

Birds from the endangered Monte, the Steppes and Coastal biomes of the province of Río Negro, northern Patagonia, Argentina

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ABSTRACT: The main ecosystem in northern Patagonia, Argentina, is the Monte, a semi-desert scrubland home to a high biodiversity. Monte is the most endangered ecosystem of southern South America, with an annual rate of clearance of the native vegetation estimated at 3.7%. Here we report the results of bird surveys carried out in the province of Río Negro, northern Patagonia. We surveyed four localities mostly dominated by the Monte ecosystem, between 1986 and 2010. Three localities are Important Bird Areas (IBAs): El Cóndor, San Antonio Oeste and Meseta de Somuncurá. The fourth locality is the Paso Córdoba nature reserve. We recorded a total of 263 bird species. The highest species richness was observed at San Antonio Oeste, followed by El Cóndor. Information regarding the period of occurrence and habitats are provided for all species and localities. Additionally, we indicated the cases in which breeding behavior was observed. This information is urgently needed for the evaluation of the consequences of habitat destruction and deterioration as well as for the success of intended remediation measures.

INTRODUCTION

The Monte ecosystem is a semi-desert scrubland characterized by bushy steppes and xerophytes forests, which covers approximately 46,000,000 ha and extends from Patagonia to northwestern Argentina (Cabrera 1971). Most of northern Patagonia is dominated by this ecosystem, characterized by the presence of numerous endemic species, such as insects and reptiles (Roig-Juñent *et al.* 2001; Roig *et al.* 2009). Parts of this region are considered some of the last wild places on Earth (WCS and CIESIN 2005). Nevertheless, the Monte is the most endangered ecosystem in southern South America. The annual rate of clearance of native vegetation in northeastern Patagonia has been estimated at 3.7%, a rate ten times higher than the average 0.4% rate of global tropical rainforest loss (Balmford *et al.* 2003; Pezzola *et al.* 2004). What consequences such ecosystem destruction may have for bird populations inhabiting the Monte remain unknown. It may lead to species range contractions and if the Monte disappears within the next 25 years as some predict (Pezzola *et al.* 2004) it will probably lead to local and/or regional population extirpations. Other habitats, with various degrees of conservation concern, are also present in northern Patagonia, including seacoast and associated cliffs and dunes, steppes, as well as large rivers with associated marshlands and ponds. An important avifauna characterizes one of these rivers, the Negro river, flowing from the Andean slopes to the Atlantic Ocean (Camperi and Darrieu 2005; Failla *et al.* 2007).

Northeastern Patagonia is also affected by unpredictable

climatic events including the El Niño Southern Oscillation (ENSO). The region experiences dry conditions during the La Niña phase of the ENSO phenomenon, and significantly increased rainfall during El Niño years (Masello and Quillfeldt 2004a; Masello *et al.* 2008a). In brief, La Niña dramatically reduces food availability in the region and, as a consequence, breeding success of bird populations in the region; El Niño events trigger opposite effects. The increased ENSO frequency observed in recent years (see Masello and Quillfeldt 2004a and references therein), adds further concern regarding the viability of bird populations of the region.

Detailed observations on biodiversity are urgently needed in order to be able to study and understand the consequences of habitat destruction and deterioration, as well as the effects of climate change. Furthermore, the success of any intended conservation effort, as well as remediation actions, will also strongly depend on information from surveys. We present observational data from 25 years of surveys in northern Patagonia, Argentina, in order to update current information on the bird diversity of the region.

MATERIALS AND METHODS

Study site

We surveyed four localities of northern Patagonia, province of Río Negro (RN), Argentina. Three localities are Important Bird Areas (IBAs): El Cóndor (RN01: according to the Argentinean IBAs nomenclature; Di Giacomo *et al.* 2007), San Antonio Oeste (RN03) and Meseta de

Somuncurá (RN06). The fourth locality is the municipal nature reserve Paso Córdoba (Figure 1).

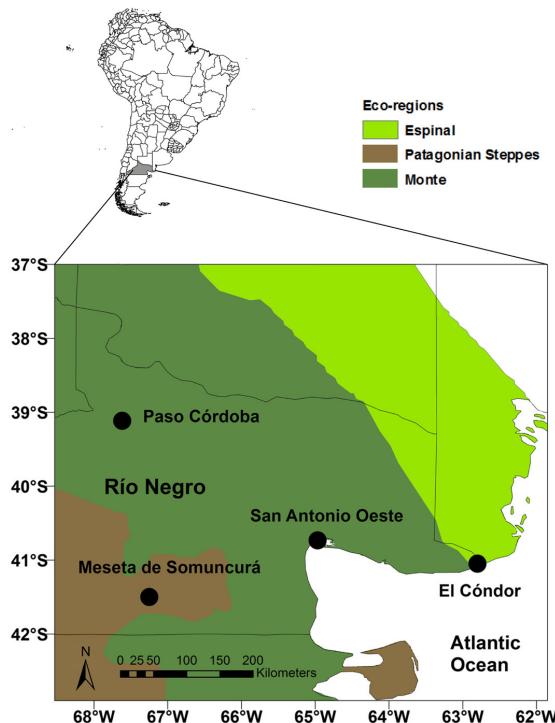


FIGURE 1. Map of northern Patagonia showing the localities surveyed in this study. The three phytogeographical provinces occurring in the region are shown in colour.

El Cónedor

The IBA El Cónedor is located in northeastern Patagonia, on the Atlantic coast (1600 ha; 41°03' S, 62°48' W; Figures 1 and 2). It is mainly characterized by remnants of Monte vegetation; however, several other habitats of importance to the local avifauna are also found: the estuary of the Negro river, its associated islands, dunes and marshlands, and sandstone cliffs (del Río *et al.* 2005; Lini *et al.* 2005; Masello and Quillfeldt 2005; Masera 2005; Olivares and Sisul 2005; Zabala and Freije 2005). Among the local vegetation, shrubs including the Chañar *Geoffroea decorticans*, the Piquillín *Condalia microphylla*, the Molle *Schinus johnstonii*, and the Yao-yin *Lycium tenuispinosum* are present (see Kröpfl *et al.* 2005 for further details). In El Cónedor it is also possible to find plants from the neighboring phytogeographical province of Espinal (Cabrera 1971; Masello and Quillfeldt 2005; 2007; Masello *et al.* 2006). The main human activities in the region are cattle ranching and local tourism in the village of El Cónedor and nearby beaches during the holiday season (Masello and Quillfeldt 2005; 2007; Torrejón and Sawicki 2005). The IBA El Cónedor lacks legal protection and consequently is highly threatened by the destruction of native Monte vegetation and resulting erosion, urban development, intensification of agricultural practices and illegal hunting of wild birds (Masello and Quillfeldt 2005; 2007).

San Antonio Oeste

The IBA San Antonio Oeste is also located in northeastern Patagonia, on the Atlantic coast (300,000 ha; 40°44' S, 64°58' W; Figures 1 and 3). The main habitats are: 1) the Monte vegetation in the flat and in the 'bajos' (below sea level) terrestrial areas, 2) large extensions of



FIGURE 2. Main habitats found at the IBA El Cónedor, province of Río Negro, northern Patagonia, Argentina: A) marshlands at the estuary of the Negro river, B) dunes close to the estuary of the Negro river, C) patch of Monte vegetation close to the dunes, D) sandstone cliffs. Photos by Mauricio Failla.



FIGURE 3. Large extensions of sandy and muddy tidal flats, with the irregular presence of shoals (A) and large dunes (B), two characteristics of the IBA San Antonio Oeste. Photos by Jan van de Kam (A) and Mauricio Failla (B).

sandy and muddy tidal flats, with the irregular presence of shoals, and large dunes, 3) sandstone cliffs (Bonuccelli 2005; González 2005; 2007; Masera 2005; Zabala and Freije 2005). The coastline is characterised by tidal amplitude of up to 9.3 m, that can expose beaches up to 7 km wide during low tide (González 2005; 2007). San Antonio Oeste is renowned as a Site of International Importance by the Western Hemisphere Shorebird Reserve Network (González 2005; 2007). It is also important to note that very few freshwater sources exist in the area in the form of seasonal streams, temporary ponds and a channel that runs from the Negro river, distant some 180 km (Guarido and Mazzitelli Mastricchio 2003). Human disturbance in this IBA is related to three cities within the region, the deep-water harbor and associated fisheries

and aquaculture, cattle ranching and tourism in the city of Las Grutas and nearby beaches during the holiday season (González 2005; 2007). Several sectors of this IBA (650 km²) belong to the provincial nature reserve Bahía de San Antonio (Paz Barreto 2005; González 2007). Despite this, urbanization, industrialization, the destruction of the native Monte vegetation and resulting erosion, the intensification of agricultural practices, poorly regulated fisheries and aquaculture, unregulated tourism and illegal hunting threaten the local bird community (González 2005; 2007).

Meseta de Somuncurá

The IBA Meseta de Somuncurá is located in the northern Patagonian steppes (1,600,000 ha) in the province of Río Negro; 41°30' S, 67°15' W; Figures 1 and 4). It is characterized by both Monte and Patagonian steppes vegetation (Cabrera 1971; Figure 1). Three main geological features characterise this IBA: a) a large plateau, with one of the few endorreic basins in South America, b) low sierras, and c) small valleys, where some streams and moorland occur (Guarido 1998; Masera 1998; Chebez 2007). This IBA is home to many endemic plants, fish, amphibians, lizards, mammals and mollusks (Paz Barreto 1998; Vinci 1998; Chebez 2007). The main human activities are associated with a small village located to the west of this IBA, cattle ranching during the summer months, and developing tourism (Cortés *et al.* 1998; del Valle Moldes 1998; Chebez 2007). These activities are poorly regulated and pose some degree of threat to this extremely fragile ecosystem (Chebez 2007). In addition, an increase in recreational activities in the outermost areas of the Meseta de Somuncurá has been noted close to several towns in the surrounding region (Sierra Grande, Valcheta, El Caín, Rincón Grande, in decreasing order). This is due to the use of off-road vehicles and to better road access in recent years.

