

Bird species of the Pantanal wetland, Brazil

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RESUMO. Espécies de aves da planície do Pantanal, Brasil. Uma lista de espécies de aves da planície do Pantanal é apresentada. Sua elaboração envolveu revisão de literatura, pesquisa em coleções ornitológicas nacionais e do exterior, e registros não publicados de ornitólogos que visitaram a região. Um total de 463 espécies de aves já foi registrado, número que representa um aumento de cerca de 31% à riqueza de espécies creditada ao Pantanal por publicações anteriores. Outras 50 espécies citadas na literatura não foram incluídas nessa lista de 463 espécies porque seus registros apresentaram evidentes incertezas. Aves coletadas no Pantanal somaram 377 espécies (81% da riqueza). Das 86 espécies restantes (registradas por observação direta, captura e/ou vocalização), 49 foram citadas em duas ou mais publicações, 18 em apenas uma, enquanto 19 resultaram de comunicações pessoais. Oito endemismos do Cerrado já foram registrados na planície. Inventários no Pantanal iniciaram-se com as coletas de Johann Natterer, em 1825, e distribuem-se principalmente em pontos de mais fácil acesso, próximos a cidades, grandes rios e rodovias. A planície apresenta-se insatisfatoriamente amostrada. Novos inventários, incluindo coletas de taxons particulares, são necessários para aumentar o conhecimento sobre a composição e distribuição da avifauna do Pantanal.

PALAVRAS-CHAVE: ave, avifauna, Cerrado, coleção, inventário, neotropical, Pantanal, planície.

ABSTRACT. A checklist of bird species recorded in the Pantanal is presented. Its elaboration involved literature review, research in Brazilian and overseas ornithological collections and unpublished records of ornithologists who visited the wetland. A total of 463 bird species has already been recorded in this wetland. This number represents an increase of about 31% to the bird species richness credited to Pantanal in previous publications. A total of 50 species found in the literature were not included in this list of 463 species because their records presented evident uncertainties. Birds collected in the Pantanal totalled 377 species (81% of the total species richness). Of the remaining 86 species (recorded by observation, capture and/or vocalization), 49 were found in two or more publications, 18 in only one, while 19 species resulted from personal communications. Eight endemics of Cerrado were recorded within this wetland. Inventories in the Pantanal started with collections by Johann Natterer in 1825 and were conducted mainly in localities of easier access, as near cities or along the major rivers and roads. The Pantanal wetland is unsatisfactorily sampled. Further inventories, including those with collections of some taxa, are necessary to improve knowledge of composition and distribution of the Pantanal's avifauna.

KEY WORDS: avifauna, bird, Cerrado, collection, inventory, neotropical, Pantanal, wetland.

An extraordinary abundance of aquatic birds, a highly diversified avifauna and phenomena as the formation of *ninhais* (nesting colonies) are outstanding peculiarities that contributed to the recognition of the Pantanal wetland as one of the most attractive places in the world to watch or study birds. Its peculiarities, however, have been attracting researchers not only recently, but since the beginning of the nineteenth century, when Johann Natterer coordinated expressive collections of about 150 bird species in the northern portion of Pantanal (Pelzeln 1870, Paynter and Traylor 1991a, b, Vanzolini 1993). In the end of the same century, expeditions coordinated by Borelli (Salvadori 1895, 1900) and Smith (Allen 1891, 1892, 1893) at the surroundings of Corumbá collected a less extensive number of bird species. These and additional records of one or few species published by several authors were joined in a remarkable publication on bird species collected in the current States of Mato Grosso and Mato Grosso do Sul (Naumburg 1930).

In the beginning of the twentieth century, the most outstanding collections were those coordinated by Roosevelt-Rondon in the former State of Mato Grosso (Naumburg 1930), by J. A. G. Rehn at Descalvados (Stone and Roberts 1934), and by members of the Museu de Zoologia da Universidade de São Paulo at several localities of Pantanal (Pinto 1932, 1938, 1940, 1944, 1945). The mid twentieth century was characterised by greater participation of national institutions which considerably increased the number and distribution of inventories in the Pantanal through several expeditions involving bird collection (Moojen *et al.* 1941, Travassos and Freitas 1942, Pinto 1944, 1945, 1948, Ruschi 1955, Travassos *et al.* 1957, Sick 1961, Schubart *et al.* 1965, Aguirre and Aldrighi 1983, 1987).

According to the literature, collections of birds in the wetland occurred until the early 1980s, when Dubs collected specimens in the Rio Negro region for the Zoologisches Museum der Universität Zürich (Dubs 1983a). On the other

hand, this period was marked by an increase in the number of studies on the biology of species and communities using techniques based on capture, observations and vocalization of species, which extended until the present (Antas 1983, Dubs 1983a, b, Munn *et al.* 1989, Yamashita and Valle 1990, Magalhães 1990a, b, Yamashita 1992a, b, Guedes 1993, Antas 1994, Guedes 1995, Miyaki *et al.* 1995, Willis 1995, Guedes and Harper 1995, Guedes 1996a, b, Oliveira 1997, Yamashita 1997, Miyaki *et al.* 1998, Pinho 1998, Tubelis and Tomas 1999, Andrade *et al.* 2001, Bouton and Bouton 2001, Caparroz *et al.* 2001, Sazima *et al.* 2001, Yabe and Marques 2001, Carciofi 2002, Del Lama *et al.* 2002, Seixas and Mourão 2002a, b). Also, new inventories and additional records of particular species were done during the last three decades without specimen collection (Weinberg 1984, Antas *et al.* 1986, Cintra and Yamashita 1990, Willis and Oniki 1990, Antas 1994, Lago-Paiva and Willis 1994, Pacheco and Bauer 1994, Strüssmann 1998), bringing additional information on the relative abundance, seasonal occurrence and habitat use by bird species.

The first checklist of bird species of the Pantanal comprised 354 species (Brown 1986). This basic reference for ornithologists interested in the region was dominated by biogeographic concerns, highlighting the influence of the surrounding ecosystems on the bird species composition in the floodplain, and showing a low level of regional endemism. Another checklist of bird species occurring in the Pantanal became available in a field guide for identification of birds found in the Brazilian portion of the high Paraguai river basin (Dubs 1992). This book, which became the major identification guide focusing on bird species occurring in the Pantanal, considered one species richness similar to that found in Brown (1986).

Although they had considered some publications on species collected, none of these checklists involved direct research in several ornithological collections. Thus, this study aims to elaborate one revised and updated checklist of bird species recorded in the Pantanal, taking into account research in bird collections of national and overseas museums, revision of literature and personal observations. We also aim to provide all the localities in which each species has been recorded, with their respective sources of information. Discussions in this paper concerned the Pantanal's species richness, taxa not included in the checklist, the types of record, and the history and distribution of inventories in the Pantanal wetland.

STUDY AREA AND METHODS

The Pantanal – This wetland is located in the central portion of South America, where it occupies about one third of the Rio Paraguai hydrographic basin (Godoi 1986). It comprises approximately 140 000 km² in Brazil, although presents some variation in function of the criteria adopted

for its delimitation (Silva 1995, Silva and Abdon 1998). Remarkable characteristics of this biome are its low altitude (Godoi 1986), the slight gradient of declivity (Alfonsi and Camargo 1986), the alternance of periods of floodings and droughts (Carvalho 1986, Adámoli 1986), high annual thermic amplitudes (Tarifa 1986), a strongly seasonal pattern of precipitation (Tarifa 1986) and a plurianual variation in the floodings (Carvalho 1986), resulted from the occurrence of consecutive years with high precipitation interrupted by sequences of years with moderate precipitation (Adámoli 1986).

Floodings and topographic and edaphic factors strongly influence the vegetation, which occurs as diversified mosaics of forest, aquatic and open habitats (Prance and Schaller 1982, Ratter *et al.* 1988, Prado *et al.* 1992, Silva *et al.* 1997, Schessl 1999). The composition of the Pantanal's flora and fauna is influenced by the surrounding biomes Cerrado, Amazonia, Chaco and the Atlantic Forest (Adámoli 1982, Brown 1986).

General considerations – A sequence of procedures was adopted to elaborate the checklist of bird species found in the Pantanal. Firstly, the physiographic limits of the Pantanal proposed by Silva and Abdon (1998) were considered as the study area (figure 1). Secondly, one preliminary checklist based on revision of literature and on research in ornithological collections of national and overseas museums was prepared. This list was then expanded by additional species recorded by ornithologists who visited the Pantanal during the last decade.

Some criteria were determined for the inclusion of records in the checklist (appendix 1). All species mentioned in the literature were included in the body of this publication, but not in appendix 1, which contains only species whose records in the Pantanal present no apparent problem to validate. Appendix 2 was created to present species whose records could be considered uncertain. Species followed by the sign ? or **cf** in the publications were included at appendix 2 if these publications were the only ones to mention these species in the Pantanal. These uncertain records, however, were included at appendix 1 (and followed by the sign ?) when the species was also recorded by other publications, but still awaiting confirmation of occurrence in the respective localities. Species recorded in municipalities (Corumbá, Miranda, Aquidauana, Cáceres and Poconé) harbouring highlands and wetlands received a similar treatment. When mentioned only by publications not providing details on the site of record (without distinguishing floodplain from highlands or without geographic coordinates) the species were included in appendix 2. However, these records were included in appendix 1 if any other reference (including personal communications) mentioned the species as occurring in the floodplains. We considered that if one species occurs in the wetland and present records for these

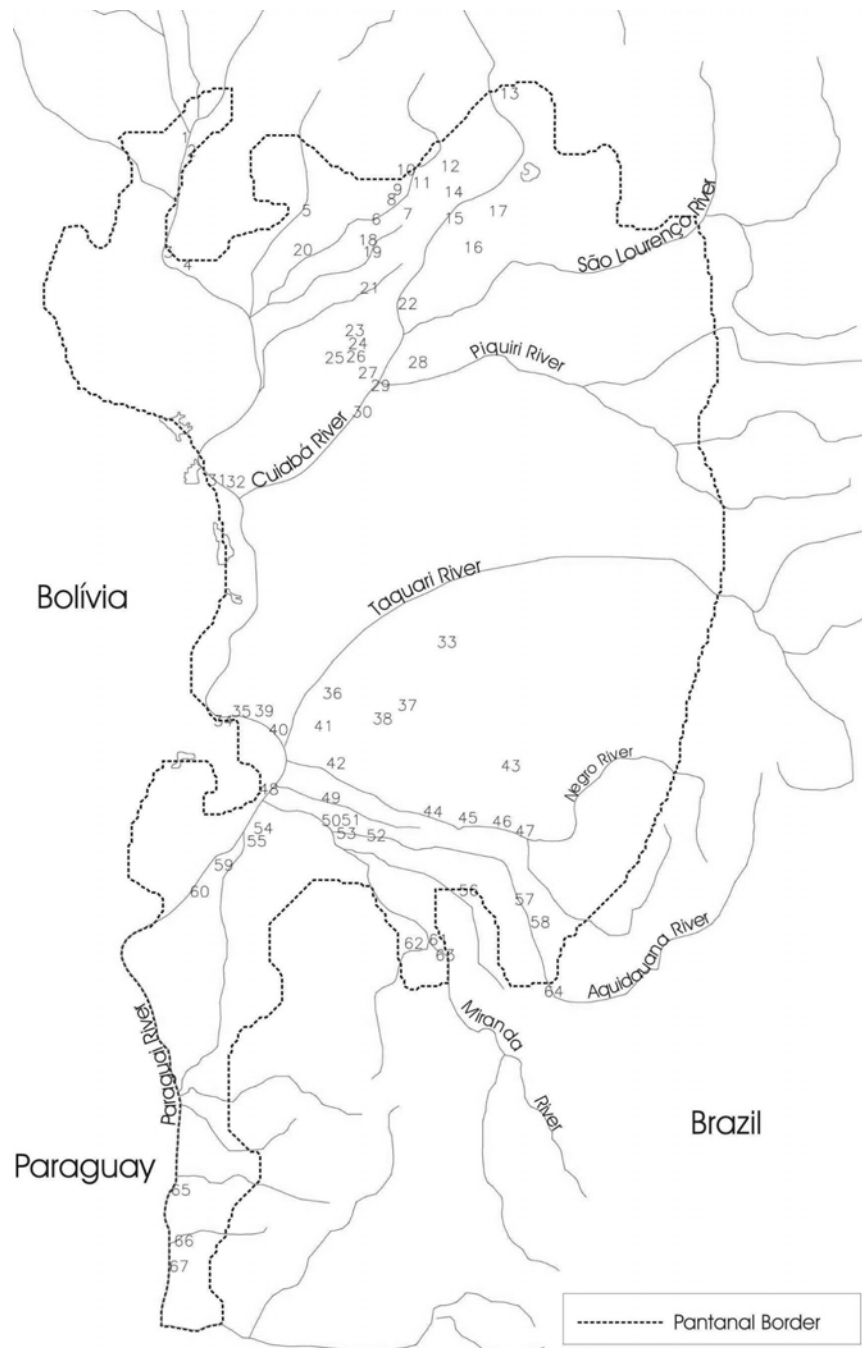


Figure 1. Localities with ornithological inventories in the Pantanal. The numbers correspond to different sample sites, whose geographic coordinates can be found in table 1.

localities, it may occur in the floodplain portions of these localities, although their records still need confirmation.

