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Bird diversity and conservation in the southern coast of Santa Catarina state, Brazil

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Abstract. Coastal lagoons and their surrounding habitats often harbour high biodiversity and some of the most threatened ecosystems in the world. However, in the Neotropics the biodiversity is often poorly described, lacking even inventories of species which therefore limits the assessment of threats and the stablishment of efficient conservation measures. We present here lists of bird species recorded at ten sites along the under-studied coastal lagoons of southern Santa Catarina, Brazil, collected mainly from October 2012 to March 2018. We present quantitative data for endemic and threatened species, identify migratory status and highlight distributional novelties. In total, we recorded 229 species encompassing 63 families, including twelve species of conservation concern, 11 endemic to the Atlantic Forest or Pampas zoogeographical provinces and 38 migrants. We provide new records of seven rare species in Santa Catarina (*Larus atlanticus, Calidris pusilla, Aramides ypecaha, Bubo virginianus, Limnornis curvirostris, Phacellodomus ferrugineigula* and *Pseudocolopteryx flaviventris*) and report the first evidence of occurrence of *Schoeniophylax phryganophilus* for the State. Based on our findings, we discuss the regional diversity and conservation of the avifauna.

Key-Words. Species list; Coastal lagoon; Inventory; Species richness; Threatened species.

INTRODUCTION

Coastal lagoons and their surrounding environments frequently form complex mosaics of aquatic and terrestrial ecossystems that harbor high biodiversity (Esteves *et al.,* 2008). The high productivity of such wetlands provides essencial ecosystemic services to humankind such as water supply and fishing resources (Esteves *et al.,* 2008). One of the largest complex of lagoons in the Neotropical region is found in the southern coast of Brazil, ranging from southern Santa Catarina state to southern Rio Grande do Sul state (Burger, 1999). This landscape was created by sea movements within the last 7,000 years and currently includes lagoons associated with a diverse range of habitats as estuaries, mangroves, grasslands, wetlands, *restingas* and lowland forests (Burger, 1999; Tomazelli & Villwock, 2005). These ecosystems have been intensively modified in southern Brazil due to human occupation, agriculture, pollution, and introduction of exotic species (Esteves *et al.,* 2008).

Along with many other types of wetlands, lagoons are amongst the most threatened Neotropical ecosystems and are considered as "extreme priority" for conservation and further research (Burger, 1999; Guadagnin & Laidner, 1999; MMA, 2002, 2007; Burger & Ramos, 2007; Esteves *et al.,* 2008). Indeed, this region plays a crucial role for bird conservation as it encompasses one of the highest concentrations of aquatic birds in Brazil and is wintering ground for a number of Nearctic and Neotropical migratory species (Schott & Carbonell, 1986; Bencke *et al.,* 2006; Valente *et al.,* 2011). Despite this importance, most bird inventories or related studies are from the southern portion of these wetlands (*i.e.,* Rio Grande do Sul state: Belton, 1994; Nascimento, 1995; Mähler-Jr. *et al.,* 1996; Guadagnin *et al.,* 2005; Bencke *et al.,* 2007; Guadagnin & Maltchik, 2007; Guadagnin *et al.,* 2009; Harrison *et al.,* 2013; Vizentin-Bugoni *et al.,* 2015; Dias *et al.,* 2016), while the northern portion is poorly sampled (*i.e.,* southern Santa Catarina state: Rosário-Bege & Marterer, 1991; Guadagnin & Laidner, 1999).

Ornithological surveys on the coastal lagoons of southern Santa Catarina were pioneered by the French naturalist August de Saint-Hilaire in 1820, who made relevant contributions such as

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Table 1. Study sites in the southern coast of Santa Catarina state, Brazil, with details on coordinates, size, sample effort, periodicity and habitats sampled (be = beach, cf = cultivated field, ex = plantation of exotic trees – eucalyptus or pinus, fo = lowland forest, la = coastal lagoon, ma = marsh with stands of emergent macrophytes, ng = native grassland, om = open marsh, pa = pasture, sr = shrubby *restinga,* ua = urban area).

Locality, Municipality	Central coordinates	Surveyed area	Effort	Period	Habitat
1. Lagoa da Urussanga Velha, Balneário Rincão	28°46′45″S, 49°12′39″W	0.80 km^2	28 h	Jun. and Jul. 2013, Dec. 2015, Jan. 2016, Nov. 2016, Jan. 2017	ar, fo, la, ma, ng, om, pa
2. Praia do Rincão, Balneário Rincão	28°52′00″S, 49°16′20″W	4.75 km^2	70 h	Oct. 2012, Feb. 2014 to Jan. 2015, Dec. 2015, Jan. 2016, Ago. 2016, Jan. and Mar. 2018	ar, be, cf, ex, la, ma, ng, om, pa, ua
3. Lagoa do Rincão/Jacaré, Balneário Rincão	28°49′22″S, 49°14′43″W	2.8 km^2	15 h	Oct. 2012 to Jan. 2013, Aug. 2013, Oct. 2013, Jan. 2016, Jan. 2017	ar, ex, la, ma
4. Foz do Rio Araranguá, Araranguá	28°53′33″S, 49°18′30″W	3.2 km^2	30 h	Feb. 2014 to Jan. 2015, Dec. 2015,	ar, be, ex, la, ma, ng
5. Praia dos Golfinhos, Balneário Arroio do Silva	28°59′44″S, 49°26′26″W	2.8 km^2	20 h	Dec. 2013	ar, cf, ex, ma, ng, om, pa
6. Lagoa do Caverá, Araranguá/Sombrio	29°02′38″S, 49°33′34″W	3.0 km^2	14 h	Dec. 2013, Mar. and Jul. 2016	fo, la, ma, om, pa
7. Furnas – Lagoa do Sombrio, Sombrio	29°07′39″S, 49°39′42″W	1.2 km^2	15 h	Mar., Apr. and Jun. 2015	cf, fo, la, ma, om, pa, ua
8. Rio Novo – Lagoa do Sombrio, Balneário Gaivota	29°09′56″S, 49°39′08″W	0.36 km^2	44 h	Feb. to Apr. 2015, Jun. to Aug. 2015, Jul. 2016	ar, cf, la, ma, ng, om, pa
9. Anita Garibaldi – Lagoa do Sombrio, Balneário Gaivota	29°10′38″S, 49°39′56″W	0.28 km^2	30 h	Sep. to Dec. 2014, Jul. 2015	ar, cf, fo, la, ma, om, pa
10. Morro dos Macacos, Passo de Torres	29°14′45″S, 49°43′39″W	1.9 km^2	8 h	Mar. and Aug. 2015	fo, la, ma, pa

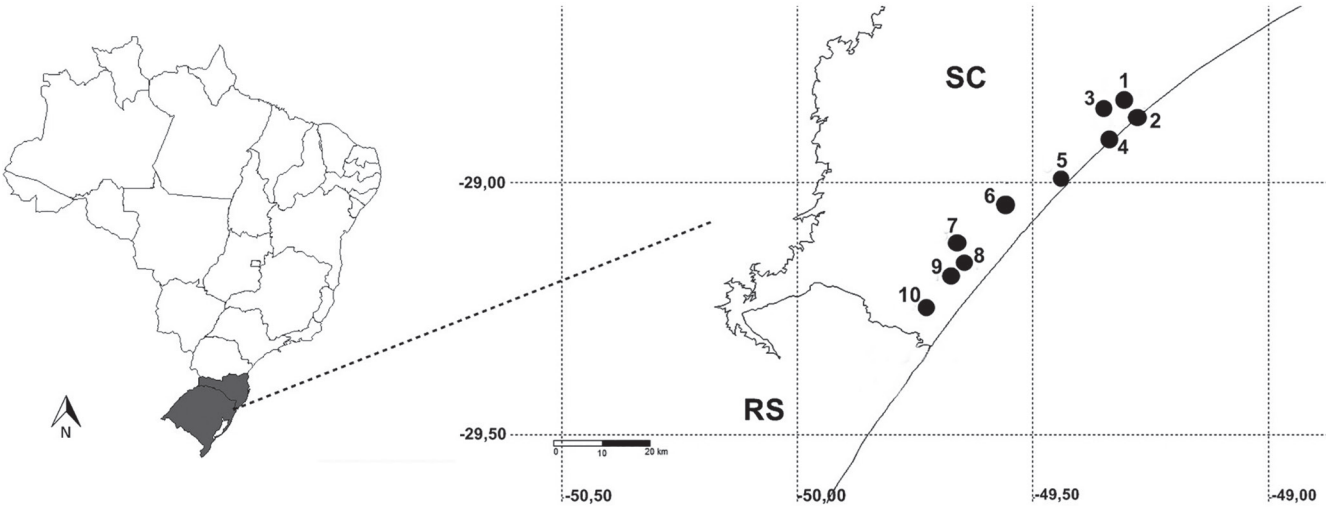

Figure 1. Localities surveyed in the southern coast of Santa Catarina state, Brazil. (1) Lagoa da Urussanga Velha; (2) Praia do Rincão; (3) Lagoa do Rincão/Jacaré; (4) Foz do Rio Araranguá; (5) Praia dos Golfinhos; (6) Lagoa do Caverá; (7) Furnas; (8) Rio Novo; (9) Anita Garibaldi; (10) Morro dos Macacos.

collecting the holotype of *Sterna hirundinacea* Lesson, 1831 in Laguna (Carlos & Voisin, 2013) and recording an enigmatic and unidentified blue macaw in Imbituba (Straube, 2010). After Saint-Hilaire, some few naturalists visited the region to collect specimens which are roughly listed in classical catalogues (*e.g.,* Hellmayr, 1936, Pinto, 1938). Later surveys in such area include broad-scale inventories with overall descriptions of the species and their distribution, which are to date the most complete studies on the avifauna for the southern coast of Santa Catarina (Rosário-Bege & Marterer, 1991; Rosário, 1996). However, comprehensive studies are still missing for the last three decades, when the region experienced fast increasing habitat modification (Guadagnin & Laidner, 1999). The few recent studies include bird inventories in beaches and islands in Laguna (Silva, 2003) and in the microbasin of the Ibiraquera lagoon (Piacentini & Campbell-Thompson, 2006), and shorebirds censuses near the mouth of the Araranguá river (Branco *et al.,* 2004). Additionally, several recent records of single or few species have been reported for the region (Azevedo & Ghizoni-Jr., 2005; Piacentini *et al.,* 2006, 2009; Amorim & Piacentini, 2006, 2007; Ghizoni-Jr. & Azevedo, 2010; Willrich *et al.,* 2015).

Here we carried out bird inventories in ten sites in the southern coast of Santa Catarina. We provide a qualitative checklist of birds, highlighting endemic and Nearctic, Austral and Neotropical migrants and provide data on habitats, abundances and sites of occurrence for threatened, novel and poorly known species for Santa Catarina. Based on our findings we discuss the importance of the region for bird conservation.