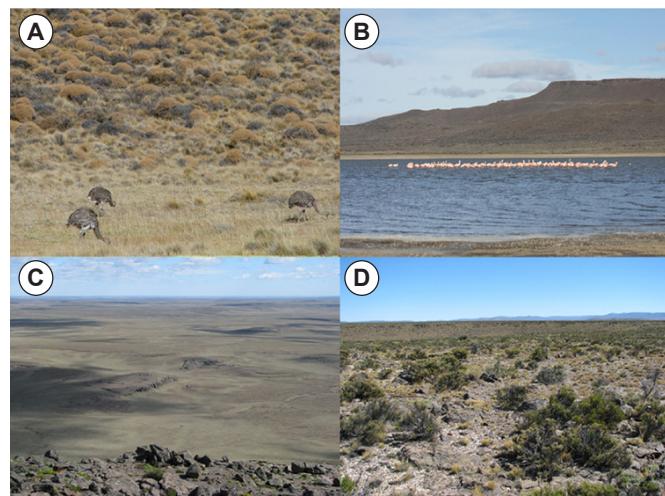


FIGURE 4. Main habitats found at the IBA Meseta de Somuncurá: A) Patagonian steppes, B) little valleys, where some freshwater is possible to be found, C) the plateau as seen from the sierras, D) the sierras as seen from the plateau (note the typical steppe vegetation). Photos by Fabián Llanos.

Paso Córdoba

The municipal nature reserve Paso Córdoba is located in the upper valley of the Negro river, surrounded by

the northern Patagonian plains (17,500 ha; 39°07' S, 67°37' W; Figures 1 and 5; see also Guarido 2001). This 'natural protected area', as it is officially called in Spanish, is one of the few in Patagonia that protects a relatively large area of the phytogeographical province of Monte. As it is located 12 km from the city of Roca, it is close to one of the most developed urban areas of Patagonia. Additionally, the region north and east of Paso Córdoba has some of the most intense agricultural developments in Patagonia. Urbanization, industrialization, intensification of agricultural practices and associated erosion, the increased use and subsequent accumulation of pesticides for agriculture, poorly regulated local tourism and illegal hunting also threaten the bird community and ecosystem of this nature reserve (Piacentini and Paz Barreto 2001).

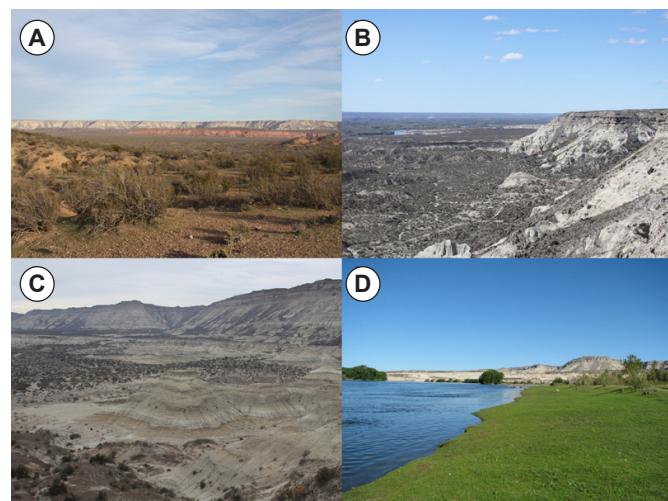


FIGURE 5. Main habitats found at the municipal nature reserve Paso Córdoba: A) and B) Monte vegetation in the valley of the Negro river, C) the 'bardas' (gorges) at the border between the valley of the Negro river and the northern Patagonian plains, D) the Negro river. Photos by Fabián Llanos.

Data collection and analysis

Although sampling effort was high during most years of the study, it differed among the studied localities. Data for El Cóndor were collected: 1) on a daily basis, all year long, between 1986 and 1989 (during some weeks of this period the frequency was reduced to once a week), 2) on a daily basis, from October to February, during the period 1998-2002; 3) two to three times per season in 2003; 4) from 2004 to 2010, during ten or more surveys in March-September (non-breeding season), and on a daily basis between October and February (breeding season). In San Antonio Oeste data were collected from: 1) one to ten surveys per month, all-year-round, between 1989 and 1995; 2) one to ten surveys, in Winter, Spring and Summer, and 4 times per week in Fall, between 1995 and 1997, 3) 40 to 70 one-day surveys from February to May, and three to seven in Spring, between 1998 and 2010.

For the municipal nature reserve Paso Córdoba, data were collected: 1) during one-day surveys carried out every 15 days, all-year-round, between 2000 and 2010, 2) during additional three-days long surveys, carried out once per season, from 2000 to 2010. At the Meseta de Somuncurá the following surveys were carried out: 1) an 18 days survey in November and December 1993, 2) a four days survey in August 2006, 3) a five days survey in September 2007, 4) a four days survey in August 2008, and

5) two to three several-days surveys per season between 2004 and 2009.

For all birds observed, we recorded species identity, habitat, and period of occurrence (season). Observations were carried out along regularly surveyed pathways by at least two of us. We also recorded whether the bird was breeding in the area or not. A bird was considered breeding in a given locality if any of the following criteria were fulfilled: 1) presence of a colony, 2) presence of a nest, or 3) observation of juvenile birds during the known breeding season. Birds were observed and identified with the assistance of binoculars and telescopes. Species identification was carried out using all the field guides available (Olrog 1959; de la Peña 1988; 1989; 1992a,b,c, de la Peña and Rumboll 1998; Narosky and Yzurieta 1989; 2003; 2010). Taxonomic position and scientific names followed Mazar Barnett and Pearman (2001), except in a few cases indicated (Table 1).

In order to compare the similarity of species composition, we calculated the Jaccard coefficient (also known as Jaccard index, or Jaccard similarity coefficient) among all pairs of localities. The Jaccard coefficient measures similarity between sample sets, and is defined as the size of the intersection divided by the size of the union of the sample sets (Real and Vargas 1996).

RESULTS AND DISCUSSION

Overall

We recorded 263 bird species (161 non Passeriformes and 102 Passeriformes) belonging to 55 families (Table 1). Most species belonged to the Monte, Espinal and coastal bird communities as defined by Narosky and Yzurieta (2003). The highest species richness was recorded at the IBA San Antonio Oeste (205 species), followed by the IBA El Cóndor (185), the nature reserve Paso Córdoba (157), and the IBA Meseta de Somuncurá (109). The Jaccard coefficient among all pairs of localities showed a clear differentiation of the IBA Meseta de Somuncurá with respect to coastal localities (El Cóndor and San Antonio Oeste), and a higher degree of similarity between the IBAs San Antonio Oeste and El Cóndor (Table 2).

San Antonio Oeste

We recorded 14 threatened bird species in the IBA San Antonio Oeste (Table 1): the Darwin's Rhea *Rhea [Pterocnemia] pennata* (d'Orbigny, 1834), the Rockhopper Penguin *Eudyptes chrysocome* (Forster, 1781), the Macaroni Penguin *E. chrysolophus* (Brandt, 1837), the Magellanic Penguin *Spheniscus magellanicus* (Forster, 1781), the Black-browed Albatross *Thalassarche melanophrys* (Temminck, 1828), the Wandering Albatross *Diomedea exulans* (Linnaeus, 1758), the Royal Albatross *D. epomophora* (Lesson, 1825), the Common Giant-Petrel *Macronectes giganteus* (Gmelin, 1789), the White-chinned Petrel *Procellaria aequinoctialis* (Linnaeus, 1758), the Sooty Shearwater *Puffinus griseus* (Gmelin, 1789), the Chilean Flamingo *Phoenicopterus chilensis* (Molina, 1782), the Two-banded Plover *Charadrius falklandicus* (Latham, 1790), the Hudsonian Godwit *Limosa haemastica* (Linnaeus, 1758), the Red Knot *Calidris canutus* (Linnaeus, 1758), the Sanderling *C. alba* (Pallas, 1764), the White-rumped Sandpiper *C. fuscicollis* (Vieillot, 1819), the

Magellanic Plover *Pluvianellus socialis* (Gray, 1846), the Olrog's Gull *Larus atlanticus* (Olrog, 1958), the Chocolate-vented Tyrant *Neoxolmis rufiventris* (Vieillot, 1823), and the Yellow Cardinal *Gubernatrix cristata* (Vieillot, 1817).

Previous studies also reported all of these species for the IBA San Antonio Oeste suggesting that this IBA might be important for them (González 2005; 2007; Piacentini and Dallorso 2005). Nevertheless, we found that eight of these threatened species were occasional visitors to the region (Table 1). Moreover, we could only confirm *R. pennata*, *C. falklandicus*, and *G. cristata* as breeding birds in the area (Table 1). Yet this finding is of remarkable importance, particularly for the latter species, which is currently highly threatened by habitat lost and trapping for the pet trade (Failla et al. 2007). As *P. chilensis* and *N. rufiventris* were present all year round (Table 1; see also González 2007) it is possible that these species actually breeds in the region, but we were not able to detect breeding behavior, colonies, or nests. Other species like *S. magellanicus*, *M. giganteus*, *P. socialis* and *L. atlanticus* were regular visitors during the non-breeding season (Table 1) but always in low numbers.

