., Borges-Junior, S. & Pinheiro-Ferreira, L. (2016) *Aves coloniais da Reserva Particular do Patrimônio Natural SESC Pantanal*. Rio de Janeiro: SESC.
- Antunes, A. Z., Santos, A. M. R. & Eston, M. R. (2008) Registros relevantes de aves para a Grande São Paulo obtidos no Parque Estadual da Cantareira (Nota Científica). *Rev. Inst. Flor.* 20: 221–224.
- Argel-de-Oliveira, M. M. (1987) Observações preliminares sobre a avifauna de São Paulo. *Bol. CEO* 4: 3–39.
- Bonney, R., Cooper, C. B., Dickinson, J., Kelling, S., Phillips, T., Rosemberg, K. V. & Shirk, J. (2009) Citizen science: a developing tool for expanding science knowledge and scientific literacy. *BioScience* 59: 977–984.
- Centro de Estudos Ornitológicos (2023) Registros ornitológicos em localidades do estado de São Paulo. Versão 18/6/2023. <https://www.ceo.org.br> (accessed 15 October 2023).
- Develey, P. (2009) *Tangara peruviana* (Desmarest, 1806). In: Bressan, P. M., Kierulff, M. C. M & Sugieda, A. M. (eds.) *Fauna ameaçada de extinção no estado de São Paulo—vertebrados*. São Paulo: Fundação Parque Zoológico de São Paulo e Secretaria do Meio Ambiente.
- Develey, P. F. & Martensen, A. C. (2006) As aves da Reserva Florestal do Morro Grande (Cotia, SP). *Biota Neotrop.* 6: 2–16.
- eBird (2023a) *eBird: an online database of bird distribution and abundance*. Ithaca, NY: Cornell Lab of Ornithology. <http://www.ebird.org> (accessed 15 October 2023).
- eBird (2023b) Global Big Day. <https://ebird.org/globalbigday>. Ithaca, NY: Cornell Lab of Ornithology (accessed 15 October 2023).
- Figueiredo, L. F. A. (2020) Lista das aves do município de São Paulo. Version: 6 May 2020. <https://www.ceo.org.br> (accessed 10 Oct 2023).
- Figueiredo, L. F. A. & Lo, V. K. (2000) Lista das aves do município de São Paulo. *Bol. CEO* 14: 15–35.
- Granzinoli, E. (2009) *Spizaetus melanoleucus* (Vieillot, 1816). In: Bressan, P. M., Kierulff, M. C. M & Sugieda, A. M. (eds.) *Fauna ameaçada de extinção no estado de São Paulo—vertebrados*. São Paulo: Fundação Parque Zoológico de São Paulo e Secretaria do Meio Ambiente.
- IUCN (2023) *The IUCN Red List of threatened species*. Version 2022–2. <https://www.iucnredlist.org> (accessed 15 October 2023).
- Lo, V. K. (1994) Ocorrência de *Laniisoma elegans* (Thunberg, 1823) (Cotingidae) e *Fluvicola nengeta* (Linnaeus, 1776) (Tyrannidae) no município de São Paulo, SP. *Bol. CEO* 10: 36–41.
- Machado, E. (2009a) *Sporophila frontalis* (Verreaux, 1869). In: Bressan, P. M., Kierulff, M. C. M & Sugieda, A. M. (eds.) *Fauna ameaçada de extinção no estado de São Paulo—vertebrados*. São Paulo: Fundação Parque Zoológico de São Paulo e Secretaria do Meio Ambiente.
- Machado, E. (2009b) *Sporophila falcirostris* (Temminck, 1820). In: Bressan, P. M., Kierulff, M. C. M & Sugieda, A. M. (eds.) *Fauna ameaçada de extinção no estado de São Paulo—vertebrados*. São Paulo: Fundação Parque Zoológico de São Paulo e Secretaria do Meio Ambiente.
- MMA (2022) *Lista nacional de espécies ameaçadas de extinção*. Portaria MMA 148, 7 June 2022. Brasília: Ministério do Meio Ambiente (accessed 15 October 2023).
- Mitchell, M. H. (1957) *Observations on birds of southeastern Brazil*. Toronto: University of Toronto.
- Pacheco, J. F., Silveira, L. F., Aleixo, A., Agne, C. E., Bencke, G. A., Bravo, G. A., Brito, G. R. R., Cohn-Haft, M., Maurício, G. N., Naka, L. N., Olmos, F., Posso, S., Lees, A. C., Figueiredo, L. F. A., Carrano, E., Guedes, R. C., Cesari, E., Franz, I., Schunck, F. & Piacentini, V. Q. (2021) Annotated checklist of the birds of Brazil by the Brazilian Ornithological Records Committee, second edition. *Orn. Res.* 29: 94–105.
- REFLORA (2024) Flora e Funga do Brasil. Jardim Botânico do Rio de Janeiro. <https://floradobrasil.jbrj.gov.br> (accessed 12 February 2024).
- São Paulo [state] (2018) Decreto Estadual N° 63.853 de 27 de novembro de 2018. Declara as espécies da fauna silvestre do estado de São Paulo regionalmente extintas, as ameaçadas de extinção, as quase ameaçadas e as com dados insuficientes para avaliação de seu grau de conservação, bem como as diretrizes a que estão sujeitas. Diário Oficial do Estado de São Paulo, seção 1, Volume 128. Número 221. São Paulo: Governo do Estado de São Paulo.
- São Paulo [city] (2022a) *Inventário da fauna do município de São Paulo*. São Paulo: Divisão de Fauna Silvestre/Secretaria do Verde e do Meio Ambiente/Prefeitura do Município de São Paulo.
