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ARTICLE

The avifauna of Curaçá (Bahia): the last stronghold of Spix's Macaw

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ABSTRACT: The region of Curaçá was one of the first regions of the Brazilian northeast to be ornithologically explored, and is known as the type locality and last stronghold of the Spix's Macaw (*Cyanopsitta spixii*), now extinct in the wild. The region of Curaçá has been considered of high conservation importance, particularly for holding some of the last relicts of Caraíba (*Tabebuia caraiba*) gallery forest in the Caatinga, and for representing the most obvious place to start a reintroduction program for *C. spixii*. Despite international interest in the plight of the macaw and frequent visits by ornithologists in the last 30 years, no general avian survey has been undertaken in the region. In this paper, we present data from three independent field seasons in the area, conducted in 1997-98, 2000, and 2011. We include data on 204 bird species recorded in the region, including 28 taxa endemic to the Caatinga. We present an analysis of the species present in the region, in relation to their preferred habitats and include natural history and breeding data for many of them. In particular, we include our observations on the last wild individual of *C. spixii*, and describe the nest and breeding behavior of *Compsothraupis loricata*. We also present an appendix with the list of all avian species recorded in the area, including the field season when these records were obtained, their seasonal and conservation status, the main habitats and localities where each record was obtained, a quantitative assessment of abundance for part of the species, and documentation (specimen, photograph, or audio recording) available for each species. We conclude that the region of Curaçá is particularly species rich, and that a great part of this avian diversity results from its high habitat heterogeneity, which includes arboreal and shrubby Caatinga, gallery forests, riverine riparian habitats along the Rio São Francisco, and open areas and artificial ponds, which are particularly important for aquatic birds.

KEY-WORDS: Birds, Caatinga, *Cyanopsitta spixii*, gallery forest, survey.

In 1819, Johan Baptist Ritter von Spix explored the dry woodlands along the Rio São Francisco, near the village of Juazeiro, in the deep interior of the Brazilian northeast (Juniper 2003). Among the specimens he collected, was a small blue macaw. That species, first observed by Georg Marcgrave when he has working in Pernambuco during the XVII Century, is now known as Spix's Macaw (*Cyanopsitta spixii*), and was known to inhabit the gallery forests near Curaçá, a small town located some 90 km east of Juazeiro, in the state of Bahia. Curaçá not only represents the type locality of the blue macaw collected by Spix, but also remained the last stronghold of this species until the end of the XX century, when the last known individual in the wild disappeared (Silveira and Straube 2008). The presence of this global rarity near the little village of Curaçá attracted many ornithologists to the region, particularly during the 1990s, but their observations remained largely unpublished, and no general surveys of the region's avifauna have been published to date.

Curaçá is located in the heart of the Brazilian Caatinga, a habitat that represents one of the most isolated, differentiated, and botanically distinct semiarid regions on the planet (Sarmiento 1983). For many years, the Caatinga was considered a region with low endemism and lacking a biogeographical identity (Vanzolini 1976; Mares *et al.* 1981; Andrade-Lima 1982, Prance 1987), but recent studies have found a high level of avian diversity and endemism (Pacheco 2004). Climatically, the Caatinga is a region marked by its aridity, hot weather, and a short rainy season, which may fail to arrive on any given year (Ab'Saber 1977). The severe climate and geomorphological characteristics of the region may explain the existence of a highly endemic flora, with many

adaptations to the dry conditions of the habitat (Mares *et al*. 1985; Sampaio 1995). Although the Caatinga has been identified as an important center of avian endemism in South America (Cracraft 1985), ecological, biogeographical, and evolutionary studies in this biome are still rare (Silva *et al*. 2003; Araujo *et al*. 2012).

Until recently, most distributional data on Caatinga birds were restricted to unpublished data or poorly known and difficult to obtain references (Pacheco 2000). The first modern compilations of the Caatinga avifauna were produced only 10 years ago, and include between 350 (Pacheco 2004) and 510 (Silva *et al*. 2003) species, depending on whether natural patches of Atlantic Forest (locally known as *brejos*) are also considered. In recent years, a clearer picture of the distribution patterns of the Caatinga avifauna have been unveiled, bringing attention to the remarkable diversity and habitat heterogeneity of this little-studied region. Such compilations were important to raise new interest in the avifauna of the Caatinga, and in 2012 the *Revista Brasileira de Ornitologia* dedicated a special issue to the region (*e.g*. Araujo *et al.* 2012; Diniz *et al*. 2012; Dornelas *et al.* 2012; Santos *et al*. 2012; Schunck *et al*. 2012; Silveira & Santos 2012; Silva *et al.* 2012; Sousa *et al*. 2012).

Lack of general distribution and diversity patterns have a direct effect on our capacity to make informed choices in terms of conservation priorities. Without a good understanding of current diversity distribution patterns, conservation priorities will hardly be effective in protecting the most representative and unique regions of the Caatinga, which is fast becoming a new agricultural frontier. Despite the fragility of this region in terms of desertification, over-exploitation, and low recovery capacity, only 7% of the native vegetation cover is included in protected areas (and only 1% in fully protected ones), and in fact, the Caatinga has the lowest number of protected areas and net protected surface of any other Brazilian major biome (Leal *et al*. 2005).

The region of Curaçá, in particular, has been indicated as being a high priority for regional conservation (Silva *et al*. 2004) and was recommended to receive full legal protection (Pacheco 2004). Among Curaçá's environmental peculiarities, it still retains a healthy and unique gallery forest dominated by Caraíba trees (*Tabebuia aurea* Bignoniaceae), which was used by Spix's Macaws as nest sites (Juniper & Yamashita 1991). The relative scarcity of this habitat, now mostly restricted to the region of Curaçá and a few areas in the neighboring state of Piauí, may have been a driver of the decline of Spix's Macaw since colonial times (Juniper & Yamashita 1991). Therefore, an assessment of the regions' avifauna may shed light into the role of this special habitat for the entire avian community.

Here, we present data from two independent surveys conducted nearly 15 years apart. During the summer of 1997, JMB, LNN, and ALR spent several months in Curaçá during activities related to the conservation of Spix's Macaw. Their observations were mostly opportunistic (composed of daily bird lists), but general notes were taken, and many of their findings remain novel today (Mazar Barnett *et al*. 2014a, this volume). In 2011, CLGS, HFPA, and AMKU revisited the region and surveyed the avifauna using mist-nets and performed quantitative surveys. In this paper, we include natural history notes on several bird species, and provide a useful characterization of the region's avifauna, calling the attention to this unique place that not too long ago represented the last stronghold of the world's rarest parrot.

METHODS

Study Area **—** This study took place in the Municipality of Curaçá (08°59' S, 39°54'W), c. 90 km ENE of the city of Juazeiro, in the Brazilian state of Bahia (Figure 1). The climate of the region is hot (mean annual temperature of 24ºC) and dry (mean annual rainfall of 66 years resulted in only 454 mm/yr; Departamento de Ciências Atmosféricas 2013). Precipitation is highly seasonal, with most rain falling between January and April (Departamento de Ciências Atmosféricas 2013). The region around Curaçá is relatively heterogeneous, including areas of dense dry forests (*Caatinga arbórea*), short shrubby vegetation (*Caatinga aberta*), and very characteristic gallery forests along seasonal watercourses, most notably Riacho da Melancia, where the last Spix's Macaws used to breed. These forests are particularly rare elsewhere and are dominated by tall Caraíba trees (*Tabebuia aurea*). Unfortunately, goats, sheep, and cattle have severely affected the regeneration of this forest (Juniper & Yamashita 1991). Other tree species that characterize the area of Curaçá include Euphorbiaceae such as *Faveleira* (*Cnidoscolus phyllacanthus*) and Pinhão (*Jatropha mollissima*), Caesalpinoidea such as the *Catingueira* (*Caesalpinia pyramidis*), and Cactacea such as Xique-xique (*Pilosocereus gounellei*) and Mandacarú (*Cereus jamaracu*). Soil is generally composed of clay, and partially covered by gravel and pebbles, with some rocky outcrops distributed throughout the landscape.