MATERIALS AND METHODS

Study area

The entire coastal region of southern Santa Catarina state extends from the municipalities of Garopaba to Passo de Torres, in the border with Rio Grande do Sul state (Guadagnin & Laidner, 1999). In this study, we in-

ventoried areas in the so called 'Complexo Lagunar de Sombrio' (*sensu* Burger, 1999; Guadagnin & Laidner, 1999) which is a mosaic of wetlands ranging from 'Barra do Camacho' in the municipality of Jaguaruna (28°36'55"S, 48°51'30"W) to Mampituba river in Passo de Torres (29°19'29"S, 49°42'46"W) (Fig. 1) (Table 1). In total, this region encompasses c. 25 lagoons, including Sombrio (50.6 km^2 of water surface), Caverá (3.50 km^2), Jaguaruna (3.25 km^2), Esteves (2.90 km^2) and Urussanga Velha (2.35 km^2) lagoons (Rosário-Bege & Marterer, 1991).

The original landscape in this region was composed by mosaics of lowland forests, wetlands, *restingas,* grasslands, lagoons and oceanic sandy beaches (Teixeira *et al.,* 1986; Guadagnin & Laidner, 1999) (Fig. 2). Lowland forests are 'dense ombrophilous forests', rich in epiphytes, lianas, ferns and with dominant emergent tree species like *Ficus cestrifolia* Schott, *Syagrus romanzoffiana* (Cham.) and *Handroanthus umbellatus* (Sond.) (Teixeira *et al.,* 1986); marshes occur mainly along the lagoons and are composed by stands of emergent macrophytes as *Scirpus giganteus* Kunth, *Schoenoplectus californicus* (C.A. Mey.) Soják and *Typha domingensis* Pers. and floating macrophytes as *Pistia stratiotes* L. and *Salvinia* spp. (Teixeira *et al.,* 1986); '*restingas*' occur in sandy areas and hold mainly xeromorphic arbustive and arboreous plant species and the ground bromeliad *Bromelia antiacan-*

Figure 2. Habitats surveyed in the southern coast of Santa Catarina state, Brazil. (A) A general view of Morro dos Conventos beach, Araranguá; (B) Dunes and shrubby *restingas* near the mouth of Araranguá river, Araranguá; (C) Lagoon in the locality of Ilhas, near the mouth of Araranguá river, Araranguá; (D) A general view of the northeastern portion of Lagoa da Urussanga Velha, Balneário Rincão; (E) Understory of a lowland forest in Morro dos Macacos ecological park, Passo de Torres; (F) Wetlands of *Typha domingensis* in the border of Lagoa do Sombrio, Passo de Torres; (G) Mouth of Urussanga river, Balneário Rincão; (H) Wetlands with *Scirpus giganteus* in Lagoa do Rincão, Balneário Rincão.

tha Bertol. (Teixeira *et al.,* 1986; Falkenberg, 1999); natural grasslands are dominated by short to medium-sized Poaceae, Asteraceae and Cyperaceae and occur sparsely in sandy areas, specially amidst dunes (Klein *et al.,* 2007; Menezes *et al.,* 2015); lagoons overall have shallow waters with or without periodic seawater discharge and are surrounded by floating macrophytes, occurring as open marshes; oceanic sandy beaches have Pleistocenic and Holocenic origins, plant communities occur in frontal dunes and are composed essentially of *Blutaparon portulacoides* (A. St.-Hil.), *Panicum racemosum* (P. Beauv.) and *Ipomoea pes-caprae* (L.) R. Br and three rivers (Urussanga, Araranguá and Mampituba) flow though these areas to the ocean. Importantly, considerable portions of such natural habitats were replaced by cultivated fields (mainly rice and corn), planted pastures, urban areas and plantations of the exotic trees *Eucalyptus* spp. and *Pinus* spp. (Guadagnin & Laidner, 1999). Climate is subtropical humid without dry seasons with annual average temperature of 19.8°C, high relative humidity (85%) and annual rainfall between 1.250 and 1.400 mm (Giannini *et al.,* 2007).

Data collection

We sampled ten sites located from the mouth of Urussanga River to the mouth of Mampituba River (Fig. 1). Sampled areas varied from 0.28 to 4.75 km^2 (summing up 21 km^2) and up to 50 m above the sea level. Surveys were carried out between October 2012 and March 2018 and consisted of one-day samplings, lasting from 3 to 10 h per site, mainly from 07:00-12:00 h and 14:00-18:00 h. In total, each site was sampled between 8 h and 70 h, summing up 274 hours of fieldwork. Coordinates, dates of field expeditions and habitats sampled in each site are described in Table 1. In each field expedition, all birds heard or seen with aid of binoculars in pre-existing trails and roads were identified. Playbacks of voice-recordings of species potentially occurring in the area were used, especially to search for cryptic species. Photographs and voice-recordings obtained during fieldwork were archived in the website WikiAves (www.wikiaves.com.br) and can be accessed online using voucher codes provided in Table 2. In order to provide a more complete inventory, species undetected during field work but with previous records for these sites in the literature (*i.e.,* Rosário, 1996; Branco *et al.,* 2004; Rupp *et al.,* 2007) or WikiAves (searched up to July 2017) were included as Appendix. Data from Rosário (1996) was obtained in the website Aves de Santa Catarina (http://avesdesantacatarina.com.br). Also, some records available at WikiAves or made by other reseachers in the study areas were cited in the species account and/or in the discussion.

Classification of endemic, migratory, threatened species and novel records

Classification of endemic species for Atlantic Forest and Pampas follows Bencke *et al.* (2006). Migrant species followed the list of migratory birds of Brazil (Somenzari *et al.,* 2018) and were classified in three categories as follows: "Nearctic migrants" breed in the Northern Hemisphere and move southward to spend the austral winter (Chesser, 1994); "Austral migrants" breed in austral regions of South America and move northward to spend the austral winter (Chesser, 1994) and; "Neotropical migrants" breed in our study area and move northward to spend the austral winter in tropical humid regions (Belton, 1994). We considered species of conservation concern those listed in at least one redlist in global (GL) (IUCN, 2015), national (BR) (MMA, 2014) and/or local (SC) levels (CONSEMA, 2011). For threatened species and distributional novelties, we provide details on number of individuals, habitats and dates of records. We considered distributional novelties in Santa Catarina as those species whose nearest record lies over 100 km from our study sites or species previously unknown or known from less than five localities in this state (*i.e.,* Rosário-Bege & Marterer, 1991; Rosário, 1996; Amorim & Piacentini, 2006; Piacentini *et al.,* 2006; Ghizoni-Jr. & Azevedo, 2010). Both criteria follow Vizentin-Bugoni *et al.* (2015). Taxonomic nomenclature follows Piacentini *et al.* (2015). Specimens found dead were deposited at the ornithological collection of the Pontifícia Universidade Católica do Rio Grande do Sul.

RESULTS

Overall, we recorded 229 species encompassing 63 taxonomic families during field surveys (Table 2). Digital vouchers provide documentation of 198 species (86% of the total). Four specimens found dead were deposited at the ornithological collection of the Pontifícia Universidade Católica do Rio Grande do Sul (MCP), namely *Calonectris borealis* (Cory, 1881) (entry number #5081), *Puffinus puffinus* (Brünnich, 1764) (MCP-4627), *Sterna* cf. *hirundinacea* (entry number #5089) – all three from Praia do Rincão – and *Sturnella superciliaris* (Bonaparte, 1850) (MCP-4621) from Lagoa do Caverá. In addition, 22 species were added to the list through literature search and WikiAves records (Appendix), summing 250 species to the study area.

Endemic species

Ten species recorded are endemic to the Atlantic Forest, namely *Ortalis squamata* (Lesson, 1829), *Thalurania glaucopis* (Gmelin, 1788), *Picumnus temminckii* Lafresnaye, 1845, *Veniliornis spilogaster* (Wagler, 1827), *Myrmotherula unicolor* (Ménétriès, 1835), *Phacellodomus ferrugineigula* (Pelzeln, 1858), *Phylloscartes kronei* Willis & Oniki, 1992, *Attila rufus* (Vieillot, 1819), *Tachyphonus coronatus* (Vieillot, 1822) and *Habia rubica* (Vieillot, 1817). The only species endemic to Pampas was *Limnornis curvirostris* Gould, 1839.

Table 2. Bird species recorded at ten sites in the southern coast of Santa Catarina state, Brazil. Details on localities of record, habitat, status of conservation, endemism, migration and voucher are provided. "+" indicates species new to the southern coast of Santa Catarina in relation to the two previous broad-scale inventories (Rosário-Bege & Marterer, 1991; Rosário, 1996). Localities: 1 = Lagoa da Urussanga Velha, 2 = Praia do Rincão, 3 = Lagoa do Rincão/Jacaré, 4 = Foz do Rio Araranguá, 5 = Praia dos Golfinhos, 6 = Lagoa do Caverá, 7 = Furnas, 8 = Rio Novo, 9 = Anita Garibaldi, 10 = Morro dos Macacos. Habitat: be = beach, cf = cultivated field, ex = plantation of exotic trees – eucalyptus or pinus, fl = fly over, fo = lowland forest, la = coastal lagoon, ma = marsh with stands of emergent macrophytes, ng = natural grassland, om = open marsh, pa = planted pasture, sr = shrubby *restinga,* ua = urban area. Status: Atl = species endemic to the Atlantic Forest, Pam = species endemic to the Pampas, Cr = critically endangered, En = endangered, Vu = vulnerable, Nt = near threatened, GL = global level, BR = national level, SC = state level, Nm = Nearctic migrant, Am = Austral migrant, Tm = Neotropical migrant. Photo/Voice-recording: catalogue numbers of our digital vouchers available at the website WikiAves.