Pinto (1945), Vanzolini (1992, 1993) and Paynter and Traylor (1991a, b) provided detailed information on the sites of records. The updating of the scientific names was based on Sick (1997), except for *Caracara plancus*, *Hydropsalis torquata*, *Chaetura meridionalis*, *Thamnophilus sticturus* and *Pseudoseisura unirufa* (Banks and Dove 1992, Pacheco and Whitney 1998, Marín 1997, Isler *et al.* 1997, Zimmer and Whittaker 2000, respectively).

Literature review – Publications on bird species found in the Pantanal since Pelzeln (1870) to those published in

2002 were considered in this study. The exceptions were four publications providing insufficient information on the localities of records (Lima 1920, Weinberg 1984, Fischer 1997, Pinho and Nogueira 2000) and two studies in which records of species in the wetland were published earlier by the same author (Naumburg 1937, 1939). This study did not consider popular birdwatching books (due to frequent equivocal identifications), abstracts of conferences and unpublished checklists. The publications considered in this study were listed below, in chronological order.

A) Pelzeln (1870) – Records with and without collection by J. Natterer at Cáceres (former Villa Maria) and

- Caiçara, from 1825 to 1828.
- B) Allen (1891) – Collections by H. H. Smith at Corumbá (1883 and 1886) and at Fazenda Acurizal (1886).
- C) Allen (1892) – Collections by H. H. Smith at Corumbá, in 1886.
- D) Allen (1893) – Collections by H. H. Smith at Corumbá, in 1882 and 1886.
- E) Salvadori (1895) – Collections by A. Borelli at Corumbá, in 1893.
- F) Salvadori (1900) – Collections by A. Borelli at Corumbá and Carandazinho, in 1899.
- G) Grant (1911a) – Collections by C. Grant in Albuquerque, Boca de Hormiguera, Forte Coimbra, Paraguai-mirim, Fazenda Rabicho, Pão-de-Açúcar, Passo do Bugre and Porto Esperança, in 1909.
- H) Grant (1911b) – Collections by C. Grant in Albuquerque, Boca de Hormiguera, Forte Coimbra, Paraguai-mirim, Fazenda Rabicho, Pão-de-Açúcar, Passo do Bugre, Porto Esperança and Ilha do Puga, in 1909.
- I) Grant (1911c) – Collections by C. Grant in Pão-de-Açúcar, Porto Esperança, Porto Murinho, Boca de Hormiguera and Fazenda Rabicho, in 1909.
- J) Cherrie (1916) – Collections by G. K. Cherrie in Rio São Lourenço, in 1914.
- K) Ménégau (1917) – Collections by M. Mocquery at Poconé, Cáceres and Corumbá in 1908 and 1909.
- L) Ribeiro and Soares (1920) – Birds collected by the Commission Rondon at Corumbá (1911), Cáceres (1908) and Fazenda Palmeiras (1911, 1913, 1914).
- M) Cherrie and Reichenberger (1923) – Collections at Caiçara and Fazenda Palmeiras, in 1916.
- N) Naumburg (1930) – Records with and without collection by G. K. Cherrie during the expedition Roosevelt to Mato Grosso. The localities were: Corumbá (1913 and 1916), Descalvados (1914 and 1916), Fedegoso (1916), Fazenda Palmeiras (1913), Fazenda São João (1913) and Rio São Lourenço (1913).
- O) *Apud* Naumburg (1930) – Species mentioned in Naumburg (1930) as occurring in the Pantanal, but not collected by the Rondon Expedition. It includes species mentioned in volumes of the *Catalog of the British Museum* published between 1888 and 1898 by Sclater, Hargit, Shelley, Salvadori, Hartert, Ogilvie-Grant and Sharpe. They are birds collected at Caiçara, Cáceres, and Corumbá. This source also includes the publications of Berlepsch and Sclater on birds collected at Caiçara and Corumbá, respectively, still in the nineteenth century. It also includes publications by Helmayr, Ihering, Ridgway and Simon on specimens collected at Corumbá, Cáceres, Poconé, Miranda and Caiçara in the beginning of the twentieth century.
- P) Pinto (1932) – Records with and without collection by O. M. O. Pinto in Aquidauana, in 1931.
- Q) Stone and Roberts (1934) – Records with and without collection by J. A. G. Rehn at Descalvados, Corumbá and Santa Rosa, in 1931.
- R) Pinto (1938) – Collections by members of the MZUSP in Aquidauana (1930, 1931), Corumbá (1917), Cáceres (1917), Miranda (1930), Porto Esperança (1930) and Santo Antônio (1937).
- S) Pinto (1940) – Records with and without collection by members of the MZUSP, at Santo Antônio, in 1937.
- T) Moojen *et al.* (1941) – Collections by the Comissão do Instituto Oswaldo Cruz, in Salobra, in 1940.
- U) Travassos and Freitas (1942) – Collections in Salobra by members of the Instituto Oswaldo Cruz, the Museu Nacional, the Instituto Tecnológico and the Fundação Rockefeller, in 1941.
- V) Pinto (1944) – Collections by members of the MZUSP at Salobra (1939, 1940, 1941), Usina Santo Antônio (1937), Corumbá (1917), Miranda (1930), Cáceres (1917), Aquidauana (1930, 1931) and Porto Esperança (1930).
- X) Pinto (1948) – Collections in the surroundings of Corumbá by members of the MZUSP, in 1944. Species collected by Garbe in 1917 and added to the checklist of Corumbá (with the sign “–” in the first column of the published table) were not considered, as they are present in the catalogues of this author (Pinto 1938, 1944). This source also includes species observed by Pinto in the northern portions of the Pantanal, along the Cuiabá and São Lourenço rivers (without greater precision), and at Fazenda São Pedro.
- W) Ruschi (1955) – Collections by A. Ruschi at Cáceres, in 1954 and 1955.
- Y) Travassos *et al.* (1957) – Collections at Salobra, in 1955, by members of the Museu Nacional, the Instituto Oswaldo Cruz and the Zoology Department of the Secretaria de Agricultura do Estado de São Paulo.
- Z) Sick (1961) – Collections by A. Aguirre in Miranda Estância (1958), and by A. Schneider in Porto Quebracho (1941).
- a) Pinto (1964) – Collections by members of the MZUSP at Aquidauana, Corumbá, Cáceres and Salobra.
- b) Schubart *et al.* (1965) – Collections coordinated by A. Aguirre to Fazenda São José do Piquiri (1941), Descalvados (1957) and Fazenda Miranda-Estância (1958). It also included species collected by A. Schneider in Porto Quebracho (1941) and species collected in Salobra (1941) by members of the Instituto Oswaldo Cruz.
- c) Reichholf (1976) – Records with no collection in Coronel Juvêncio, Aquidauana and Miranda, in 1970.
- d) Sick (1979) – Records with no collection along the Transpantaneira, near Poconé.
- e) Aguirre and Aldrighi (1983) – Collections by Aggio Neto, A. C. Aguirre and others at Fazenda Miranda Estância (1958), Fazenda Rabicho (1940), Fazenda São José do Piquiri (1941, 1942, 1946, 1951 and 1957),

- Salobra (1940), Porto Jofre (1941 and 1942), Fazenda Firme (1940), Fazenda Rio Negro (1940) and Descalvados (1970).
- f) Antas (1983) – Records with no collection in the Pantanal.
- g) Dubs (1983a) – Records with and without collections at Miranda Estância, Fazendas Salina, Barranco Alto, Barra Mansa and Tarumã, in 1982 and 1983.
- h) Dubs (1983b) – Records with no collection at Fazenda Salina, in 1982.
- i) Aguirre (1984) – Collections at Miranda Estância in 1958, by members of the Museu da Fauna do IBDF.
- j) Sick (1984) – Records with no collection in Porto Quebracho.
- k) Antas *et al.* (1986) – Records with no collection in the surroundings of Poconé, in 1983.
- l) Brown (1986) – It included only species not recorded in the literature used by this author. Thus, it included all species recorded (with no collection) by J. Vielliard, mainly in the region between Poconé and Porto Joffre, between 1980 and 1984, and mentioned as personal observations (sign V in the table). It also included species followed by the signal (?), which were not related to any source of information in Brown (1986).
- m) Sick (1986) – Records with no collection in the Pantanal.
- n) Aguirre and Aldrighi (1987) – Collections by Aggio Neto, A. C. Aguirre and others at Fazenda São José do Piquiri (1941 and 1957), Fazenda Rabicho (1940), Porto Jofre (1942), Fazenda Miranda Estância (1957 and 1958), Fazenda Firme (1940), Descalvados (1957) and Cáceres (1957).
- o) Alho *et al.* (1988) – Records with no collection in the Pantanal.
- p) Dubs (1988) – Records with no collection in southern Nhecolândia, in 1987.
- q) Munn *et al.* (1989) – Records with no collection in the Pantanal.
- r) Cintra and Yamashita (1990) – Records with no collection in the Pantanal of Poconé, mainly along the Transpantaneira highway and in the Parque Nacional do Pantanal, between 1982 and 1986.
- s) Magalhães (1990a) – Records with no collection in the Pantanal of Poconé.
- t) Magalhães (1990b) – Records with no collection in the Pantanal of Poconé, in 1986.
- u) Mittermeier *et al.* (1990) – Records with no collection in the Pantanal.
- v) Willis and Oniki (1990) – Records with no collection along the Transpantaneira in 1985, 1987 and 1988.
- x) Yamashita and Valle (1990) – Records with no collection in northern Pantanal, from 1979 to 1984.
- w) Dubs (1992) – Records with and without collection in several portions of the Pantanal.
- y) Yamashita (1992a) – Records with no collection in the Pantanal.
- z) Yamashita (1992b) – Records in the Pantanal.
- A)** Guedes (1993) – Records in the Nhecolândia, in 1991 and 1992.
- B)** Antas (1994) – Records with no collection in the Pantanal, from 1980 to 1993.
- C)** Guedes (1994) – Records with no collection in the Nhecolândia, from 1991 to 1993.
- D)** Hylander *et al.* (1994) – Records with no collection in Porto Jofre and Descalvados, in 1992.
- E)** Lago-Paiva and Willis (1994) – Records with no collection at Fazenda Caiman, in 1986 and 1989.
- F)** Pacheco and Bauer (1994) – Collections by A. Schneider at Porto Quebracho (1941) and records with no collection by J. F. Pacheco and C. Bauer in the floodplains of Porto Murtinho, in 1991.
- G)** Guedes (1995) – Records with no collection in southern Pantanal, from 1991 to 1995.
- H)** Guedes and Harper (1995) – Records with no collection in Nhecolândia, in 1991 and 1992.
- I)** Miyaki *et al.* (1995) – Record with no collection in the Pantanal.
- J)** Willis (1995) – Records with no collection in the Pantanal.
- K)** Yamashita and Lo (1995) – Records with no collection at Miranda Estância, in 1991 and 1992.
- L)** Guedes (1996a) – Records with no collection in Nhecolândia, from 1991 to 1995.
- M)** Guedes (1996b) – Records with no collection in southern Pantanal, in 1995.
- N)** Alho and Vieira (1997) – Records with no collection in the surroundings of Poconé.
- O)** Lourival and Fonseca (1997) – Records with no collection in Nhecolândia, in 1989 and 1990.
- P)** Oliveira (1997) – Records with no collection in the surroundings of Poconé, in 1995 and 1996.
- Q)** Sick (1997) – Records at several places in the Pantanal.
- R)** Yamashita (1997) – Records with no collection at Miranda Estância, in 1981.
- S)** Miyaki *et al.* (1998) – Records with no collection in the Pantanal, from 1993 to 1997.
- T)** Pinho (1998) – Records with no collection at Pirizal, from 1995 to 1997.
- U)** Strüssmann (1998) – Records with no collection at Fazenda Santa Inês, in 1992, 1996 and 1997.
- V)** Whittingham *et al.* (1998) – Records with no collection along the transpantaneira, in 1996.
- X)** Tubelis and Tomas (1999) – Records with no collection at Fazenda Nhumirim, in 1991 and 1992. This source also includes non-published records of other species observed by the authors, between 1989 and 1992.
- W)** Faria (2000) – Records with no collection in southern

Table 1. Sites and regions with records of bird species in the Pantanal wetland, followed by their geographic coordinates and their sources of information. The number of each site (N) refers to those present in the map (figure 1). The letters in the column of references correspond to the sources of the records, mentioned in the methodology.