San Antonio Oeste is an important place for waders (González 2005 and references therein). We recorded 15 Nearctic shorebirds using San Antonio Oeste as migration stop-over (Table 1), of which *C. canutus*, *C. alba*, *C. fuscicollis*, *L. haemastica*, and the Grey Plover *Pluvialis squatarola* (Linnaeus, 1758) were observed in large numbers, particularly during the Austral Fall (Table 1). Between February and April, varying among years, 25 to 50% of the total population of *C. c. rufa* makes stopover in San Antonio Oeste on their way back to the Northern Hemisphere (González et al. 2004; 2006; González 2007).

El Cóndor

We also observed nine threatened species at El Cóndor: the Greater Rhea *Rhea americana* (Linnaeus, 1758), *S. magellanicus*, *T. melanophris*, *M. giganteus*, *P. chilensis*, the Ruddy-headed Goose *Chloephaga rubidiceps* (Sclater, 1861), *L. atlanticus*, *G. cristata*, and the Pampas Meadowlark *Sturnella defilippii* (Bonaparte, 1850) (Table 1). We found that three of these species breed at el Cóndor (Table 1). Individuals of *R. americana* were observed breeding in farmland with extensive cattle ranching and in Monte patches, while the *G. cristata* were nesting in remnant patches of undisturbed Monte vegetation (Table 1). Adults of *S. defilippii* were found breeding at the marshlands on the western side of the estuary of the Negro river during spring 2006. This breeding place was located some 200 km south of the previously known breeding areas (Fernández et al. 2003; Cozzani et al. 2004; Gabelli et al. 2004). This finding is of paramount importance for bird conservation as *S. defilippii* is an endemic, vulnerable species from Argentina (Tubaro and Gabelli 1999).

Another species found in El Cóndor, some 200 km out of its normal range (see Mazar Barnett and Pearman 2001; Narosky and Yzurieta 2003), was the Limpkin *Aramus guarauna* (Linnaeus, 1766) (Table 1). Although several individuals were observed in the marshlands on the western side of the estuary of the Negro river in all seasons during the last two years, breeding could not be confirmed (Table 1). Groups of up to 20 *L. atlanticus* regularly used the islands, sand banks and marshlands on

the western side of the estuary of the Negro river. These are probably individuals from several colonies of this species located at the IBA San Blas (BA16), about 100 km to the north of the estuary of the Negro river, which would represent 38% of the breeding population of the species (Rabuffetti 2007). The marshlands at the estuary of the Negro river also attracted several species of waders: we recorded eight Nearctic migrants, three resident species, and two Neotropical migrants (Table 1).

The most striking ornithological feature of El Cóndor is the colony of the Burrowing Parrot *Cyanoliseus patagonus* (Vieillot, 1818) (Masello and Quillfeldt 2005; 2007; Masello et al. 2006). The *C. patagonus* colony extends along 12.5 km of sandstone cliffs facing the Atlantic Ocean in the westernmost part of this IBA (Masello et al. 2006; Failla et al. 2007). A detailed study showed that the colony contained > 50,000 burrows, an estimated > 37,000 of which were active (Masello et al. 2006). To our knowledge, this is the largest known colony of Psittaciformes of the world. Note that Masello et al. (2006) mentioned an extension of the colony of only 9 km. In the years after that study, the colony expanded further westwards reaching its present extension (12.5 km). Additionally, 6500 *C. patagonus* not attending nestlings were found to be associated with the colony during counts carried out in the 2003-2004 breeding season (Masello et al. 2006). Several other bird species use collapsed *C. patagonus* nests for their own breeding, including high numbers of the Southern Martin *Progne modesta* (Gould, 1838) (see Masello and Quillfeldt 2005), the Chimango Caracara *Milvago chimango* (Vieillot, 1816), the American Kestrel *Falco sparverius* (Linnaeus, 1758), the Peregrine Falcon *Falco peregrinus* (Tunstall, 1771), the Common Barn Owl *Tyto alba* (Scopoli, 1769), and the Field Flicker *Colaptes campestris* (Vieillot, 1818) (Masello et al. 2008b). These findings support El Cóndor as a region of critical importance for the avifauna of NE Patagonia. Paradoxically, the IBA El Cóndor lacks legal protection, which is urgently needed in order to protect its bird community (Masello and Quillfeldt 2003, 2004b, 2005, 2007; Masello et al. 2007; Masello 2009).

Paso Córdoba

At the municipal nature reserve Paso Córdoba we detected birds species mainly associated with the Monte ecosystem or to the Negro River (Table 1). Among the Monte species, we found two partial austral migrants: the Rusty-backed Monjita *Neoxolmis rubetra* (Burmeister, 1860) and the Austral Negrito *Lessonia rufa* (Gmelin, 1789) (Table 1). We also detected two threatened species, the *R. [Pterocnemia] pennata* and *P. chilensis* (Table 1). In addition, we detected *A. guarauna* at Paso Córdoba, suggesting a recent expansion of this species into northern Patagonia (see above, El Cóndor). It is also important to note that we observed large flocks of the Andean Swift *Aeronautes andecolus* (d'Orbigny and Lafresnaye, 1837) at Paso Córdoba all-year-round (Table 1). It is regularly seen in other parts of the Monte ecosystem, but these swifts are usually found much further north. To our knowledge, this is the first observation of the species in northern Patagonia (Paz Barreto 1997a,b; Piacentini and Paz Barreto 2001). The species richness at Paso Córdoba was lower than in the coastal localities investigated (see also Piacentini and

Paz Barreto 2001; Tables 1 and 2). This was due to the absence of seabirds and the low number of wader species recorded, as Paso Córdoba is far from the sea. The southern limit of the distribution of the Rufous Hornero *Furnarius rufus* (Gmelin, 1788) was considered to be the Colorado River, northern limit of Patagonia, until the 1960s (Gazari 1967). Our observation of *F. rufus* breeding in all four surveyed localities provide further support for the range expansion of this species towards the south. This expansion was first mentioned by Gazari (1967) and confirmed by other studies (Navas 1970; Bettinelli and Chebez 1986; Canevari et al. 1992; Paz Barreto 1997a,b).

Meseta de Somuncurá

We confirmed the presence of all species first observed in the Meseta de Somuncurá by Bettinelli and Chabéz (1986): the Southern Lapwing *Vanellus chilensis* (Molina, 1782), *C. campestris*, the Black-billed Shrike-Tyrant *Agriornis montana* (d'Orbigny and Lafresnaye, 1837), the White-browed Ground-Tyrant *Muscisaxicola albiflora* (Lafresnaye, 1855), the Ochre-naped Ground-Tyrant *M. flavinucha* (Lafresnaye, 1855), the Cinnamon-bellied Ground-Tyrant *M. capistrata* (Burmeister, 1860), the Black-fronted Ground-Tyrant *M. frontalis* (Burmeister, 1860), the Spot-billed Ground-Tyrant *M. maculirostris* (d'Orbigny and Lafresnaye, 1837), and the Grey-hooded Sierra-Finch *Phrygilus gayi* (Gervais, 1834) (Table 1). The breeding of *M. capistrata* in the Meseta de Somuncurá, as suggested by Chebez (2007), was not confirmed. Among threatened species, we observed the presence of *R. pennata*, the Andean Condor *Vultur gryphus* (Linnaeus, 1758) (recently reintroduced to Northeastern Patagonia; see Jácome et al. 2005), *P. chilensis*, *C. rubidiceps*, and *N. rufiventris* (Table 1). As in previous studies, our data correspond to observations carried out mainly in the Spring and Summer. Thus, data from Winter months are still needed, as pointed out by Chebez (2007). Altogether, we found a significantly larger number of species than any previous studies in the Meseta de Somuncurá and the surrounding region (Daciuk 1979; Bettinelli and Chebez 1986; Navas and Bó 1990; Canevari et al. 1992; Vuilleumier 1994; Lambertucci et al. 2009). However, as Chebez (2007) suggested, taking into account the isolation of most of this study site, and the high number of endemic species in other taxa, studies that are more detailed would be desirable in order to investigate potential population differentiation and speciation.

Further remarks

The current list of long-term bird observations in four localities of northern Patagonia, together with information on habitat use and breeding, substantially improves the knowledge of the regional avifauna. Moreover, the rate of Monte clearance in northern Patagonia (see Pezzola et al. 2004) makes this kind of studies urgent, as they will allow us to take the necessary conservation and remediation actions, based on current field data. As Paz Barreto (1997c) found in his analysis, the Monte and Espinal are indeed the two ecosystems in major need of conservation and remediation actions in the province of Río Negro, Patagonia. We expect that our study trigger more intense and detailed ornithological research in the region.

TABLE 1. List of bird species of the four localities studied at the province of Río Negro, Patagonia, Argentina. The period of occurrence is indicated as follows: Su, summer; F, fall; W, winter; Sp, spring; A, all-year-round; R, infrequent occurrence. ‘Habitat’ corresponds to the habitat where birds were observed and it is detailed as follows: C, coast of the sea; D, dunes; S, steppes; P, ponds; M, “Monte” vegetation; Ri, river. The column “Breed” indicates if the bird species breeds or not in the locality where it was observed. Species nomenclature follows Mazar Barnett and Pearman (2001); exceptions where indicated by numbers (1 and 2) and followed Narosky and Yzurieta (1989).