Fieldwork **—** Our '1997' data was collected between 29 December 1996 and 8 February 1997 by JMB, LNN, and ALR. Subsequently, ALR spent six additional months between February and July 1998. Observations occurred mostly at Fazenda Concórdia (09°10'26"S, 39°46'39"W), at the former headquarters of the Spixi's Macaw Project, but other fazendas such as Gangorra (9°09'51"S, 39°45'20"W), Canabrava (9°12'28"S, 39°42'25"W), Prazeres (9°08'50"S, 39°53'37"W), and Macambira (9°01'0"S, 39°46'08"W) were also explored. Several habitats were available at those sites, including

arboreal and shrubby Caatinga, as well as gallery forests along the (often dry) creeks. We also surveyed the margins of the Rio São Francisco, including the island of Curaçá (08°59'29"S, 39°55'05"W), just opposite the village. Given that the goal at the time was to provide a rapid assessment of the region's avifauna, no quantitative abundance data were collected. Between 5 and 7 January, 2000 JMB returned to Curaçá and visited the locality Poço do Baú (9º07'47"S, 39º54'37"W) and the island of Curaçá. Several years later, between 19 and 24 April 2011, CLGS, HFPA, and AMKU surveyed the avifauna of Curaçá at Fazenda Concórdia and at Serra da Gruta de Patamuté (9°19'22"S, 39°36'34"W) using several methods, including mist-nets, MacKinnon lists, and

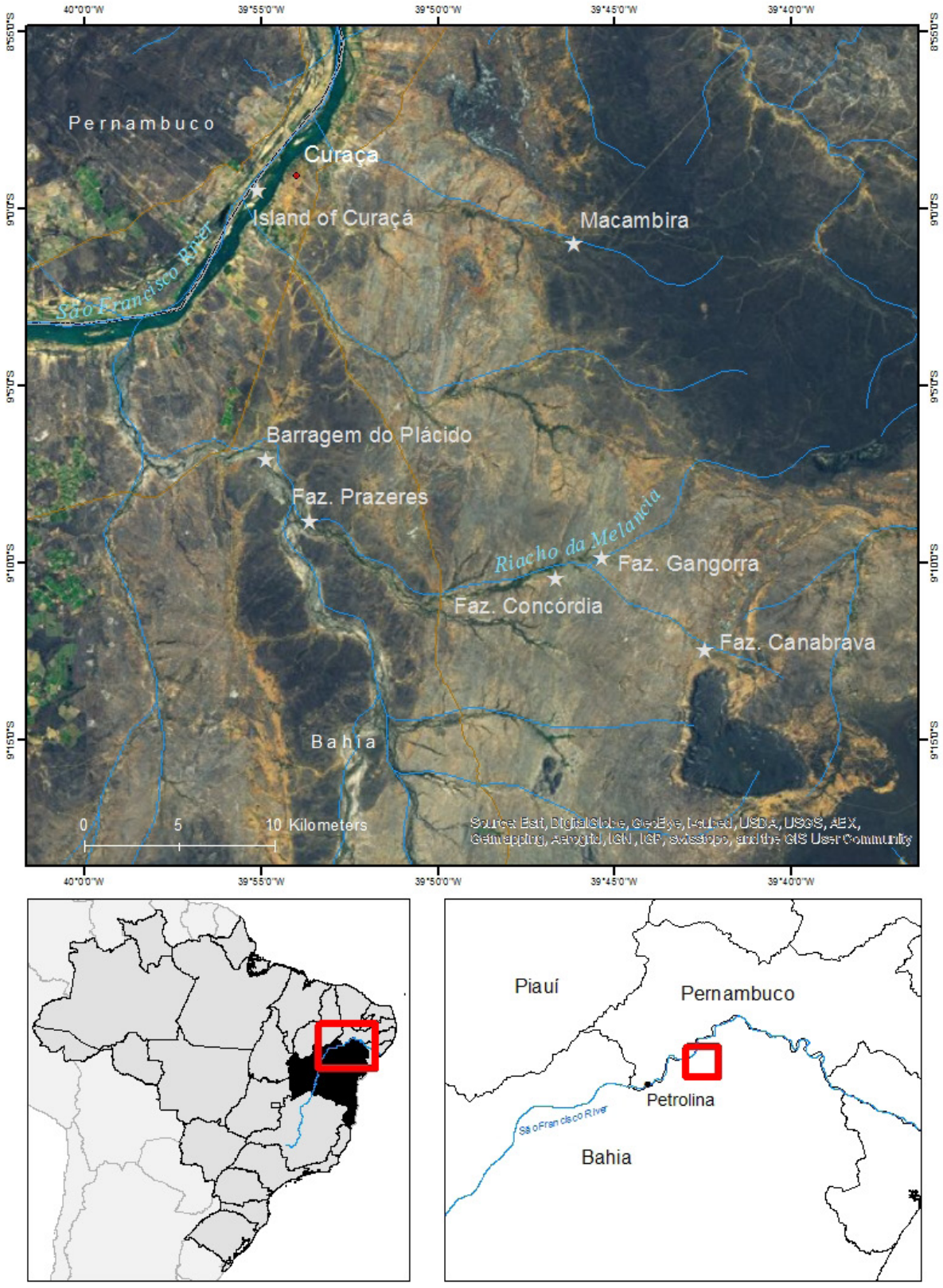

FIGURE 1. The area of Curaçá, including the main localities mentioned in the text.

opportunistic observations (Sutherland *et al*. 2004). Lines of five standard 12-m mist-nets were opened from dawn until 11 am. MacKinnon samples (10 species' lists) were produced for four different habitats, including arboreal Caatinga (31 lists), shrubby Caatinga (34 lists), open areas (7 lists), and gallery forests (29 lists). Observations were conducted along trails, from sunrise to ~11 am, and between 4 pm until sunset. Abundance data presented in the appendix were drawn from these samples.

Breeding activities were represented by observations of individuals copulating, feeding young or fledgings, carrying food, or building material for their nests, or direct observations of pairs building or using nests. We allocated the different species to different habitats, including i) dense arboreal Caatinga, ii) low shrubby Caatinga, iii) gallery forest, iv) wetlands and artificial ponds, v) riverine habitats, and vi) open areas. To explore avian similarity among habitats, we performed a cluster analysis using a similarity matrix built with Jaccard's index. This analysis was performed using Program Spade (Chao & Shen 2010). A limited number of individuals were collected to provide a reference collection of the study area. Specimens were collected under license number 54731333 (SISBIO) granted to HPFA. Specimens are held at the Coleção de Aves Heretiano Zenaide at the Universidade Federal da Paraíba (UFPB) and Coleção da Divisão de Aves do Museu de Zoologia at the Universidade Federal de Feira de Santana (DAMZFS). We present the documentation obtained for each species in Curaçá, which included specimens (see above), but also digital vouchers (or e-vouchers), which have proven to be particularly useful in avian inventories (Lees *et al*. 2014). These include recordings or photographs, which were either available through online sources such as xeno-canto (xenocanto.org) or WikiAves (wikiaves.org.br), or through the personal collection of JMB. These are currently being incorporated at the Macaulay Library Collection, and will soon be available online at macaulaylibrary.org. Taxonomy, nomenclature, and order of families and species follow the latest taxonomic treatment (Comitê Brasileiro de Registros Ornitológicos 2014).