N	Locality	Latitude	Longitude	Reference
Localities with coordinate				
1	Caíçara	16° 04' S	57° 45' W	AMOW
2	Cáceres	16° 08' S	57° 43' W	AKLORVWanQstucα
3	Fazenda Santo Antônio das Lendas	16° 39' S	57° 50' W	αβ
4	Descalvados /Fedegoso	16° 43' S	57° 45' W	NQbenDQvw
5	Porto da Fazenda	16° 27'S	57° 07'W	j
6	Fazenda Santa Inês	16° 30' S	56° 45' W	U
7	Fazenda Rio Claro	16° 37' S	56° 44' W	wy
8	Transpantaneira	16° 24' S	56° 40' W	r
9	Posto do Ibama, Transpantaneira	16° 21' S	56° 38' W	r
10	Poconé	16° 15' S	56° 37' W	KOokstNPQsw
11	Parque de Exposições, Poconé	16° 19' S	56° 32' W	v
12	Pirizal	16° 14' S	56° 23" W	T
13	Santo Antônio (antiga usina)	15° 52' S	56° 04' W	RSVfsux
14	Fazenda São Pedro	16°22'S	56°22'W	Xu
15	Porto Cercado	16°30'S	56°22'W	r
16	RPPN SESC	16°39'S	56°16'W	h
17	Fazenda Piraputanga	16°28'S	56°08'W	c
18	Transp., entre Rio B. Gomes e Pixaim	16°35'S	56°44'W	r
19	Fazenda Baía, Pixaim	16°40'S	56°48'W	r
20	Baía da Gaíva	16°39'S	57°10'W	j
21	Transpantaneira, Pixaim	16°51'S	56°49'W	r
22	Fazenda São João	16°56'S	56°37'W	N
23	Fazenda Santa Cruz	17°04'S	56°54'W	r
24	Fazenda Rio Alegre	17°08'S	56°53'W	r
25	Fazenda Santa Isabel	17°11'S	57°01'W	r
26	Base do Ibama, Transpantaneira	17°12'S	57°00'W	r
27	Fazenda Jofre, Transpantaneira	17°17'S	56°50'W	r
28	Fazenda São José do Piquiri	17°14'S	56°34'W	ben
29	Porto Jofre/ Santa Rosa	17°21'S	56°46'W	QenDuwy
30	Rio São Lourenço/Cuiabá	17°29'S	56°52'W	r
31	Fazenda Acurizal	17°49'S	57°33'W	Br
32	Parque Nacional do Pantanal	17°51'S	57°25'W	r
33	Fazenda Baía Bonita	18°40'S	56°26'W	j
34	Corumbá	18°59'S	57°38'W	BCDEFKLNQORVXawQstvxxy
35	Fazenda Rabicho	18°59'S	57°37'W	GHlen
36	Fazenda Palmeiras	18°55'S	57°03'W	LMNt
37	Fazenda Nhumirim	18°59'S	56°39'W	Xiμ
38	Fazenda Alegria	19°03'S	56°47'W	δ

Continued

Table 1. Continued.

N	Locality	Latitude	Longitude	Reference
Localities with coordinate (cont.)				
39	Rio Paraguai-mirim	19°00'S	57°25'W	GH
40	Boca de Hormiguera	19°03'S	57°19'W	GHI
41	Fazenda Tarumã	19°05'S	57°06'W	g
42	Fazenda Firme / Fazenda Leque	19°15'S	57°01'W	enμ
43	Southern Nhecolândia	19°18'S	56°06'W	p
44	Fazenda Fazendinha	19°29'S	56°29'W	μ
45	Fazenda Rio Negro	19°30'S	56°17'W	em
46	Fazendas Salina / Barranco Alto	19°35'S	56°09'W	ghw
47	Fazenda Barra Mansa	19°35'S	56°05'W	g
48	Albuquerque	19°24'S	57°24'W	GH
49	Pantanal do Abobral	19°27'S	57°03'W	<i>bo</i>
50	Passo do Lontra	19°34'S	57°02'W	<i>aβπ</i>
51	Area near Rios Miranda/Abobral	19°34'S	57°01'W	<i>n</i>
52	Area near Rios Vermelho/Miranda	19°36'S	56°56'W	<i>g</i>
53	Area near Rio Vermelho	19°36'S	56°51'W	<i>j</i>
54	Porto Esperança	19°36'S	57°26'W	GHIRVx
55	Morro/Ilha do Puga	19°37'S	57°30'W	H
56	Miranda Estância/Fazenda Caiman	19°56'S	56°20'W	ZbeginEKQRZpqφφ
57	Fazenda Retirinho	19°59'S	56°02'W	<i>j</i>
58	Fazenda Aguapé	20°06'S	55°57'W	φ
59	Ilha dos Bugres/Passo do Bugre	19°47'S	57°39'W	GH
60	Forte Coimbra	19°55'S	57°47'W	GH
61	Salobra	20°11'S	56°30'W	TUVYabetux
62	Coronel Juvêncio	20°12'S	56°38'W	c
63	Miranda	20°14'S	56°22'W	ORVcQsxw
64	Aquidauana	20°29'S	55°48'W	PRVacsux
65	Morro Pão de Açúcar	21°26'S	57°53'W	GHI
66	Porto Murtinho	21°41'S	57°52'W	IFQ
67	Fazenda Quebracho/ Porto Quebracho	21°50'S	57°53'W	ZbjFQt
Regions (without precision of sampled site) or places not found				
68	Carandazinho (not found)	–	–	F
69	Rio São Lourenço	15°50'S to 17°25'S	54°30'W to 56°55'W	JNw
70	Rio São Lourenço and Rio Cuiabá	–	–	X
71	Nhecolândia	–	–	ACHLOQ
72	Transpantaneira highway (between Poconé and Porto Jofre)	–	–	dlrvwQV
73	Pantanal wetland	–	–	fmoquwyzBIJQSYkm
74	Northern Pantanal	–	–	xwQ
75	Southern Pantanal	–	–	wGMWdelr
76	Central Pantanal	–	–	w
77	Rio Negro region	–	–	w
78	Rio Taquari	–	–	w
79	Northwestern Pantanal	–	–	w

- Pantanal, in 1998 and 1999.
- Y)** Goerck *et al.* (2000) – Records with no collection in the Pantanal.
- Z)** Seixas and Mourão (2000) – Records with no collection at Fazenda Caiman, in 1997.
- a)** Andrade *et al.* (2001) – Records with no collection in Passo do Lontra, in 2000.
- b)** Araújo (2001) – Records with no collection near Rio Vermelho (Faz. Santa Clara, Sagrado, São Bento and Xaraés), in 1999 and 2000.
- c)** Bouton and Bouton (2001) – Records with no collection at Fazenda Piraputanga, in 2000.
- d)** Caparroz *et al.* (2001) – Records with no collection in southern Pantanal, from 1995 to 1997.
- e)** Guedes *et al.* (2001) – Records with no collection in southern Pantanal, from 1990 to 1998.
- f)** Sazima *et al.* (2001) – Records with no collection in the floodplains of Santo Antônio, in 1997 and 1998.
- g)** Yabe and Marques (2001) – Records with no collection in the Pantanal of Abobral, near Rio Vermelho, in 1999.
- h)** Antas (2002) – Records with no collection in the RPPN SESC, in 1998 and 2001.
- i)** Carciofi (2002) – Records with no collection at Faz. Nhumirim and surroundings.
- j)** Del Lama *et al.* (2002) – Records with no collection at five sites in the Pantanal.
- k)** Galetti *et al.* (2002) – Records with no collection in the Pantanal.
- l)** Guedes (2002) – Records with no collection in southern Pantanal, from 1990 to 2002.
- m)** Guedes and Seixas (2002) – Records with no collection in the Pantanal.
- n)** Longo (2002) – Records with no collection along Rio Miranda and Rio Abobral, in 2000.
- o)** Ramos (2002) – Records with no collection near Rio Vermelho (Faz. Santa Clara, Sagrado, São Bento and Xaraés), in 2000.
- p)** Seixas and Mourão (2002a) – Records with no collection at Fazenda Caiman, from 1997 to 1999.
- q)** Seixas and Mourão (2002b) – Records with no collection at Fazenda Caiman, from 1997 to 1999.
- r)** Seixas *et al.* (2002) – Records with no collection in southern Pantanal, from 1995-2001.
- Research on collections made by museums* – The research on bird skins involved elaboration of partial checklists of bird species found in: 1) reference books of major national collections; 2) the reference books of the American Museum of Natural History; 3) on-line collections of major North American museums. Bird skins were not examined, with the exception of those present in the AMNH. The collections of the following institutions were studied:
- s)** Fundação Museu de Ornitologia (FMO), in Goiânia, GO – collection visited in November 2000 and January 2001. All birds were collected by J. Hidasi at the floodplains (J. Hidasi pers. comm. 2001) surrounding the following towns: Poconé (1963, 1964, 1973, 1974, 1975, 1983, 1994), Cáceres (1964), Corumbá (1978 and 1981), Aquidauana (1981), Miranda (1981) and Santo Antônio (1965 and 1966).
- t)** Museu Nacional (MNRJ), in Rio de Janeiro – collection visited in December 2000. It included birds collected: 1) at Porto Quebracho by A. Schneider in 1941; 2) at Faz. Palmeiras by Reinisch in 1913; 3) at Cáceres by Miranda Ribeiro and Hoechne in 1908 and 1909; 4) at Corumbá by Snethlage in 1928 and 1929, and by Hoechne in 1911; 5) at Salobra, collected by Moojen and Berla in 1940, and by members of the Instituto Oswaldo Cruz in 1941. Specimens collected by E. Przyjewski along Rio Piquiri, without date, were not considered due to lack of further description of the site of the record along the river.
- u)** Museu de Zoologia da Universidade de São Paulo (MZUSP), in São Paulo – collection visited in August 2000. Bird species mentioned by this source considered only records not included in publications referent to the collection of this museum (Pinto 1938, 1940, 1944, 1945, 1948). Research on the reference books was done only on skins with reference numbers higher than 17500, as birds deposited previously had been published (Pinto 1938, 1944). These unpublished records included: 1) non-passeriform, Furnariidae, Dendrocolaptidae and Formicariidae species collected at Salobra in 1939, 1940, 1941 and 1955; 2) birds collected at Cáceres in 1966 and 1993; 3) birds collected at Porto Jofre in 1982; 4) birds collected at Aquidauana in 1947; 5) birds collected at Santo Antônio in 1937; 6) birds collected at Faz. São Pedro in 1944.
- v)** American Museum of Natural History (AMNH), in New York – collection visited in December 2002. All records found in the reference books were considered, except for those published previously (Allen, 1891, 1892, 1893, Naumburg 1930). Thus, this research included birds collected at Corumbá by V. A. Borelli (1893, 1905, 1907) and in Descalvados, by G. Garlepp (1883, 1888).
- x)** Museum of Comparative Zoology (MCZ), in Cambridge – Collection database available on-line consulted in December 2002. It included species collected by members of the MZUSP in Santo Antônio (1937), Salobra (1940), Porto Esperança (1930), Corumbá (1917), Aquidauana (1931) and Miranda (1930).
- w)** The Field Museum (FM), in Chicago – Collection database available on-line consulted in December 2002. It included birds collected in Miranda (1930), Santa Rosa (1974), Poconé (1973), Fazenda Rio Claro (1973 and 1974) and Descalvados (1926 to 1928).
- y)** National Museum of Natural History (NMNH),

Smithsonian Institution, Washington – Database provided by the bird collection managers in April 2003. It included specimens collected by J. Hidasi at Santa Rosa (1974) and at Fazenda Rio Claro (1973), and by T. J. Page in Corumbá (1884 and 1859).

Personal communications. The preliminary checklist based on literature and collections was expanded by unpublished records of six other persons. Further details of their records are provided below.

- α) personal observation by F. M. D’Horta, in the wetlands surrounding Cáceres and at Fazenda Santo Antônio das Lendas, in November 1998.
- β) personal observation by P. F. Develey at the surroundings of Passo do Lontra (August 1991) and at Fazenda Santo Antônio das Lendas (October 1997).
- δ) personal observation by R. F. F. Lourival and H. Herrera at Fazenda Alegria.
- φ) personal observation by L. F. Silveira at Fazendas Aguapé and Caiman, in August 1997.
- φ) personal observation by D. P. Tubelis at Fazenda Caiman, in June 1993.
- μ) personal observation by W. M. Tomas at Fazendas Nhumirim, Leque, Rio Negro and Fazendinha.
- π) personal observation by J. F. Pacheco at Passo do Lontra, in August 1991.

RESULTS AND DISCUSSION

Pantanal’s species richness – The bird species richness found in the Pantanal wetland is much higher than that established in previous publications. The total of 463 species in this review of inventories represents an increase of about 31% in the bird species richness credited to the wetland by Brown (1986) and Dubs (1992). In Asia, major wetlands harbouring considerable bird species richness are located in China (Yancheng, Dafeng and Poyangh), with 379, 315 and 300 species respectively (Ramsar 2002). In Africa, about 400 species occur in the Okavango Delta (Sinclair and Hockey 1997, Harrison *et al.* 1997a, b), while other outstanding bird species richness are found in the Lakes Naivasha and Bogoria (both in Kenya), with 350 and 300 species, respectively (Ramsar 2002). Also in Kenya, a richness of “near 500 bird species” is credited to Baringo (Ramsar 2002). As Ramsar usually provides the exact number of species found in each wetland, this information on Baringo’s avifauna becomes inconsistent. In the American continent, the Everglades harbours 364 bird species (Robertson *et al.* 1984), while no checklists have been produced for other major wetlands (e.g. Orinoco Delta and the Amazonian and Paranaense wetlands). Therefore, the available information on bird species of major wetlands found worldwide leads to the conclusion that the 463 species recorded in the Pantanal places it as the wetland harbouring the highest bird species richness in the world.