		EL CÓNDOR			SAN ANTONIO OESTE			SOMUNCURÁ			PASO CÓRDOBA		
		PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED
RHEIDAE		A	M	Yes	A	M	Yes	A	S-M	Yes	A	M	Yes
<i>Rhea americana</i> (Linnaeus, 1758)													
<i>Rhea [Pterocnemia] pennata</i> (d'Orbigny, 1834)													
TINAMIDAE													
<i>Rhynchos rufescens</i> (Temminck, 1815)	Sp-Su	M	No	A	M	Yes	A	S-M	Yes	A	M	M	Yes
<i>Nothoprocta cinerascens</i> (Burmeister, 1860)	A	M	Yes	A	M	Yes	A	M	Yes	A	M	M	Yes
<i>Nothura darwinii</i> (Gray, 1867)	A	M	Yes	A	M	Yes	A	M	Yes	A	M	M	Yes
<i>Nothura maculosa</i> (Temminck, 1815)	A	M	Yes	A	M	Yes	A	M	Yes	A	M	M	Yes
<i>Eudromia elegans</i> (Geoffroy Saint-Hilaire, 1832)	A	M	Yes	A	M	Yes	A	M	Yes	A	M	M	Yes
<i>Tinamotis ingoufi</i> (Oustalet, 1890)								Su	S	Yes			
SPHENISCIDAE													
<i>Aptenodytes patagonicus</i> (Miller, 1778)	F	C	No	R	C	No							
<i>Eudyptes chrysocome</i> (Forster, 1781)	F	C	No	R	C	No							
<i>Eudyptes chrysolophus</i> (Brandt, 1837)	F	C	No	F	C	No							
<i>Spheniscus magellanicus</i> (Forster, 1781)	F	C	No										
PODICIPEDIDAE													
<i>Rollandia rolland</i> (Quoy and Gaimard, 1824)	A	C-Ri	Yes	A	C	No							
<i>Podilymbus podiceps</i> (Linnaeus, 1758)	A	C-Ri	Yes	A	C	No							
<i>Podiceps major</i> (Boddart, 1783)	A	C-Ri	Yes	A	C	Yes							
<i>Podiceps occipitalis</i> (Garnot, 1826)	A	C-Ri	Yes	A	C	No							
DIOMEDEIDAE													
<i>Thalassarche cauta</i> (Gould, 1841)				R	C	No							
<i>Thalassarche melanophris</i> (Temminck, 1828)	Sp-W	C	No	R	C	No							
<i>Diomedea exulans</i> (Linnaeus, 1758)				R	C	No							
<i>Diomedea epomophora</i> (Lesson, 1825)				R	C	No							
PROCELLARIIDAE													
<i>Macronectes giganteus</i> (Gmelin, 1789)	A	C	No	R	C	No							
<i>Fulmarus glacialisoides</i> (Smith, 1840)	R	C	No	R	C	No							
<i>Daption capense</i> (Linnaeus, 1758)				R	C	No							
<i>Pachyptila belcheri</i> (Mathews, 1912)				R	C	No							
<i>Procellaria aequinoctialis</i> (Linnaeus, 1758)				R	C	No							
<i>Puffinus puffinus</i> (Brünnich, 1764)				R	C	No							
<i>Puffinus griseus</i> (Gmelin, 1789)				R	C	No							
<i>Puffinus gravis</i> (O'Reilly, 1818)	Sp	C	No	R	C	No							
HYDROBATIDAE													
<i>Oceanites oceanicus</i> (Kuhl, 1820)	Sp	C	No	R	C	No							

TABLE 1. CONTINUED.

	EL CÓNDOR			SAN ANTONIO OESTE			SOMUNCURÁ			PASO CÓRDOBA		
	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED
PELECANOIDAE												
<i>Pelecanoides magellani</i> (Mathews, 1912)	Sp-W	C	No				R	C	No			
SULIDAE												
<i>Morus capensis</i> (Lichtenstein, 1823)												
PHALACROCORACIDAE												
<i>Phalacrocorax brasiliensis</i> (Gmelin, 1789)	A	Ri	No	Sp-W	C	No	A	P	No	A	Ri	No
<i>Phalacrocorax magellanicus</i> (Gmelin, 1789)				R	C	No						
<i>Phalacrocorax [atriceps] albiventris</i> (King, 1828)	Sp-W	C	No	Su	C	No						
FREGATIDAE												
<i>Fregata magnificens</i> (Mathews, 1914)	Su	C	No									
ARDEIDAE												
<i>Ixobrychus involucris</i> (Vieillot, 1823)	Su-Sp	Ri	No	R	C	No	R	P	No	No	A	Ri
<i>Nycticorax nycticorax</i> (Linnaeus, 1758)				A	C	Yes	Su-Sp	P-Ri	No			Yes
<i>Syrigma sibilatrix</i> (Temminck, 1824)				No	A	C	No	Su	M	No		
<i>Egretta thula</i> (Molina, 1782)	A	C-Ri	No	A	C	No	Su	R	No	A	Ri	Yes
<i>Ardea cocoi</i> (Linnaeus, 1766)	A	C-Ri	No	A	C	Yes	Su	R	No	A	Ri	Yes
<i>Ardea [casmerodus] alba</i> (Linnaeus, 1758)	A	C-Ri	No	A	C	No	Su	R	No	A	Ri	Yes
<i>Bubulcus [Ardeotis] ibis</i> (Linnaeus, 1758)	A	C-Ri	No	Su	C	No			Su		M-Ri	No
THRESKIORNITHIDAE												
<i>Plegadis chihi</i> (Vieillot, 1817)	R	M	No	F-W	C	No			Su-Sp	Ri	No	
<i>Theristicus melanopis</i> (Gmelin, 1789)	F-W	Ri	No	Su	C	No	Su	M	Yes	Su-Sp	M-Ri	Yes
<i>Ajaia ajaja</i> (Linnaeus, 1758)	Su-Sp	C-Ri	No						R	Ri	No	
CICONIIDAE												
<i>Mycteria americana</i> (Linnaeus, 1758)	R	Ri	No	R	C	No						
<i>Ciconia maguari</i> (Gmelin, 1789)												
CATHARTIDAE												
<i>Coragyps atratus</i> (Bechstein, 1783)	A	C-D-Ri	Yes	A	C-D	Yes	A	S-M	Yes	A	Ri-M	Yes
<i>Cathartes aura</i> (Linnaeus, 1758)	A	C-D-Ri	Yes	A	C-D	Yes	A	S-M	Yes	A	Ri-M	Yes
<i>Vultur gryphus</i> (Linnaeus, 1758)							A	S-M	No			
PHOENICOPTERIDAE												
<i>Phoenicopterus chilensis</i> (Molina, 1782)	A	C-Ri	No	A	C	No	R	P	No	A	Ri	No
ANATIDAE												
<i>Coscoroba coscoroba</i> (Molina, 1782)	A	C-Ri	No	Su	C	No	Su-Sp	P	No	Su-Sp	Ri	No
<i>Cygnus melanocorypha</i> (Molina, 1782)	A	C-Ri	No	Su	C	No	Su-Sp	P	No	A	Ri	No
<i>Chloephaga picta</i> (Gmelin, 1789)	F-W	C-Ri	No	Su-F	C	No	Su-Sp	P-S	Yes	W	Ri	No
<i>Chloephaga poliocephala</i> (Sclater, 1857)	F-W	Ri	No									
<i>Chloephaga rubidiceps</i> (Sclater, 1861)												
<i>Lophonetta specularioides</i> (King, 1828)	F-W	C	No	A	C	No	Su	P	Yes			

TABLE 1. CONTINUED.

	EL CÓNDOR			SAN ANTONIO OESTE			SOMUNCURÁ			PASO CÓRDOBA		
	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED
<i>Tachyeres patachonicus</i> (King, 1828)	A	C-Ri	No	Su	C	No	Su	P	No	Su	C	No
<i>Anas plattea</i> (Vieillot, 1816)	Su-Sp	Ri	No	Su	C	No	Su	P	No	Su	P-Ri	No
<i>Anas cyanoptera</i> (Vieillot, 1816)	A	C-Ri	No	Su-F	C	No	Su	P	No	Su-F-Sp	Ri	No
<i>Anas versicolor</i> (Vieillot, 1816)	A	C-Ri	No	Su-F	C	No	Su	P	No	Su-Sp	Ri	No
<i>Anas sibilatrix</i> (Poepig, 1829)	A	C-Ri	Yes	Su-F	C	No	Su	P	No	A	Ri	Yes
<i>Anas flavirostris</i> (Vieillot, 1816)	A	C-Ri	Yes	Su-F	C	No	Su	P	No	A	Ri	Yes
<i>Anas bahamensis</i> (Linnaeus, 1758)										Su	Ri	No
<i>Anas georgica</i> (Gmelin, 1789)	A	C-Ri	Yes	Su-F	C	No	Su	P	Yes	A	Ri	Yes
<i>Netta /Metopiana/ peposaca</i> (Vieillot, 1816)	A	C-Ri	No	Su	P	No	Su	P	No	Su	Ri	No
<i>Oxyura vittata</i> (Philippi, 1860)										Su	Ri	No
ACCIPITRIDAE												
<i>Elanus leucurus</i> (Vieillot, 1818)	A	C-M-Ri	Yes	A	C-M	Yes				A	M	No
<i>Circus buffoni</i> (Gmelin, 1788)	A	C-D-M-Ri	Yes	A	C-M	Yes						
<i>Circus cinereus</i> (Vieillot, 1816)	A	C-D-M-Ri	Yes	A	C-M	Yes	Sp-Su	S	No	R	M-Ri	No
<i>Parabuteo unicinctus</i> (Temminck, 1824)	A	M	Yes	A	M	Yes						
<i>Geranoaetus melanoleucus</i> (Vieillot, 1819)	A	C	Yes	A	C	Yes	A	S	Yes	A	M-Ri	Yes
<i>Buteo magnirostris</i> (Gmelin, 1788)	R	M	No									
<i>Buteo swainsoni</i> (Bonaparte, 1838)	F	C	No									
<i>Buteo albicaudatus</i> (Vieillot, 1816)	F	D-M	No	A	M	No						
<i>Buteo polyosoma</i> (Quoy and Gaimard, 1824)	A	M-C	Yes	A	M	Yes	A	S	Yes	A	M	Yes
FALCONIDAE												
<i>Caracara plancus</i> (Miller, 1777)	A	C-D-M-Ri	Yes	A	C-D-M	Yes	A	S	Yes	A	M-Ri	Yes
<i>Milvago chimango</i> (Vieillot, 1816)	A	C-D-M-Ri	Yes	A	C-D-M	Yes	A	M-S	Yes	A	M-Ri	Yes
<i>Spizapteryx circumcinctus</i> (Kaup, 1852)				R	C	Yes						
<i>Falco sparverius</i> (Linnaeus, 1758)	A	C-D-M-Ri	Yes	A	C-D-M	Yes	A	M-S	Yes	A	M-Ri	Yes
<i>Falco femoralis</i> (Temminck, 1822)	F	C	No	A	C-D-M	Yes	Su	M	No	A	M-Ri	No
<i>Falco peregrinus</i> (Tunstall, 1771)	A	C	Yes	Su-Sp	C	Yes	Su	M	No	A	M-Ri	Yes
RALLIDAE												
<i>Pardirallus sanguinolentus</i> (Swainson, 1838)	A	Ri	Yes	F-W	C	No	Su-Sp	R	Yes	A	P-Ri	Yes
<i>Gallinula melanops</i> (Vieillot, 1819)	A	Ri	Yes	A	C	Yes	Su	P	No	A	P-Rii	Yes
<i>Fulica leucoptera</i> (Vieillot, 1817)				A	C	Yes						
<i>Fulica armillata</i> (Vieillot, 1817)	F	C	No	A	C	Yes						
<i>Fulica rufifrons</i> (Philippi and Landbeck, 1861)												
ARAMIDAE												
<i>Aramus guarauna</i> (Linnaeus, 1766)	A	C	No							R	Ri	No
HAEMATOPODIDAE												
<i>Haematopus palliatus</i> (Temminck, 1820)	A	C-Ri	Yes	A	C	Yes						
<i>Haematopus ater</i> (Vieillot and Oudart, 1825)	R	C	No	Su	C	Yes						