Taxon	Localities	Habitat	Status	Photo/Voice-recording
Tinamidae Gray, 1840				
Crypturellus obsoletus (Temminck, 1815) +	6	fo		WA2045021
Nothura maculosa (Temminck, 1815)	1,2,4,5,6,7,8,9,10	cf, ng, pa		WA916393
Anhimidae Stejneger, 1885				
Chauna torquata (Oken, 1816)	5,6,7,8,9,10	om		WA1178200, WA1495224, WA1744286, WA1749013
Anatidae Leach, 1820				
Dendrocygna viduata (Linnaeus, 1766)	1,2,3,4,5,6,7,8,9,10	la, om		WA1586936, WA1804435
Amazonetta brasiliensis (Gmelin, 1789)	1,2,3,4,5,6,7,8,9,10	la, om		WA1739496, WA1808835, WA1809421
Anas georgica Gmelin, 1789	2,4	la, om		WA1620614, WA1805133
Anas versicolor Vieillot, 1816	4,7,8	la, om		WA1082946, WA1739498
Podicipedidae Bonaparte, 1831				
Rollandia rolland (Quoy & Gaimard, 1824)	1,3	la		WA1215451
Podilymbus podiceps (Linnaeus, 1758) +	1,3,10	la		WA1082949, WA1809423
Podicephorus major (Boddaert, 1783)	2,4	la		WA1461291
Spheniscidae Bonaparte, 1831				
Spheniscus magellanicus (Forster, 1781)	2	be	Am, Nt-GL	WA988659
Diomedeidae Gray, 1840				
Thalassarche chlororhynchos (Gmelin, 1789) +	2	be	Am, En-GL, BR, SC	
Thalassarche melanophris (Temminck, 1828)	2	be	Am, Nt-GL, En-SC	
Procellaridae Leach, 1820				
Procellaria aequinoctialis Linnaeus, 1758	2	be	Am, Vu-GL, BR, SC	
Calonectris borealis (Cory, 1881)	2	be	Nm	
Puffinus puffinus (Brünnich, 1764)	2	be	Nm	
Cracidae Rafinesque, 1815				
Ortalis squamata (Lesson, 1829)	1,4,5,8,9	fo	Atl	WA1740948, WA2354730
Ciconiidae Sundevall, 1836				
Ciconia maguari (Gmelin, 1789)	4,5,6,7,8,9,10	om		WA1631472
Mycteria americana Linnaeus, 1758 +	7	om		
Fregatidae Degland & Gerbe, 1867				
Fregata magnificens Mathews, 1914	1,2,3,4,6,9	fl		WA1987245
Phalacrocoracidae Reichenbach, 1849				
Nannopterum brasilianus (Gmelin, 1789)	1,2,3,4,5,6,7,8,9,10	be, la		WA1172630, WA1216379
Ardeidae Leach, 1820				
Tigrisoma lineatum (Boddaert, 1783) +	9	om		WA1587910
Botaurus pinnatus (Wagler, 1829) +	3,7,8,9	ma, om		WA1667250
Ixobrychus involucris (Vieillot, 1823)	6,8,9	ma		WA1256664
Nycticorax nycticorax (Linnaeus, 1758)	1,2,4,5,6,7,8	be, om		WA1586440
Butorides striata (Linnaeus, 1758)	1,2,3,4,5,6,7,9	la, om		WA1496237, WA2047195
Bubulcus ibis (Linnaeus, 1758)	1,2,3,4,5,6,7,8,9,10	cf, ng, pa		WA1740945, WA1805136
Ardea cocoi Linnaeus, 1766	1,2,4,6,7,8,9	be, om		WA1026574
Ardea alba Linnaeus, 1758	1,2,3,4, 5,6,7,8,9,10	be, om		WA1987261
Syrigma sibilatrix (Temminck, 1824)	1,2,3,4,5,6,7,8,9,10	cf, ng, om, pa		WA1497322
Egretta thula (Molina, 1782)	1,2,4,5,7,10	be, om		WA1026576, WA1740927
Threskiornithidae Poche, 1904				
Plegadis chihi (Vieillot, 1817)	1,2,3,4,5,6,7,8,9,10	om		
Phimosus infuscatus (Lichtenstein, 1823) +	1,2,3,4,5,6,7,8,9,10	be, ng, om, pa, ua		WA1620617, WA1631382
Theristicus caudatus (Boddaert, 1783)	1,2,3,4,5,6,7,8,9,10	cf, ng, pa, ng		WA1215452
Platalea ajaja Linnaeus, 1758	4,9	om		WA1444654, WA1805134
Cathartidae Lafresnaye, 1839				
Cathartes aura (Linnaeus, 1758)	1,2,3,4,5,6,7,8,9,10	be, fl		WA1026575

Taxon	Localities	Habitat	Status	Photo/Voice-recording
Cathartes burrovianus Cassin, 1845 +	1,3,6,8	pa		WA1172631, WA1603881, WA1976484, WA2044982
Coragyps atratus (Bechstein, 1793)	1,2,3,4,5,6,7,8,9,10	be, fl, ua		WA1027470, WA1739507
Accipitridae Vigors, 1824				
Elanus leucurus (Vieillot, 1818) +	9	pa		
Circus buffoni (Gmelin, 1788)	1,2,3,4,5,6,7,8,9	ma, om		WA1496238, WA1621757, WA1631384
Accipiter striatus Vieillot, 1808	6	fo		WA2209115, WA2229797
Rostrhamus sociabilis (Vieillot, 1817)	2,3,6,7,8	ma, om		WA1803625
Heterospizias meridionalis (Latham, 1790)	1,2,5,8,10	ng, pa		WA1215399, WA1976489
Rupornis magnirostris (Gmelin, 1788)	1,2,3,4,5,6,7,8,9,10	ex, fo, ua		WA1497320
Aramidae Bonaparte, 1852				
Aramus guarauna (Linnaeus, 1766)	2,3,4,5,6,7,8,9,10	ma, om		WA1178201, WA1805142
Rallidae Rafinesque, 1815				
Aramides ypecaha (Vieillot, 1819) +	7,8,9,10	ma, om		WA1495195, WA1496255, WA1634969, WA1739497
Aramides saracura (Spix, 1825)	2,6,8,9,10			WA843617
Laterallus melanophaius (Vieillot, 1819)	1,3,5,6,7,8,9,10	ma		WA1016183, WA1749121
Laterallus leucopyrrhus (Vieillot, 1819)	1	ma		WA2354729
Mustelirallus albicollis (Vieillot, 1819)	1,2,4,5,9	ma, om		WA1068010, WA1082947
Pardirallus nigricans (Vieillot, 1819)	2,5,6,7,8,9,10	ma, om		
Pardirallus sanguinolentus (Swainson, 1838)	1,2,3,4,6,7,8,9	ma, om		WA1027626, WA1667279
Gallinula galeata (Lichtenstein, 1818)	2,3,5,6,7,8,9	la, om		WA1740947, WA1805144
Fulica armillata Vieillot, 1817	2	be, la		WA1214653
Charadriidae Leach, 1820				
Vanellus chilensis (Molina, 1782)	1,2,3,4,5,6,7,8,9,10	cf, ng, om, pa, ua		WA1576083, WA1744217
Pluvialis dominica (Statius Muller, 1776)	2,4	be	Nm	WA1805145
Pluvialis squatarola (Linnaeus, 1758)	2,4	be	Nm	WA1331389
Charadrius semipalmatus Bonaparte, 1825	2,4	be	Nm	WA1024468
Charadrius collaris Vieillot, 1818	2,4	be		WA1331385
Charadrius falklandicus Latham, 1790 +	2	be	Am	WA965980, WA1372703
Charadrius modestus Lichtenstein, 1823	2	be	Am	WA1576074
Haematopodidae Bonaparte, 1838				
Haematopus palliatus Temminck, 1820	1,2,4	be, la		WA1621759
Recurvirostridae Bonaparte, 1831				
Himantopus melanurus Vieillot, 1817	1,2,4,6,7,10	be, la, om		WA1214763, WA1744231
Scolopacidae Rafinesque, 1815				
Gallinago paraguaiae (Vieillot, 1816)	1,2,3,4,5,6,7,8,9	om		WA1744210
Gallinago undulata (Boddaert, 1783)	2	ng	Vu-SC	
Tringa melanoleuca (Gmelin, 1789)	2,4	be, la	Nm	WA940366
Tringa semipalmata (Gmelin, 1789) +	4	be	Nm	WA1331388
Tringa flavipes (Gmelin, 1789)	1,2,4	be, la	Nm	WA874975
Calidris canutus (Linnaeus, 1758)	2,4	be	Nm, Cr-BR	WA1576078
Calidris alba (Pallas, 1764)	2,4	be	Nm	WA1576082
Calidris pusilla (Linnaeus, 1766)	2	be	Nm	WA2927732
Calidris fuscicollis (Vieillot, 1819)	2,4	be	Nm	WA1215450
Calidris melanotos (Vieillot, 1819) +	2	be	Nm	WA1675808
Jacanidae Chenu & Des Murs, 1854				
Jacana jacana (Linnaeus, 1766)	1,2,3,4,5,6,7,8,9,10	la, om		WA1603878
Laridae Rafinesque, 1815				
Chroicocephalus maculipennis (Lichtenstein, 1823)	2,4	be		WA965981
Larus atlanticus Olrog, 1958 +	2	be	Am, Vu-GL	WA1372730, WA1371318
Larus dominicanus Lichtenstein, 1823	2,4	be		WA804253
Sternidae Vigors, 1825				
Sternula superciliaris (Vieillot, 1819)	2,4	be		WA1805141, WA988658
Sterna hirundo Linnaeus, 1758 +	2,4	be	Nm	WA1803622
Sterna hirundinacea Lesson, 1831	2,4	be	Vu-BR	WA807753, WA2079160
Sterna trudeaui Audubon, 1838	2,4	be		WA1207781, WA1216378
Thalasseus acuflavidus (Cabot, 1847)	2,4	be		WA808747, WA911660, WA999158
Thalasseus maximus (Boddaert, 1783)	2,4	be	En-BR, Vu-SC	WA988660, WA1622675
Rynchopidae Bonaparte, 1838				
Rynchops niger Linnaeus, 1758	2,4	be		WA1572905, WA808745, WA911670, WA2079174
Stercorariidae Gray 1870				
Stercorarius parasiticus (Linnaeus, 1758) +	2,4	be	Nm	WA942968