None of these 463 species are endemic to the Pantanal wetland, as all of them had been found outside its limits (Naumburg 1930, Pinto 1938, 1944, Short 1975, Ridgely 1989, Willis and Oniki 1990, Ridgely 1994, Hayes 1995, Sick 1997). Brown (1986) referred to the wetland plus the surrounding highlands when he mentioned bird species endemic to the Pantanal region. Of the endemisms cited by Brown (1986), only four had been recorded in the wetland (*Pyrrhura devillei*, *Phaethornis subochraceus*, *Cercomacra melanaria* and *Thryothorus guarayanus*). *Pyrrhura devillei* and *Phaethornis subochraceus* occur outside the wetland and, apparently, are endemics to the basin of the higher Rio Paraguai. The other two occur also in northern and western Bolivia, and in eastern Paraguay (Short 1975, Ridgely 1989, 1994, Asociación Harmonia 1995, Hayes 1995).

Brown (1986) also considered *Columbina cyanopis*, *Picumnus fuscus*, *Tachyphonus nattereri*, *Conothraupis mesoleuca* and *Sporophila nigrorufa* as endemisms of the Pantanal region. However, all of them present rare records, some in regions as far from the wetland as the northwestern portion of Mato Grosso or even Goiás (Naumburg 1930, Pinto 1938, 1944, 1978). This seems inconsistent with their restriction even to the hydrographic basin of Rio Paraguai. Another endemic in Brown’s publication, *Basileuterus leucophrys*, is found much more towards eastern Brazil, being common even in gallery forests of Minas Gerais and Distrito Federal (Sick 1997).

This study showed that eight (21.6%) of the 37 species considered endemic to Cerrado (Cavalcanti 1988, Silva 1995, 1997) were found in the Pantanal. The forest species *Penelope ochrogaster*, *Herpsilochmus longirostris* and *Antilophia galeata* represent 20% of the forest dependent endemic species (Cavalcanti 1988, Silva 1995, 1997). The other Cerrado endemics in the Pantanal are *Amazona xanthops*, *Saltator atricollis*, *Passerina caeruleascens*, *Cypsnagra hirundinacea* and *Cyanocorax cristatellus* that, together, correspond to 22,7% of the bird species endemic to Cerrado associated with open habitats (Cavalcanti 1998, Silva 1995, 1997).

The available information permits us to visualize that part of these Cerrado endemics are not restricted to the Pantanal periphery. Some of these species were found in localities situated more than 150 km from the adjacent highlands. For example, *Amazona xanthops* and *Saltator atricollis* are commonly found at Fazenda Nhumirim (pers. obs.). The number of Cerrado endemic species in the Pantanal must be even higher, as the eastern and northern portion of this wetland (where the influence of Cerrado is high) are still poorly inventoried (figure 1). This is supported by the records of *Heliactin cornuta* at Cáceres (appendix 2), which was not included in the checklist due to lack of details on the site of record.

Type of record – Of the 463 species recorded in the

Pantanal wetland, 377 (81%) were collected and posteriorly deposited in zoological collections of national and overseas museums (appendix 1). Of the remaining 86 species (that included birds captured, heard or seen), 49 were mentioned in two or more publications, while 18 species were cited by only one published reference. Records originating from personal communications totalled 19 species.

Some of those species mentioned by only one or two publications (appendix 1) may represent equivocal identification. It is important to consider that, in some cases, two or more publications refer to the same record. Thus, species associated with two or three published references may represent the same record. As these records present no apparent problem of validity, and as we are not able to judge identification skills, further studies are required to confirm the occurrence of some species that are only included in one or few publications. Additional inventories, preferably those involving collections, photographs and bird recordings are necessary to register new species, as well as to consolidate or discredit the occurrence of poorly documented taxa.

Species mentioned in the literature but not included in the checklist – A total of 50 species found in publications formed the appendix 2. The occurrence of most of these species (mainly those of categories I and III) in the Pantanal wetland is probable (and actually could had been recorded in the wetland), but further studies are still required to confirm their occurrence.

The first group of species (category I at appendix 2) included 31 taxa. This category highlights the necessity of more detailed information on the sites of record by future expeditions. The seven species collected during expeditions conducted by the former Museu de Caça e Pesca (Schubart *et al.* 1965, Aguire and Aldrighi 1983, 1987) and by the Instituto Oswaldo Cruz (Moojen *et al.* 1941, Travassos *et al.* 1957) fall into another group (category II at appendix 2). They were deposited in the MNRJ after the earlier institutions closed. Three reasons made us allocate these species at appendix 2. Firstly, part of the material collected during the above mentioned expeditions (including these seven species) was wrongly identified and some specimens deserve a formal reexamination (J. F. Pacheco pers. comm. 2000). Second, these seven records were not found in the reference books of the MNRJ. Third, these records were also not considered by posterior major publications concerning the distribution of these species (Ridgely 1989, 1994, Pinto 1978, Sick 1997).

Also excluded from the Pantanal checklist (category III at appendix 2) were eight taxa only recorded in publications whose authors considered their identification as uncertain. Another group (category IV at appendix 2) refers to bird species recorded along rivers but followed by no further details on the geographic position of the

record. The only species in this category was *Opisthocomus hoazin*, which was included in the Brown's (1986) checklist. This record was credited to Naumburg (1930), who referred to skins collected in the Rio Guaporé and one specimen followed by imprecise local of record ("Rio Paraguai or Cuiabá"). Its occurrence in the Pantanal become inconsistent as these two rivers occur in the highlands situated north of the wetland as well. The last group (category V at appendix 2) included: *Phaethornis gounellei*, re-identified as being *P. subochraceus* (Meyer de Schauensee 1966); *Elaenia parvirostris* re-identified as being *E. chiriquensis* (Pinto 1944); *Taphrospilus hyposticus*, rejected after consultation with Pacheco (2000).

Inventories – In general, inventories are located mainly in easily accessed localities, like the surroundings of cities, along the main rivers, and along the transpantaneira (between Poconé and Porto Jofre). As a result, inventories are not well distributed through the Pantanal (figure 1). Thus, extensive gaps of knowledge become evident, mainly in the central area, along all the entire eastern border, in the south (region between Corumbá and Porto Murtinho) and in the extreme northwestern portion (Pantanal of Cáceres), near the border with Bolivia.

To our knowledge, inventories were conducted, but not published, in the Pantanal of Cáceres (P. F. Develey and F. M. D'Horta pers. comm., 2000), Barão de Melgaço (P. T. Z. Antas pers. comm., 1999), Miranda and Nhecolândia (see Cintra and Yamashita 1990). The publication of these and new inventories will represent an essential contribution to the understanding of the composition and distribution of the Pantanal's avifauna.

The distribution of samples becomes even more restricted if we consider only inventories that recorded more than 100 species. This highlights the necessity for consistent inventories across most of the Pantanal floodplain. Localities or regions better sampled are the areas along the Transpantaneira highway, the surroundings of Cáceres, Caiçara and Descalvados, in the northern portion, the Fazenda Nhumirim in the center, and the surroundings of Corumbá, Salobra, Porto Murtinho and Porto Quebracho, in the south.

Despite presenting the highest values of species richness, most of these places are still sub-sampled as these numbers (usually less than 200 species) are considerably lower than those (about 300 species) commonly found in localities of Cerrado near Pantanal (e.g. Allen 1891, 1892, 1893, Silva and Oniki 1988, Robbins *et al.* 2000). Although regions already sampled still need detailed inventories, greater attention should be directed to regions not yet sampled. These include large areas of continuous forests in Cáceres, Poconé, Barão de Melgaço and Rio Negro, as well as those permanently flooded (as "brejos" of Negro and Taboco rivers). Finally, regions ecologically distinct

as the Pantanal of Porto Murtinho (which is greatly influenced by the Chaco) may present species not even yet recorded in Brazil. In conclusion, further inventories involving collections of particular taxa and considerations on the quality of the records must be ranked among the top priorities concerning studies about the rich and diversified avifauna found in the Pantanal wetland.

CONCLUSION

The checklist presented in this study must not be considered definitive, as many portions of the Pantanal are still poorly known or not sampled. Further inventories will probably add new species and lead to the rejection of some records. As our research in museums involved only the reading of reference books, future examinations of skins in these collections will probably lead to the correction of some records presented.

Although numerous birds had been collected in the Pantanal, its avifauna has not been the primary target of the most extensive expeditions. Major collecting expeditions crossing central South America have spent relatively shorter periods in the Pantanal, than in other regions (see Pelzeln 1870, Allen 1891, 1892, 1893, Salvadori 1895, 1900, Grant 1911a, b, c, Naumburg 1930, Pinto 1945, 1948, Vanzolini 1993). Thus, extensive collections are necessary in the Pantanal in order to better understand the patterns of species distribution within its limits. The current knowledge does not even make possible an analysis of representativeness of protected areas in the conservation of species, such as that recently done for Distrito Federal (Braz and Cavalcanti 2001).

This study showed that the Pantanal is the wetland with the highest bird species richness in the world. It also has great importance from a biogeographic view point (Brown 1986), receiving migratory bird species (Antas 1983, Sick 1984, 1986, Cintra and Yamashita 1990, Antas 1994) and harbouring extraordinary populations of waterbirds (Sick 1997). Therefore, this region should receive the deserved attention from the Brazilian government, which should make more effort to concretize the numerous conservation recommendations proposed by studies conducted in the Pantanal and in the surrounding highlands. These efforts should include the creation and effective protection of reserves (Mittermeier *et al.* 1990, Cavalcanti 1999), inhibition of illegal animal capture and trade (Yamashita 1992 b), reduction of the release of environmental contaminants (Alho and Vieira 1997), control of habitat destruction (Cavalcanti 1999, Tubelis and Tomas 1999), establishment of conservation corridors along major rivers (Cavalcanti 1999) and sustainable use of wildlife (Mittermeier *et al.* 1990, Lourival and Fonseca 1997). Further, adequate biodiversity conservation will not be achieved without contribution of local ranchers, who

should be given incentives to use natural resources in environmental friendly ways (Guedes 1993). Finally, incentives to the practice of sustainable tourism in this wetland, as recommended previously (Alho *et al.* 1988, Mittermeier *et al.* 1990, Yabe and Marques 2000), may transform the Pantanal into a window of national consciousness. Promoting experience in its wildness should be viewed as a major strategy to educate Brazilians about the needs of conserving the outstanding natural heritage present in the country.

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Appendix I. Relation of the 463 bird species recorded in the Pantanal wetland. Records were grouped according to the occurrence or not of collection of specimens. Numbers refer to the localities where the species were recorded, while letters refer to the sources of the respective records. The localities can be found in table 1, while the sources can be found in the methodology.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Tinamidae		
<i>Crypturellus undulatus</i>	1A 2ARt 4Q 10s 13S 28e 34Rx 35e 56b 61Tatux 63Rx	37X 72lr 73w
<i>Crypturellus parvirostris</i>	1A 2Rt 4Q 13S 46g 61tu 64PR 67F	37X 72lr 73w
<i>Crypturellus tataupa</i>	2K 10K 13S 34R 67Ft	37X 73w
<i>Rhynchotus rufescens</i>	4w 61u	4N 73w
<i>Nothura maculosa</i>	67F	72l?
Rheidae		
<i>Rhea americana</i>	1A 4Q 56be 61aTUtu 67bFt	4N 37X 46g 71O 72lr 73ouw
Podicipedidae		
<i>Tachybaptus dominicus</i>	1A 46g 64PRAux	64P 72r 73Bw
<i>Rollandia rolland</i>		46g 73wQ
<i>Podilymbus podiceps</i>		73B
Phalacrocoracidae		
<i>Phalacrocorax brasilianus</i>	4Q 10s 34Ev 35e 61Utu 67bFt	4N 10N 17c 37X 56g 66F 70X 72rv 73wBJQ 74x
Anhingidae		
<i>Anhinga anhinga</i>	1AO 4Q 28e 36N 61tu 67Ft	10N 37X 46g 70X 72lr 73wBJQ 74x
Ardeidae		
<i>Ardea cocoi</i>	1A 4Q 45e 61Ubtu 67bFt	37X 47g 66F 72lr 73wBJQ 74x
<i>Casmerodius albus</i>	1A 4N 34E 45e 61t 64PR 67Ft	4Q 10N 37X 46g 66F 70X 72rv 73wBJQ 74x
<i>Egretta thula</i>	1A 4b 13S 28e 67bF	34w 37X 46g 66F 72rv 73wB 74x
<i>Egretta caerulea</i>	4b 10s	72rw 73Q
<i>Bubulcus ibis</i>		37X 66F 72lr 73wBQ 74x
<i>Butorides striatus</i>	1A 4Qw 34EN 35He 36N 61Yetu 67Ft	37X 46g 66F 72lr 73wB
<i>Agamia agami</i>	1A 2A	
<i>Syrigma sibilatrix</i>	61Ttu 67Ft	37X 46g 47g 66F 72lr 73w
<i>Pilledorius pileatus</i>	1A 2A 4Qw 10s 34Rv 35e 61u 64PR 68F	10w 66F 72lr 73w
<i>Nycticorax nycticorax</i>	1A 4Q 29e 34Ev 35e 61t 67bFt	37X 72lr 73wBJQ 74x
<i>Tigrisoma lineatum</i>	1A 2K 4Q 10s 13S 22N 34X 35e 61TUtu 67Ft	4N 37X 46g 66F 72lr 73wB
<i>Ixobrychus exilis</i>		72l?rw
<i>Zebrilus undulatus</i>	1A 10s	
Cochlearidae		
<i>Cochlearius cochlearius</i>	1A 4Q 35e 59H 61Tt 67bF	1w 34w 66F 72r 73B