RESULTS

A total of 204 species of 50 avian families have been recorded so far in Curaçá and surrounding areas (Appendix). We recorded most of these species (201) during our fieldwork, but documentation (photographs) of three additional species was found at WikiAves (Appendix). Most species (191) were first recorded in 1997, another six were added in 2000, and four were recorded in 2011 for the first time. Our records include 28 taxa (15 species and 13 subspecies) endemic to the Caatinga (Appendix). Most of the species recorded in Curaçá (143, or 70 % of the total) were documented by either: specimens (92 skins, 42 species), recordings (109 species), or photographs (63 species). Most of the species lacking evidence are non-passerines, which are relatively easy to identify and are known to occur in neighboring areas.

Most of the species recorded in Curaçá are assumed to be resident; we documented breeding activities in 32 of them (see Appendix), but visits at other seasons are necessary to permit a better understanding of the seasonal patterns of most species. Interestingly, there is a group of aquatic species that seem to visit the region following the local rains, when ponds and rivers fill with water. The rainy season of 1996/1997 was particularly wet, resulting in the formation of many bodies of water. In 1997, we found many aquatic bird species, including *Dendrocygna viduata* (White-faced Whistling-Duck), *Cairina moschata* (Muscovy Duck), *Sarkidiornis sylvicola* (Comb Duck), *Amazonetta brasiliensis* (Brazilian Teal), *Netta erythrophthalma* (Southern Pochard), *Nomonyx dominica* (Masked Duck), *Tachybaptus dominicus* (Least Grebe), *Podilymbus podiceps* (Pied-billed Grebe), *Nycticorax nycticorax* (Black-crowned Night-Heron), *Aramides ypecaha* (Giant Wood-Rail), *Gallinula galeata* (Common Gallinule), *Gallinula melanops* (Spot-flanked Gallinule), *Vanellus cayanus* (Pied Lapwing), *Himantopus mexicanus* (Black-necked Stilt), and *Actitis macularius* (Spotted Sandpiper), all of which were not found in 2011.

Among all habitats explored, we recorded the most species in low shrubby Caatinga (96 species), followed by gallery forests (72 species), dense arboreal Caatinga (70), open areas (60), riverine environments (46), and wetlands and ponds (36) (Appendix). We observed a higher similarity (among habitats) between the avifaunas of arboreal Caatinga and gallery forests, and of both with shrubby Caatinga. The avifauna found on riverine enviroments and wetlands and ponds were most dissimilar (Figure 2).

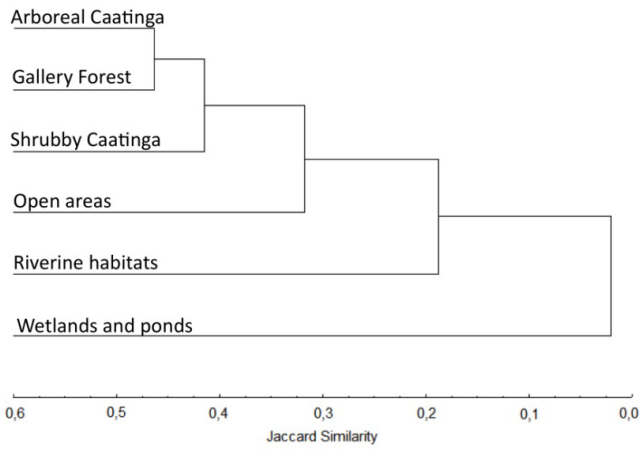

FIGURE 2. Cluster analysis (obtained from a similarity matrix using Jaccard's index) of the bird species composition in each major habitat described in the text.

Below, we include some natural history notes on poorly known or rare species, including some unreported observations of Spix's Macaw, as well as previously undescribed breeding behaviors of several species.

Species accounts

Netta erythrophthalma Southern Pochard

We observed two females and a male at an artificial pond at Fazenda Concórdia on 29 December 1996; two males and a female were present at the site on 2 January 1997. Numbers of individuals continued to fluctuate on the following weeks, ranging from 11 birds on 6 January to 30 birds on 17 January, which was the last time we observed the species at the pond. Seasonal movements of this species are poorly known, particularly in South America (Carboneras 1992), but lack of records in other seasons suggests that this species is undertaking seasonal movements to locate ephemeral wetlands throughout the Caatinga.

Penelope jacucaca White-browed Guan

This Vulnerable species (BirdLife International 2012a) was frequently observed in gallery forests along dry creeks during our 1997 fieldwork. Between March and June 1998, ALR observed small groups (ranging from 2 to 7 individuals) drinking water in small ponds along a particular temporary creek (Riacho da Melancia). These observations occurred after the rainy season, suggesting that temporary ponds remain important for this species. A detailed compilation of these records have been published previously (Roos & Antas 2006).

Nyctidromus hirundinaceus Pygmy Nightjar

We found four active 'nests' around the headquarters of Fazenda Concórdia in January 1997, which possibly belonged to three different pairs. As is the case for other species in the family, no actual nest is built by this species; eggs were found on the ground, at the side of a dirt road used only occasionally by vehicles and people, whereas another egg was found close to a rocky outcrop. All 'nests' contained a single egg, laid directly on the sandy or stony ground. Detailed observations of these nests, eggs, and chicks, including details of their breeding behavior are available elsewhere in this volume (Mazar Barnett *et al*. 2014).

Cyanopsitta spixii Spix's Macaw

The last known wild individual of this species was observed several times during our 1997 field season and in January 2000. In 1997, the male was often seen flying along the dry creeks together with a female *Primolius maracana* (Blue-winged Macaw), with which it had attempted to breed in previous years and with which it had produced infertile eggs (BirdLife International 2013). On 3 January 1997, the hybrid pair was observed at a particular Caraíba tree, known locally as the *caraíba dos três ocos* (caraíba with the three holes). We observed the hybrid pair perched on this tree at 5:55 am, sharing the tree with another pair of *Primolius maracana*. In a couple of occasions, the male Spix's made short flights in order to chase away the pair of *Primolius*, as if defending the potential nesting site. At 7:15, the hybrid pair started to explore the largest of the three holes, which the male Spix's eventually entered. A few minutes later both individuals departed, and, a few hours later, were heard in another location. On 7 January, the hybrid pair was seen exploring the area around a nesting box, to which they returned a couple of hours later. The last time we saw the male Spix's during our 1997 field season was on 22 January at Fazenda Prazeres, when the male accompanied the female *Primolius* to her roosting site at dusk, before departing, probably to his own roost site. In 2000, JMB made detailed observations of the same pair which this time had laid eggs. On 6 January, the male Spix's was observed to leave the nest in the early morning. Its flight when leaving the nesting tree was rather erratic, including slow, arrhythmic, and shallow flaps and many glides making use of the wind. During that day it was seen again a couple of times, including flights with the female *maracana*, which was flying below the male. The male only returned to the nest during the afternoon, when it perched near the nesting hole. During that time, it emitted some nasal soft calls "au," probably contacting the female *maracana* that was likely inside the nest. About 1 hr before sunset, the male left the nesting area, and was heard vocalizing a few hundred meters from the nest, where it probably spent the night. On the following day, the hybrid couple left the nesting hole agitated as they heard human activities near the nest, and performed a couple of flights in circles above the 'intruders.' A few minutes later, the pair returned to the nest, but given the presence of people nearby were reluctant to enter the nest, and flew in a few circles until they perched on the top of nearby trees. Eventually, the female *maracana* entered the nest and the male Spix perched close to the nesting hole in the *caraibeira* tree, somewhat hidden in the foliage, vocalizing its typical "prrr prrr" call. The male Spix finally flew to the top of a nearby tree. Those were our last observations of the last individual in the wild of Spix's Macaw, which finally disappeared a few months later and was never to be seen again in the wild.