- São Paulo [city] (2022b) *Inventário da fauna silvestre do município de São Paulo*. Dados compilados até 1 dez. 2022. São Paulo: Prefeitura do Município de São Paulo/Secretaria do Verde e do Meio Ambiente/Divisão da Fauna Silvestre.
- Schunck, F. (2009a) *Laniisoma elegans* (Thunberg, 1823). In: Bressan, P. M., Kierulff, M. C. M & Sugieda, A. M. (eds.) *Fauna ameaçada de extinção no estado de São Paulo—vertebrados*. São Paulo: Fundação Parque Zoológico de São Paulo e Secretaria do Meio Ambiente.
- Schunck, F. (2009b) *Onychorhynchus swainsoni* (Pelzeln, 1858). In: Bressan, P. M., Kierulff, M. C. M & Sugieda, A. M. (eds.) *Fauna ameaçada de*

- extinção no estado de São Paulo—vertebrados*. São Paulo: Fundação Parque Zoológico de São Paulo e Secretaria do Meio Ambiente.
27. Schunck, F. (2009c) *Phylloscartes paulista* Ihering & Ihering, 1907. In: Bressan, P. M., Kierulff, M. C. M & Sugieda, A. M. (eds.) *Fauna ameaçada de extinção no estado de São Paulo—vertebrados*. São Paulo: Fundação Parque Zoológico de São Paulo e Secretaria do Meio Ambiente.
28. Schunck, F., Silveira, L. F. & Candia-Gallardo, C. (2023) Seasonal altitudinal movements of birds in Brazil: a review. *Zoologia* 40: 1–18.
29. Sick, H. (1997) *Ornitologia Brasileira*. Rio de Janeiro: Nova Fronteira.
30. Silveira, L. F. & Uezu, A. (2011) Checklist das aves do estado de São Paulo, Brasil. *Biota Neotrop.* 11: 1–28.
31. Somenzari, M., Amaral, P., Cueto, V., Guaraldo, A., Jahn, A., Lima, D., Lima, P., Lugarini, C., Machado, C. G., Martinez, J., Nascimento, J. L. X., Pacheco, J. F., Paludo, D., Prestes, N. Serafini, P., Silveira, L. F., Souza, A. E., Souza, N. A., Souza, M. A., Telino-Júnior, W. & Whitney, M. M. (2018) An overview of migratory birds in Brazil. *Pap. Avulsos Zool.* 58: 1–66.
32. Tonetti, V. R., Rego, M. A., De Lucca, A., Develey, P. F., Schunck, F. & Silveira, L. F. (2017) Historical knowledge, richness and relative representativeness of the avifauna in the largest native urban rainforest in the world. *Rev. Bras Zool.* 34: 1–18.
33. Vale, M. M., Tourinho, L., Lorini, M. L., Rajão, H. & Figueiredo, M. S. L. (2018) Endemic birds of the Atlantic Forest: traits, conservation status, and patterns of biodiversity. *J. Field Orn.* 89: 193–206.
34. WikiAves (2023) A enciclopédia das aves do Brasil. <http://www.wikiaves.com/4466838> (accessed 15 October 2023).
35. Willis, E. O. & Oniki, Y. (2003) *Aves do estado de São Paulo*. Rio Claro: Ed. Divisa.
- Fabio Schunck**
Comitê Brasileiro de Registros Ornitológicos, Museu Biológico, Instituto Butantan, Av. Vital Brazil, 1500, CEP 05503-900, São Paulo, SP, Brazil. E-mail: fabio_schunck@yahoo.com.br.
- Marco Aurélio Galvão da Silva**
SAVE Brasil, R. Fernão Dias, 219, casa 2, CEP: 05427-010, São Paulo, SP, Brazil. E-mail: marcosama@gmail.com.
- Matheus de Moraes dos Santos**
Laboratório de Ecologia e Conservação, UFSCar Campus Sorocaba, Rodovia João Leme dos Santos, km 110 – Bairro Itinga, CEP: 18052-780, Sorocaba, SP, Brazil. E-mail: maths.msantos@gmail.com.
- Clarissa de Oliveira Santos**
Museu Biológico, Instituto Butantan, Av. Vital Brazil, 1500, CEP 05503-900, São Paulo, SP, Brazil. E-mail: clarissaoliveira2204@gmail.com
- Martin Kunze and Thomas Kunze**
Sítio Piraquara, Estr. Maria Soares Pereira, 2650, São Lourenço da Serra, SP, Brazil, CEP 06890-000; Caixa Postal 1932. E-mail: thomas.e.kunze@gmail.com.
- Erika Hingst-Zaher**
Museu Biológico, Instituto Butantan, Av. Vital Brazil, 1500, CEP 05503-900, São Paulo, SP, Brazil. E-mail: erika.zaher@butantan.gov.br.

Appendix. List of bird species recorded at Sítio Piraquara, São Paulo, Brazil. Taxonomy is that of the Brazilian Ornithological Records Committee. Symbols next to the scientific names indicate: # = species endemic to the Atlantic Forest²³; * = migratory species; and ** = partially migratory species³¹. Codes for the habitat column ('Hab'): FL = forest; OF = open field, including *capoiras* and anthropogenic areas; HF = humid, flooded areas and swamps; only a single (the most typical) habitat is listed for each species^{29,35}. Codes for the 'Threat status' column: EN = Endangered; and VU = Vulnerable. Numbers in parentheses after the threat category correspond to the global (1)⁴, national (2)¹⁸ and state (3)²² Red Lists. Codes for the type of record and documentation column ('Record'): V = visual; A = auditory; M = mist-netted; VT = feather or other trace evidence; C = specimen; P = photograph and R = audio recording.