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Threskiornithidae		
<i>Theristicus caerulescens</i>	1A 2AO 4NQ 34R 42e 56e 61Ttu 64PR 67bFt	37X 43p 46g 47g 52g 66F 71AH 72rv 73wBQ
<i>Theristicus caudatus</i>	1A 2t 13S 42e 56e 61TYtu 64PR 67bFt	17c 37X 43p 46g 52g 66F 71AH 72rv 73wBQ
<i>Mesembrinibis cayennensis</i>	1A 4Q 28e 29e 61t 67bFt	37X 43p 46w 72lrwv 73w
<i>Phimosus infuscatus</i>	1AO 10s 34NR 56be 61Tt 64PR 67F	4N 37X 46g 64P 72lr 73wBQ
<i>Plegadis chihi</i>	56b	37X 47g 72lrwv 73wB 77w
<i>Platalea ajaja</i>	1A 2At 4Q 28be 61u 67F	13S 17c 37X 46g 70X 72lr 73wBJQ 74x
Ciconiidae		
<i>Mycteria americana</i>	1A 2A 13S 28e 36N 61t 67bFt	4NQ 5j 13S 17c 20j 33j 34Nw 37X 46g 53j 57j 70X 72rv 73wBJQ 74x
<i>Ciconia maguari</i>	1A 34ERav 61t 67bFt	4N 34Nw 37X 47g 72lr 73BQ 77w 78w
<i>Jabiru mycteria</i>	1A 4Q 36N 42e 67bFt	4ND 10P 13S 37X 46g 47g 66F 70X 71AH 72drv 73wBQ
Cathartidae		
<i>Sarcoramphus papa</i>	1A 10K 28e 67F	2w 72r 73w
<i>Coragyps atratus</i>	67F	4Q 29D 37X 52g 66F 71AH 72rv 73w 74x 75GM
<i>Cathartes aura</i>	61t 67F	4Q 37X 46g 52g 66F 72rv 73w
<i>Cathartes burrovianus</i>		37X 52g 66F 72rv 75w 76w 77w
Anatidae		
<i>Dendrocygna bicolor</i>	34N	37X 72rvw 73wB
<i>Dendrocygna viduata</i>	1A 2R 4NQ 22N 35e 61u 67F	4N 34N 37X 46g 72rv 73B 77w 78w
<i>Dendrocygna autumnalis</i>	1A 4Q 10s 56e 68F	37X 46g 71AH 72lr 73mBQ 74w 75G 77w
<i>Coscoroba coscoroba</i>		34Q 38s 71Q
<i>Neochen jubata</i>	1A 67F	
<i>Anas versicolor</i>		42μ
<i>Callonetta leucophrys</i>		69w 73B
<i>Amazonetta brasiliensis</i>	35e 61b 64PR 67Ft 68F	37X 46g 66F 72lr 73wB
<i>Sarkidiornis melanotos</i>	1A	34w 72rvw 73B 74w
<i>Cairina moschata</i>	1A 4b 13Sx 35e 42e 61Ubtu 65H 67F 68F	4NQ 34N 37X 46g 56pq 71AHO 72rv 73wBQ 75Gl
<i>Oxyura dominica</i>	1A 64a	73B
Anhimidae		
<i>Anhima cornuta</i>		70X 74Q
<i>Chauna torquata</i>	2ARs 10s 29e 34KR 61Y 67Ft 69N	4Q 34NQ 37X 46g 66F 70X 71O 72rv 73uwBQ
Accipitridae		
<i>Elanus leucurus</i>	67F	72lr 73w
<i>Gampsonyx swainsonii</i>	1A 4Q 28e 61tux	52g 72rv 73Q

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Accipitridae (cont.)		
<i>Elanoides forficatus</i>		72r
<i>Leptodon cayanensis</i>	13S 61u 67F	72lr 73w
<i>Chondrohierax uncinatus</i>	4Q 34Ra	73w
<i>Ictinia plumbea</i>	1A 10K 34R 61Ubtu	37X 72v 73w
<i>Rostrhamus sociabilis</i>	2A 4NQ 29e	10sN 37X 46g 66F 72rv 73wBQ 77w
<i>Accipiter bicolor</i>	34x 61u	72rv
<i>Accipiter striatus</i>		72r
<i>Geranoaetus melanoleucus</i>		50B
<i>Buteo albicaudatus</i>	13s 28e 34Ra 67F	72r
<i>Buteo albonotatus</i>		72rvw
<i>Asturina nitida</i>	1A 2R	
<i>Rupornis magnirostris</i>	1A 4Q 10K 13S 28e 34RXa 61Tbtu 63Rx 64PR 67Ft	37X 52g 66F 72rv 73w
<i>Leucopternis albicollis</i>		3B
<i>Busarellus nigricollis</i>	1A 2t 4Qw 10s 13S 34Xa 35e 36t 61t 67bFt	10t 13S 37X 46g 50a 66F 72lr 73wBQ
<i>Buteogallus meridionalis</i>	4Qw 10s 34R 35e 61TUat 67bFt	12T 37X 46g 52g 66F 72lr 73w
<i>Buteogallus urubitinga</i>	1A 2A 4Qw 10s 35e 61t 67t	37X 46g 52g 72rv 73w 75G
<i>Harpyhaliaetus coronatus</i>		44u 73Q
<i>Spizastur melanoleucus</i>	2A	72rw
<i>Spizaetus ornatus</i>		66F 72rvw
<i>Circus buffoni</i>	67bF	
<i>Geranospiza caerulescens</i>	4Q 13s 29e 34Xa 61au 67F	37X 52g 72rv 73w 75G 77w
Pandionidae		
<i>Pandion haliaetus</i>	1A	2w 72rw 73BQ 74w
Falconidae		
<i>Herpetotheres cachimans</i>	1A 2Rt 13S 61t	37X 52g 66F 72lr 73w 77w
<i>Micrastur semitorquatus</i>	2A	37X 71AH 72rv 75GM
<i>Micrastur ruficollis</i>	67Ft	
<i>Milvago chimachima</i>	2K 4Q 10K 28e 61Yau 64Px 67Ft	37X 52g 72rv 73w
<i>Caracara plancus</i>	4Q 35e 61tu 64P 67Ft	17c 29D 37X 46g 52g 71AH 72lr 73wQ 74x 75GMI
<i>Falco deiroleucus</i>		73w
<i>Falco rufigularis</i>	1A 10K 34R 61u	12T 37X 52g 71AH 72rv 73w 75GI
<i>Falco femoralis</i>	1A 4w 28e 61btu 67Ft	37X 66F 72r
<i>Falco sparverius</i>	2t 10K 29Q 34X 61tu 67Ft	37X 66F 72r 73w
Cracidae		
<i>Ortalis canicollis</i>	1A 2At 4Qw 10s 34Ra 35e 36N 42e 61UYbtu 67Ft 69N 16h 37X 52g 66F 71O 72rv 73gwQ	
<i>Penelope superciliaris</i>	2R 61bu	72rw

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Cracidae (cont.)		
<i>Penelope ochrogaster</i>	4N	10 Q 16 h 72rv 73w
<i>Pipile pipile</i>	2AR 4N 28e 56be 61TU btu 65I 67 F 68F	37 X 52g 72lr 73gw Q
<i>Crax fasciolata</i>	1A 2A 4NQ 10K 13S 28e 34R 42e 61 u	16 h 37 X 46g 71 O 72rv 73w
Aramidae		
<i>Aramus guarauna</i>	1A 4Q w 28e 34ENRay 35e 61Yb 64PR 65I 67b Ft	10N 37 X 47g 66 F 72lr 73w BQ
Rallidae		
<i>Rallus nigricans</i>		66 F 72lrw 73w
<i>Aramides cajanea</i>	4Q w 13S 34RX 35e 61Y btu 63R 65I 67b Ft	37 X 66 F 71 AH 72lr 73w B
<i>Porzana albicollis</i>	67b Ft	72r
<i>Laterallus exilis</i>	67 F	67 Q
<i>Laterallus melanophaius</i>		72l 76w
<i>Neocrex erythrops</i>		72rw
<i>Gallinula chloropus</i>	1AO	46w 73w B
<i>Porphyryla martinica</i>	1A 67 Ft 68F	46w 72rv 73w B
<i>Porphyryla flavirostris</i>	1A 4N 34D	72r 73w
Heliornithidae		
<i>Heliornis fulica</i>	13S 61 au	4Q 34Q 72lr 74w
Eurypygidae		
<i>Eurypyga helias</i>	1A 2A 28e	72lrw 74w
Cariamidae		
<i>Cariama cristata</i>	10K 61Y tu 67 Ft	4Q 37 X 46g 66 F 72r 73ow
Jacanidae		
<i>Jacana jacana</i>	1AO 4Q 10K 34KX 35e 36N 61 btu 63R 64PR 67 Ft	37 X 46g 64P 66 F 72rv 73w B
Charadriidae		
<i>Vanellus chilensis</i>	1A 4Q 35e 56b 61Y bt 64PR 67 Ft	37 X 47g 64P 66 F 72lr 73w B
<i>Hoploxypterus cayanus</i>	4Q 13S 28e 34DOX 69N	37 X 46g 72rv 73w
<i>Pluvialis squatarola</i>		73 B
<i>Pluvialis dominica</i>	2A 67 Ft	73fo B
<i>Charadrius collaris</i>	1A 4Q 13S 28e 34DO 67 Ft 69N	37 X 72rv 73w B
Scolopacidae		
<i>Tringa solitaria</i>	1A 4b 28e 54I 61 btu 63R	37 X 66 F 72rvw 73fw B
<i>Tringa flavipes</i>	1A 13S 54I 67 Ft 68F	37 X 66 F 72rv 73fw B

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Scolopacidae (cont.)		
<i>Tringa melanoleuca</i>	1A 67t 68F	66F 73fwB
<i>Actitis macularia</i>	34D	72rv 73w
<i>Calidris canutus</i>		72rw
<i>Calidris minutilla</i>		72rw 73w
<i>Calidris fuscicollis</i>	1A 4Q 67t	72rw 73fwB?
<i>Calidris melanotos</i>	1A 34N 54I 68F	72rw 73fwB
<i>Calidris pusilla</i>		37μ
<i>Calidris alba</i>	67Ft	
<i>Tryngites subruficollis</i>		73fB 74w
<i>Bartramia longicauda</i>	67Ft	73fB
<i>Numenius borealis</i>		73fB
<i>Limosa haemastica</i>	1A	
<i>Gallinago paraguaiiae</i>	1A 2KR 34N 61t	37X 72lrw 73wBQ
Recurvirostridae		
<i>Himantopus himantopus</i>	1AO	37X 72lr 73B 77w
Phalaropodidae		
<i>Steganopus tricolor</i>	1AO	67j 73fw
Laridae		
<i>Phaetusa simplex</i>	1A 4Q 45e 67Ft 68F	37X 72lr 73wB
<i>Sterna hirundo</i>		72rw 73m
<i>Sterna supercilialis</i>	67Ft 68F	37X 66F 72lr 73wB
Rynchopidae		
<i>Rynchops niger</i>	1A 4Q 28e 67Ft	37X 46g 72lr 73wBQ
Columbidae		
<i>Columba picazuro</i>	2K 4Q 13S 28e 34R 54I 67Ft	13f 37X 52g 66F 72rvw 73w
<i>Columba cayennensis</i>	13S 34N 61t 63R	13f 37X 52g 66F 72lrw 73w
<i>Zenaida auriculata</i>	4Qbe 28e 34Xa 61Tt 64PR 67Ft	37X 66F 72rvw 73w
<i>Columbina minuta</i>	2R 34X 36N	52g 72l 73w
<i>Columbina talpacoti</i>	2K 10Ks 13S 28e 34R 35I 61u	37X 52g 66F 72rv 73w
<i>Columbina picui</i>	1A 2AK 4Qw 10s 13S 28e 34RX 40I 46g 61u 63R 64PR 67Ft	37X 52g 66F 72lr 73w
<i>Claravis pretiosa</i>	61b 63R 68F	4Q 37X 72lrw 73w
<i>Uropelia campestris</i>	4Q 10s 13u 28e	72lrw 73w
<i>Scardafella squammata</i>	34X 61Tbtu	37X 46gw 66F 72lr 73w
<i>Leptotila verreauxi</i>	4Q 10K 13S 28e 34OX 46g 61Tb 63R 64PR 66I 67Ft 69N	37X 52g 66F 72rv 73w
<i>Leptotila rufaxilla</i>	69N	37X 72rv 73w
<i>Geotrygon montana</i>		72rw