Eupsitulla cactorum Cactus Parakeet

We found four active nests at Fazenda Concórdia in January, February, and March 1997. All nests were located within active arboreal termite (*Nasutitermes*) mounds. Clutch sizes varied from 4 to 6 eggs, and all eggs were laid within an internal chamber excavated by the pairs.

Detailed observations of these nests and eggs have been published previously (Naka 1997).

Synallaxis hellmayri Red-shouldered Spinetail
This Caatinga endemic was seen only by JMB at Serra do Icó, Fazenda Macambira on 8 February 1997, in an area of dense Caatinga. Despite being a vocally conspicuous species, *S. hellmayri* was not found in other areas around Curaçá (such as Fazenda Concórdia). Its absence around Curaçá is surprising, and together with other Caatinga endemics not found around Curaçá (e.g., *Megaxenops parnaguae* Great Xenops or *Sakesphorus cristatus* Silvery-cheeked Antshrike), quite intriguing.

Compsothraupis loricata Scarlet-throated Tanager
JMB made detailed observations of a nesting site of this species on 31 January 1997 at the Fazenda Gangorra (9°09'51"S, 39°45'20"W). Until now, very little information regarding the breeding biology of this Caatinga endemic is available, and no detailed description of its nest is available (Hilty 2011). The nest was found on top of a large leafless Caraíba tree (*Tabebuia caraiba*). It was relatively small made of sticks, resembling somewhat that of an old *Pseudoseisura cristata* (Caatinga Cacholote). It differed from a chachalote's nest in having a wider entrance, and a much thinner 'see-though' outer structure, suggesting that it was not an old abandoned nest and might have been built by the tanagers themselves, although this remains unclear. The nest was located on a tree where three other nest-like structures were apparent; the largest structure possibly represented an old abandoned cachalote nest; the second appeared to be either an old tanager nest (from a previous season) or a false nest, to trick possible predators; the third structure represented a shapeless accumulation of sticks, and could have been an even older nest, or even a second false nest. The hypothesis of a false nest seems quite plausible, given that the nesting individuals often passed by this structure before and after carrying food to the active nest, from which begging calls could be heard. Birds were observed on several occasions approaching what it seemed as the entrance of this inactive nest, and lowering their heads as if looking inside or as if feeding a chick. After spending some time at this structure, birds would move slowly to the active nest. The nest was attended by four individuals, including an adult male, two female-looking individuals, and an immature male. This group clearly represented an adult pair, and two young (a male and a female) that likely acted as helpers. There were no clear differences among the two females, but the young male was completely black (as the females) except a few red feathers (sometimes difficult to see) on the throat. On two occasions, a female was seen inside the nest, while the adult male vocalized from a nearby tree and the two immature birds were elsewhere. Very often, all four individuals would arrive together carrying food, although it was the adult male that first visited the begging chick(s). This male seemed to perform a sort of ritual before entering the nest, fluffing the feathers of the throat, chest, head, and flanks, while lowering its head and performing short jumps. Sometimes, none of the birds would visit the chicks immediately, and remain with the food in their bills for some time, either hiding in the vegetation or doing their typical vocalizations. After some time, all individuals would approach the nest. The immature male seemed to be the most cautious (possibly due to the presence of the observer) and on some occasions it would approach the nest, only to leave again, and start the approaching process all over again. Once a *Falco femoralis* (Aplomado Falcon) passed by the nest, while chasing a *Falco sparverius* (American Kestrel). When the four tanagers detected the falcons, they left the tree immediately and went to the ground, from where they uttered some alarm calls. On two occasions the four tanagers were seen chasing a *Sporophila albogularis* (White-throated Seedeater), while allowing two adult male *Coereba flaveola* (Bananaquits) to stay atop of the tree. A second group was later found near the Riacho da Melancia, which consisted of a female and two young birds, which begged for food, although not too insistently. A male within that group was seen carrying a small stick, but nest building was not detected.

Charitospiza eucosma **Coal-crested Finch**
This Near Threatened species (BirdLife International 2012b) was relatively rare in Curaça in 1997, and was not recorded in 2011. JMB found a pair feeding a young bird on the ground in an area of shrubby Caatinga on 18 January 1997. The young bird was similar to the female in plumage, although slightly smaller in size, with a shorter tail, and vestiges of a yellow gape were apparent. There are very few records of the species breeding in the Caatinga, and its nest was only recently described in the Cerrado of central Brazil (Borges & Marini 2008). A more detailed study suggested that the species breeds on the rainy season in central Brazil (Diniz *et al*. 2013), as seems to be the case in the Caatinga, given our observations.

Icterus jamacaii **Campo Troupial**
We found a pair using an old *Pseudoseisura cristata* (Caatinga Cacholote) nest to breed around the houses at the headquarters of the Fazenda Concórdia on 31 December 1996. On 10 January 1997, three young birds left the nest and were seen on the ground. That same used nest was then occupied by a pair of *Agelaiodes fringillarius* (Pale Baywing) in the following weeks (see below).

Agelaiodes fringillarius **Pale Baywing**
Several breeding behaviors were observed during our 1997 field season. On 3 January, JMB observed a pair of this Brazilian endemic occupying a nest. The nest consisted of a base of sticks and a large cup on top (similar to a thrush nest) on which one individual sat for a while. Once, a pair *Pseudoseisura cristata* (Caatinga Cacholote)

arrived and chased the blackbirds away. On 24 January, JMB observed another pair using an old cachalote nest, which had been used by *Icterus jamacaii* (Campo Troupial) two weeks before. The pair was observed carrying nesting material (grasses) to the nest, likely to line the main incubation chamber. Up to four individuals of the species were observed around the nest, suggesting the presence of helpers. Occasionally, birds performed agonistic behaviors, although those were not too violent. Another abandoned cachalote nest was visited by another pair of baywings, which slept below the construction. The nesting behavior of *A. fringilloides* remained poorly known until recently (Fraga 2011, and Fraga & D'Angelo, this volume), although the use of abandoned nests of furnariids was well established in the group (Friedmann 1929, Jaramillo & Burke 1999). The observations of four individuals at the nesting site probably represent one of the first evidences of cooperative breeding in this species, which is described in further detailed by Fraga & D'Angelo Neto (this volume).

DISCUSSION

The avifauna of Curaçá is rather typical for the Caatinga, both in terms of species richness and species composition. We believe that we have detected the most representative species in the region, having recorded over 200 species. It is quite clear, however, that other species are likely to be found with further sampling, particularly if different seasons are sampled. Surprisingly, only four species not detected in 1997 were detected in 2011. Three of these were small tyrant flycatchers (*Elaenia chilensis* Chilean Elaenia, *Casiornis fusca* Ash-throated Casiornis, and *Cnemotriccus fuscatus* Fuscous Flycatcher) caught in mist-nets. *Casiornis fusca* seems to have a rather secretive behavior and is more often found in mist-nets than in acoustic surveys, possibly passing undetected during our first field season. Both *Elaenia chilensis* and *Cnemotriccus fuscatus* have migratory populations, and individuals recorded in April 2011 may represent early migrants.

On the other hand, 91 species were recorded in 1997 but not in 2011. Although a large part of this difference can be attributed to a longer field season in 1997 (more than 40 days in the field), some aquatic species were clearly absent in 2011. In fact, a group of 16 species tight to aquatic environments were present on temporary ponds around the Spix's Macaw's Project headwaters in 1997, but were not recorded in 2011. The rainy season of 2011 was not as intense as that of 1997, and few bodies of water formed during that year, explaining the absence of water-related species, and suggesting the existence of local movements where these species must be tracking available bodies of water or exploring other regions (Olmos *et al*. 2005; Araujo *et al*. 2012).