TABLE 1. CONTINUED.

	EL CÓNDOR			SAN ANTONIO OESTE			SOMUNCURÁ			PASO CÓRDOBA		
	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED
RECURVIROSTRIDAE												
<i>Haematopus leucopodus</i> (Garnot, 1826)				R	C	No						
<i>Himantopus melanurus</i> (Vieillot, 1817)	A	Ri	Yes	A	C	No	Su-Sp	P	No	A	Ri	No
CHARADRIDAE												
<i>Vanellus chilensis</i> (Molina, 1782)	A	C-D-M-Ri	Yes	A	C-D-M	Yes	Su-Sp	P	Yes	A	Ri	Yes
<i>Pluvialis dominica</i> (Muller, 1776)	Su-F-Sp	C-Ri	No	F-Sp	C	No						
<i>Pluvialis squatarola</i> (Linnaeus, 1758)	Su-F-Sp	Ri	No	F-Sp	C	No						
<i>Charadrius semipalmatus</i> (Bonaparte, 1825)	F	C	No	F	C	No						
<i>Charadrius collaris</i> (Vieillot, 1818)	Su-Sp	Ri	No	F	C	No						
<i>Charadrius falklandicus</i> (Latham, 1790)	A	C-Ri	No	Su-F-W	C	Yes	Su-Sp	P	No			
<i>Charadrius modestus</i> (Lichtenstein, 1823)	Su-Sp	Ri	No	Su	C	No						
<i>Oreopholus ruficollis</i> (Wagler, 1829)	F-W	C	No	Su	C	No	Su	S	Yes	R	Rii	No
SCOLOPACIDAE												
<i>Gallinago paraguaiae</i> (Vieillot, 1816)				R	C	No						
<i>Limosa haemastica</i> (Linnaeus, 1758)	Su-F-Sp	Ri	No	Su	C	No						
<i>Numenius phaeopus</i> (Linnaeus, 1758)	A	Ri	No	Su-F-Sp	C	No						
<i>Tringa melanoleuca</i> (Gmelin, 1789)	A	Ri	No	Su-F-Sp	C	No						
<i>Tringa flavipes</i> (Gmelin, 1789)												
<i>Arenaria interpres</i> (Linnaeus, 1758)												
<i>Aphriza virgata</i> (Gmelin, 1789)												
<i>Calidris canutus</i> (Linnaeus, 1758)	R	Ri	No	Su-F-Sp	C	No						
<i>Calidris alba</i> (Pallas, 1764)	Su-Sp	C	No	A	C	No						
<i>Calidris pusilla</i> (Linnaeus, 1766)	Su-Sp	C	No	Su	C	No						
<i>Calidris fuscicollis</i> (Vieillot, 1819)	Su-Sp	Ri	No	Su	C	No						
<i>Calidris bairdii</i> (Couch, 1861)	Su-Sp	Ri	No	Su	C	No	Su-Sp	P	No			
<i>Phalaropus tricolor</i> (Vieillot, 1819)				F-Sp	C	No	Su-Sp	P	No			
THINOCORIDAE												
<i>Thinocorus orbignyanus</i> (Geoffroy Saint-Hilaire and Lesson, 1831)	R	C	No	F	C	No	Su	S	Yes	W	M	No
<i>Thinocorus rumicivorus</i> (Eschscholtz, 1829)												
PLUVIANELLIDAE												
<i>Pluvianellus socialis</i> (Gray, 1846)	R	C	No	F-Sp	C	No						
CHIONIDAE												
<i>Chionis alba</i> (Gmelin, 1789)	A	C-Ri	No	W-Sp	C	No						
LARIDAE												
<i>Stercorarius chilensis</i> (Bonaparte, 1825)	F	C	No	F	C	No						
<i>Stercorarius antarcticus</i> (Lesson, 1831)												
<i>Stercorarius parasiticus</i> (Linnaeus, 1758)												
<i>Chroicocephalus cirrocephalus</i> (Vieillot, 1818)	Su	C	No									



TABLE 1. CONTINUED.

	EL CÓNDOR			SAN ANTONIO OESTE			SOMUNCURÁ			PASO CÓRDOBA		
	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED
<i>Chroicocephalus maculipennis</i> (Lichtenstein, 1823)	A	C-Ri	No	F	C	No	R	Ri	No	R	Ri	No
<i>Larus scorebii</i> (Traill, 1823)	F	C	No	F	C	No						
<i>Larus pipixcan</i> (Wagler, 1813)				F-W	C	No						
<i>Larus atlanticus</i> (Olrog, 1958)	A	C	No	W	C	No						
<i>Larus dominicanus</i> (Lichtenstein, 1823)	A	C-D-M-Ri	No	A	C	No						
<i>Sterna fuscata</i> (Gmelin, 1789)	Su-Sp	Ri	No	Su	C	No						
<i>Sterna Thalasseus maxima</i> (Boddart, 1783)	A	C	No	Su-F	C	No						
<i>Sterna eurynota</i> (Saunders, 1876) (1)	Su-Sp	C	No	Su-F	C	No						
<i>Sterna sandvicensis</i> (Latham, 1787) (2)	F	Ri	No	Su-F	C	No						
<i>Sterna hirundinacea</i> (Lesson, 1831)	A	C-Ri	No	A	C	Yes						
<i>Sterna hirundo</i> (Linnaeus, 1758)				R	C	No						
<i>Sterna vittata</i> (Gmelin, 1789)	Su-Sp	C-Ri	No	Su-F	C-P	Yes						
<i>Sterna trudeaui</i> (Audubon, 1838)	Su-Sp	C-Ri	No	Su	C	No						
<i>Rynchops niger</i> (Linnaeus, 1758)												
COLUMBIDAE												
<i>Columba livia</i> (Gmelin, 1789)	A	C-M	Yes	A	C-M	Yes	A	M	Yes	A	Ri	Yes
<i>Columba picazuro</i> (Temminck, 1813)	A	C-M-Ri	Yes	A	C-M	Yes	A	M-Ri	Yes	A	M-Ri	Yes
<i>Columba maculosa</i> (Temminck, 1813)	A	C-M	Yes	A	C-M	Yes	A	M-Ri	Yes	A	M-Ri	Yes
<i>Zenaidura auriculata</i> (Des Murs, 1847)	A	C-M	Yes	A	C-M	Yes	A	M-Ri	Yes	A	M-Ri	Yes
<i>Columbina picui</i> (Temminck, 1813)	A	C-M	Yes	A	C-M	Yes	A	M	Yes	A	M-Ri	Yes
<i>Columbina talpacoti</i> (Temminck, 1809)	R	Ri	No									
PSITTACIDAE												
<i>Cyanoliseus patagonus</i> (Vieillot, 1818)	A	C-D-M-Ri	Yes	A	C-M	Yes	Su	M	Yes	A	M-Ri	Yes
<i>Myiopsitta monachus</i> (Boddart, 1783)	A	M	Yes	A	C-M	Yes	A	M	Yes	A	Ri	Yes
CUCULIDAE												
<i>Coccyzus cinereus</i> (Vieillot, 1817)				R	M	No						
<i>Coccyzus melacoryphus</i> (Vieillot, 1817)				R	M	No						
<i>Guita guira</i> (Gmelin, 1788)	A	C-M	Yes	A	M	Yes						
TYTONIDAE												
<i>Tyto alba</i> (Scopoli, 1769)	A	C-M	Yes	A	C	Yes	Su	M-S	Yes	A	M-Ri	Yes
STRIGIDAE												
<i>Otus Megascops choliba</i> (Vieillot, 1817)	A	C	Yes	A	C	Yes	A	M-S	Yes	A	Ri	Yes
<i>Bubo magellanicus</i> (Gmelin, 1788)	A	M	Yes								M	Yes
<i>Glaucidium brasiliatum</i> (Gmelin, 1788)	A	M	Yes	A	C-D-M	Yes	A	M-S	Yes	A	M-Ri	Yes
<i>Glaucidium nanum</i> (King, 1828)	A	C-D-M	Yes	A	C-D-M	Yes	A	M-S	Yes	A	M-Ri	Yes
<i>Athene Speotyotus cunicularia</i> (Molina, 1782)	A	M	Yes									
<i>Asio clamator</i> (Vieillot, 1807)												
<i>Asio flammeus</i> (Pontoppidan, 1763)	Su	M	No	Su	M	No	Su-Sp	M	Yes	A	M	No



TABLE 1. CONTINUED.