Taxon	Localities	Habitat	Status	Photo/Voice-recording
Columbidae Leach, 1820				
Columba livia Gmelin, 1789	2,3,7,8,10	be, ua		WA2006330
Columbina talpacoti (Temminck, 1810)	1,2,3,4,5,6,7,8,9,10	cf, sr, ua		WA1983693
Columbina picui (Temminck, 1813)	1,2,3,4,5,6,7,8,9,10	ng, sr, ua		WA886852, WA1497319
Patagioenas picazuro (Temminck, 1813)	1,2,3,4,5,6,8,9	cf, ex, fo, pa,		WA1745049
Zenaida auriculata (Des Murs, 1847) +	1,2,3,4,5,6,7,8,9,10	cf, sr, ua		WA1983694
Leptotila verreauxi Bonaparte, 1855	1,2,3,4,5,6,7,8,9,10	fo, sr		WA1495244, WA1739487
Cuculidae Leach, 1820				
Piaya cayana (Linnaeus, 1766)	1,4,6,7,8,9,10	fo, sr		WA1983701, WA1496257
Coccyzus melacoryphus Vieillot, 1817 +	1,2,8	sr		WA1976486
Coccyzus americanus (Linnaeus, 1758) +	6	sr	Nm	WA2018654
Crotophaga ani Linnaeus, 1758	1,2,3,4,5,6, 8,9,10	pa, sr, ua		WA1983695
Guira guira (Gmelin, 1788)	1,2,3,4,5,6,7,8,9,10	cf, ex, pa, sr, ua		WA1591752, WA1804429
Tapera naevia (Linnaeus, 1766)	1,2,3,4,5,6,8,9	sr		WA1079735
Strigidae Leach, 1820				
Bubo virginianus (Gmelin, 1788) +	7,10	fo		WA1631386
Athene cunicularia (Molina, 1782)	1,2,4,5,6,8	be, ng, pa		WA1586933, WA891425, WA1172628, WA1804426
Caprimulgidae Vigors, 1825				
Hydropsalis torquata (Gmelin, 1789)	3	sr		
Podager nacunda (Vieillot, 1817) +	2,8	pa		WA1667313
Apodidae Olphe-Galliard, 1887				
Cypseloides fumigatus (Streubel, 1848) +	2,8,9	fl		WA1452837, WA1216380
Streptoprocne zonaris (Shaw, 1796)	1,2,5,7	fl		WA1740949
Streptoprocne biscutata (Sclater, 1866) +	2	fl		WA1983854
Chaetura meridionalis Hellmayr, 1907	2,9	fl		
Trochilidae Vigors, 1825				
Eupetomena macroura (Gmelin, 1788) +	2,4	ua		WA1247525
Anthracothorax nigricollis (Vieillot, 1817) +	2,4	ua		WA844048, WA843599
Chlorostilbon lucidus (Shaw, 1812) +	1,2,3,4,5,6,7,9	fo, sr, ua		WA843602, WA1634978
Thalurania glaucopis (Gmelin, 1788) +	10	fo	Atl	
Leucochloris albicollis (Vieillot, 1818)	2,5	ua		WA1239257
Amazilia fimbriata (Gmelin, 1788) +	1,2,3,4,5,6	fo, sr, ua		WA1586445, WA843603
Alcedinidae Rafinesque, 1815				
Megaceryle torquata (Linnaeus, 1766)	1,2,3,8,9	la		WA1622681, WA2228829
Chloroceryle amazona (Latham, 1790)	2,4	la		WA1496286
Picidae Leach, 1820				
Picumnus temminckii Lafresnaye, 1845	1,2,4,6,8,10	fo, sr	Atl	WA1983699
Melanerpes candidus (Otto, 1796) +	1,2,6,7	cf, pa		WA1826616, WA1804271
Veniliornis spilogaster (Wagler, 1827) +	1,9	fo, sr		WA1215453, WA1590761
Colaptes melanochloros (Gmelin, 1788)	1,9	sr		
Colaptes campestris (Vieillot, 1818)	1,2,3,4,5,6,7,8,9,10	cf, ng, pa		WA1804439
Celeus flavescens (Gmelin, 1788)	1,4,5,6,8	fo, sr		WA1215398, WA2044988
Falconidae Leach, 1820				
Caracara plancus (Miller, 1777)	1,2,3,4,5,6,7,8,9,10	be, ex, ng, pa, ex		WA1572864, WA1622683
Milvago chimachima (Vieillot, 1816)	1,2,3,4,5,6,7,8,9,10	be, ex, fo, sr		WA1804428, WA1739510
Milvago chimango (Vieillot, 1816)	1,2,3,4,5,6,7,8,9,10	be, ng, pa		WA1557885, WA1603889, WA1809418
Herpetotheres cachinnans (Linnaeus, 1758) +	4,5	ex, sr		WA1178257
Falco sparverius Linnaeus, 1758	2,4,5,9,10	cf, ng, pa, ua		WA1027471, WA1215400
Falco femoralis Temminck, 1822 +	1,2,4,7,8	ng, pa		WA1013623, WA1667276, WA1634980, WA1025231
Psittacidae Rafinesque, 1815				
Myiopsitta monachus (Boddaert, 1783) +	1,2,3,4,5,6,7,8,9,10	cf, ex, pa, ua		WA1804427, WA1739506, WA901069
Thamnophilidae Swainson, 1824				
Myrmotherula unicolor (Ménétriès, 1835) +	6	fo	Atl, Nt-GL	WA2045047
Thamnophilus ruficapillus Vieillot, 1816	1,2,3,4,8	sr		WA1804273, WA988355
Thamnophilus caerulescens Vieillot, 1816	1,4,6,7	fo, sr		WA1675785, WA1739493
Conopophagidae Sclater & Salvin, 1873				
Conopophaga lineata (Wied, 1831) +	1,6,10	fo		WA2045040
Scleruridae Swainson, 1827				
Geositta cunicularia (Vieillot, 1816)	2,4	be, ng	Vu-SC	WA1014901, WA942792, WA1583389
Furnariidae Gray, 1840				
Furnarius rufus (Gmelin, 1788)	1,2,3,4,5,6,7,8,9,10	cf, ng, pa, ua		WA2006331

Taxon	Localities	Habitat	Status	Photo/Voice-recording
Limnornis curvirostris Gould, 1839 +	8,9	ma	Pam	WA1668353, WA1296192, WA1452904
Phleocryptes melanops (Vieillot, 1817)	2,4,6,7,8,9	ma		WA1667249, WA1809443
Anumbius annumbi (Vieillot, 1817)	1,2,4,5,6,7,8,9	ng, pa		WA1025232, WA1603879, WA891240, WA1588847
Phacellodomus ferrugineigula (Pelzeln, 1858) +	1,8	ma	Atl	WA1739509, WA1739483, WA2354732, WA2354763
Schoeniophylax phryganophilus (Vieillot, 1817) +	6,9	pa		WA2045008
Certhiaxis cinnamomeus (Gmelin, 1788)	1,2,3,4,5,6,7,8,9,10	ma		WA1588848, WA1452835
Synallaxis spixi Sclater, 1856	1,3,4,5,7,8,9,10	sr		
Pipridae Rafinesque, 1815				
Manacus manacus (Linnaeus, 1766)	1,6	fo		
Chiroxiphia caudata (Shaw & Nodder, 1793)	6	fo	Atl	WA2228939
Platyrinchidae Bonaparte, 1854				
Platyrinchus mystaceus Vieillot, 1818 +	6	fo		
Tachurisidae Ohlson *et al.* 2013				
Tachuris rubrigastra (Vieillot, 1817)	8	ma	Vu-SC	WA1749009, WA1739508, WA2228844
Rhynchocyclidae Berlepsch, 1907				
Leptopogon amaurocephalus Tschudi, 1846 +	10	fo		
Tolmomyias sulphurescens (Spix, 1825) +	1	fo		
Poecilotriccus plumbeiceps (Lafresnaye, 1846)	1,6	sr		WA2045035
Phylloscartes kronei Willis & Oniki, 1992 +	1,6,10	sr, fo	Atl, Nt-GL	WA2045020, WA2231007
Tyrannidae Vigors, 1825				
Camptostoma obsoletum (Temminck, 1824)	1,2,3,4,5,6,7,8,9,10	sr, fo		
Elaenia flavogaster (Thunberg, 1822)	1,2,3,4,6,8,9,10	sr		
Elaenia parvirostris Pelzeln, 1868	1,3,4,9	sr, fo	Tm	WA1495307, WA2354726
Elaenia obscura (d'Orbigny & Lafresnaye, 1837)	1,2,3,4,5,6,9	sr		WA2045031
Pseudocolopteryx sclateri (Oustalet, 1892)	3,6,7,8,9	ma		WA1256663, WA1631412, WA1739501, WA1587907
Pseudocolopteryx flaviventris (d'Orbigny & Lafresnaye, 1837) +	8,9	ma		WA1667277, WA1452903, WA1557931
Serpophaga nigricans (Vieillot, 1817)	5,7,8,9	ma		WA1497321, WA1667253, WA1587908, WA1593543
Serpophaga subcristata (Vieillot, 1817) +	1,2,3,4,8,9	sr		WA1495271, WA1027469
Attila rufus (Vieillot, 1819) +	6,10	fo	Atl	WA2219896, WA2229809
Myiarchus swainsoni Cabanis & Heine, 1859	1	fo	Tm	WA2354836
Pitangus sulphuratus (Linnaeus, 1766)	1,2,3,4,5,6,7,8,9,10	cf, ex, fo, sr, ua		WA1744717, WA1745018
Machetornis rixosa (Vieillot, 1819)	1,2,3,4,5,6,7,8,9,10	ng, pa, ua		WA1667382, WA1452838, WA1631381
Myiodynastes maculatus (Statius Muller, 1776) +	8	fo	Tm	
Tyrannus melancholicus Vieillot, 1819	1,2,3,4,5,6,7,8,9,10	fo, sr	Tm	WA1983709, WA1594760
Tyrannus savana Daudin, 1802	1,2,3,4,6,7	cf, ng, pa, sr	Tm	WA1803623
Empidonomus varius (Vieillot, 1818) +	1,2,9	fo, sr	Tm	WA1496256, WA1591751
Myiophobus fasciatus (Statius Muller, 1776)	1,4,5,6,8	sr		WA1215397, WA1496241, WA1983698, WA1591754
Arundinicola leucocephala (Linnaeus, 1764)	6,7,8,9	ma		WA1809440, WA1667381, WA1603880, WA1590782
Cnemotriccus fuscatus (Wied, 1831) +	10	fo		
Lathrotriccus euleri (Cabanis, 1868) +	6	fo	Tm	
Hymenops perspicillatus (Gmelin, 1789)	2,8,9	ma, ng, om		WA1013625, WA1024351
Satrapa icterophrys (Vieillot, 1818)	1,2,3,4,7,8,9	sr		WA1634834, WA1983710, WA1593541
Xolmis irupero (Vieillot, 1823)	1,2,3,4,5,6,7,8,9,10	ng, pa		WA1622676, WA1631471, WA1603887
Xolmis dominicanus (Vieillot, 1823)	6	pa	Vu-GL-BR, En-SC	WA2208102, WA2209035, WA2209036
Vireonidae Swainson, 1837				
Cyclarhis gujanensis (Gmelin, 1789)	1,5,6,7,8,9,10	fo, sr		WA2354727
Vireo chivi (Vieillot, 1817) +	1,2,5,9	fo	Tm	WA2354734
Hirundinidae Rafinesque, 1815				
Pygochelidon cyanoleuca (Vieillot, 1817)	1,2,3,4,5,6,7,8,9,10	be, ng, pa, ua		
Alopochelidon fucata (Temminck, 1822)	2,3,4,8,10	be, ng, pa		WA1620613
Stelgidopteryx ruficollis (Vieillot, 1817)	1	pa	Tm	WA1976493
Progne tapera (Vieillot, 1817)	1,2,3,4,5,6,7,8,9,10	cf, ng, pa	Tm	WA1583590
Progne chalybea (Gmelin, 1789)	1,2,3,4,7	cf, ng, ua	Tm	WA807751
Tachycineta leucorrhoa (Vieillot, 1817)	1,2,3,4,5,6,7,8,9,10	be, ng, pa		WA844003
Hirundo rustica Linnaeus, 1758	1,2,4,8,9,10	ng, pa	Nm	WA1803624
Troglodytidae Swainson, 1831				
Troglodytes musculus Naumann, 1823	1,2,3,4,5,6,7,8,9,10	sr, ua		WA2219900
Polioptilidae Baird, 1858				
Polioptila dumicola (Vieillot, 1817) +	2,7,8,9	sr		WA843574, WA1495243, WA1593539, WA2228871
Turdidae Rafinesque, 1815				
Turdus flavipes Vieillot, 1818 +	4,6	fo		