Species	Portuguese name	English name	Hab	Threat status	Record
Tinamiformes					
Tinamidae					
<i>Tinamus solitarius</i> #	macuco	Solitary Tinamou	FL		A
<i>Crypturellus obsoletus</i>	inhambuquauçu	Brown Tinamou	FL		A,V,P
<i>Crypturellus tataupa</i>	inhambu-chintã	Tataupa Tinamou	FL		V,P
Anseriformes					
Anatidae					
<i>Cairina moschata</i>	pato-do-mato	Muscovy Duck	HF		V,P

Species	Portuguese name	English name	Hab	Threat status	Record
<i>Amazonetta brasiliensis</i>	marreca-ananai	Brazilian Teal	HF		V,P
<i>Spatula versicolor</i> **	marreca-cricri	Silver Teal	HF		V
Galliformes					
Cracidae					
<i>Penelope obscura</i>	jacuguauçu	Dusky-legged Guan	FL		A,V,P
Odontophoridae					
<i>Odontophorus capueira</i> #	uru	Spot-winged Wood-Quail	FL		A,P,R
Columbiformes					
Columbidae					
<i>Patagioenas picazuro</i>	pomba-asa-branca	Picazuro Pigeon	FL		A,V,P
<i>Patagioenas cayennensis</i>	pomba-galega	Pale-vented Pigeon	FL		A,V
<i>Patagioenas plumbea</i>	pomba-amargosa	Plumbeous Pigeon	FL		A,V,P
<i>Geotrygon montana</i>	pariri	Ruddy Quail-Dove	FL		A,M,C,P
<i>Leptotila verreauxi</i>	juriti-pupu	White-tipped Dove	FL		A,V,P
<i>Leptotila rufaxilla</i>	juriti-de-testa-branca	Grey-fronted Dove	FL		A,V
<i>Zenaida auriculata</i>	avoante	Eared Dove	OF		A,V
<i>Columbina talpacoti</i>	rolinha-roxa	Ruddy Ground-Dove	OF		A,V,P,R
Cuculiformes					
Cuculidae					
<i>Guira guira</i>	anu-branco	Guira Cuckoo	OF		V,P
<i>Crotophaga ani</i>	anu-preto	Smooth-billed Ani	OF		V,P
<i>Tapera naevia</i>	saci	Striped Cuckoo	FL		A,R
<i>Dromococcyx pavoninus</i>	peixe-frito-pavonino	Pavonine Cuckoo	FL		A
<i>Piaya cayana</i>	alma-de-gato	Squirrel Cuckoo	FL		A,V,P
Nyctibiiformes					
Nyctibiidae					
<i>Nyctibius griseus</i> **	urutau	Common Potoo	FL		A,V,P,R
Caprimulgiformes					
Caprimulgidae					
<i>Lurocalis semitorquatus</i> **	tuju	Short-tailed Nighthawk	FL		A,V,R
<i>Hydropsalis torquata</i>	bacurau-tesoura	Scissor-tailed Nightjar	OF		A
Apodiformes					
Apodidae					
<i>Cypseloides</i> sp.	taperuçu	swift sp.	FL		V
<i>Streptoprocne zonaris</i>	taperuçu-de-coleira-branca	White-collared Swift	FL		V,P
<i>Chaetura meridionalis</i> *	andorinhão-do-temporal	Sick's Swift	OF		A,V
Trochilidae					
<i>Florisuga fusca</i> **	beija-flor-preto	Black Jacobin	FL		A,V,P
<i>Ramphodon naevius</i> #	beija-flor-rajado	Saw-billed Hermit	FL		V
<i>Phaethornis squalidus</i> #	rabo-branco-pequeno	Dusky-throated Hermit	FL		V,M,C
<i>Phaethornis pretrei</i>	rabo-branco-acanelado	Planalto Hermit	FL		A,V
<i>Phaethornis eurynome</i> #	rabo-branco-de-garganta-rajada	Scale-throated Hermit	FL		A,V,M,C,P
<i>Anthracothorax nigricollis</i> **	beija-flor-de-veste-preta	Black-throated Mango	FL		A,V,P

Species	Portuguese name	English name	Hab	Threat status	Record
<i>Lophornis chalybeus</i>	topetinho-verde	Festive Coquette	FL		V,P
<i>Heliodoxa rubricauda</i> #	beija-flor-rubi	Brazilian Ruby	FL		V
<i>Calliphlox amethystina</i>	estrelinha-ametista	Amethyst Woodstar	FL		V,P
<i>Chlorostilbon lucidus</i>	besourinho-de-bico-vermelho	Glittering-bellied Emerald	FL		A,V,M,C,P
<i>Thalurania glaucopis</i> #	beija-flor-de-fronte-violeta	Violet-capped Woodnymph	FL		A,V,M,C,P
<i>Eupetomena macroura</i>	beija-flor-tesoura	Swallow-tailed Hummingbird	FL		V,P
<i>Aphantochroa cirrochloris</i>	beija-flor-cinza	Sombre Hummingbird	FL		V,P
<i>Chrysuronia versicolor</i>	beija-flor-de-banda-branca	Versicoloured Emerald	FL		A,V,P
<i>Leucochloris albicollis</i>	beija-flor-de-papo-branco	White-throated Hummingbird	FL		V,P
<i>Chionomesa fimbriata</i>	beija-flor-de-garganta-verde	Glittering-throated Emerald	FL		A,V
<i>Chionomesa lactea</i>	beija-flor-de-peito-azul	Sapphire-spangled Emerald	FL		A,V,P
Gruiformes					
Rallidae					