Given a variety of methodologies and sampling used, comprehensive comparisons between our observations and other sites are unwarranted; yet a figure of ~200 bird species recorded in Curaçá is expected for a relatively well-preserved locality in the Caatinga. Olmos (1993) recorded 208 species at Serra da Capivara, Piauí; Nascimento *et al*., (2000) recorded 193 at Chapada do Araripe, Ceará; and Lima *et al*. (2003) recorded 191 at the Raso da Catarina, Bahia. On the other hand, surveys in areas with more human activities often report fewer species, such as the studies conducted by Olmos *et al*. (2005) in western Pernambuco and Ceará (where they recorded between 93 and 125 species in eight different localities), or Farias *et al*. (2006) with only 94 species at Curimataú, Paraíba, or even Araújo & Rodrigues (2011) with 120 species at the interior of Alagoas. Although sampling effort is not comparable throughout the different studies, it seems quite clear that more pristine areas harbor higher number of species (Araujo & Rodrigues 2011), and Curaçá is one of the most speciose sites in the biome, possibly due to its relatively high habitat heterogeneity.

Among the species absent in 2011 we can sadly include Spix's Macaw, extinct in the wild since 2000 (Silveira & Straube 2008). Until 1985, Curaçá, and more particularly the Riacho da Melancia (one of the areas we sampled), represented the last stronghold for this species, as the last five individuals were found in the area (Rowley & Collar 1997). Unfortunately most of those birds were likely taken by the illegal trade and only a single bird remained to be seen during our 1997 field season. Several management strategies were planned, from exchanging the infertile cross-species eggs with real captive-produced Spix's eggs, to releasing a captive female to mate with the lone male. A female was eventually released, but never paired with the male, and ultimately both birds disappeared (Juniper 2003). Despite the absence of the macaw, Curaçá has been considered as a priority area for conservation (Tabarelli & Silva 2004), and remains the best candidate area for a reintroduction program, particularly given the abundance of remnant Caraíba woodlands (*Tabebuia aurea*) that seem to represent a vital resource for the reproductive success of Spix's Macaw (Collar *et al*. 1997).

From our surveys, it is quite evident that several Caatinga specialists are absent from Curaçá. Species such as *Megaxenops parnaguae* (Great Xenops), *Herpsilochmus sellowi* (Caatinga Antwren), *Sakesphorus cristatus* (Silvery-cheeked Antshrike), *Hylopezus ochroleucus* (White-browed Antpitta), or *Synallaxis scutata* (Ochre-cheeked Spinetail) seem to be completely absent in the region. And in fact, the only area where *Synallaxis hellmayri* (Red-shouldered Spinetail) was present was in Fazenda Macambira, some 20 km from Fazenda Concórdia, where most of our fieldwork took place. All these species are quite widespread in the Caatinga, and have been

recorded nearby. Understanding the drivers of these local distribution patterns is a biogeographic and conservation priority. These species may require denser Dry Forests (or Caatinga *arbórea*), a physiognomy that may not be that common around Curaçá.

In terms of compositional similarity, we found that the avifauna of the dense arboreal Caatinga was most similar to that of the gallery forests. This similarity is possibly explained by the presence of forest-dependent species in both habitats. On the other hand, we also found an equally high level of similarity between low shrubby Caatinga and gallery forests, possibly due to the presence of streams and their accompanying matrix of lower vegetation. The high species richness found in Curaçá seems to be the result of greater habitat heterogeneity. Some habitats, like the riparian vegetation found at the island of Curaçá, provided the only records of some species (e.g., *Laterallus melanophaius* Rufous-sided Crake, *Phacellodomus ruber* Greater Thornbird, *Cranioleuca vulpina* Rusty-backed Spinetail, *Saltator coerulescens* Grayish Saltator, and *Thlypopsis sordida* Orange-headed Tanager), which were only recorded along the Rio São Francisco. These observations suggest that this habitat is unique in the region and stands out as an important habitat for many species. This heterogeneity enforces the need of conservation efforts in areas with habitat diversity (Araujo & Rodrigues 2011, Araujo *et al*. 2012), such as Curaçá. Our results suggest that the region of Curaçá remains a hotspot for biodiversity in the Brazilian Caatinga, and requires immediate legal protection, particularly given its potential for the reintroduction of Spix's Macaw.

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APPENDIX:

List of bird species recorded in Curaçá, Bahia, including field season of records, breeding, migratory, or endangered status, habitats used in the area, abundance (observation frequency), and documentation. Taxonomy, nomenclature, and species order follows the Comitê Brasileiro de Registros Ornitológicos (2014), except for the Nightjars where we follow Sigurdsson and Cracraft (2014) and for some Thraupidae where we follow Burns et al. (2014).

Families and species[1]	Field season[2] 1997-98	2011	Status[3]	Localities[4]	Habitats[5]	Ab.[6]	Documentation[7]
RHEIDAE							
Rhea americana	x		NT	Co	O		
TINAMIDAE							
Crypturellus parvirostris	x	x		Cn, Co, Ma, PB	B F O	1,98	R (JMB:T5)
Crypturellus tataupa	x	x		Ca, Gp, Ma	A B F	15,84	
Rhynchotus rufescens[ssp]	x			Co	B		R (JMB:T8)
Nothura boraquira	x			Cn, Co, PB	B O		R (JMB:T4)
Nothura maculosa	x			Co	B O		R (JMB:T8)
ANATIDAE							
Dendrocygna viduata	x		Sea/W	Co, IC	W		R (XC15376)
Cairina moschata	x		Sea/W	Co, Ga, Pr	W		
Sarkidiornis sylvicola	x		Sea/W	Co	W		R (XC33195)
Amazonetta brasiliensis	x		Sea/W	Co, IC	W		
Netta erythrophthalma	x		Sea/W	Co	W		R (XC33194)
Nomonyx dominica	x		Sea/W; br	Co	W		R (JMB:T4)
CRACIDAE							
Penelope jacucaca[sp]	x		Vul	Co, Rm, Bp	F		P (WA665458)
PODICIPEDIDAE							
Tachybaptus dominicus	x		Sea/W	Co	W		R (XC15443)
Podilymbus podiceps	x		Sea/W	Co	W		R (XC15464)
CICONIIDAE							
Ciconia maguari	x		Sea/W	Pr	W		
Mycteria americana		x	Sea/W	Co	W O	1,98	
PHALACROCORACIDAE							
Phalacrocorax brasilianus	JMB 00			IC	W		
ARDEIDAE							
Tigrisoma lineatum	x		Sea/W	Co, Rm	W		
Nycticorax nycticorax	x		Sea/W	Bp	W		P (WA717303)
Butorides striata	x		Sea/W	Cn, Co, Bp	W		
Bubulcus ibis	x	x		Co	W O	1,98	P (WA839919)
Ardea alba	x	x		Bp, Co	W B O F	6,93	
Egretta thula	x		Sea/W	Bp, Co	W		
CATHARTIDAE							
Cathartes aura	x	x		Bp, Cn, Co, PB	B F	2,97	
Cathartes burrovianus	x	x		Cn, Co	O	0,99	
Coragyps atratus	x	x		Bp, Cn, Co, Gp, Rm	A B O	3,96	
Sarcorhamphus papa	x			Cn	B		
ACCIPITRIDAE							
Gampsonyx swainsonii	Wikiaves		**br**				P (WA691106)