	EL CÓNDOR			SAN ANTONIO OESTE			SOMUNCURÁ			PASO CÓRDOBA		
	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED
CAPRIMULGIDAE												
<i>Caprimulgus longirostris</i> (Bonaparte, 1825)	Su-Sp	M	Yes	A	M	Yes	A	M-S	Yes	A	M	Yes
APODIDAE												
<i>Aeronautes andecolus</i> (d'Orbigny and Lafresnaye, 1837)										Su-Sp	M	No
TROCHILIDAE												
<i>Chlorostilbon aureoventris</i> (d'Orbigny and Lafresnaye, 1838)	Su-Sp	C	Yes	Su-Sp	C	No	Su-Sp	C	No			
<i>Leucochloris albicollis</i> (Vieillot, 1818)	F	C	No	Su-Sp	C	No						
<i>Sephanoides sephanooides</i> (Lesson, 1827)	A	C	Yes									
PICIDAE												
<i>Picoides mixtus</i> (Bodddaert, 1783)	R	M	No	Su	M	No	Su	M	Yes	A	Ri	Yes
<i>Colaptes melanochloros</i> (Gmelin, 1788)	A	D-C-M	Yes	A	D-C-M	Yes	Su	M	Yes	A	Ri	Yes
<i>Colaptes campestris</i> (Vieillot, 1818)	A	D-C-M	Yes	Su	D-C-M	Yes	Su	M	Yes	A	M-Ri	Yes
FURNARIIDAE												
<i>Geositta rufipennis</i> (Bünteister, 1860)										W	M	No
<i>Geositta cunicularia</i> (Vieillot, 1816)	Su-Sp	C	Yes	A	M	No	Su	M	Yes	Su-Sp	M	Yes
<i>Upucerthia dumetaria</i> (Geoffroy Saint-Hilaire, 1832)										Su-Sp	M	Yes
<i>Upucerthia focheterorhynchus ruficauda</i> (Meyen, 1834)												
<i>Cinclodes fuscus</i> (Vieillot, 1818)	Su-Sp	C-M-Ri	Yes	A	C-M	Yes	Su	M	Yes	Su	Ri	No
<i>Furnarius rufus</i> (Gmelin, 1788)	A	C-M-Ri	Yes	A	C-M	Yes	A	M	Yes	A	Ri	Yes
<i>Leptasthenura platensis</i> (Reichenbach, 1853)	Su-Sp	M	Yes	A	C-D-M	Yes	Su	M	Yes	A	M-Ri	Yes
<i>Leptasthenura aegithaloides</i> (Kittlitz, 1830)	A	C-D-M	Yes	Su	D-M	Yes	Su	M	Yes	Su	Ri	No
<i>Craniolaeca pyrrhophia</i> (Vieillot, 1818)	Su-Sp	C-M	Yes	Su-Sp	C-M	Yes	Su	M	Yes	F	M	No
<i>Asthenes pyrrholeuca</i> (Vieillot, 1817)	A	M	Yes	Su	M	Yes	Su	M	Yes	A	M	Yes
<i>Asthenes baeri</i> (Berlepsch, 1906)												
<i>Asthenes modesta</i> (Eyton, 1851)												
<i>Asthenes steinbachi</i> (Hartert, 1909)												
<i>Asthenes patagonica</i> (d'Orbigny, 1839)												
<i>Phlegocryptes melanops</i> (Vieillot, 1817)	Su-Sp	Ri	Yes	Su	M	Yes	Su	M	Yes	F	M	No
<i>Anumbius annumbi</i> (Vieillot, 1817)	A	D-M	Yes	V	M	Yes	A	M	Yes	A	M	Yes
<i>Eremobius phoenicurus</i> (Gould, 1839)				V	M	Yes	Su	M	Yes	A	M	Yes
<i>Pseudoseisura lophotes</i> (Reichenbach, 1853)	A	M	Yes	A	M	Yes	A	M	Yes	A	Ri	Yes
<i>Pseudoseisura gutturalis</i> (d'Orbigny and Lafresnaye, 1838)												
RHYNOCHRIPTIDAE												
<i>Rhinocrypta lanceolata</i> (Geoffroy Saint-Hilaire, 1832)												
<i>Teledromas fuscus</i> (Schater and Salvini, 1873)												
TYRANNIDAE												
<i>Sublegatus modestus</i> (Wied, 1831)	Su-Sp	Ri	Yes	A	M	Yes	A	M	Yes	A	M	Yes
<i>Suiriri suiriri</i> (Vieillot, 1818)												



TABLE 1. CONTINUED.

	EL CÓNDOR			SAN ANTONIO OESTE			SOMUNCURÁ			PASO CÓRDOBA		
	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED
<i>Elaenia albiceps</i> (d'Orbigny and Lafresnaye, 1837)	Su-Sp	M	Yes	Su-Sp	M	Yes	Su	M	Yes	Su	M-Ri	No
<i>Serpophaga nigricans</i> (Vieillot, 1817)	A	D-M	Yes				Su	M	Yes	Su-Sp	M	Yes
<i>Serpophaga subcristata</i> (Vieillot, 1817)												
<i>Serpophaga griseiceps</i> (Berlioz, 1959)	Su-Sp	C-M	Yes	Su	M	No				W	M-Ri	No
<i>Stigmatura budytoides</i> (d'Orbigny and Lafresnaye, 1837)				A	M	Yes				A	M-Ri	Yes
<i>Anairetes flavirostris</i> (Schäfer and Salvin, 1876)	Su-Sp	M	Yes	A	M	Yes	Su-Sp	M	Yes	A	M-Ri	Yes
<i>Anairetes parulus</i> (Kittlitz, 1830)	Su-Sp	M-Ri	Yes	Su-Sp	M	Yes				A	Ri	Yes
<i>Tachuris rubrigaster</i> (Vieillot, 1817)												
<i>Pseudocolopterix flavigularis</i> (d'Orbigny and Lafresnaye, 1837)	Su-Sp	C-D-M	Yes	Su-F	M	Yes	Su-Sp	M	Yes	Su-Sp	Ri	Yes
<i>Pyrocephalus rubineus</i> (Boddaert, 1783)										F	Ri	No
<i>Xolmis pyrrhoe</i> (Kittlitz, 1830)	Su-Sp	M	Yes	Su-F	M	No				Su	M	Yes
<i>Xolmis coronata</i> (Vieillot, 1823)	A	C-D-M	Yes	A	M	Yes				A	M-Ri	Yes
<i>Xolmis irupero</i> (Vieillot, 1823)	Su-Sp	M	No	Su-Sp	M	No						
<i>Neoxolmis rufiventris</i> (Vieillot, 1823)												
<i>Neoxolmis rubetra</i> (Burmeister, 1860)												
<i>Agriornis montana</i> (d'Orbigny and Lafresnaye, 1837)	F	D-M	No	Su	M	Yes	Su	S	Yes	Su	M	No
<i>Agriornis microptera</i> (Gould, 1839)	Su-Sp	M	No	Su	M	Yes	Su	M-S	No	R	M	No
<i>Agriornis murina</i> (d'Orbigny and Lafresnaye, 1837)										F	M	No
<i>Muscisaxicola maculirostris</i> (d'Orbigny and Lafresnaye, 1837)	Su-Sp	D-M	No	A	M	No	Su	S	Yes	Su-Sp	M	Yes
<i>Muscisaxicola macloviana</i> (Garnot, 1829)										F	Ri	No
<i>Muscisaxicola albifrons</i> (Lafresnaye, 1855)												
<i>Muscisaxicola capistrata</i> (Burmeister, 1860)												
<i>Muscisaxicola frontalis</i> (Burmeister, 1860)												
<i>Muscisaxicola flavinucha</i> (Lafresnaye, 1855)												
<i>Lessonia rufula</i> (Gmelin, 1789)	Su-Sp	C-D-M	No	Su	C-M	No	Su	M-S	No	Su-F	Ri	No
<i>Knipolegus hudsoni</i> (Schäfer, 1872)										Su-Sp	M-Ri	Yes
<i>Knipolegus aterrimus</i> (Kaup, 1853)												
<i>Hymenops perspicillatus</i> (Gmelin, 1789)	A	M-Ri	Yes	A	M	Yes	Su	M	Yes	Su-Sp	M	Yes
<i>Machetornis rixosus</i> (Vieillot, 1819)	Su-Sp	M	Yes	A	M	Yes	Su-Sp	M	Yes	Su-Sp	M-Ri	Yes
<i>Tyrannus melancholicus</i> (Vieillot, 1819)	Su-Sp	M	Yes	Su-Sp	M	No	Su	M	Yes	Su-Sp	M-Ri	Yes
<i>Tyrannus savana</i> (Vieillot, 1808)	Su-Sp	C-M	Yes	Su-F	M	Yes	Su	M	Yes	Su-Sp	Ri	Yes
<i>Griseotyrannus aurantioatrocristatus</i> (D'Orbigny and Lafresnaye, 1837)	Su-Sp	M	No	A	M	Yes	A	M	Yes	A	Ri	Yes
<i>Pitangus sulphuratus</i> (Linnaeus, 1766)	A	M	Yes									
COTINGIDAE												
<i>Phytotoma rutila</i> (Vieillot, 1818)	A	D-M	Yes	Su-Sp	M	Yes	Su	M	Yes	Su-Sp	M	Yes
HIRUNDINIDAE												
<i>Progne modesta</i> (Gould, 1838)	Su-Sp	C-D-M-Ri	Yes	Su-Sp	M	Yes	Su	M	Yes	Su-Sp	M-Ri	Yes
<i>Progne tapera</i> (Linnaeus, 1766)	Su-Sp	C-D-Ri	Yes	Su-Sp	M	Yes						



TABLE 1. CONTINUED.