<i>Aramides saracura</i> #	saracura-do-mato	Slaty-breasted Wood-Rail	HF		A,V,P
<i>Gallinula galeata</i>	galinha-d'água	Common Gallinule	HF		V,P
Charadriiformes					
Charadriidae					
<i>Vanellus chilensis</i>	quero-quero	Southern Lapwing	OF		A,V,P
Suliformes					
Phalacrocoracidae					
<i>Nannopterum brasilianum</i>	biguá	Neotropic Cormorant	HF		V,P
Pelecaniformes					
Ardeidae					
<i>Tigrisoma lineatum</i>	socó-boi	Rufescent Tiger-Heron	HF		V,P
<i>Butorides striata</i>	socozinho	Striated Heron	HF		V,P
<i>Bubulcus ibis</i>	garça-vaqueira	Cattle Egret	OF		V,P
<i>Ardea cocoi</i>	garça-moura	Cocoi Heron	HF		V,P
<i>Ardea alba</i>	garça-branca-grande	Great Egret	HF		V,P
<i>Syrigma sibilatrix</i>	maria-faceira	Whistling Heron	OF		V,P
<i>Egretta thula</i>	garça-branca-pequena	Snowy Egret	HF		V
Threskiornithidae					
<i>Mesembrinibis cayennensis</i>	coró-coró	Green Ibis	FL		A,V,P
Cathartiformes					
Cathartidae					
<i>Coragyps atratus</i>	urubu-preto	Black Vulture	OF		V,P
<i>Cathartes aura</i>	urubu-de-cabeça-vermelha	Turkey Vulture	OF		V,P
Accipitriformes					
Accipitridae					
<i>Leptodon cayanensis</i>	gavião-gato	Grey-headed Kite	FL		V,P
<i>Elanoides forficatus</i> **	gavião-tesoura	Swallow-tailed Kite	FL		V,P
<i>Spizaetus tyrannus</i>	gavião-pegamacaco	Black Hawk-Eagle	FL		A,V,P,R
<i>Spizaetus melanoleucus</i>	gavião-pato	Black-and-white Hawk-Eagle	FL	EN (3)	A
<i>Harpagus diodon</i> *	gavião-bombachinha	Rufous-thighed Kite	FL		V,P

Species	Portuguese name	English name	Hab	Threat status	Record
<i>Accipiter striatus</i>	tauató-miúdo	Sharp-shinned Hawk	FL		V
<i>Geranospiza caerulescens</i>	gavião-pernilongo	Crane Hawk	FL		A,P
<i>Heterospizias meridionalis</i>	gavião-caboclo	Savanna Hawk	FL		V,P
<i>Amadonastur lacernulatus</i> #	gavião-pombo-pequeno	White-necked Hawk	FL	VU (1,2,3)	V,P
<i>Rupornis magnirostris</i>	gavião-carijó	Roadside Hawk	FL		A,V,P
<i>Buteo brachyurus</i>	gavião-de-cauda-curta	Short-tailed Hawk	OF		A,V,P
Strigiformes					
Tytonidae					
<i>Tyto furcata</i>	suindara	American Barn Owl	FL		V
Strigidae					
<i>Megascops choliba</i>	corujinha-do-mato	Tropical Screech-Owl	FL		A,V,P
<i>Pulsatrix koeniswaldiana</i> #	murucututu-de-barriga-amarela	Tawny-browed Owl	FL		A,V,P,R
<i>Strix virgata</i>	coruja-do-mato	Mottled Owl	FL		A,P,R
<i>Glaucidium minutissimum</i> #	caburé-miudinho	Least Pygmy-Owl	FL		A
Trogoniformes					
Trogonidae					
<i>Trogon surrucura</i>	surucuá-variado	Surucua Trogon	FL		A,V,M,C,P
<i>Trogon chrysochloros</i> #	surucuá-dourado	Southern Black-throated Trogon	FL		A,V,P
Coraciiformes					
Momotidae					
<i>Baryphthengus ruficapillus</i> #	juruva	Rufous-capped Motmot	FL		A,V,M,C,P
Alcedinidae					
<i>Megaceryle torquata</i>	martim-pescador-grande	Ringed Kingfisher	HF		V,P
<i>Chloroceryle amazona</i>	martim-pescador-verde	Amazon Kingfisher	HF		A,V,P
<i>Chloroceryle americana</i>	martim-pescador-pequeno	Green Kingfisher	HF		V,M,C,P
Galbuliformes					
Buconidae					
<i>Nonnula rubecula</i>	macuru	Rusty-breasted Nunlet	FL		V,P
<i>Malacoptila striata</i> #	barbudo-rajado	Crescent-chested Puffbird	FL		A,V,P
<i>Nystalus chacuru</i>	joão-bobo	White-eared Puffbird	FL		V,P
Piciformes					
Ramphastidae					
<i>Ramphastos dicolorus</i> #	tucano-de-bico-verde	Red-breasted Toucan	FL		A,V,P
<i>Selenidera maculirostris</i> #	araçari-poca	Spot-billed Toucanet	FL		V,P
Picidae					
<i>Picumnus temminckii</i> #	picapauzinho-de-coleira	Ochre-collared Piculet	FL		A,V,P
<i>Melanerpes candidus</i>	pica-pau-branco	White Woodpecker	FL		A,V,P
<i>Veniliornis spilogaster</i>	picapauzinho-verde-carijó	White-spotted Woodpecker	FL		A,V,M,C,P
<i>Campephilus robustus</i> #	pica-pau-rei	Robust Woodpecker	FL		V,P