Taxon	Localities	Habitat	Status	Photo/Voice-recording
Turdus leucomelas Vieillot, 1818 +	1,4,6	fo		WA2229159, WA2354733
Turdus rufiventris Vieillot, 1818	1,2,3,4,5,6,7,8,9,10	fo, sr, ua		WA2229124
Turdus amaurochalinus Cabanis, 1850	1,2,3,4,5,6,7,8,9,10	fo, sr		WA1805137, WA1983853, WA2229812
Turdus albicollis Vieillot, 1818	6,10	fo		
Mimidae Bonaparte, 1853				
Mimus saturninus (Lichtenstein, 1823)	1,2,3,4,5,9,10	ng, sr		WA806208, WA1496259
Mimus triurus (Vieillot, 1818) +	2	sr	Am	WA1803618
Motacillidae Horsfield, 1821				
Anthus lutescens Pucheran, 1855	1,2,4,5,6,7,8,9,10	ng, pa		WA1016940, WA1631470, WA1634952, WA1588845
Anthus hellmayri Hartert, 1909 +	2,4	ng		WA943270, WA988364
Passerellidae Cabanis & Heine, 1850				
Zonotrichia capensis (Statius Muller, 1776)	1,2,3,4,5,6,7,8,9,10	ex, ng, pa, sr		WA1808836, WA2229802
Ammodramus humeralis (Bosc, 1792)	1,2,4,5,8,10	ng, pa		WA1803616, WA1633917
Parulidae Wetmore *et al.* 1947				
Setophaga pitiayumi (Vieillot, 1817)	1,2,3,4,5,6,7,8,9,10	fo, sr		WA1593548
Geothlypis aequinoctialis (Gmelin, 1789)	1,2,3,4,5,6,7,8,9,10	ma, sr		WA1805143
Basileuterus culicivorus (Deppe, 1830)	1,4,6,7,8,10	fo, sr		WA1721314
Myiothlypis leucoblephara (Vieillot, 1817) +	1	fo		WA2354735
Icteridae Vigors, 1825				
Icterus pyrrhopterus (Vieillot, 1819)	1,4,5,9	fo, sr		
Amblyramphus holosericeus (Scopoli, 1786)	1,2,3,4,6,7,8,9	ma		WA890908, WA1749012, WA1590764, WA843600
Agelasticus thilius (Molina, 1782)	1,2,3,4,6,7,8,9	ma		WA1667251, WA1976483
Chrysomus ruficapillus (Vieillot, 1819)	1,2,4,7,8,9,10	ma, om		WA1740926
Xanthopsar flavus (Gmelin, 1788) +	6	pa	Vu-GL-BR, Cr-SC	WA2209033, WA2231008, WA2231010
Pseudoleistes guirahuro (Vieillot, 1819)	1,2	ma, ng, pa		WA806226, WA1068021, WA806234, WA1987255
Pseudoleistes virescens (Vieillot, 1819)	1,2,3,4,6,7,8,9	ma, ng, om		WA1024447, WA1016342, WA1013612
Agelaioides badius (Vieillot, 1819)	1,2,3,4,5,6,7,8,9,10	ng, pa, sr		WA1803615, WA1976481, WA1586906
Molothrus bonariensis (Gmelin, 1789)	1,2,3,4,5,6,7,8,9,10	ex, ng, sr ua		WA1587905
Sturnella superciliaris (Bonaparte, 1850)	1,2,4,5,6,7,8,9,10	ma, ng, pa		WA1588850
Thraupidae Cabanis, 1847				
Coereba flaveola (Linnaeus, 1758)	1,4,5,6,7,9	fo, sr		
Tachyphonus coronatus (Vieillot, 1822)	1,2,4,6,8,9,10	fo, sr	Atl	
Coryphospingus cucullatus (Statius Muller, 1776) +	1,4,5,8	ex, sr		WA1803639, WA1497304, WA2228888
Dacnis cayana (Linnaeus, 1766)	1,9	fo, sr		WA1452839, WA1557863
Tangara sayaca (Linnaeus, 1766)	1,2,3,4,5,6,7,8,9,10	fo, sr, ua		WA1805135, WA1497302, WA2231005
Tangara preciosa (Cabanis, 1850) +	8	sr		WA2576966
Paroaria coronata (Miller, 1776) +	9	pa		WA1631411
Pipraeidea melanonota (Vieillot, 1819) +	7	fo		WA1739502
Tersina viridis (Illiger, 1811) +	2	sr		WA2378961
Donacospiza albifrons (Vieillot, 1817)	3,4,5,8,9	ma		WA1024446, WA1215401, WA1497303, WA988366
Sicalis flaveola (Linnaeus, 1766)	1,2,3,4,5,6,7,8,9,10	ng, pa, ua		WA1804437
Sicalis luteola (Sparrman, 1789)	1,2,5,10	ma, ng, pa		WA1976490, WA1178202
Emberizoides ypiranganus Ihering & Ihering, 1907	1,2,4,5,9	ma, ng		WA1082948, WA1082948, WA1068009
Embernagra platensis (Gmelin, 1789)	1,2,3,4,5,6,7,8,9	ma, ng		WA1082945, WA806233, WA890868, WA1591749
Volatinia jacarina (Linnaeus, 1766)	1,2,4,5,10	pa		
Sporophila caerulescens (Vieillot, 1823)	2,3,4,5,6	sr	Tm	
Cardinalidae Ridgway, 1901				
Habia rubica (Vieillot, 1817)	6	fo	Atl	WA2045000
Fringillidae Leach, 1820				
Spinus magellanicus (Vieillot, 1805)	1,2,4,10	sr		WA2354839
Euphonia chlorotica (Linnaeus, 1766)	1,8	fo, sr		WA1739479, WA1016917
Euphonia violacea (Linnaeus, 1758)	2,6	fo		WA1178079
Euphonia pectoralis (Latham, 1801)	10	fo	Atl	
Estrildidae Bonaparte, 1850				
Estrilda astrild (Linnaeus, 1758)	1,2,4,9,10	ua		WA1987253
Passeridae Rafinesque, 1815				
Passer domesticus (Linnaeus, 1758)	1,2,3,4,5,6,7,8,9,10	pa, ua		WA1987270

Migratory species

Overall, 38 species (17% of the total) are migrants (Table 2). Nearctic migrants are two shearwaters (Procellaridae), eight sandpipers (Scolopacidae), three plovers (Charadriidae), one tern (Sternidae), one jaeger (Stercorariidae), one cuckoo (Cuculidae), one falcon (Falconidae) and one swallow (Hirundinidae) species. Austral migrants are two albatrosses (Diomedeidae), one petrel (Procellaridae), two plovers, one penguin (Spheniscidae), one gull (Lariidae) and one mockingbird (Mimidae) species. Neotropical migrants are seven flycatchers (Tyrannidae), three swallows, one vireo (Vireonidae) and one seedeater (Thraupidae) species (Table 2).

Species of conservation concern

***Spheniscus magellanicus* (Forster, 1781)**
(GL – NT; BR – LC; SC – LC)

On June 15th 2013, 65 dead and three alive individuals (WA1804272) were found on the beach in Praia do Rincão (28°81'93"S, 49°20'95"W). In addition, dozens of individuals were found regularly every winter