	EL CÓNDOR			SAN ANTONIO OESTE			SOMUNCURÁ			PASO CÓRDOBA		
	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED
<i>Tachycineta meyeni</i> (Cabanis, 1850)	Su-Sp	C-D-M-Ri	Yes	Su-Sp	C-D	Yes	Su	M	Yes	Su-Sp	M-Ri	Yes
<i>Notiochelidon [Pygochelidon] cyanoleuca</i> (Vieillot, 1817)	Su-Sp	C-D-M-Ri	Yes	Su-Sp	C-D	Yes	Su	M	Yes	Su-Sp	M-Ri	Yes
<i>Stelgidopteryx fuscata</i> (Temminck, 1822)				Su	C	No				Su-Sp	Ri	No
<i>Riparia riparia</i> (Linnaeus, 1758)				Su	C	No				Su-Sp	M-Ri	No
<i>Hirundo rustica</i> (Linnaeus, 1758)										Su-Sp	M-Ri	No
TROGLODYTIDAE												
<i>Cistothorus platensis</i> (Latham, 1790)	A	M-Ri	Yes	A	C-M	Yes	Su	M	Yes	R	M-Ri	No
<i>Troglodytes aedon</i> (Vieillot, 1809)	A	C-D-M-Ri	Yes	A	C-M	Yes	Su	M	Yes	A	M-Ri	Yes
POLIOPHILIDAE				Su-Sp	M	Yes						
<i>Polioptila dumicola</i> (Vieillot, 1817)												
TURDIDAE												
<i>Turdus chiguanco</i> (Lafresnaye and d'Orbigny, 1837)	R	D	No	A	M-D	No	A	M	Yes	A	Ri	Yes
<i>Turdus falcklandii</i> (Quoy and Gaimard, 1824)	A	C-D-M-Ri	Yes	A	C-M	Yes	A	M	Yes	A	Ri	Yes
MIMIDAE												
<i>Mimus saturninus</i> (Lichtenstein, 1823)	A	C-D-M-Ri	Yes	A	C-M	Yes	A	M	Yes	A	M-Ri	Yes
<i>Mimus patagonicus</i> (Lafresnaye and d'Orbigny, 1837)	A	C-D-M-Ri	Yes	A	C-M	Yes	A	M	Yes	A	M-Ri	Yes
<i>Mimus triurus</i> (Vieillot, 1818)	A	C-D-M-Ri	Yes	Su	C-M	Yes	A	M	Yes	A	M-Ri	Yes
MOTACILLIDAE												
<i>Anthus correndera</i> (Vieillot, 1818)	A	C-M	Yes	A	C-M	No						
<i>Anthus furcatus</i> (Lafresnaye and d'Orbigny, 1837)	Su-Sp	M	No				Su	M	No			
<i>Anthus hellmayri</i> (Hartert, 1909)												
THRAUPIDAE												
<i>Thraupis bonariensis</i> (Gmelin, 1789)	Su-Sp	M	Yes	A	M	Yes				R	M-Ri	No
EMBERIZIDAE												
<i>Phrygilus gayi</i> (Gervais, 1834)	R	M	No	A	M-D	Yes	Su	S	Yes	W	M	No
<i>Phrygilus fruticeti</i> (Kittlitz, 1833)	Su-Sp	C-M	Yes	A	M-D	Yes	Su	M	Yes	A	M-Ri	Yes
<i>Phrygilus carbonarius</i> (Lafresnaye and d'Orbigny, 1837)	Su-Sp	C-M	Yes	Su-Sp	C-M	Yes	Su	M	Yes	R	M	
<i>Diuca diuca</i> (Molina, 1782)	Su-Sp	M	No	R	M	No	R	M	Yes	A	M	Yes
<i>Poospiza ornata</i> (Leybold, 1865)										Su-Sp	M	Yes
<i>Poospiza torquata</i> (d'Orbigny and Lafresnaye, 1837)	R	M	No							R	M	No
<i>Sporophila caerulescens</i> (Vieillot, 1823)										Su-Sp	M	Yes
<i>Catamenia analis</i> (d'Orbigny and Lafresnaye, 1837)	A	M	Yes	A	M	Yes				A	M-Ri	Yes
<i>Sicalis leucurus</i> (Oustalet, 1891)	A	C-D-M	Yes	A	M-D	Yes				A	Ri	Yes
<i>Sicalis flaveola</i> (Linnaeus, 1766)	A	C-D-M	Yes	A	M-D-C	Yes				A	Ri	Yes
<i>Sicalis uroleuca</i> (Sparrman, 1789)										Sp	Ri	No
<i>Embernagra platensis</i> (Gmelin, 1789)										A	Ri	Yes
<i>Paroaria coronata</i> (Miller, 1776)												
<i>Gubernatrix cristata</i> (Vieillot, 1817)	A	C-M	Yes	A	M	Yes						



TABLE 1. CONTINUED.

	EL CÓNDOR			SAN ANTONIO OESTE			SOMUNCURÁ			PASO CÓRDOBA		
	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED	PERIOD	HABITAT	BREED
<i>Zonotrichia capensis</i> (Miller, 1776)	A	C-D-M-Ri	Yes	A	C-D-M	Yes	A	M-P-S	Yes	A	M-Ri	Yes
CARDINALIDAE												
<i>Saltator aurantiirostris</i> (Vieillot, 1817)				R	M	No						
ICTERIDAE												
<i>Agelaius/Chrysomus/therilius</i> (Molina, 1782)	Su-Sp	Ri	Yes	A	C	Yes	Su	M	Yes	A	Ri	Yes
<i>Agelaioides badius</i> (Vieillot, 1819)	A	C-D-M-Ri	Yes	Su-Sp	M	Yes	Su	M	Yes	A	Ri	Yes
<i>Molothrus bonariensis</i> (Gmelin, 1789)	A	C-D-M-Ri	Yes	Su-Sp	M	Yes	Su	M	Yes	A	M-Ri	Yes
<i>Molothrus rufoaxillaris</i> (Cassin, 1866)				R	M	No				A	M-Ri	Yes
<i>Sturnella defilippii</i> (Bonaparte, 1850)	Su-Sp	M-Ri	Yes	A	C-D-M	Yes	Su	M	Yes	A	M-Ri	Yes
<i>Sturnella loyca</i> (Molina, 1782)	A	C-D-M	Yes	A	C-D-M	Yes	Su	M	Yes	A	M-Ri	Yes
FRINGILLIDAE												
<i>Carduelis chloris</i> (Linnaeus, 1758)	Su-Sp	M	Yes	R	M	No	Su	M	No	A	M-Ri	Yes
<i>Carduelis magellanica</i> (Vieillot, 1805)	A	C-D-M	Yes	Su	M	Yes	Su	M	No			
<i>Carduelis barbata</i> (Molina, 1782)	A	M	Yes	Su	M	Yes						
PASSERIDAE												
<i>Passer domesticus</i> (Linnaeus, 1758)	A	C-D-Ri	Yes	A	C-D	Yes	A	M	Yes	A	M-Ri	Yes

TABLE 2. Jaccard similarity coefficients for the observed species richness at El Cónedor, San Antonio Oeste, Meseta de Somuncurá and Paso Córdoba, province of Río Negro, northern Patagonia, Argentina. Values are given in percentage (%).