Families and species[1]	Field season[2] 1997-98	2011	Status[3]	Localities[4]	Habitats[5]	Ab.[6]	Documentation[7]
Accipiter bicolor	x			Co	F		P (WA856148)
Rostrhamus sociabilis	x			Co	W		
Geranospiza caerulescens	x			Cn, Co, PB, Rm	B F		R (XC15402)
Heterospizias meridionalis	x			Cn			
Rupornis magnirostris	x	x		Bp, Cn, Co, IC,Gp, Rm	A B F R	12,87	P (WA811814); R (JMB:T8)
Geranoaetus melanoleucus	x			Cn, Co	A		R (XC15326)
ARAMIDAE							
Aramus guarauna	JMB 00			IC	W		
RALLIDAE							
Aramides ypecaha	x			Pr, Rm	W		
Aramides cajaneus	x	x		Co, PB, Pr, Rm	F	0,99	
Laterallus melanophaius	x			IC			R (JMB:T9)
Gallinula galeata	x		Sea/W	Co	W		
Gallinula melanops	x		Sea/W	Co	W		
CHARADRIIDAE							
Vanellus cayanus	x		Sea/W	Co, IC			
Vanellus chilensis	x	x		Bp, Co	O W	4,95	P (WA282375); R (JMB:T8)
Charadrius collaris	x		Sea/W	IC			P (WA612146); R (JMB:T9)
RECURVIROSTRIDAE							
Himantopus mexicanus	x		Sea/W	Co	W		P (WA612145); R (JMB:T6)
SCOLOPACIDAE							
Actitis macularius	x		Sea/W; VN	Co	W		
Tringa solitaria	x	x	Sea/W; VN	Co	W	0,99	R (XC15346, JMB:T4)
JACANIDAE							
Jacana jacana	x		Sea/W	Co	W		
COLUMBIDAE							
Columbina minuta	x	x		Cn, Co, IC, Pr	B O F	19,8	S (CAHZ00194); R (JMB:T8)
Columbina talpacoti	x			IC	O R		
Columbina squammata	x	x		Cn, Co, Gp, IC, Rm	A B O F R	29,7	S (CAHZ00203) R (JMB:T4)
Columbina picui	x	x		Cn, Co, Gp, IC, Pr, Rm	A B O F R	29,7	S (CAHZ 00205); P (WA283113); R (JMB:T6)
Patagioenas picazuro	x	x		Co, Gp, PB, Rm	A B O F	6,93	R (XC15463; JMB:T6)
Zenaida auriculata	x			Cn, Co, PB	B O		S (CAHZ 207)
Leptotila verreauxi	x	x		Co, Gp, IC, Rm	A B O F R	28,71	R (JMB:T8)
Leptotila rufaxilla	x			Cn, Co, IC	F		R (JMB:T4)
CUCULIDAE							
Piaya cayana	x	x		Co, Gp	A F	6,93	
Coccyzus melacoryphus	x			Cn, Co	B		P (WA816425)

Families and species[1]	Field season[2] 1997-98	2011	Status[3]	Localities[4]	Habitats[5]	Ab.[6]	Documentation[7]
Coccyzus americanus	JMB 00		VN	PB	A		
Crotophaga major	x			Bp, Co, PB	W		
Crotophaga ani	x	x		Co	B O F	1,98	
Guira guira	x			Cn, Co, IC	B R		R (JMB:T4)
Tapera naevia	x			Cn, Co, IC	B R		
TYTONIDAE							
Tyto furcata	JMB 00			Cur	V		
STRIGIDAE							
Megascops choliba	x	x	br	Co, Gp, Ma, Pr	A F	2,97	S (CAHZ 215)
Bubo virginianus	x			Rm	F		
Glaucidium brasilianum	x	x		Co, Gp	A F	2,97	P (WA705505)
Athene cunicularia	x			Co	O		
NYCTIBIIDAE							
Nyctibius griseus	x			Co, Pr	F		
CAPRIMULGIDAE							
Antrostomus rufus	Wikiaves						P (WA856139)
Hydropsalis parvulus	x	x		Co, PB, Pr	B V	0,99	
Nyctidromus hirundinaceus[ssp]	x	x	br	Cn, Co, PB	B O		P (WA628847); R (JMB:T8)
Hydropsalis torquata	x			Co			R (JMB:T8)
Chordeiles pusillus[ssp]	x	x	br	Co, Cur	B O		R (JMB:T4)
Chordeiles acutipennis	x			Cur, Pr	B O V		
Podager nacunda	x			Cur	V		
APODIDAE							
Tachornis squamata	x			Cur	V		
TROCHILIDAE							
Eupetomena macroura	x	x		Bp, Cn, Co, Gp, Rm	A B F	2,97	S (CAHZ198); P (WA710911)
Chrysolampis mosquitus	x	x	br	Co, PB, Rm	B F	0,99	R (WA143290; JMB:T8)
Chlorostilbon lucidus	x	x	br	Bp, Cn, Co, Gp, PB, Pr	A B F	10,89	S (CAHZ 236)
Amazilia fimbriata	x			IC			
Heliomaster squamosus	x	x		Co, Gp	A B	1,98	S(CAHZ 246)
ALCEDINIDAE							
Megaceryle torquata	x			IC	W R		R (JMB:T9)
Chloroceryle americana	x			Bp, Co	W		
GALBULIDAE							
Galbula ruficauda	x			IC			R (JMB:T9)
BUCCONIDAE							
Nystalus maculatus	x	x	br	Cn, Co, Gp, PB	A B	5,94	P (WA747548)
PICIDAE							
Picumnus pygmaeus[sp]	x	x	br	Co, IC	O F R	1,98	P (WA954833); R (JMB:T6)
Melanerpes candidus	x			Cn	B		
Veniliornis passerinus	x	x		Bp, Co, Gp, IC	A B O F	10,89	P (WA705491)

Families and species[1]	Field season[2] 1997-98	2011	Status[3]	Localities[4]	Habitats[5]	Ab.[6]	Documentation[7]
Colaptes melanochloros	x	x		Cn, Co	F	2,97	S (CAHZ 221); P (WA945563); R (JMB:T8)
Colaptes campestris	x			Cn, Co	B O		R (JMB:T5)
Campephilus melanoleucos	x	x		Co, Ga, Gp, Rm	A B F	5,94	P (WA665479); R (JMB:T8)
CARIAMIDAE							
Cariama cristata	x	x	br	Bp, Cn, Co, Gp, PB	A B O W	10,89	R (JMB:T4)
FALCONIDAE							
Caracara plancus	x	x		Bp, Cn, Co	B F	0,99	P (WA710916); R (JMB:T4)
Milvago chimachima	x	x		Co	F O	0,99	
Herpetotheres cachinnans	x	x	br	Cn, Co, Ga, Gp, PB	A F	2,97	P (WA992909); R (JMB:T4)
Falco sparverius	x	x		Cn, Co, Gp	A B	0,99	S (CAHZ 230)
Falco femoralis	x			Bp, Co, IC	B R		P (WA1055939)
Falco peregrinus	x		VN	Co, Cur, IC	V		
PSITTACIDAE							
Cyanopsitta spixii[sp]	x		CE / Ext W	Bp, Co, PB, Pr	A B F		P (WA41251); R (JMB:T9)
Primolius maracana	x	x	Br / NT	Bp, Cn, Co, Gp, PB, Pr, Rm	B O F	6,93	P (WA791457); R (JMB:T4)
Thectocercus acuticaudatus[ssp]	x		br	Bp, Cn, Co, Pr	B F		P (WA958781); R (JMB:T4)
Eupsittula cactorum[sp]	x	x	br	Bp, Cn, Co, , PB, Pr, Rm	A B O F	42,57	S (CAHZ 231); P (WA960813)
Forpus xanthopterygius	x	x		Cn, Co, IC, PB	B O F R	8,91	P (WA961430); R (JMB:T7)
Amazona aestiva	x	x		Co, Pr, Rm, Bp	A B O F	14,85	
THAMNOPHILIDAE							
Myrmorchilus strigilatus[sp]	x	x		Cn, Co, Gp, IC, Ma	A B O	13,86	S (CAHZ 199); R (JMB:T5)
Formicivora melanogaster[ssp]	x	x		Co, Gp, IC, Ma	A B R	5,94	R (JMB:T9)
Thamnophilus capistratus[sp]	x	x	br	Cn, Co, Gp, Pr	A B	2,97	R (JMB:T5)
Taraba major	x	x		Gp,IC	A R	2,97	S (CAHZ 245); R (JMB:T9)
DENDROCOLAPTIDAE							
Sittasomus griseicapillus	x	x		Co, Gp, Rm	A O F	16,83	S (CAHZ 228); P (WA964806); R (JMB:T8)
Lepidocolaptes angustirostris[ssp]	x	x		Cn, Co, Gp, Rm	A B O F	42,57	S (CAHZ 224); P (WA960808); R (JMB:T4)
FURNARIIDAE							
Furnarius figulus	x	x		Cn, Co, Cur, IC	A F R	1,98	R (JMB:T9)
Furnarius leucopus	x	x		Bp, IC, PB, Rm	A F	16,83	S (CAHZ 217); R (WA143316; JMB:T4)
Pseudoseisura cristata[sp]	x	x	br	Bp, Cn, Co	B F	1,98	P (WA959729); R (JMB:T8)
Phacellodomus rufifrons[ssp]	x			IC	B O R		