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Psittacidae		
<i>Anodorhynchus hyacinthinus</i>	4NQw 36LNt 42e 56b 61Ytu	12T 37Xi 46g 52g 56gR 71ACHL 72rvV 73oquwyzQSYk 75GMWllr
<i>Ara ararauna</i>		37X 47g 71AH 72lr 73wQ 75I 77w
<i>Ara chloroptera</i>	1A 2t 42e 61Tb	4N 37X 46gw 66F 71AHO 72lr 73wQ 75GIMWd
<i>Propyrrhura auricollis</i>	2AOt 4NQv 28e 34X 36t 61Tetux 63Rx 67Ft	37X 46g 52g 56gw 66F 72rv 73wQ 77w
<i>Diopsittaca nobilis</i>	63Rx	12T 13f 37X 71AH 72r 73w 77w
<i>Aratinga acuticaudata</i>	35e 46g 67Ft	37X 52g 66F 72lr 73wQ 77w
<i>Aratinga leucophthalmus</i>	4NQv 34LXt 61Tbux	13f 37X 52g 56pq 72rv 73w 77w
<i>Aratinga aurea</i>	2R 4Qvw 36MN 45e 46g 61tu 63x	13f 37X 46w 52g 66F 72lr 73w
<i>Nandayus nenday</i>	4N 34t 42e 54Rx 61u 63x 67Ft 68F	12T 37X 52g 56gpq 66F 71AH 72r 73wQk
<i>Pyrrhura devillei</i>	61Tbtu 63Rxx 67F	66F 72l 75w
<i>Pyrrhura molinae</i>	34LRst	34Q 73k
<i>Myiopsitta monachus</i>	2O 4Qvw 7w 10s 34KRXt 36N 42e 46g 54Rx 55H 67Ft 68F	4N 37X 62c 63c 64c 66F 69N 71AH 72rv 73wQm
<i>Forpus xanthopterygius</i>		46φ 48φ
<i>Brotogeris chiriri</i>	2KLRt 4Qvw 7w 28e 34NOX 36N 46g 54Rx 61btu 63OR 64PRx 67F	13f 37X 46w 52g 66F 72lr 73w
<i>Pionus menstruus</i>	2ALR 61b	73w
<i>Pionus maximiliani</i>	4Qw 10s 34KLRXt 35e 54R 61u 67Ft	37X 72rvw 73w
<i>Amazona xanthops</i>	46g	37X 72r 73w 77w
<i>Amazona aestiva</i>	2Rt 4NQw 13u 36LNt 45e 61TUetu 63x 65H 67Ft	12T 37X 52g 56Zpq 66F 71AHO 72rv 73wQ 75lr
<i>Amazona amazonica</i>	2AKLRtu 4Q 13S 63Rx	72lr 73w
Cuculidae		
<i>Coccyzus melacoryphus</i>	4N 34NX	37X 73w
<i>Coccyzus americanus</i>		34w 37X
<i>Piaya cayana</i>	4Q 34X 40H 61Tbtu 63R 64PRs 65H 67t 73e	37X 46g 72lr 73w
<i>Piaya minuta</i>	2AOR 61u 63R	72lrw 74w
<i>Crotophaga ani</i>	4Q 34X 61b 67Ft	37X 46g 52g 66F 72lr 73w
<i>Crotophaga major</i>	1A 2Rt 4N 10s 61Ybu 67Ft	37X 46g 71AH 72rv 73w
<i>Guira guira</i>	1A 4Q10s 34Xs 46g 61Tb 63R 67Ft	37X 52g 66F 71AH 72lr 73w
<i>Tapera naevia</i>	4w 34RX 56e 63R 64PR 67Ft	34N 37X 72lrw 73w
<i>Dromococcyx phasianellus</i>	4N 63R	13S 37X 73w
Tytonidae		
<i>Tyto alba</i>	67F	4Q 37X 72r 75I
Strigidae		
<i>Otus choliba</i>	34R 61tu 67Ft	37X 72lrw 73w
<i>Bubo virginianus</i>	4Q 10s 34N 67bFt	37X 71AH 72lrw 73w 74x
<i>Pulsatrix perspicillata</i>		56Z 72rvw

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Strigidae		
<i>Glaucidium hardyi</i>	1A	
<i>Glaucidium brasilianum</i>	4NQ 10s 34X 46g 61u 67F 68F	37X 52g 72rv 73w
<i>Speotyto cunicularia</i>		37X 66F 72r 77w
<i>Rhinoptynx clamator</i>	59H 67bFt	
<i>Asio stygius</i>		34w
Nyctibiidae		
<i>Nyctibius grandis</i>	1A 4w	37X 72rw
<i>Nyctibius griseus</i>		37X 72r
Caprimulgidae		
<i>Chordeiles pusillus</i>		72r 72w 74w
<i>Chordeiles acutipennis</i>		37μ
<i>Nyctiproge leucopyga</i>	34E 54H	72lrvw 73w
<i>Podager nacunda</i>	2R 10K 28e 48H 56be 67Ft 68F	4N 37X 66F 72rvw 73w
<i>Nyctidromus albicollis</i>	1A 4NQ 28e 34Rt 39H 48H 61btu 63R 67Ft	37X 72rvw 73w
<i>Nyctiphrynus ocellatus</i>		3B
<i>Caprimulgus rufus</i>	28e	37X 72l?rw 73w
<i>Caprimulgus maculicaudus</i>		72vw
<i>Caprimulgus parvulus</i>	2AO 4Q 34N 67F	37X 72rvw 73w
<i>Hydropsalis torquata</i>	2N 4Nw 10K 67Ft	37X 72rvw 73w
Apodidae		
<i>Chaetura meridionalis</i>		72rw
<i>Reinarda squamata</i>		3B
Trochilidae		
<i>Glaucis hirsuta</i>	2W 4N	72rw 74w
<i>Phaethornis eurynome</i>		49b 51n 52g
<i>Phaethornis pretrei</i>	2W 10O	37X 72lrvw 73w
<i>Phaethornis subochraceus</i>	4N 22N	72rvwQ
<i>Phaethornis nattereri</i>	1AO 2W 13RS	
<i>Phaethornis ruber</i>		72r
<i>Eupetomena macroura</i>	2Wt 4Q 10KO 13RS 34X 61tu 63x 67F 69N	37X 49bo 51n 52g 73w
<i>Anthracothorax nigricollis</i>	2W 4N 13RS 64PR	52g 73w
<i>Chrysolampis mosquitus</i>		72v
<i>Chlorostilbon aureoventris</i>	2OW 10KO 13Su 34NX 63R	37X 52g 73w
<i>Thalurania furcata</i>	2W 10KO 13RS 34t	37X 72rv 73w
<i>Hylocharis sapphirina</i>		37X 72rv?w

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Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Trochilidae (cont.)		
<i>Hylocharis chrysura</i>	2Wtu 4NQw 34KNXst 61bu 64PRx 67F 69N	4N 37X 49bo 51n 52g 66F 72r 73w
<i>Polytmus guainumbi</i>	1A 2OW 13RS 22N 34N 35H 40H	37X 49b 51n 52g 72rvw
<i>Amazilia versicolor</i>	2W 69N	13f 72rvw 73w
<i>Amazilia fimbriata</i>	1A 2O 4Q 7y 10KO 13RSu	37X 72rvw 73w
<i>Helimaster furcifer</i>	2Wtu	66F 72rw
<i>Calliphlox amethystina</i>	2Wu 4N	73w
Trogonidae		
<i>Trogon surrucura</i>		37X 72l
<i>Trogon curucui</i>	2AOR 4Q 13RS 28e 46g 48H 61Ybtu 67Ft	37X 46w 52g 56g 72lrv 73wQ
Alcedinidae		
<i>Ceryle torquata</i>	4Q 35e 61tu 67Ft	37X 46g 47g 66F 70X 72lrv 73wB
<i>Chloroceryle amazona</i>	2K 4Qw 10K 28e 34EX 41g 61tu 67Ft	37X 66F 72rv 73wB
<i>Chloroceryle americana</i>	4Qw 13RSs 22N 28e 34N 35e 61u 67Ft	37X 56gw 66F 72lrv 73wB
<i>Chloroceryle inda</i>		72rvw
<i>Chloroceryle aenea</i>	1A 4N 10s	34N 72rvw 74w
Momotidae		
<i>Momotus momota</i>	2At 34R 61bt 63R	72rv 73w 77w
Galbulidae		
<i>Brachygalba lugubris</i>	2R	73w 77w
<i>Galbula ruficauda</i>	2AR 4NQw 13RS 22N 28e 29y 34ENR 61bu 63R 69N	37X 41g 46g 52g 72rv 73w
Bucconidae		
<i>Nystalus chacuru</i>	1A	
<i>Nystalus striatipectus</i>	1AM 34DERX 46g 61TYbux 63Rx 64PRx	34X 37X 66F 72lr 73w
<i>Monasa nigrifrons</i>	1A 2ARt 13RS 28e 29e 34t 68F 69N	72rv 73w
Ramphastidae		
<i>Pteroglossus castanotis</i>	1A 2KR 4NQ 28e 34Rs 61bu 63R 68F 69N	37X 52g 71AH 72rv 73wQ
<i>Selenidera maculirostris</i>		79w
<i>Ramphastos vitellinus</i>	2A 28e	
<i>Ramphastos toco</i>	1A 2K 4NQw 10s 13RS 34R 42e 56b 60H 61Ttu 63R 64PR 65H 67Ft	12T 37X 46g 52g 56pq 66F 71AH 72rv 73wQ 75GMI
Picidae		
<i>Picumnus albosquamatus</i>	4NQ 10Ks 22N 29u 34NR 61u 63Rx 69N	37X 52g 56E 72rv 73w
<i>Picumnus cirratus</i>	61Ut 67Ft	
<i>Picumnus aurifrons</i>	1A	
<i>Colaptes campestris</i>	4b 10K 28e 67Ft	37X 46g 52g 56E 66F 72r 73w
<i>Colaptes melanochloros</i>	1AO 2A 4w 28e 34RXt 36N 54R 63Rx 67Ft 68F	37X 52g 56E 72r 73w

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Picidae (cont.)		
<i>Piculus chrysochloros</i>	34DFR 61tu 67Ft 69N	37X 52g 72rv 73w
<i>Celeus flavescens</i>	63x	37X 72r
<i>Celeus lugubris</i>	1A 2AR 4NQbw 10s 13S 28e 34RXtv 46g 56be 61Tbtu 63R 65H	37X 52g 56E 66F 72v 73w
<i>Celeus torquatus</i>	1AO	
<i>Dryocopus lineatus</i>	4NQb 28e 56b 61tu 63R	37X 46gh 47g 56E 72rv 73w 75G
<i>Melanerpes cruentatus</i>	1A 2A	
<i>Melanerpes candidus</i>	1A 46g 61Tbex 63R 64PRx 67Ft	13f 37X 46w 52g 56gEppq 66F 72lrv 73w
<i>Melanerpes cactorum</i>	56Zei	6U 56wEKQ
<i>Veniliornis passerinus</i>	1AO 2AR 4Qw 28e 34Xst 46g 48H 61btu 63R 64PR 67Ft 68F	37X 52g 56E 72lrv 73w
<i>Picoides mixtus</i>	63Rx 67Ft	
<i>Campephilus melanoleucos</i>	1A 2AR 4Qw 7y 28e 34R 61Tbtu 63R 64s 67Ft	37X 52g 56E 72lrvw 73w
<i>Campephilus leucopogon</i>	67ZFt	37X 46gh 66Q 73Q 75w 77w
Formicariidae		
<i>Taraba major</i>	4NQw 10s 13RS 14u 22N 28n 29n 34DERXst 40G 46g 61Ubtu 63R 64PR 67Ft 69N	37X 52g 66F 72rv 73w
<i>Thamnophilus doliatus</i>	2K 4Q 10s 13RS 28n 29n 34ENRXst 40G 46g 61bu 63R 64PRs 67Ft 69N	37X 66F 72rv 73w
<i>Thamnophilus sticturus</i>	34FORXs 64s 67Ft	37X 72r 74w 75w
<i>Thamnophilus caerulescens</i>	63R 67Ft	66F
<i>Dysithamnus mentalis</i>	2AOR 13RS 69N	72rv 73w
<i>Myrmotherula menetriesii</i>		74w
<i>Myrmorchilus strigilatus</i>	34X	72rv
<i>Herpsilochmus longirostris</i>	4N 10K 63R 69N	72rv 73w
<i>Formicivora rufa</i>	2K 4NQ 36N 46g 48G 61u 64PR	37X 52g 72rv 73w
<i>Formicivora grisea</i>		3α
<i>Formicivora melanogaster</i>		72l 73w
<i>Cercomacra cinerascens</i>	10s 22N 69N	73w
<i>Cercomacra melanaria</i>	2AK 4NQw 10K 13RS 22N 29n 34N 35G 40G 48G 54R 61bu 63R 69N	72rv 73wQ
<i>Pyriglena leuconota</i>	2R 13RS 34R	
<i>Hypocnemoides maculicauda</i>	2A 4Nw 13RS	13S 72v 74w
Conopophagidae		
<i>Conopophaga lineata</i>		72r 74w
Furnariidae		
<i>Furnarius rufus</i>	2K 4Qb 13RS 14u 28n 34Xt 46g 54G 61btu 64PRx 67Ft	37X 52g 66F 72lrv 73w
<i>Furnarius leucopus</i>	4Q 13RSx 34DX 39G 61u 64PR	34NX 66F 72rv 73w
<i>Schoeniophylax phryganophila</i>	4Qw 10s 34t 35n 61u 63Rx 67F 68F 69N	34N 37X 52g 66F 72rv 73w
<i>Synallaxis frontalis</i>	2K 4Q 10K 65G	72r 73w
<i>Synallaxis albescens</i>	1AO 67F?t	72l 73w