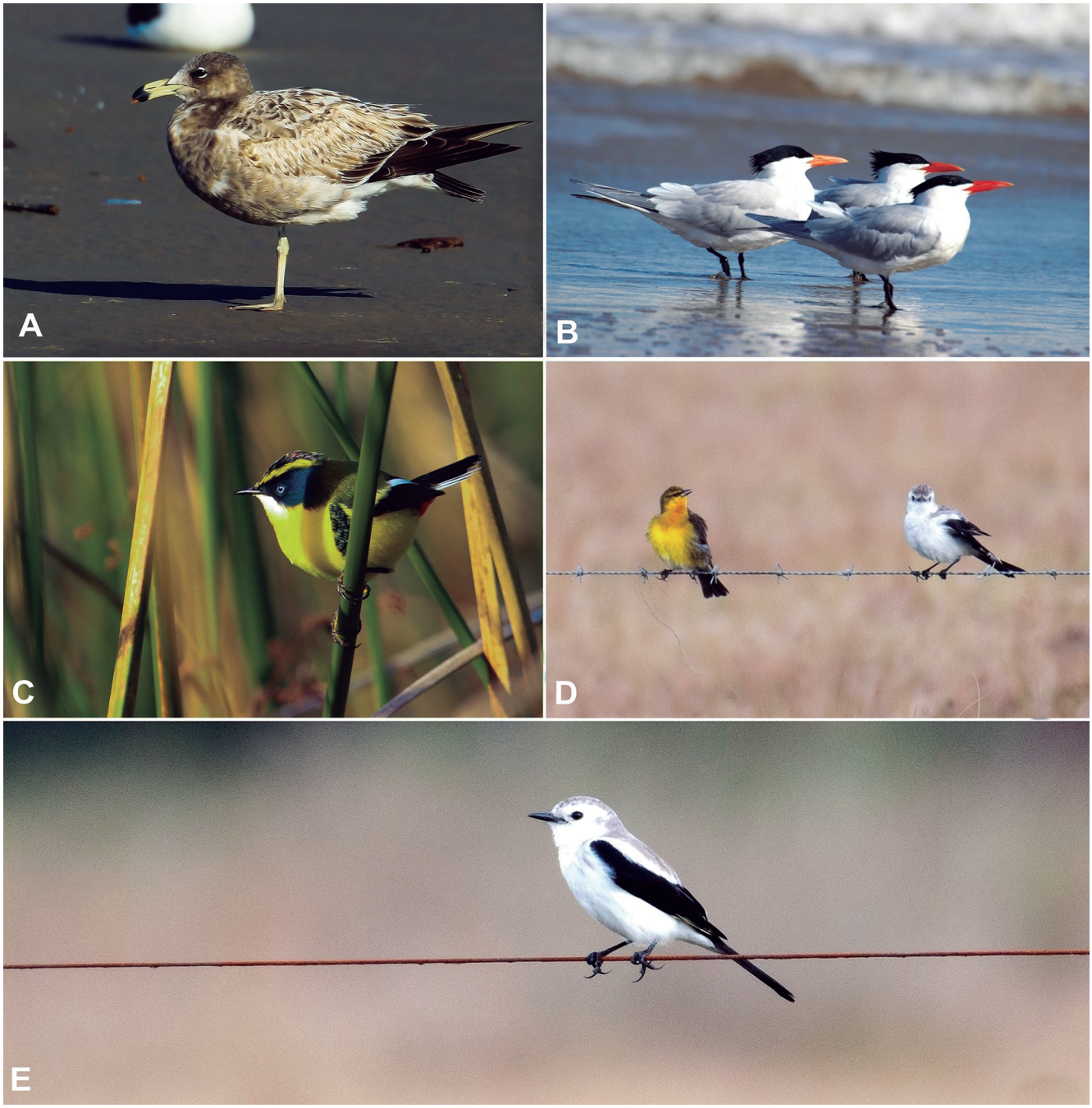

Figure 3. Records of conservation concern birds in the southern coast of Santa Catarina state, Brazil. (A) *Larus atlanticus,* Balneário Rincão; (B) *Thalasseus maximus,* Balneário Rincão; (C) *Tachuris rubrigastra,* Balneário Gaivota; (D) *Xanthopsar flavus* (yellow bird) and *Xolmis dominicanus* (black-and-white bird), Balneário Gaivota; (E) *Xolmis dominicanus,* Balneário Gaivota.

(from the 2,000s up to moment) on the entire southern coast of Santa Catarina during beach monitoring programs made by the 'Museu de Zoologia Prof. Morgana Cirimbelli Gaidzinski' of the 'Universidade do Extremo Sul Catarinense' (R. Freitas, *pers. comm.*).

***Larus atlanticus* Olrog, 1958**
(GL – VU; BR – LC; SC – LC)

On June 29th 2014, a juvenile was photographed (Fig. 3A; WA1372730) and five other adults were observed in a mixed flock with *Larus dominicanus* (Lichtenstein, 1823) on the beach in Praia do Rincão. On August 28th 2016, again an adult individual was recorded in Praia do Rincão (WA2257972).

***Gallinago undulata* (Boddaert, 1783) (SC – VU)**

On 13th January 2018, we heard for five times calls of two individuals and once barely observed them in a natural grassland used for livestock raising near the mouth of Urussanga River (28°48'47.60"S, 49°12'34.23"W).

***Calidris canutus* (Linnaeus, 1758)**
(GL – NT; BR – CR; SC – LC)

Several records during summer and autumn were obtained on the beach in Praia do Rincão: in 2013, it was recorded on April 21st (53 individuals; WA940368), October 6th (one individual) and November 2nd (four individuals); in 2014, it was recorded on March 30th (70 individuals) and April 18th, 2014 (158 individuals; WA1576078). In addition, on April 14th 2014, some small flocks were recorded near Araranguá river mouth (WA936332).

***Thalasseus maximus* (Boddaert, 1783)**
(GL – LC; BR – EN; SC – VU)

Several records during autumn, winter and spring were obtained on the beach in Praia do Rincão: in 2013, it was recorded on May 19th (10 individuals), June 13th (nine individuals) and June 15th (four individuals; WA988660), July 13th (nine individuals) and October 3rd (eight individuals; Fig. 3B and WA1622675); in 2014, it was recorded on May 24th (two individuals), June 29th (two individuals) and June 26th, 2014 (10 individuals). In addition, some scattered flocks of three up to four individuals were recorded near Araranguá river mouth on April 21st 2013 (WA960303).

***Sterna hirundinacea* Lesson, 1831**
(GL – LC; BR – VU; SC – LC)

Several records were obtained during the winter, autumn and spring on the beach in Praia do Rincão: on October 14th 2012 (two individuals; WA807753). In 2013, it was recorded on June 13th (135 individuals), August 31st (150 individuals), September 14th (50 individuals), October 6th (four individuals). In 2014, it was recorded on May 24th (10 individuals), June 29th (two individuals), July 26th (650 individuals; WA2079160), August 24th (80 individuals) and September 21st (four individuals). On April 21st 2014, a small flock was observed near Araranguá river mouth (WA1320064).

***Myrmotherula unicolor* Ménétriès, 1835**
(GL – NT; BR – LC; SC – LC)

On March 6th 2016, a pair was observed and voice-recorded (WA2045047) in a patch of lowland forest north of Lagoa do Caverá (29°00'49.02"S, 49°32'25.41"W).

***Geositta cunicularia* (Vieillot, 1816)**
(GL – LC; BR – LC; SC – VU)

This species was recorded year-round on the frontal dunes of Praia do Rincão. In 2013, it was recorded on March 17th (three individuals), April 21st (three individuals; WA942792), May 19th (one individual), September 14th (one individual) and December 21st (six individuals). In 2014, it was recorded on February 15th (one individual), March 29th (one individual), June 29th (three individuals), July 26th (one individual), August 24th (one individual), October 19th (one individual; WA1583389), November 22nd (one individual) and December 13th (two individuals). In 2015, it was recorded on January 16th (one individual). In 2016, it was recorded on January 9th (one individual) and 15th (two individuals) and August 28th (two individuals; WA2257977). In 2017, it was recorded on January 5th (four individuals) and 6th (two individuals; WA2433937) and February 2nd (one individual).

***Phylloscartes kronei* Willis & Oniki, 1992**
(GL – VU; BR – LC; SC – LC)

On March 7th 2015, a pair was voice-recorded (WA1631446) and photographed (WA1634968) in Morro dos Macacos (29°14'39.21"S, 49°43'47.14"W). On December 31st 2015, one individual was heard near Lagoa da Urussanga Velha (28°46'42.42"S, 49°12'30.36"W). On March 6th 2016, seven individuals were observed and some of them photographed (WA2046315) and voice-recorded (WA2045020) north of Lagoa do Caverá (29°00'49.02"S, 49°32'25.41"W). On July 23rd 2016, four individuals were recorded (WA2231007) in the surroundings of Lagoa do Caverá (29°05'21.46"S, 49°35'10.08"W). This species was also recorded near Lagoa da Urussanga Velha (28°47'36.53"S, 49°12'04.28"W) on November 5th 2016 (four individuals), January 4th (two individuals) and February 11th 2017 (five individuals). All records made in patches of lowland forest, except one in an arbustive *restinga* (Lagoa da Urussanga Velha).

***Tachuris rubrigastra* (Vieillot, 1817)**
(GL – LC; BR – LC; SC – VU)

An individual was photographed (WA1739508) in Rio Novo (29°09'50.80"S, 49°39'14.44"W) on June 27th 2015. New records in this same site were made on July 5th 2015 (seven individuals; Fig. 3C) and on July 23rd 2016 (four individuals; WA2228844). All records were in marshes dominated by *Schoenoplectus californicus*.

***Xolmis dominicanus* (Vieillot, 1823)**
(GL – VU; BR – VU; SC – EN)

On July 16th 2016, five individuals were observed in the southwest of Lagoa do Caverá (29°05'21.81"S, 49°33'43.17"W; WA2208102). On July 23rd 2016, 15 individuals along with six *Xanthopsar flavus* (Gmelin, 1788) were photographed in this same locality (Fig. 3D, Fig. 3E and WA2209035; WA2210218; WA2231009). Observations were made in overgrazed sandy grassland with sparse clumps of *Baccharis trimera* (Less.) DC and *Pinus* plantations.

***Xanthopsar flavus* (Gmelin, 1788)**
(GL – VU; BR – VU; SC – CR)

On July 23rd 2016, six individuals of *Xanthopsar flavus* along with 15 *Xolmis dominicanus* were photographed (Fig. 3D and WA2231008; WA2231010) in the same locality described above (*i.e.,* 29°05'21.81"S, 49°33'43.17"W).

Distributional novelties

***Calidris pusilla* (Linnaeus, 1766)**

On March 29th 2018, we observed an adult individual (WA2927732) in Praia do Rincão within a mixed flock of nearly 500 individuals of *Calidris alba* (Pallas, 1764).

***Aramides ypecaha* (Vieillot, 1819)**

On September 25th, December 14th 2014, and August 23rd 2015 we observed up to two individuals which were photographed (WA1496255) and voice-recorded (WA1495195) in Rio Novo (29°09'50.89"S, 49°39'16.20"W) and Anita Garibaldi (29°10'43.82"S, 49°40'21.04"W). On March 7th 2015, one individual was photographed (WA1631483) in Morro dos Macacos (29°14'41.04"S, 49°43'39.65"W). On April 18th (WA1667252) and June 26th 2015 (WA1739497), up to two individuals were photographed in Furnas (29°07'34.17"S, 49°39'52.55"W). All records were in flooded grasslands and edges of marshes covered by *Scirpus giganteus* and *Schoenoplectus californicus.*

***Bubo virginianus* (Gmelin, 1788)**

On July 3rd 2015, one individual was photographed (Fig. 4A) in Furnas (29°07'35.46"S, 49°39'56.40"W). On August 23rd 2015, one individual was heard in Morro dos Macacos (29°14'39.21"S, 49°43'47.14"W). All records were in the edge of disturbed patches of lowland forest.