<i>Dryocopus lineatus</i>	pica-pau-de-banda-branca	Lineated Woodpecker	FL		A,V,P
<i>Celeus flavescens</i>	pica-pau-de-cabeça-amarela	Blond-crested Woodpecker	FL		A,V,P,R
<i>Colaptes melanochloros</i>	pica-pau-verde-barrado	Green-barred Woodpecker	FL		A,V,P
<i>Colaptes campestris</i>	pica-pau-do-campo	Campo Flicker	OF		A,V,R

Species	Portuguese name	English name	Hab	Threat status	Record
Falconiformes					
Falconidae					
<i>Herpetotheres cachinnans</i>	acauã	Laughing Falcon	FL		A,R
<i>Micrastur ruficollis</i>	falcão-caburé	Barred Forest-Falcon	FL		A,M,C,R
<i>Micrastur semitorquatus</i>	falcão-relógio	Collared Forest-Falcon	FL		A,R
<i>Caracara plancus</i>	carcarã	Crested Caracara	OF		A,V,P
<i>Milvago chimachima</i>	carrapateiro	Yellow-headed Caracara	OF		A,V,P
<i>Falco femoralis</i>	falcão-de-coleira	Apomado Falcon	FL		A,V,P
Psittaciformes					
Psittacidae					
<i>Brotogeris tirica</i> #	periquito-rico	Plain Parakeet	FL		A,V,P
<i>Pionopsitta pileata</i> #	cuiú-cuiú	Pileated Parrot	FL		A,P
<i>Triclaria malachitacea</i> #	sabiá-cica	Blue-bellied Parrot	FL		A,V,P,R
<i>Pionus maximiliani</i>	maitaca	Scaly-headed Parrot	FL		A,V,P
<i>Forpus xanthopterygius</i>	tuim	Blue-winged Parrotlet	FL		A,V
<i>Pyrrhura frontalis</i> #	tiriba-de-testa-vermelha	Maroon-bellied Parakeet	FL		A,V
<i>Psittacara leucophthalmus</i>	periquitão	White-eyed Parakeet	FL		A,V,P
Passeriformes					
Thamnophilidae					
<i>Terenura maculata</i> #	zidedê	Streak-capped Antwren	FL		A,V
<i>Rhopias gularis</i> #	choquinha-de-garganta-pintada	Star-throated Antwren	FL		A,V,M,C,P
<i>Dysithamnus stictothorax</i> #	choquinha-de-peito-pintado	Spot-breasted Antvireo	FL		A
<i>Dysithamnus mentalis</i>	choquinha-lisa	Plain Antvireo	FL		A,V,M,C,P
<i>Herpsilochmus rufimarginatus</i>	chorozinho-de-asa-vermelha	Southern Rufous-winged Antwren	FL		A,V,P,R
<i>Thamnophilus caeruleus</i>	choca-da-mata	Variable Antshrike	FL		A,V,P
<i>Hypodaedalus guttatus</i> #	chocão-carijó	Spot-backed Antshrike	FL		A,V,M,P,R
<i>Batara cinerea</i>	matracão	Giant Antshrike	FL		A,R
<i>Mackenziaena severa</i> #	borralhara	Tufted Antshrike	FL		A
<i>Myiodesmus squamosus</i> #	papa-formiga-de-grota	Squamate Antbird	FL		A,V,M,C,P,R
<i>Pyriglena leucoptera</i> #	papa-taoca-do-sul	White-shouldered Fire-eye	FL		A,V,M,C,P,R
<i>Dryophila ferruginea</i> #	dituí	Ferruginous Antbird	FL		A,V,R
<i>Dryophila rubricollis</i>	choquinha-dublê	Bertoni's Antbird	FL		A,R
<i>Dryophila ochropyga</i> #	choquinha-de-dorso-vermelho	Ochre-rumped Antbird	FL		A
<i>Dryophila malura</i> #	choquinha-carijó	Dusky-tailed Antbird	FL		A
Conopophagidae					
<i>Conopophaga lineata</i>	chupa-dente	Rufous Gnateater	FL		A,V,M,C,P
Grallariidae					
<i>Grallaria varia</i>	tovacuçu	Variigated Antpitta	FL		A,R
Rhinocryptidae					
<i>Psilorhamphus guttatus</i> #	tapaculo-pintado	Spotted Bamboo-wren	FL		A
<i>Eleoscytalopus indigoticus</i> #	macuquinho	White-breasted Tapaculo	FL		A,R
<i>Scytalopus speluncae</i> #	tapaculo-preto	Mouse-coloured Tapaculo	FL		A

Species	Portuguese name	English name	Hab	Threat status	Record
Formicariidae					
<i>Formicarius colma</i>	galinha-do-mato	Rufous-capped Anthrush	FL		A,R
<i>Chamaeza campanisona</i>	tovaca-campainha	Short-tailed Antthrush	FL		A
<i>Chamaeza meruloides</i> #	tovaca-cantadora	Such's Antthrush	FL		A,R
Scleruridae					
<i>Sclerurus scansor</i> #	vira-folha	Rufous-breasted Leaf-tosser	FL		A,V,M,C,P
Dendrocolaptidae					
<i>Sittasomus griseicapillus</i>	arapaçu-verde	Olivaceous Woodcreeper	FL		A,V,M,C,P
<i>Dendrocicla turdina</i> #	arapaçu-liso	Plain-winged Woodcreeper	FL		A,V,M,C,P,R
<i>Dendrocolaptes platyrostris</i>	arapaçu-grande	Planalto Woodcreeper	FL		A,V,P
<i>Xiphocolaptes albicollis</i>	arapaçu-de-garganta-branca	White-throated Woodcreeper	FL		A,V,P,R