Families and species[1]	Field season[2] 1997-98	2011	Status[3]	Localities[4]	Habitats[5]	Ab.[6]	Documentation[7]
Phacellodomus ruber	x			IC			R (JMB:T9)
Certhiaxis cinnamomeus	x			Cur, IC			R (JMB:T9)
Synallaxis hellmayri[sp]	x		NT	Ma, PB	A		R (JMB:T9)
Synallaxis frontalis	x	x	br	Co, Gp, IC, PB, Rm	F R	4,95	S (CAHZ 222); R (WA143325)
Synallaxis albescens	x			Co, Cn	B O		R (JMB:T4)
Cranioleuca vulpina[ssp]	x			IC	W		P (WA791433); R (WA727033; JMB:T9)
TITYRIDAE							
Pachyramphus viridis	x		br	Co, IC	F		
Pachyramphus polychopterus	x	x		Cn, Co, Gp, PB, Rm	A B F	11,88	S (CAHZ 227); R (JMB:T8)
Pachyramphus validus	x		br	Co, PB	F		R (JMB:T9)
Xenopsaris albinucha	x		br	Cn, Co	B		P (WA856146); R (JMB:T8)
RHYNCHOCYCLIDAE							
Tolmomyias flaviventris	x	x	br	Cn, Co, Gp, IC, PB, Rm	A B O F R	29,7	S (CAHZ 218); P (WA964815), R (JMB:T4)
Todirostrum cinereum	x	x	br	Cn, Co, Gp, IC, PB, Rm	A B F R	15,84	S (CAHZ 211); P (WA959689)
Hemitriccus margaritaceiventer	JMB 00	x		Co, Gp, PB	A B	12,87	S (CAHZ 234); P (WA961437)
TYRANNIDAE							
Hirundinea ferruginea	x	x		Cn, Gp	A	0,99	P (WA764856)
Stigmatura napensis[ssp]	x	x		Cn, Co, IC, PB	B O R	6,93	S (CAHZ 192); P (WA705472); R (JMB:T6)
Stigmatura budytoides[ssp]	x			Co	B		P (WA782431)
Euscarthmus meloryphus	x	x		Cn, Co, IC	B	3,96	R (JMB:T5)
Camptostoma obsoletum	x	x		Cn, Co, Gp	B O F	3,96	S(CAHZ 187); R (JMB:T5)
Elaenia spectabilis	x	x		IC	A	0,99	S (CAHZ 241); P (WA856150)
Elaenia chilensis		x	VS	Gp	A	0,99	S(CAHZ 237)
Suiriri suiriri[ssp]	x	x	br	Co	B O	2,97	S (CAHZ 210); P (WA964822)
Myiopagis viridicata	x	x		Cn, Co, Gp, PB, Rm	A F	10,89	S (CAHZ 247); R (JMB:T4)
Phaeomyias murina	x	x		Cn, Co, Gp, IC, PB, Rm	A B R	6,93	R (JMB:T6)
Myiarchus swainsoni	JMB 00			PB			P (WA816423)
Myiarchus tyrannulus	x	x		Cn, Co, Rm, PB	A B O F	49,5	S (CAHZ 238); P (WA1121635); R (JMB:T8)
Casiornis fuscus[sp]		x		Gp	A	1,98	P (WA857041)
Pitangus sulphuratus	x	x		Cn, Co, PB, Pr, Rm	B F	1,98	R (JMB:T4)
Machetornis rixosa	x			Bp, Co, Pr	O		R (JMB:T6)
Myiodynastes maculatus	x	x	br	Cn, Co,Gp, Rm	A B O F	15,84	S (CAHZ 212)
Myiozetetes similis	x	x		Cn, Co, IC	A O F	9,9	P (WA302938); R (JMB:T4)
Megarynchus pitangua	x			Cn, Co, Gp, PB, Rm	A F R		S (CAHZ 243); R (JMB:T8)

Families and species[1]	Field season[2] 1997-98	2011	Status[3]	Localities[4]	Habitats[5]	Ab.[6]	Documentation[7]
Tyrannus melancholicus	x	x		Cn, Co, Gp, IC, PB, Rm	A B O F R	50,49	R (WA876462)
Tyrannus savana	x			IC	R V		
Empidonomus varius	x	x		Cn, Co, Gp, IC, Rm	A B F R	9,9	S (CAHZ 196); P (WA282376); R (JMB:T8)
Myiophobus fasciatus	x						
Sublegatus modestus	x			Cn, Co	B		R (JMB:T5)
Fluvicola albiventer	x		br	Co	W		P (WA606629; JMB:T4)
Fluvicola nengeta	x			Bp, Co, IC			P (WA839912)
Arundinicola leucocephala	x		br	Cur, IC	R W		P (WA769720)
Cnemotriccus fuscatus		x		Gp	B		
Satrapa icterophrys	x			Co	F		
Xolmis irupero[ssp]	x	x		Co	B	1,98	P (WA960812)
VIREONIDAE							
Cyclarhis gujanensis	x	x		Cn, Co, Gp, IC, Rm, PB	A B O F	21,78	R (JMB:T6)
Vireo olivaceus	x	x	VN	Co, IC, PB, Rm	A F R	8,91	S (CAHZ 233); R (WA138581; JMB:T4)
CORVIDAE							
Cyanocorax cyanopogon[sp]	x	x		Bp, Cn, Co, Rm	A B O F	36,63	S (CAHZ 220); P (WA835028); R (JMB:T8)
HIRUNDINIDAE							
Progne tapera	x			Co, IC	B W		R (JMB:T4)
Progne chalybea	x			Cur	W		
Tachycineta albiventer	x			Co	W		R (XC15335)
Riparia riparia	x		VN	Cur, IC			
Hirundo rustica	x		VN	Cur, IC	V		R (JMB:T9)
TROGLODYTIDAE							
Troglodytes musculus	x	x		Bp, Cn, Co, Gp, IC, PB, Rm	A B O F	45,54	S (CAHZ 226); R (WA1143402; JMB:T8)
Cantorchilus longirostris[ssp]	x	x		Cn, Co,Gp, IC, Ma	A B	19,8	R (JMB:T8)
POLIOPTILIDAE							
Polioptila plumbea	x	x		Bp, Cn, Co, Gp, IC, PB, Rm	A B O F R	27,72	S (CAHZ 208); P (WA1121632); R (JMB:T8)
TURDIDAE							
Turdus rufiventris	x	x		Cn, Co, Gp, IC, Rm	A B F R	3,96	P (WA705501); R (JMB:T7)
Turdus amaurochalinus	x	x		Cn, Co	B F	3,96	S (CAHZ 216); R (JMB:T8)
MIMIDAE							
Mimus saturninus[ssp]	x	x		Bp, Cn, Co	B O	7,92	
PASSERELLIDAE							
Zonotrichia capensis	x	x		Cn, Co, IC	B O		