***Limnornis curvirostris* Gould, 1839**

On June 3rd 1991, a specimen now deposited in the Museu Nacional do Rio de Janeiro, MN-37523 was collected by Marcos R. Bornschein and Marcos da Ré in "Lagoa do Sombrio, Furação, São João do Sul" (D. Figueira, *in litt.*);

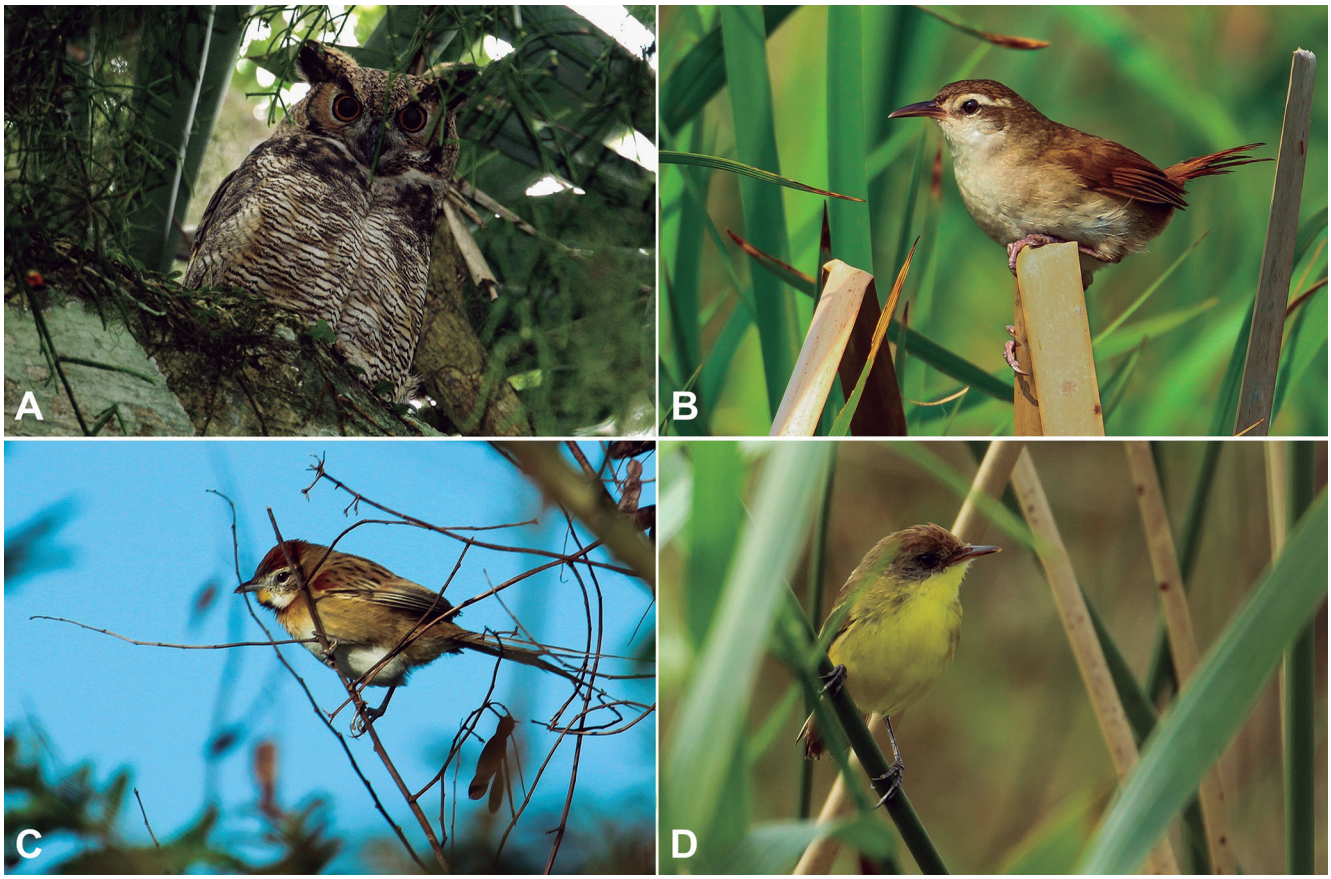

Figure 4. Birds considered novel distributional records for the southern coast of Santa Catarina state, Brazil. (A) *Bubo virginianus,* Sombrio; (B) *Limnornis curvirostris,* Balneário Gaivota; (C) *Schoeniophylax phyrganophilus,* Balneário Gaivota; (D) *Pseudocolopteryx flaviventris,* Balneário Gaivota.

July 26th 2003, at least six individuals were observed in marshes on the eastearn border of 'Lagoa do Sombrio' (M.R. Bornschein & G.N. Mauricio, *pers. comm.*); on April 11th 2014, a pair was photographed and voice-recorded (available at WikiAves, WA1296192 and WA1298515) in a marsh near 'Interpraias' highway, in Passo de Torres (29°17'57.31"S, 49°42'11.35"W). On September 13th 2014 and July 5th 2015, up to two individuals were photographed (Fig. 4B; WA1748311) and voice-recorded in Anita Garibaldi (29°10'28.07"S, 49°40'22.01"W). On December 14th 2014, April 18th and May 7th 2015, up to four individuals were photographed (WA1667278) and voice-recorded (WA1668353) in Rio Novo (29°09'48.22"S, 49°39'07.24"W). All records were in marshes dominated by *Scirpus giganteus* with small patches of *Schoenoplectus californicus.*

***Schoeniophylax phryganophilus* (Vieillot, 1817)**

On July 5th 2015, one individual was photographed (Fig. 4C; WA1750012; WA1750038) and voice-recorded (WA1750015) in Anita Garibaldi (29°10'38.98"S, 49°40'02.59"W). On March 6th 2016, two individuals were observed and one of them photographed (WA2044970) and voice-recorded (WA2045008) in the southern border of Lagoa do Caverá, locality of Nova Guarita (29°03'57.92"S, 49°35'10.02"W), Sombrio. All records were in pastures with sparse shrubs.

***Phacellodomus ferrugineigula* (Pelzeln, 1858)**

On May 7th, June 27th and August 23rd 2015, up to two individuals were photographed (WA1739509) and voice-recorded in Rio Novo (29°09'48.22"S, 49°39'07.24"W). On November 5th 2016 (four individuals; WA2354763; WA2354732), January 4th (one individual) and February 11th 2017 (five individuals), the species was recorded along Urussanga river near Lagoa da Urussanga Velha (28°47'31.41"S, 49°12'00.44"W). All records were in marshes dominated by *Scirpus giganteus* with sparse shrubs.

***Pseudocolopteryx flaviventris* (d'Orbigny & Lafresnaye, 1837)**

On 26th July 2003, voice-records of one individual were obtained in marshes in the eastern border of Lagoa do Sombrio (M.R. Bornschein & G.N. Mauricio, *pers. comm.*). On October 13th 2014, two individuals were observed and one of them was photographed (Fig. 4D) in Anita Garibaldi (29°10'28.07"S, 49°40'22.01"W). On April 18th, June 27th, July 5th and August 23rd 2015, up to two individuals were photographed (WA1667277; WA1744755; WA1748288) in Rio Novo (29°09'48.22"S, 49°39'07.24"W).

DISCUSSION

Bird diversity

We present here a comprehensive update of the bird diversity and composition in the region of the coastal lagoons in southern Santa Catarina. In total, the 250 species recorded here represents 36% of the avifauna of Santa Catarina state (700 species; Aves de Santa Catarina, 2016). Proper comparisons of bird diversity between ours and previous studies from surrounding areas are limited due to major differences in sampling and habitats considered. In coastal wetlands of Rio Grande do Sul, for example, the presence of multiple habitats, *e.g.,* forests, marshes, and grasslands, has been shown to increase considerably the bird species richness (Vizentin-Bugoni *et al.,* 2015; Dias *et al.,* 2016), which may be the case for coastal Santa Catarina as well, which encompass multiple habitats even in relatively short distances. Nevertheless, the total richness observed in our study can be considered intermediate in comparison to other coastal areas of southern Brazil: 120 species were recorded in Ibiraquera lagoon microbasin (Piacentini & Campbell-Thompson, 2006), 227 species in Carijós Ecological Station (Vieira *et al.,* 2014) and 228 species in Pirajubaé Extractive Marine Reserve (Vieira, 2016), all of them in Santa Catarina. Other inventories in the coast of Santa Catarina (*e.g.,* Branco *et al.,* 2004; Grose *et al.,* 2013; Grose & Cremer, 2015; Vieira *et al.,* 2015) were restricted to few habitats (*i.e.,* islands and beaches) and are too local for any comparison. For coastal wetland areas in Rio Grande do Sul, bird richness varies from 170 to 283 species (Vizentin-Bugoni *et al.,* 2015).

Considering together ours and previous studies and records from online databases as WikiAves, specimens from museums and literature (Rosário-Bege & Marterer, 1991; Rosário, 1996; Piacentini & Campbell-Thompson, 2006; Piacentini *et al.,* 2006), over 300 bird species have been reported to the region of coastal lagoons of southern Santa Catarina. However, further inventories will likely reveal new species for the region. The coast of southern Santa Catarina and Rio Grande do Sul are contiguous and similar in habitat composition (Burger, 1999; Menezes *et al.,* 2015). Some species that occur in the coast of Rio Grande do Sul (Belton, 1994; Bencke *et al.,* 2010) probably also occur in Santa Catarina, but were not found in this state yet due to low densities, inconspicuiness, migratory habits or because they use the region as stopover for only few days. This may be the case for several species, for example, *Anas platalea* Vieillot, 1816, *Theristicus caerulescens* (Vieillot, 1817), *Coturnicops notatus* (Gould, 1841), *Cranioleuca sulphurifera* (Burmeister, 1869), *Calidris bairdii* (Coues, 1861), *Limnodromus griseus* (Gmelin, 1789), *Cinclodes fuscus* (Vieillot, 1818) and *Anthus furcatus* d'Orbigny & Lafresnaye, 1837.

Distributional novelties

A total of 68 species are novel records for the southern coast of the state in comparison to the previous broad-scale inventories (Rosário-Bege & Marterer, 1991; Rosário, 1996). However, most of the novel species to the region are currently common and locally widely distributed with numerous recent records on online databases (*e.g.,* WikiAves). Some of these species represent recent

range expansions in Santa Catarina as *Eupetomena macroura* (Gmelin, 1788), *Myiopsitta monachus* (Boddaert, 1783), *Zenaida auriculata* (Des Murs, 1847) and *Turdus leucomelas* Vieillot, 1818 (*e.g.,* Rosário, 1996; Straube *et al.,* 2006) or are species difficult to detect due to inconspicuous behavior such as *Botaurus pinnatus* (Wagler, 1829), *Ixobrychus involucris* (Vieillot, 1823) and *Bubo virginianus.* We also recorded *Schoeniophylax phryganophilus* for the first time in Santa Catarina and presented the first records of *Aramides ypecaha* and *Limnornis curvirostris* in the field, which were to date known in the state only by single unpublished museum specimens. *Larus atlanticus, Bubo virginianus* and *Phacellodomus ferrugineigula* are known to the state by only one (Pacheco *et al.,* 2009), four (Piacentini *et al.,* 2006; Alves & Pozenato, 2013; Just *et al.,* 2015, 2016) and two (Minns *et al.,* 2010; Just *et al.,* 2015) previous records in literature, respectively. We also reported here the third and the first known populations of the globally threatened *Xolmis dominicanus* and *Xanthopsar flavus,* respectively, for the coast of Santa Catarina. As the nearest breeding populations of such species are known only for the coast of Rio Grande do Sul (Belton, 1994; Dias & Maurício, 2002) and upland grasslands in Santa Catarina and Rio Grande do Sul (Repenning *et al.,* 2010), our records likely correspond to wintering individuals.