<i>Xiphorhynchus fuscus</i> #	arapaçu-rajado	Lesser Woodcreeper	FL		A,V,M,C,P,R
<i>Lepidocolaptes falcinellus</i> #	arapaçu-escamoso-do-sul	Scalloped Woodcreeper	FL		V,P,R
Xenopidae					
<i>Xenops minutus</i>	bico-virado-miúdo	Plain Xenops	FL		A,V,M,C,P
<i>Xenops rutilans</i>	bico-virado-carijó	Streaked Xenops	FL		A,V,P
Furnariidae					
<i>Furnarius rufus</i>	joão-de-barro	Rufous Hornero	FL		A,V,P
<i>Lochmias nematura</i>	joão-porca	Sharp-tailed Streamcreeper	FL		A,V,M,C,P
<i>Heliobletus contaminatus</i> #	trepadorzinho	Sharp-billed Treehunter	FL		A
<i>Philydor atricapillus</i> #	limpa-folha-coroado	Black-capped Foliage-gleaner	FL		A,V,M,C,P
<i>Dendroma rufa</i>	limpa-folha-de-testa-baia	Buff-fronted Foliage-gleaner	FL		A,V,M,C,P
<i>Automolus leucophthalmus</i> #	barranqueiro-de-olho-branco	White-eyed Foliage-gleaner	FL		A,V,M,C,P,R
<i>Cranioleuca pallida</i> #	arredio-pálido	Pallid Spinetail	FL		A,V,P
<i>Synallaxis ruficapilla</i> #	pichororé	Rufous-capped Spinetail	FL		A,V,M,C,P,R
<i>Synallaxis spixi</i>	joão-teneném	Spix's Spinetail	FL		A,V,P,R
Pipridae					
<i>Neopelma chrysolophum</i> #	fruxu	Serra do Mar Tyrant-Manakin	FL		A,V,R
<i>Ilicura militaris</i> #	tangarazinho	Pin-tailed Manakin	FL		A,V,P,R
<i>Chiroxiphia caudata</i> #	tangará	Swallow-tailed Manakin	FL		A,V,M,C,P,R
<i>Manacus manacus</i>	rendeira	White-bearded Manakin	FL		V
Cotingidae					
<i>Pyroderus scutatus</i>	pavó	Red-ruffed Fruitcrow	FL		A,V,P
<i>Procnias nudicollis</i> #	araponga	Bare-throated Bellbird	FL		A,V,P,R
Tityridae					
<i>Schiffornis virescens</i> #	flautim	Greenish Schiffornis	FL		A,V,M,C,R
<i>Lanius elegans</i> #	chibante	Shrike-like Cotinga	FL	VU (3)	V,P
<i>Tityra inquisitor</i>	anambé-branco-de-bochecha-parda	Black-crowned Tityra	FL		V,P
<i>Tityra cayana</i>	anambé-branco-de-rabo-preto	Black-tailed Tityra	FL		V,P
<i>Pachyramphus viridis</i>	caneleiro-verde	Green-backed Becard	FL		A
<i>Pachyramphus castaneus</i>	caneleiro	Chestnut-crowned Becard	FL		A,V,P
<i>Pachyramphus polychopterus</i> **	caneleiro-preto	White-winged Becard	FL		A,V
<i>Pachyramphus validus</i> *	caneleiro-de-chapéu-preto	Crested Becard	FL		A,V,P

Species	Portuguese name	English name	Hab	Threat status	Record
Onychorhynchidae					
<i>Onychorhynchus swainsoni</i> #	maria-leque-do-sudeste	Atlantic Royal Flycatcher	FL	VU (1,3)	M,P
<i>Myiobius atricaudus</i>	assanhadinho-de-cauda-preta	Black-tailed Flycatcher	FL		A,V,M,C,P
Pipritidae					
<i>Piprites chloris</i>	papinho-amarelo	Wing-barred Piprites	FL		A,V,P
Platyrrinchidae					
<i>Platyrrinchus mystaceus</i>	patinho	White-throated Spadebill	FL		A,V,M,C,P
Rhynchocyclidae					
<i>Mionectes rufiventris</i> #	abre-asa-de-cabeça-cinza	Grey-hooded Flycatcher	FL		A,V,M,C,P
<i>Leptopogon amaurocephalus</i>	cabeçudo	Sepia-capped Flycatcher	FL		A,V,M,C,P
<i>Phylloscartes ventralis</i>	borboletinha-do-mato	Mottle-cheeked Tyrannulet	FL		A,V
<i>Phylloscartes paulista</i> #	não-pode-parar	Sao Paulo Tyrannulet	FL	VU (3)	A,V,R
<i>Tolmomyias sulphurescens</i>	bico-chato-de-orelha-preta	Yellow-olive Flycatcher	FL		A,V,P
<i>Todirostrum poliocephalum</i> #	teque-teque	Grey-headed Tody-Flycatcher	FL		A,V
<i>Todirostrum cinereum</i>	ferreirinho-relógio	Common Tody-Flycatcher	FL		A,V
<i>Poecilotriccus plumbeiceps</i>	tororó	Ochre-faced Tody-Flycatcher	FL		A,V,P
<i>Myiornis auricularis</i> #	miudinho	Eared Pygmy-Tyrant	FL		A,V
<i>Hemitriccus diops</i> #	olho-falso	Drab-breasted Pygmy-Tyrant	FL		A,V,M,C
<i>Hemitriccus orbitatus</i> #	tiririzinho-do-mato	Eye-ringed Tody-Tyrant	FL		A,V,M,C
<i>Hemitriccus nidipendulus</i>	tachuri-campainha	Hangnest Tody-Tyrant	FL		A,V,P
Tyrannidae					