Families and species[1]	Field season[2] 1997-98	2011	Status[3]	Localities[4]	Habitats[5]	Ab.[6]	Documentation[7]
Ammodramus humeralis	x	x		Cn, Co, PB	B O	3,96	S (CAHZ 204); P (WA960804); R (JMB:T6)
ICTERIDAE							
Procacicus solitarius	x			IC			P (WA879413); R (JMB:T9)
Icterus pyrrhopterus	x	x		Bp, Co, Gp, IC, Pr	A F R	1,98	P (WA710908); R (JMB:T8)
Icterus jamacaii[sp]	x	x	br	Bp, Cn, Co, Gp,IC, Rm	A B O F	3,96	P (WA973957; R (JMB:T4)
Chrysomus ruficapillus	x			Co, Pr	O		R (XC15396)
Agelaioides fringillarius[sp]	x		br	Bp, Cn, IC	B R		P (WA710906); R (JMB:T9)
Molothrus rufoaxillaris	x			Cn	A		
Molothrus bonariensis	x			Cn, Pr	B O		
Sturnella superciliaris	Wikiaves						R (WA141160; JMB:T8)
THRAUPIDAE							
Coereba flaveola	x	x		Bp, Co, PB, Rm	A B F	6,93	S (CAHZ 213); R (JMB:T4)
Saltator coerulescens	x			IC			R (JMB:T9)
Saltator similis	x			Cn, IC	A B		R (JMB:T8)
Compsothraupis loricata[sp]	x	x	br	Bp, Cn, Co, Ga, Gp, PB	A B	3,96	P (WA961425); R (JMB:T4)
Nemosia pileata	x			Bp, Co, Gp,Rm	A		R (XC15437)
Thlypopsis sordida	x			IC			R (JMB:T9)
Coryphospingus pileatus	x	x		Cn, Co, Gp, IC, PB, Rm	A B O R	42,57	S (CAHZ 235); R (WA143333; JMB:T8)
Tangara sayaca	x	x		Cn, Co,Gp, IC	A B F R	5,94	
Paroaria dominicana	x	x	br	Bp, Cn, Co,Gp, IC, PB	A B O F R	24,75	S (CAHZ 188); P (WA765294); R (JMB:T5)
Conirostrum speciosum	x	x		Bp, Co, PB	A B F	2,97	
Sicalis columbiana	x			Cur	V		P (WA606652); R (JMB:T9)
Sicalis flaveola	x		br	Co	B		P (WA961434); R (JMB:T6)
Sicalis luteola	x			Co	B		R (JMB:T6)
Volatinia jacarina	x	x		Bp, Co, IC, Rm	A B O	8,91	S (CAHZ 206); R (JMB:T9)
Sporophila lineola	x	x		Co, Cur, IC, Rm	A O R	0,99	R (XC33350)
Sporophila nigricollis	x			Co	W		R (WA141097; JMB:T8)
Sporophila caerulescens	x			Co	W		
Sporophila albogularis[sp]	x	x		Bp, Co	B O F	12,87	S (CAHZ 229)
Sporophila bouvreuil	x			Co, IC	W		R (JMB:T6)
Charitospiza eucosma	x		Br / NT	Cn, Co	B		P (WA791455); R (JMB:T7)
CARDINALIDAE							
Cyanoloxia brissonii	x	x		Co, IC, Gp	A B	1,98	R (JMB:T9)
FRINGILLIDAE							
Euphonia chlorotica	x	x		Cn, Co, Gp, IC, Rm	A B F R	6,93	R (JMB:T9)

Families and species[1]	Field season[2] 1997-98	2011	Status[3]	Localities[4]	Habitats[5]	Ab.[6]	Documentation[7]
PASSERIDAE							
Passer domesticus	x		Introduced	Co, Cur	V		

[1] Families and Species. Caatinga endemic taxa are denoted by a superscript note referring to whether a given taxon represents an endemic species [SP] , or subspecies [SSP].

[2] Field Season. Refers to the date when our observations were obtained. Because two independent groups provided records, this information may be important for follow-up inquiries or to assess temporal changes in the avifauna. Rather than including a third column for JMB's observations during a short period in 2000, we included his novel observations under the 1997-98 column followed by "JMB 00". When records were not obtained by any of the authors, we included a note indicating the source of the data.

[3] Status. We include here data on breeding, migratory, or conservation status. Breeding species (br) represent those species for which we personally made observations suggestive of breeding activity. Observations included i) pairs copulating, ii) birds attending or building a nest or carrying nesting material, iii) presence of chicks, nestlings or fledgings, or iv) birds carrying food. Migratory species represent taxa that are unlikely to spend the entire year in Curaçá, and include Northern Visitors (NV), represented by birds that breed in the Northern Hemisphere and spend the austral summer (November – April) in the area; Southern Visitors (SV), which breed in Southern South America spend apparently spend the austral winter (May - September) in the area; and Seasonal Visitors (Sea), which are likely to performed seasonal movements that are not well understood. We also noted those seasonal visitors that appear following the availability of water resources (Sea/W), such as natural ponds or artificial lakes. We believe that all other species are likely residents and breed in the area, but we do not have data to support this assessment. We also included whether a species is endangered according to the IUCN (BirdLife International 2013), denoting which species is Extinct (Ext), Critically Endangered (CE), Vulnerable (Vul), or Near-threatened (NT).

[4] Localities. Refers to the general locations where each species was recorded. Fazendas Concórdia (Co), Gangorra (Ga), Canabrava (Cn), Prazeres (Pr), and Macambira (Ma), Gruta Patamuté (Gp), Island of Curaçá (IC), Poço do Baú (PB), Town of Curaçá (Cur), Riacho da Melancia (Rm), and Barragem do Plácido (Bp). For coordinates and a brief description of these localities see Study Area.

[5] Habitat. Represents the major habitats where we recorded each species in Curaçá. A: Arboreal of dense Caatinga; B: Shrubby or low Caatinga; F: Gallery Forest; O: Open areas; R: Riparian Forest; V: villages and towns; W: wetlands and ponds.

[6] Abundance. Refer to frequency of observations derived from quantitative data obtained through MacKinnon lists. Abundance data was only included for the 2011 field season.

[7] Documentation. Refers to the hard evidence supporting the presence of each species in the study area. S: specimens (held at the Bird Collections of the Federal Universites of Paraíba (UFPB) and Feira de Santana (UEFS); R: recordings, are available at Xeno-canto (xenocanto.org), wikiaves (wikiaves.org.br), or the personal collection of JMB, which is currently being included in the Macaulay Library database (macaulaylibrary.org).

Cyanopsitta spixii – Propyrrhura maracana

"Gangorra", Rcho Melancia, Curaçá – 03/I/97