Conservation issues

The mosaic of habitats including the coastal lagoons of southern Santa Catarina has been recognized as "an area of extreme importance for the conservation, sustainable use and benefit sharing of the Brazilian biodiversity" (MMA, 2007). Likewise, Schott & Carbonell (1986) defined 'Lagoa do Sombrio' as an important area for the conservation of aquatic birds in the Neotropics. Despite these designations, there is currently only a few protected areas which cover small portions of natural habitats and are of sustanaible use, namely 'Área de Proteção Ambiental Baleia Franca' and 'Reserva Particular do Patrimônio Natural Capão Redondo' (14 ha). Additional protected areas have been created recently in the region of Praia do Rincão, namely 'Monumento Natural Morro dos Conventos' (280 ha), 'Área de Proteção Ambiental Costa de Araranguá' (3,213 ha) and 'Reserva Extrativista Rio Araranguá' extractive reserve (566 ha), but such reserves are not implemented yet and may be considered "paper parks" (Araranguá, 2016a, b, c). Importantly, the high diversity of Nearctic and Austral migrants and regionally threatened species found in the region of Praia do Rincão suggest that these protected areas may be especially important for the conservation of resident and migratory shorebirds.

Three threatened species, namely *Larus atlanticus, Xolmis dominicanus* and *Xanthopsar flavus,* were only scarsely recorded in the region and may be considered occasional visitors. Specifically, *Larus atlanticus* migrates northward after breeding in austral regions of South America, while the two other species are endemic to natural grasslands of southeastern South America (Rosário, 1996). On the other hand, native habitats play an important role for the other nine threatened species in our study area. Lowland forests harbour high numbers of the vulnerable *Phylloscartes kronei* and other eight resident least concern species endemic to the Atlantic Forest. Mouths of Urussanga and Araranguá rivers and adjacent sandy beaches are important as wintering ground for a high number of long-distance migratory birds (Branco *et al.,* 2004; this study), as breeding ground for some species as *Sternula superciliaris* (Vieillot, 1819) (Branco *et al.,* 2004), *Geositta cunicularia* and *Haematopus palliatus* Temminck, 1820 (*pers. obs.*) and hold populations of regionally threatened birds, namely *Thalasseus maximus, Calidris canutus, Sterna hirundinacea,* and *Geositta cunicularia.* Marshy areas surrounding lagoons may be relevant in Santa Catarina to sustain high numbers of wetland-dependent species as the regionally threatened *Tachuris rubrigastra* and other least concern species as *Pseudocolopteryx* spp., *Phleocryptes melanops* (Vieillot, 1817), *Limnornis curvirostris* and *Hymenops perspicillatus* (Gmelin, 1789).

Notably, some bird species previously recorded in the region were not found in this study and the reasons may be diverse. Although some few species were likely undetected due to their cryptic habits, populations of other species may be decreasing or have gone locally extinct. This may be the case of species like: *Rhea americana* (Linnaeus, 1758), which is known for Santa Catarina only for a egg collected in 1934 in Sombrio (Rosário, 1996); *Cygnus melancoryphus* (Molina, 1782) and *Netta peposaca* (Vieillot, 1816) which were last recorded in the region almost 30 years ago (Sick *et al.,* 1981; Rosário, 1996); *Hydropsalis anomala* (Gould, 1838) which was collected on 1991 in Sombrio (deposited in the Museu Nacional do Rio de Janeiro, MN-37515) (Rupp *et al.,* 2007). There is also an intriguing undocumented report of the threatened *Biatas nigropectus* (Lafresnaye, 1850) for a lowland forest north of Lagoa do Caverá in 1988 (Rosário, 1996). Other records of this bamboo-dependent species in Santa Catarina are restricted to montane forests in the northeastern portion of the state (Rosário, 1996; distribution map available at WikiAves, www.wikiaves.com.br/mapaRegistros_papo-branco).

Additionally, the rate of records of some aquatic and wetland dependent species seems to have considerably decreased in the last three decades. For example, hundreds of individual of waterfowl species (Anatidae) were historically reported for the coastal lagoons of southern Santa Catarina (Rosário-Bege & Marterer, 1991; Rosário, 1996), however, we recorded less than half of the Anatidae species mentioned for these studies and always in small flocks up to ten individuals. Other aquatic species of the families Podicipedidae (*i.e., Podicephorus major* (Boddaert, 1783), *Podilymbus podiceps* (Linnaeus, 1758) and *Rollandia Rolland* (Quoy & Gaimard, 1824)) and Rallidae (*Fulica armillata* Vieillot, 1817) were also detected in low numbers and some other species were not even found (*i.e., Fulica rufifrons* Philippi & Landbeck, 1861 and *Porphyriops melanops* (Vieillot, 1819)). Capture for pet trade and habitat loss may have extirpated the once

frequent *Sporophila collaris* (Boddaert, 1783) from most suitable marshy areas in the region (Rosário, 1996), as it has few recent records (WikiAves, www.wikiaves.com.br/mapaRegistros_coleiro-do-brejo).

In regard to migratory birds, the lack of previous comprehensive studies on these groups has apparently hampered the inclusion of the southern coast of Santa Catarina in conservation initiatives (Bencke *et al.,* 2006; Valente *et al.,* 2011; CEMAVE/ICMBio, 2016). For instance, an attempt to identify important areas for Nearctic migratory birds in Brazil included adjacent Rio Grande do Sul and Santa Catarina states, but excluded the southern coast of the latter (Valente *et al.,* 2011). Our records of 18 shorebirds species plus six other species from literature and WikiAves sum up 24 species of Nearctic migrants for southern Santa Catarina; additional species are *Numenius hudsonicus* Latham, 1790 (Silva, 2010), *Calidris himantopus* (Bonaparte, 1826) (Willrich *et al.,* 2015), *Calidris minutilla* (Vieillot, 1819) (Leal, 2015), *Calidris subruficollis* (Vieillot, 1819) (Machado, 2012), *Arenaria interpres* (Linnaeus, 1758) (Bianco, 2009) and *Phalaropus tricolor* (Vieillot, 1819) (Santos, 2012). This high richness compared to other important stopover areas (Valente *et al.,* 2011; CEMAVE/ICMBio, 2016) demonstrates the importance of southern Santa Catarina for several migratory species. Thus, we strongly recommend that future initiatives on migratory birds carefully consider the southern coast of Santa Catarina, especially sandy beaches from Laguna to Passo de Torres.

In summary, we demonstrated that the region of the coastal lagoons of southern Santa Catarina harbours high bird richness, including several threatened, endemic and long-distance migratory species. We believe this inventory presents crucial basic information useful to support further conservation strategies concerning this important coastal area in southern Brazil. The regional avifauna would be benefited by the implementation and proper management of the existing protected areas. Moreover, areas of high diversity of threatened and migratory birds such as Praia do Rincão and Lagoa do Sombrio, may be priority regions for the establishment of new protected areas and conservation efforts. We also encourage further surveys in such areas specially focused on assessing the abundances of endemic, threatened and migratory species. Further research aiming to investigate the consequences of anthropic activities on the avifauna is also necessary in order to understand the extent of such impacts, especially fragmentation of wetlands and grasslands, plantation of large stands of exotic trees, traffic on beaches and drainage of wetlands.

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APPENDIX

Bird species undetected in our ten study sites during field work but with previous records from literature (*i.e.,* Rosário, 1996; Branco *et al.,* 2004; Rupp *et al.,* 2007) or WikiAves (author and catalogue number available at the website – WA). Localities: 2 = Praia do Rincão, 4 = Foz do Rio Araranguá, 6 = Lagoa do Caverá, 7 = Furnas, 8 = Rio Novo, 9 = Anita Garibaldi. Status: Atl = species endemic to the Atlantic Forest, En = endangered, Vu = vulnerable, Nt = near threatened, GL = global level, SC = state level, Nm = Nearctic migrant, Tm = Neotropical migrant.

Taxon	Localities	Date of record	Source	Status
Rhea americana (Linnaeus, 1758)	7	1934	Rosário (1996)	
Cygnus melancoryphus (Molina, 1782)	2,8	10 Nov. 1987, 28 Apr. 1980	Rosário (1996)	
Netta peposaca (Vieillot, 1816)	7,8,9	3 Sep. and 18 Dec. 1982, 25 Aug. 1992	Rosário (1996)	
Dendrocygna bicolor (Vieillot, 1816)	6,8	19 Dec. 1982, 25 Aug. 1992	Rosário (1996)	
Anas bahamensis Linnaeus, 1758	6,8	18 Jul. 1988, 25 Aug. 1992	Rosário (1996)	
Fulica rufifrons Philippi & Landbeck, 1861	7,8,9	28 and 29 Apr. 1980, 15 Jul. 1988, 25 Aug. 1992	Rosário (1996)	
Porphyriops melanops (Vieillot, 1819)	2,6,8	15 and 18 Jul. and 14 Aug. 1988	Rosário (1996)	
Limosa haemastica (Linnaeus, 1758)	4	21 Out. 2015	E. Morisso (WA1887303)	Nm
Actitis macularius (Linnaeus, 1766)	4	2002 or 2003	Branco *et al.* (2004)	Nm
Phalaropus tricolor (Vieillot, 1819)	4	10 Jan. 2011	I. Ghizoni-Jr. (WA370198)	Nm
Chroicocephalus cirrocephalus (Lichtenstein, 1823)	4	1 Sep. 2009	I. Ghizoni-Jr. (WA599792)	
Hydropsalis anomala (Gould, 1838)	8	3 June 1991	Rupp *et al.* (2007)	Nt-GL, En-SC
Hylocharis chrysura (Shaw, 1812)	4,8	26 Apr. 2014; 30 Jul. 2016	J.C. Campos (WA1320844); B. Junior (WA2301999)	
Florisuga fusca (Vieillot, 1817)	4	5 Feb. 2012	J.C. Campos (WA803233)	
Falco peregrinus Tunstall, 1771	4	14 Apr. 2015	R. Cardoso (WA1663881)	Nm
Biatas nigropectus (Lafresnaye, 1850)	6	18 Jul. 1988	Rosário (1996)	Atl, Vu-GL-SC
Pyrocephalus rubinus (Boddaert, 1783)	4	21 Sep. 2014, 21 Oct. 2016	E. Morisso (WA1460203, WA2351796)	Tm
Turdus flavipes Vieillot, 1818			E. Morisso (WA1899049)	
Tangara palmarum (Wied, 1821)	4	17 Sep. 2014	J.C. Campos (WA1454507)	
Hemithraupis guira (Linnaeus, 1766)	4	15 Nov. 2015	E. Morisso (WA1914459)	
Hemithraupis ruficapilla (Vieillot, 1818)	4	21 Oct. 2015	E. Morisso (WA1887286)	Atl
Pipraeidea bonariensis (Gmelin, 1789)	4	25 Dec. 2011	I. Teixeira (WA1112011)	
Sporophila collaris (Boddaert, 1783)	8	18 Dec. 1982 and 25 Aug. 1992; 6 May 2015	Rosário (1996); L. Deconto (WA1691009)	

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