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Furnariidae (cont.)		
<i>Synallaxis albilora</i>	2A 4NQw 10K 13RSx 29n 34NRXt 36N 61bu 63Rx 67Ft 69N	37X 52g 66F 72rv 73wQ
<i>Synallaxis hypospodia</i>	34N 69N	72lrv 73w
<i>Poecilurus scutatus</i>		37X 73w
<i>Certhiaxis cinnamomea</i>	4w 34DRt 67Ft	37X 66F 72rv 73w
<i>Cranioleuca vulpina</i>	2A 4NQw 10s 35G 69N	72rv 74w
<i>Phacellodomus rufifrons</i>	2K 4Nw 10Ks 34RX 35n 46g 61Tbtu 63Rx 64PRx 67Ft	13S 62c 63c 64c 66F 72rv 73w
<i>Phacellodomus ruber</i>	2A 34DXt 61u 63R 69JN	4N 34N 37X 52g 62c 63c 64c 66F 72rv 73w
<i>Anumbius anumbi</i>	67Ft	66F
<i>Pseudoseisura unirufa</i>	2A 4NQw 10s 13Sx 28n 34DNt 36N 59G 68F 69N	13f 37X 52g 66F 72rv 73w
<i>Philydor dimidiatus</i>		73w
<i>Hylocryptus rectirostris</i>		72rw 73w
<i>Xenops minutus</i>		74w
<i>Xenops rutilans</i>	2A 28n	72r
Dendrocolaptidae		
<i>Sittasomus griseicapillus</i>	34X 61bu 63Rx 65G 67Ft	37X 66F 72rv 73w
<i>Glyphorhynchus spirurus</i>		74w
<i>Xiphocolaptes major</i>	1A 4w 10s 34RXt 46g 61btux 63Rx 67Ft	34Q 37X 52g 66F 72lrvw 73w
<i>Dendrocolaptes picumnus</i>	13RS 34RX 61tu 64s 67t	37X 52g 72rv
<i>Xiphorhynchus picus</i>	1A 2A 4NQ 10s 28n	72rv 73w
<i>Xiphorhynchus guttatus</i>	2At 4N 13RS 34R	37X 72rv 73w
<i>Lepidocolaptes angustirostris</i>	1A 4w 28n 34DEORX 35n 36N 39G 46g 61Tbtu 63R 64PRx 67Ft	37X 52g 66F 72lrv 73w
<i>Lepidocolaptes albolineatus</i>		74w
<i>Campylorhamphus trochilirostris</i>	2R 4NQ 10s 28n 29n 34DFORXst 35G 36N 39G 46g 61u 63Rx 67Ft 68F	37X 52g 56g 66F 72rv 73w
Tyrannidae		
<i>Camptostoma obsoletum</i>	2K 4Q 10K 34X 61Vb 67Ft	37X 66F 72rv 73w
<i>Phaeomyias murina</i>	2K 10K 34X 61bt	66F 72rv 73w
<i>Sublegatus modestus</i>	2K 4Q 34X 63V 64PV 67Ft	37X 52g 66F 72v
<i>Suiriri suiriri</i>	34X 61V 63V 67Ft	66F
<i>Myiopagis viridicata</i>	4N 61Vt	72r
<i>Myiopagis gaimardii</i>	13S 61V	72rvw
<i>Elaenia flavogaster</i>	2K 10K 35n 61Y 63V	13f 37X 72r 73w
<i>Elaenia spectabilis</i>	34NV	72v
<i>Elaenia chiriquensis</i>	13V	73w
<i>Serpophaga subcristata</i>	65G 67F?t	37X 66F 72rw 73w
<i>Inezia inornata</i>	34X 61V 63V	72v
<i>Polystictus pectoralis</i>		50π

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Tyrannidae (cont.)		
<i>Pseudocolopteryx</i> sp.		72v
<i>Euscarthmus meloryphus</i>	4w 34X 63s 64PV	37X 72lrv 73w
<i>Leptopogon amaurocephalus</i>	61V	72rv
<i>Corythopsis delalandi</i>	2A69N	73w
<i>Hemitriccus striaticollis</i>	2AOV 4N 13S 64s	72rv 74w
<i>Hemitriccus margaritaceiventer</i>	2K 4NQ 13SV 34FVXt 36N 46g 61Vt 63V 64PV 65G 67Ft 69N	37X 66F 72rv 73w
<i>Todirostrum cinereum</i>	1A 2K 4Qw 22N 34COX 35G 63V 67Ft 69N	4N 34N 72rv 73w
<i>Todirostrum latirostre</i>	4NQ 13SV 34NX 61V 64PV 69N	37X 72rv 73w
<i>Tolmomyias sulphurescens</i>	4NQ 13SV 34Xt 46g 61Vb 63V 67Ft	37X 66F 72rv 73w
<i>Myiobius barbatus</i>		72l 74w
<i>Myiophobus fasciatus</i>	4w 10K	72rv 73w
<i>Contopus cinereus</i>		37X 72r
<i>Lathrotriccus eulerei</i>	4N 69N	37X 52g 72rv 73w
<i>Cnemotriccus fuscatus</i>	2K 4NQ 13SV 34NX 61V 65G 69N	37X 52g 72rvw 74w 75w
<i>Pyrocephalus rubinus</i>	2K 4Q 10K 13SV 14u 28n 34AEVX 46g 54V 61Vt 64PV 67Ft 68F	14X 37X 52g 66F 72rv 73wQ
<i>Xolmis cinerea</i>	34X 64PV 67Ft	66F 72l 73w
<i>Xolmis irupero</i>	34X 56n 61TVt 63V 67Ft	37X 66F 72r
<i>Xolmis velata</i>	4w 10s 46g 61Vt 63V 67Ft 69N	37X 66F 72lrv 73w
<i>Knipolegus hudsoni</i>	4Q	4Q
<i>Knipolegus striaticeps</i>	34OXy	34Q
<i>Fluvicola albiventer</i>	2K 4Q 13S 34CEFNVX 67Ft 68F	37X 46g 66F 72rv 73w
<i>Arundinicola leucocephala</i>	2K 34CN 36N 64PV 67Ft 68F	4N 37X 46g 66F 72lrv 73w
<i>Colonia colonus</i>		72l 73w
<i>Alectrus risora</i>	67Ft	
<i>Gubernetes yetapa</i>	63V	64P 66F
<i>Satrapa icterophrys</i>	34N 67Ft 69N	37X 72rvw 73w
<i>Hirundinea ferruginea</i>		74w 75w
<i>Machetornis rixosus</i>	4w 13SV 28n 34X 41g 46g 64PV 67Ft 69N	13f 34N 37X 52g 66F 72rv 73w
<i>Attila bolivianus</i>	2A 4N 13SV	72rv 73w 74Q
<i>Casiornis rufa</i>	4Q 13SV 28n 34VXs 46g 61Vt 63V 67Ft	37X 66F 72rv 73w
<i>Sirystes sibilator</i>		72l 73w
<i>Myiarchus ferox</i>	4NQ 34NX 35G 39G 40G 61Tt 63V 64P 67t 69N	37X 52g 72rv 73w
<i>Myiarchus tyrannulus</i>	2u 4Qw 34VXt 46g 61TVt 63V 65G 67Ft	37X 52g 66F 72lrv 73w
<i>Myiarchus swainsoni</i>	34X 41g 64V	37X 52g 72l 73w
<i>Philohydor lictor</i>	4w	72lrv 73w
<i>Pitangus sulphuratus</i>	4NQw 13SV 34NXs 36N 39G 61t 63V 64PV 67Ft 69N	13f 37X 46g 52g 62c 63c 64c 66F 72rv 73w
<i>Megarynchus pitangua</i>	2K 4N 13SV 34X 61t 67Ft	37X 52g 72rv 73w
<i>Myiozetetes cayanensis</i>	4NQ 13SV 22N 34X 61U	52g 66F 72rv 74w

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Tyrannidae (cont.)		
<i>Myiozetetes similis</i>	28n 61b	72rw
<i>Conopias trivirgata</i>		56φ
<i>Myiodynastes maculatus</i>	13SV 34KV 46g 61Vbt 63V 67Ft	37X 72r 73w
<i>Legatus leucophaeus</i>	4N 46g 61Vb	22N 37X 72rv 73w
<i>Empidonomus varius</i>	13S 61Ut 63V	37X 52g 72lv 73w
<i>Griseotyrannus aurantioatrocristatus</i>	2V 34V 40G 63V 67Ft	37X 72l 73w
<i>Tyrannus savana</i>	2Kt 4Qb 34V 65G 67Ft	37X 72lr 73mw
<i>Tyrannus melancholicus</i>	4Q 7w 34Xs 54G 61Tt 67Ft 69N	34N 37X 52g 66F 72rv 74w 76w
<i>Tyrannus albogularis</i>		72v
<i>Pachyramphus viridis</i>	2K 34DXs 35G 61V 63V 64PV 67Ft	52g 66F 72rv 73w
<i>Pachyramphus polychopterus</i>	4N 34NXs 61Vbt	37X 52g 72rv 73w
<i>Tityra cayana</i>	34NV 60G 61t	37X 46g 72rv 73w
<i>Tityra semifasciata</i>	1A	
<i>Tityra inquisitor</i>	2V 34DX 61Tbt	72lrwv 73w
Pipridae		
<i>Pipra fasciicauda</i>	2AOV 4NQ 13SV 34V	
<i>Antilophia galeata</i>	4N 13SV 61t	72rv
<i>Chiroxiphia caudata</i>		56φ
Cotingidae		
<i>Cephalopterus ornatus</i>	1A 2A	74w
<i>Gymmoderus foetidus</i>	1AO 2At 4N	74w
Hirundinidae		
<i>Tachycineta albiventer</i>	4w 28n 35n 41g 68F	37X 72rv 73w
<i>Tachycineta leucorrhoa</i>	67Ft	72rv
<i>Phaeoprogne tapera</i>	1A 4N 31B 34BKN 35G 36N 61Ut 64s 67Ft 69N	10k 37X 66F 72rv 73w
<i>Progne chalybea</i>	1A 10K 14u 29n 34K 41g 61b 67Ft	10kw 37X 66F 72rv
<i>Progne subis</i>	10s	10k 72rvw
<i>Notiochelidon cyanoleuca</i>	4Q	
<i>Stelgidopteryx ruficollis</i>	1A 4NQ 34X 35G 64PV 67Ft	66F 72rv 73w
<i>Riparia riparia</i>	1A 35n	73Q
<i>Hirundo rustica</i>	34B	72rvw 74w 75w
<i>Hirundo pyrrhonota</i>		72v
Corvidae		
<i>Cyanocorax cyanomelas</i>	1A 2Vt 4Q 13SV 28n 34VXst 46g 61TUVYbt 64PV 67Ft	12T 37X 52g 66F 72lr 73wQ
<i>Cyanocorax cristatellus</i>		72r
<i>Cyanocorax chrysops</i>	34BXst 46g 61TUVYb 63V 67Ft	37X 46w 52g 66F 71AH 73w

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Troglodytidae		
<i>Campylorhynchus turdinus</i>	2V 4NQw 10s 13SV 28n 29n 31B 34NVXst 36N 46g 61TV 63V 64PV 67Ft 69N	13S 34X 37X 52g 66F 72rv 73wQ
<i>Donacobius atricapillus</i>	4Qw 13SV 22N 34BEr 40G 63V 67Ft	37X 66F 72rv 73w
<i>Thryothorus genibarbis</i>	2KV 4NQ 13SV	72rv 74w
<i>Thryothorus leucotis</i>	2K 4NQ 13SV 34Es 69N	37X 72rv 73w
<i>Thryothorus guarayanus</i>	34NVX 41g	73w
<i>Troglodytes aedon</i>	10K 34X 67Ft	37X 66F 72lv 73w
Muscicapidae		
<i>Polioptila dumicola</i>	2Ku 4Q 10s 13SV 28n 34BXt 46g 61Vbt 63Vx 64PVx 67Ft 69N	37X 66F 72rv 73w
<i>Turdus rufiventris</i>	4Q 34NX 61TUVYt 63V 64PV 67Ft	13f 37X 52g 66F 72lr 73w
<i>Turdus leucomelas</i>		13f 52g 66F 72r 74w 75w
<i>Turdus amaurochalinus</i>	10w 29n 34X 54G 61Tt 63V	37X 52g 66F 72lr 73w
Mimidae		
<i>Mimus saturninus</i>	4Q 10s 34t 46g 64PVs	37X 66F 72lr 73w
<i>Mimus triurus</i>	4Q 13SV 29n 34VX 54V 67Ft	66F 75w
Motacillidae		
<i>Anthus lutescens</i>	10s 29n 34Bt 56bn 67Ft	37X 66F 72lr 73w
Vireonidae		
<i>Cyclarhis gujanensis</i>	4Qw 10Ks 29n 34FX 46g 61Vbt 63Vx 64PV 65G 67Ft	37X 52g 66F 72lr 73w
<i>Vireo chivi</i>	2K 10K 13S 34t 61Vb 63V 64s	37X 72r 73w
<i>Hylophilus poicilotis</i>	35G 39G	
<i>Hylophilus pectoralis</i>	2A 13SV	72lrw 73w
Emberezidae		
<i>Parula pitiayumi</i>	2K 4Q 34X 61V 63V 64PV 67Ft	37X 66F 72lr 73w
<i>Geothlypis aequinoctialis</i>	4Qw 34BVX 67Ft	37X
<i>Basileuterus flaveolus</i>	2K 64PV 67Ft	4N 37X 72rvw 73w
<i>Basileuterus culicivorus</i>	13S 61Vt 63x 64PV	37X 72lr 73w
<i>Oporornis agilis</i>	69N	
<i>Coereba flaveola</i>	2K 4Q 10K 64PV	13f 37X 52g 72rv 73w
<i>Cypsnagra hirundinacea</i>		56φ 58φ
<i>Cissopis leveriana</i>		3♂
<i>Thlypopsis sordida</i>	4Q 10K 34N 61b	72r 73w
<i>Hemithraupis guira</i>	61Vb 63V	73w
<i>Nemosia pileata</i>	2V 10s 34BX 61Vbt	37X 72rv 73w
<i>Eucometis penicillata</i>	2AOV 4N 13S 28n 61Vt 69N	37X 72rvw 73w