<i>Hirundinea ferruginea</i>	gibão-de-couro	Cliff Flycatcher	FL		A,V,P
<i>Tyranniscus burmeisteri</i>	piolhinho-chiador	Rough-legged Tyrannulet	FL		A,V,P
<i>Camptostoma obsoletum</i>	risadinha	Southern Beardless-Tyrannulet	FL		A,V
<i>Elaenia flavogaster</i>	guaracava-de-barriga-amarela	Yellow-bellied Elaenia	FL		A,V,P
<i>Elaenia spectabilis</i> **	guaracava-grande	Large Elaenia	FL		A,V
<i>Elaenia parvirostris</i> **	tuque-pium	Small-billed Elaenia	FL		A,P,R
<i>Elaenia mesoleuca</i>	tuque	Olivaceous Elaenia	FL		A,V,P
<i>Elaenia obscura</i>	tucão	Small-headed Elaenia	FL		A,V
<i>Phyllomyias virescens</i>	piolhinho-verdoso	Greenish Tyrannulet	FL		A
<i>Phyllomyias fasciatus</i>	piolhinho	Planalto Tyrannulet	FL		A,V,P
<i>Phyllomyias griseicapilla</i> #	piolhinho-serrano	Grey-capped Tyrannulet	FL		A,V
<i>Attila phoenicurus</i> *	capitão-castanho	Rufous-tailed Attila	FL		A,P,R
<i>Attila rufus</i> #	capitão-de-saíra	Grey-hooded Attila	FL		A,V,M,C,P,R
<i>Legatus leucophaeus</i> **	bem-te-vi-pirata	Piratic Flycatcher	FL		A,V,P,R
<i>Myiarchus swainsoni</i> **	irré	Swainson's Flycatcher	FL		A,V,P
<i>Myiarchus ferox</i>	maria-cavaleira	Short-crested Flycatcher	FL		A
<i>Syrstes sibilator</i>	gritador	Sibilant Syrstes	FL		A,V,P,R
<i>Pitangus sulphuratus</i> **	bem-te-vi	Great Kiskadee	FL		A,V,P,R
<i>Machetornis rixosa</i>	suiriri-cavaleiro	Cattle Tyrant	OF		A,V
<i>Myiodynastes maculatus</i> **	bem-te-vi-rajado	Streaked Flycatcher	FL		A,V,P,R
<i>Megarynchus pitangua</i>	neinei	Boat-billed Flycatcher	FL		A,V,P
<i>Myiozetetes similis</i>	bentevizinho-de-penacho-vermelho	Social Flycatcher	FL		A,V,P
<i>Tyrannus melancholicus</i> **	suiriri	Tropical Kingbird	FL		A,V,P

Species	Portuguese name	English name	Hab	Threat status	Record
<i>Tyrannus savana</i> **	tesourinha	Southern Fork-tailed Flycatcher	OF		A,V,P
<i>Empidonomus varius</i> **	peitica	Variiegated Flycatcher	FL		A,V,P
<i>Colonia colonus</i>	viuvinha	Long-tailed Tyrant	FL		A,V,P
<i>Fluvicola nengeta</i>	lavadeira-mascarada	Masked Water-Tyrant	HF		V,P
<i>Myiophobus fasciatus</i> **	filipe	Bran-coloured Flycatcher	FL		A,V,P
<i>Cnemotriccus fuscatus</i>	guaracavuçu	Fuscous Flycatcher	FL		A,R
<i>Lathrotriccus euleri</i> **	enferrujado	Euler's Flycatcher	FL		A,V
<i>Contopus cinereus</i>	papa-moscas-cinzento	Tropical Pewee	FL		V,P
Vireonidae					
<i>Cycalrhis gujanensis</i>	pitiguari	Rufous-browed Peppershrike	FL		A,V,P
<i>Hylophilus poicilotis</i> #	verdinho-coroado	Rufous-crowned Greenlet	FL		A,V,P
<i>Vireo chivi</i> **	juruviera	Chivi Vireo	FL		A,V,P,R
Corvidae					
<i>Cyanocorax cristatellus</i>	gralha-do-campo	Curl-crested Jay	OF		VT
Hirundinidae					
<i>Pygochelidon cyanoleuca</i>	andorinha-pequena-de-casa	Blue-and-white Swallow	OF		A,V
<i>Stelgidopteryx ruficollis</i> **	andorinha-serradora	Southern Rough-winged Swallow	OF		A,V,P
<i>Progne tapera</i> **	andorinha-do-campo	Brown-chested Martin	OF		A,V
<i>Progne chalybea</i> **	andorinha-grande	Grey-breasted Martin	OF		A,V
<i>Tachycineta leucorrhoa</i>	andorinha-de-sobre-branco	White-rumped Swallow	HF		V
Troglodytidae					
<i>Troglodytes musculus</i>	corruíra	Southern House Wren	FL		A,V,M,C,P
Poliopitidae					
<i>Ramphocaenus melanurus</i>	chirito	Long-billed Gnatwren	FL		A,V,R
Donacobiidae					
<i>Donacobius atricapilla</i>	japacaním	Black-capped Donacobius	HF		A
Turdidae					
<i>Turdus flavipes</i> **	sabiá-una	Yellow-legged Thrush	FL		A,V,P,R
<i>Turdus leucomelas</i>	sabiá-barranco	Pale-breasted Thrush	FL		A,V,M,C,P,R
<i>Turdus rufiventris</i>	sabiá-laranjeira	Rufous-bellied Thrush	FL		A,V,M,C,P,R
<i>Turdus amaurochalinus</i> **	sabiá-poca	Creamy-bellied Thrush	FL		A,V,P
<i>Turdus albicollis</i>	sabiá-coleira	White-necked Thrush	FL		A,V,M,C,P,R
Mimidae					