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Emberezidae (cont.)		
<i>Tachyphonus nattereri</i>	2AO	2Q
<i>Tachyphonus coronatus</i>	61b	
<i>Tachyphonus rufus</i>	2V 13SV 61b 63V 67Ft	13f 66F 72lr 73w
<i>Piranga flava</i>	34w 64PV 67Ft	
<i>Ramphocelus carbo</i>	2AV 4NQw 13S 14u 22N 28n 34VX 35G 36N 46g 61Vbt 63V 64PVs 69N	13f 37X 52g 66F 72rv 73w
<i>Thraupis sayaca</i>	4Q 14u 28n 34EVXs 41g 61TUVbt 63V 64PVs 67Ft	13f 37X 46g 52g 66F 72lrv 73w
<i>Thraupis palmarum</i>	2AKVt 28n	13f 37X 46g 52g 72lrv 73w
<i>Euphonia chlorotica</i>	4NQ 10K 34NX 61t 68F	13f 37X 66F 72rv 73w
<i>Euphonia violacea</i>		72rw
<i>Tangara cayana</i>	13S	72v
<i>Dacnis cayana</i>		2α 56φ 58φ
<i>Cyanerpes caeruleus</i>		2α
<i>Conirostrum speciosum</i>	2V 34BOX 61V 64PV 68F 69N	37X 72rvw 73w
<i>Tersina viridis</i>	67F	
<i>Zonotrichia capensis</i>	10K 67Ft	66F 72r 73w
<i>Ammodramus humeralis</i>	2K 10K 34st 67Ft 68F	37X 52g 66F 72rv 73w
<i>Poospiza melanoleuca</i>	65G 67Ft	34w 66F
<i>Sicalis citrina</i>		72rw
<i>Sicalis columbiana</i>		72lrv
<i>Sicalis flaveola</i>	2K 4NQ 10K 14u 29w 34Et 36N 54x 61b 63Vx 64PVx 67Ft 68F	14X 37X 66F 72rv 73wQ
<i>Sicalis luteola</i>	41g	78w
<i>Emberizoides herbicola</i>	2V 61b	72r
<i>Volatinia jacarina</i>	4Qw 34X 61V	37X 52g 66F 72rv 73w
<i>Sporophila plumbea</i>		72rw
<i>Sporophila collaris</i>	2Kn 4NQb 29u 34BV 36N 46g 63s 67Ft 68F	37X 52g 72rv 73w
<i>Sporophila lineola</i>	22N	72r 73w
<i>Sporophila caeruleascens</i>	4N 13SV 34E 67Ft	37X 66F 72rv 73w
<i>Sporophila leucoptera</i>	2K 4Qw 13S 34BN 40G 54V 63Vx 64PVx 67Ft 69JN	37X 66F 72rv 73w
<i>Sporophila bouvreuil</i>	54V	72lrv 76w
<i>Sporophila hypoxantha</i>	4N 68F	34N 73w
<i>Sporophila cinnamomea</i>		66F
<i>Oryzoborus maximiliani</i>		72l 74w
<i>Oryzoborus angolensis</i>	4N 7w 13SV 22N	52g 66F 72rv 73w
<i>Tiaris fuliginosa</i>		72l 73w
<i>Arremon flavirostris</i>	2Ku 13SV 34FX 61Vt 63Vx 67Ft	72rv 74w 75w
<i>Coryphospingus cucullatus</i>	2K 4NQ 7w 34Xt 46g 56bn 61bt 64P 67Ft	13f 37X 52g 66F 72rv 73w
<i>Paroaria coronata</i>	4NQ 10s 34VX 46g 56b 67Ft	37X 66F 72lrv 73wQ 77w
<i>Paroaria capitata</i>	1A 2AK 4NQw 10s 13S 14u 22N 31B 34BKNVXt 35n 46g 54V 61UVbt 63Vsx 67Ft 69N 10w 13f 14X 37X 46w 52g 66F 72rv 73wQ	

Continued

Appendix I. Continued.

Families/Species	Localities/Sources	
	Specimens collected	Specimens not collected
Emberezidae (cont.)		
<i>Saltator maximus</i>		2 α
<i>Saltator similis</i>	65G 67 Ft	37X 72lrw 73w
<i>Saltator coerulescens</i>	2K 4NQw 10Ks 13SV 22N 28n 34ENVX 46g 60G 61TVbt 63V 67 Ft 68F 69N	13f 37X 46w 52g 66 F 72lrv 73w
<i>Saltator aurantirostris</i>	34F	75w
<i>Saltator atricollis</i>	34t 46g	37X 72lr 73w
<i>Passerina brissonii</i>	4Q 63V 64PV	73w
<i>Porphyrospiza caerulescens</i>		34w 74w
<i>Pheucticus aureoventris</i>	2A 4Q 63V	2Q 63Q 72rvw
<i>Psarocolius decumanus</i>	2V 4Q 10s 34VX 42n 46g 61VYbt 63V	13f 37X 52g 66 F 71AH 72rv 73w
<i>Cacicus cela</i>	2AV 4Q 13S 28n 34V 69N	13f 72rv 73w
<i>Cacicus haemorrhous</i>		72r
<i>Cacicus chrysopterus</i>	56bgn 61V 63V 67 Ft	66 F 72l 75w
<i>Cacicus solitarius</i>	2t 4Qw 13S 22N 28n 34BEVX 61Vb 63V 67 Ft	4N 37X 52g 72rv 73w
<i>Icterus cayanensis</i>	2KV 4Qw 7w 10Ks 13SV 28n 34BEVXstv 46g 54V 61VYbt 63V 64PV 67 Ft	4N 13f 34N 37X 46w 52g 66 F 72rv 73w
<i>Icterus jamacaii</i>	4NQw 10s 13SV 28n 31B 34ENVt 46g	13f 37X 46w 52g 72rv 73w
<i>Agelaius cyanopus</i>	4NQbn 22N 34BNVX 36N 46g 56n 67 Ft	37X 52g 72rv 73w
<i>Agelaius ruficapillus</i>	36N	
<i>Leistes superciliaris</i>	1A 4Qbn 67 Ft	37X 66 F 72rv
<i>Amblyramphus holosericeus</i>	4bn 34Vs 36N 67 Ft 68F	37X 72rv 73wQ
<i>Gnorimopsar chopi</i>	34t 36N 56n 61Vt 67 Ft	4N 13f 37X 52g 56pq 66 F 72lrv 73w
<i>Molothrus badius</i>	4Q 22N 28n 61Vt 67 Ft	10w 37X 66 F 72rv 73w
<i>Molothrus rufoaxillaris</i>	67 F	66 F
<i>Molothrus bonariensis</i>	4NQ 13S 34VX 61Tt 64PV 67 Ft	10w37X 66 F 72rv 73w
<i>Scaphidura oryzivora</i>	1A 13S	37X 66 F 72lv 73wQ
<i>Dolichonyx oryzivorus</i>	34BN	73ow
Fringillidae		
<i>Carduelis magellanicus</i>	61TVb 64PV 67 Ft	66 F
Passeridae		
<i>Passer domesticus</i>		72vw

Appendix 2. List of the 50 species mentioned in the literature but not included in the checklist of the Pantanal wetland because their records presented uncertainties. Further details on each category can be found in the discussion.

Species	Locality of record	Reference
Category I		
<i>Buteo brachyurus</i>	Corumbá	Pinto (1938, 1964)
<i>Spizaetus tyrannus</i>	Cáceres	Pinto (1938, 1964)
<i>Falco peregrinus</i>	Cáceres	Ménégaux (1917), Naumburg (1930)
<i>Columba speciosa</i>	Cáceres	Pinto (1938)
<i>Propyrrhura maracana</i>	Aquidauana	Pinto (1932, 1938), MCZ
<i>Colibri serrirostris</i>	Cáceres	Ruschi (1955)
<i>Lophornis gouldii</i>	Cáceres	Ruschi (1955)
<i>Thalurania glaucopis</i>	Aquidauana	Pinto (1932, 1938)
<i>Amazilia chionogaster</i>	Cáceres	Ruschi (1955)
<i>Heliactin cornuta</i>	Cáceres	Ruschi (1955), MNRJ
<i>Heliomaster longirostris</i>	Cáceres	Ruschi (1955)
<i>Trogon melanurus</i>	Cáceres	Pelzeln (1870), Pinto (1938)
<i>Trogon viridis</i>	Cáceres	Pelzeln (1870)
<i>Trogon collaris</i>	Cáceres	Pelzeln (1870), Naumburg (1930)
<i>Nonnula ruficapilla</i>	Cáceres	Pelzeln (1870), Naumburg (1930), Pinto (1938)
<i>Piculus leucolaemus</i>	Cáceres	MZUSP
<i>Veniliornis affinis</i>	Cáceres	Pelzeln (1870)
<i>Thamnophilus amazonicus</i>	Cáceres	Pelzeln (1870)
<i>Myrmotherula axillaris</i>	Cáceres	Pelzeln (1870)
<i>Herpsilochmus atricapillus</i>	Corumbá	Pinto (1948)
<i>Myrmeciza atrothorax</i>	Cáceres	Pelzeln (1870), Naumburg (1930), Pinto (1938)
<i>Hypocnemis cantator</i>	Cáceres	Pelzeln (1870)
<i>Hylophilax poecilinota</i>	Cáceres	Pelzeln (1870), Naumburg (1930)
<i>Ramphotrigon ruficauda</i>	Cáceres	Pelzeln (1870)
<i>Platyrrhynchus mystaceus</i>	Aquidauana	Pinto (1932, 1944)
<i>Attila phoenicurus</i>	Corumbá	Pinto (1948)
<i>Myiarchus tuberculifer</i>	Cáceres	Pelzeln (1870)
<i>Xenopsaris albinucha</i>	Corumbá	Pinto (1948)
<i>Schiffornis turdinus</i>	Cáceres	Pelzeln (1870)
<i>Tachyphonus luctuosus</i>	Cáceres	Pelzeln (1870), Naumburg (1930)
<i>Euphonia lanirostris</i>	Cáceres	Pelzeln (1870)
Category II		
<i>Penelope obscura</i>	Faz. São José do Piquiri	Aguirre and Aldrichi (1983)
<i>Hydropsalis climacocerca</i>	Faz. São José do Piquiri	Aguirre and Aldrichi (1983)
<i>Piculus aurulentus</i>	Salobra	Schubart et al. (1965)
<i>Campephilus robustus</i>	Salobra	Travassos et al. (1957)
<i>Pyriglena leucoptera</i>	Salobra	Moojen et al. (1941)
<i>Xiphocolaptes albicollis</i>	Faz. São José do Piquiri	Aguirre and Aldrichi (1987)
<i>Myiopagis flavivertex</i>	Salobra	Schubart et al. (1965)

Continued

Appendix 2. Continued,

Species	Locality of record	Reference
<i>Category III</i>		
<i>Botaurus pinnatus</i>	Transpantaneira	Brown (1986), Antas (1994)
<i>Ixobrychus involucris</i>	Transpantaneira	Brown (1986)
<i>Accipiter poliogaster</i>	Transpantaneira	Brown (1986)
<i>Rallus maculatus</i>	Pantanal	Antas (1994)
<i>Charadrius semipalmatus</i>	Pantanal	Antas (1994)
<i>Larus cirrocephalus</i>	Transpantaneira	Brown (1986)
<i>Asio flammeus</i>	Transpantaneira	Brown (1986)
<i>Sporophila nigrorufa</i>	Corumbá	Salvadori (1895)
	Transpantaneira	Willis and Oniki (1990)
<i>Category IV</i>		
<i>Opisthocomus hoazin</i>	Rio Paraguai or Cuiabá	Brown (1986)
<i>Category V</i>		
<i>Phaethornis gounellei</i>	Descalvados and Faz. São João	Naumburg (1930)
<i>Taphrospilus hyposticus</i>	Cáceres	Sick (1997)
<i>Elaenia parvirostris</i>	Santo Antônio	Pinto (1940)

Category I - birds recorded in municipalities harbouring wetlands and highlands, followed by lack of precise descriptions of the locality of collection; Category II - skins probably wrongly identified (see discussion); Category III - records not confirmed by the respective authors; Category IV - record with lack of precision describing the locality of collection; Category V - birds wrongly identified, as confirmed by posterior publications (see discussion).