<i>Mimus saturninus</i>	sabiá-do-campo	Chalk-browed Mockingbird	OF		V,P
Fringillidae					
<i>Spinus magellanicus</i>	pintassilgo	Hooded Siskin	FL		V,P
<i>Cyanophonia cyanocephala</i>	gaturamo-rei	Golden-rumped Euphonia	FL		V
<i>Chlorophonia cyanea</i>	gaturamo-bandeira	Blue-naped Chlorophonia	FL		A,V
<i>Euphonia violacea</i>	gaturamo	Violaceous Euphonia	FL		A,V,P
<i>Euphonia pectoralis</i> #	ferro-velho	Chestnut-bellied Euphonia	FL		A,V,P
Passerellidae					
<i>Zonotrichia capensis</i>	tico-tico	Rufous-collared Sparrow	FL		A,V,P
Icteridae					
<i>Psarocolius decumanus</i>	japu	Crested Oropendola	FL		A,V

Species	Portuguese name	English name	Hab	Threat status	Record
<i>Cacicus chrysopterus</i>	japuíra	Golden-winged Cacique	FL		A,V,P
<i>Cacicus haemorrhous</i>	guaxe	Red-rumped Cacique	FL		A,R
<i>Molothrus bonariensis</i>	chupim	Shiny Cowbird	OF		A,V,P
Parulidae					
<i>Geothlypis aequinoctialis</i>	pia-cobra	Masked Yellowthroat	HF		A,V,P
<i>Setophaga pitayumi</i>	mariquita	Tropical Parula	FL		A,V
<i>Myiothlypis leucoblephara</i>	pula-pula-assobiador	White-browed Warbler	FL		A,V,M,C
<i>Myiothlypis rivularis</i>	pula-pula-ribeirinho	Neotropical River Warbler	FL		A,V,P,R
<i>Basileuterus culicivorus</i>	pula-pula	Golden-crowned Warbler	FL		A,V,M,C,P
Cardinalidae					
<i>Habia rubica</i>	tiê-de-bando	Red-crowned Ant-Tanager	FL		A,V,M,C,P
Thraupidae					
<i>Chlorophanes spiza</i>	sai-verde	Green Honeycreeper	FL		V
<i>Hemithraupis ruficapilla</i> #	saira-ferrugem	Rufous-headed Tanager	FL		A,V,P
<i>Tersina viridis</i> **	sai-andorinha	Swallow Tanager	FL		V,P
<i>Dacnis cayana</i>	sai-azul	Blue Dacnis	FL		A,V,P
<i>Saltator similis</i>	trinca-ferro	Green-winged Saltator	FL		A,V,P
<i>Saltator fuliginosus</i> #	bico-de-pimenta	Black-throated Grosbeak	FL		A,R
<i>Coereba flaveola</i>	cambacica	Bananaquit	FL		A,V,P
<i>Asemospiza fuliginosa</i>	cigarra-preta	Sooty Grassquit	FL		V
<i>Volatinia jacarina</i>	tiziu	Blue-black Grassquit	OF		A,V,P
<i>Trichothraupis melanops</i>	tiê-de-topete	Black-goggled Tanager	FL		A,V,M,C,P,R
<i>Lorius cristatus</i>	tiê-galo	Flame-crested Tanager	FL		A,V,P,R
<i>Tachyphonus coronatus</i> #	tiê-preto	Ruby-crowned Tanager	FL		A,V,M,C,P
<i>Sporophila lineola</i> **	bigodinho	Lined Seedeater	OF		A
<i>Sporophila frontalis</i> #	pixoxó	Buffy-fronted Seedeater	OF	VU (1,2); EN (3)	A,V,P
<i>Sporophila falcirostris</i> #	cigarrinha-do-sul	Temminck's Seedeater	OF	VU (1,2); EN (3)	A,V,P,R
<i>Sporophila caeruleascens</i> **	coleurinho	Double-collared Seedeater	OF		A,V,P
<i>Thlypopsis sordida</i>	sai-canário	Orange-headed Tanager	FL		V
<i>Conirostrum speciosum</i>	figuinha-de-rabo-castanho	Chestnut-vented Conebill	FL		A,V,P
<i>Sicalis flaveola</i>	canário-da-terra	Saffron Finch	OF		A,V,P,R
<i>Haplospiza unicolor</i> #	cigarra-bambu	Uniform Finch	FL		A,V,M,C
<i>Pipraeidea melanonota</i>	saira-viúva	Fawn-breasted Tanager	FL		V,P
<i>Paroaria dominicana</i>	cardeal-do-nordeste	Red-cowled Cardinal	OF		V,P
<i>Thraupis sayaca</i>	sanhaço-cinzento	Sayaca Tanager	FL		A,V,P
<i>Thraupis cyanopectera</i> #	sanhaço-de-encontro-azul	Azure-shouldered Tanager	FL		A,V,P,R
<i>Thraupis palmarum</i>	sanhaço-do-coqueiro	Palm Tanager	FL		A,V,P
<i>Thraupis ornata</i> #	sanhaço-de-encontro-amarelo	Golden-chevroned Tanager	FL		A,V,P
<i>Stelpnia peruviana</i> #	saira-sapucaia	Black-backed Tanager	FL	VU (1,3)	V,P
<i>Stelpnia preciosa</i>	saira-preciosa	Chestnut-backed Tanager	FL		A,V
<i>Stelpnia cayana</i>	saira-amarela	Burnished-buff Tanager	FL		A,V
<i>Tangara seledon</i> #	saira-sete-cores	Green-headed Tanager	FL		A,V,P
<i>Tangara cyanocephala</i> #	saira-militar	Red-necked Tanager	FL		A,V,P
<i>Tangara desmaresti</i> #	saira-lagarta	Brassy-breasted Tanager	FL		A,V