	EL CÓNDOR	SAN ANTONIO OESTE	MESETA DE SOMUNCURÁ	PASO CÓRDOBA
EL CÓNDOR	-	65	39	54
SAN ANTONIO OESTE	-	-	42	56
MESETA DE SOMUNCURÁ	-	-	-	54

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LITERATURE CITED

- Balmford, A., R.E. Green and M. Jenkins. 2003. Measuring the changing state of nature. *Trends in Ecology and Evolution* 18(2): 326-330.
- Bettinelli, M.D. and J.C. Chebez. 1986. Notas sobre aves de la meseta de Somuncurá. *Hornero* 12(2): 230-234.
- Bonuccelli, R. 2005. Los acantilados del Balneario Las Grutas. Procesos que intervienen sobre el litoral. Destrucción de los acantilados. Medidas preventivas para que se transformen en estructuras estables; p. 221-234 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina*. Viedma: Ministerio de Familia, Gobierno de Río Negro.
- Cabrera, A.L. 1971. Fitogeografía de la República Argentina. *Boletín de la Sociedad Argentina de Botánica* 14(1): 1-42.
- Camperi, A.R. and C.A. Darrieu. 2005. Aves del alto valle del Río Negro, Argentina. *Revista del Museo Argentino de Ciencias Naturales, Nueva Serie* 7(1): 51-56.
- Canevari, M., R. Chiesa and G. Lingua. 1992. *Relevamiento de la meseta de Somuncurá*. Boletín FVSA 9. Buenos Aires: Fundación Vida Silvestre. 38 p.
- Chebez, J.C. 2007. Área Natural Protegida Provincial Meseta de Somuncurá; p. 348-349 In A.S. Di Giacomo, M.V. De Francesco and E.G. Coconier (ed.). *Áreas importantes para la conservación de las aves en Argentina. Sitios prioritarios para la conservación de la biodiversidad*. Buenos Aires: Aves Argentinas / Asociación Ornitológica del Plata.
- Cortés, H.R., R.F. Masera, A. Dallorso and G. Serra Peirano. 1998. La gente y la economía del Somuncurá: Una aproximación a su estudio desde el análisis censal; p. 207-294 In R.F. Masera (ed.) *La Meseta Patagónica del Somuncurá. Un horizonte en movimiento. 2º edición revisada y ampliada*. Viedma: Secretaría de Estado de Acción Social de Río Negro.
- Cozzani, N., R. Sánchez and S. Zabala. 2004. Nidificación de la loica pampeana (*Sturnella defilippii*) en la provincia de Buenos Aires, Argentina. *Hornero* 19(1): 47-52.
- Daciuk, J. 1979. Contribuciones sobre protección, conservación, investigación y manejo de la vida silvestre y áreas naturales. VI. Reserva Natural Integral de Somuncurá proyectada en Río Negro (Rep. Arg.). *Physis C* 38(94): 99-106.
- de la Peña, M.R. 1988. *Guía de Aves Argentinas. 1º edición. Tomo V*. Buenos Aires: L.O.L.A. 112 p.
- de la Peña, M.R. 1989. *Guía de Aves Argentinas. 1º edición. Tomo VI*. Buenos Aires: L.O.L.A. 125 p.
- de la Peña, M.R. 1992a. *Guía de Aves Argentinas. 2º edición. Tomo I*. Buenos Aires: L.O.L.A. 126 p.
- de la Peña, M.R. 1992b. *Guía de Aves Argentinas. 2º edición. Tomo II*. Buenos Aires: L.O.L.A. 166 p.
- de la Peña, M.R. 1992c. *Guía de Aves Argentinas. 2º edición. Tomo III*. Buenos Aires: L.O.L.A. 130 p.
- de la Peña, M.R. and M. Rumboll. 1998. *Birds of Southern South America and Antarctica*. London: Harper Collins. 304 p.
- del Río, J.L., M.J. Bó, A.M. López de Armentía, J.R. Álvarez, J. Martínez Arca, C. Wagner and M. Camino. 2005. Geomorfología descriptiva y ambiental de la costa oriental del golfo San Matías y la desembocadura del río Negro; p. 201-219 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina*. Viedma: Ministerio de Familia, Gobierno de Río Negro.
- del Valle Moldes, B. 1998. Plumas, pieles, tejido y Ganado. Contribución al conocimiento de la transición del sector social con economía doméstica en Somuncurá; p. 75-206 In R.F. Masera (ed.). *La Meseta Patagónica del Somuncurá. Un horizonte en movimiento. 2º edición revisada y ampliada*. Viedma: Secretaría de Estado de Acción Social de Río Negro.
- Di Giacomo, A.S., M.V. De Francesco and E.G. Coconier. 2007. *Áreas importantes para la conservación de las aves en Argentina. Sitios prioritarios para la conservación de la biodiversidad. Temas de Naturaleza y Conservación 5. CD-ROM. Edición Revisada y Corregida*. Buenos Aires: Aves Argentinas/Asociación Ornitológica del Plata. 515 p.
- Failla M., M.L. Pagnossin, D. Paz Barreto, A. Pagnossin, M. Marchesan, P. Quillfeldt, C. Sommer and J.F. Masello. 2007. Villa Marítima El Cóndor. Donde la diversidad de aves contribuye con el turismo del nordeste patagónico. *Naturaleza y Conservación* 20: 24-30.
- Fernández, G., G. Posse, V. Ferretti and F. Gabelli. 2003. Bird-habitat relationship for the Pampas meadowlark populations in the southern Pampas grasslands. *Biological Conservation* 115(1): 139-148.
- Gabelli, F.M., G.J. Fernández, V. Ferretti, G. Posse, E. Coconier, H.J. Gavieiro, P.E. Llambías, P.I. Peláez, M.L. Vallés and P.L. Tubaro. 2004. Range contraction in the Pampas Meadowlark *Sturnella defilippii* in the Southern Pampas grasslands of Argentina. *Oryx* 38(1): 164-170.
- Gazari, R.R. 1967. Notas sobre algunas aves no señaladas o poco conocidas al sur del río Colorado. *Hornero* 10(4): 451-454.
- González, P.M. 2005. Las aves migratorias. Las preguntas de la ida y vuelta de los chorlos y playeros entre los Hemisferios Sur y Norte. Su estadía temporaria en el Área Natural Protegida 'Bahía de San Antonio' y su reconocimiento como 'Sitio Internacional'. Estudio de su potencial ecoturístico. La declinación; p. 321-347 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina*. Viedma: Ministerio de Familia, Gobierno de Río Negro.
- González, P.M. 2007. San Antonio Oeste; p. 341-343 In A.S. Di Giacomo, M.V. De Francesco and E.G. Coconier (ed.). *Áreas importantes para la conservación de las aves en Argentina. Sitios prioritarios para la conservación de la biodiversidad*. Buenos Aires: Aves Argentinas / Asociación Ornitológica del Plata.
- González, P., M. Carbajal, R.I.G. Morrison and A.L.J. Baker. 2004. Tendencias poblacionales del playero rojizo (*Calidris canutus rufa*) en el sur de Sudamérica. *Ornitología Neotropical* 15 (Suppl.): 357-365.
- González, P.M., A.J. Baker and M.E. Echave. 2006. Annual survival of red knots (*Calidris canutus rufa*) using the San Antonio Oeste stopover site is reduced by domino effects involving late arrival and food depletion in Delaware Bay. *Hornero* 21(2): 109-117.
- Guardo, J.C. 1998. Unidades geográficas Meseta de Somuncurá; p. 57-74 In R.F. Masera (ed.). *La Meseta Patagónica del Somuncurá. Un horizonte en movimiento. 2º edición revisada y ampliada*. Viedma: Secretaría de Estado de Acción Social de Río Negro.
- Guardo, J.C. 2001. Geografía Física - Departamento El Cuy - Provincia de Río Negro; p. 31-62 In R.F. Masera (ed.). *La Meseta Patagónica de El Cuy. Una vasta soledad*. Viedma: Secretaría de Estado de Acción Social de Río Negro.
- Guardo, J.C. and M. Mazzitelli Mastricchio. 2003. Geograffa. El Bajo del Gualicho; p. 23-57 In R.F. Masera and J.C. Guardo (ed.). *Bajo del Gualicho: Una planicie patagónica bajo el nivel del mar. Realidad y leyenda*. Viedma: Secretaría de Estado de Acción Social de Río Negro.
- Jácome, N.L., V. Astore and M. Bertini. 2005. El retorno del Cóndor al Mar; p. 373-396 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina*. Viedma: Ministerio de Familia, Gobierno de Río Negro.
- Kröpfl, A.L., G.A. Cecchi, N.M. Villasuso, E. Rossio and J.P. Pelotto. 2005. *Manual de especies silvestres del Monte rionegrino*. Viedma: Estación Experimental Agropecuaria Valle Inferior, INTA and Centro Universitario Regional Zona Atlántica, Universidad Nacional del Comahue. 184 p.
- Lambertucci, S.A., F. Barbar, C. Cabrera and M. Bertini. 2009. Comentarios sobre las Aves de la Sierra de Pailemán, Río Negro, Argentina. *Nuestras Aves* 54: 81-87.
- Lini, R.M., O. Sanguineti, G. Zeppi, M. Alcalde and R.F. Masera. 2005. El estuario del río Negro. ¿Hacia un área natural protegida?; p. 441-452 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina*. Viedma: Ministerio de Familia, Gobierno de Río Negro.
- Masello, J.F. 2009. Natural wonder. IBA designation brings parrot colony closer to protection. *PsittaScene* 21(1): 10-11.
- Masello, J.F. and P. Quillfeldt. 2003. The breeding colony of Burrowing Parrots in Patagonia. *PsittaScene* 15(4): 12-13.
- Masello, J.F. and P. Quillfeldt. 2004a. Consequences of La Niña phase of ENSO for the survival and growth of nestling Burrowing Parrots on the Atlantic coast of South America. *Emu* 104(4): 337-346.
- Masello, J.F. and P. Quillfeldt. 2004b. Burrowing Parrots news from El Cóndor, Patagonia, Argentina. *PsittaScene* 16(2): 7-9.
- Masello, J.F. and P. Quillfeldt. 2005. La colonia de loros barranqueros en la costa rionegrina de El Cóndor. Un patrimonio mundial; p. 349-371 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina*. Viedma: Ministerio de Familia, Gobierno de Río Negro.
- Masello, J.F. and P. Quillfeldt. 2007. Villa Marítima El Cóndor; p. 338-339 In A.S. Di Giacomo, M.V. De Francesco and E.G. Coconier (ed.). *Áreas importantes para la conservación de las aves en Argentina. Sitios*

- prioritarios para la conservación de la biodiversidad.* Buenos Aires, Aves Argentinas / Asociación Ornitológica del Plata.
- Masello, J.F., M.L. Pagnossin, C. Sommer and P. Quillfeldt. 2006. Population size, provisioning frequency, flock size and foraging range at the largest known colony of Psittaciformes: the Burrowing Parrots of the north-eastern Patagonian coastal cliffs. *Emu* 106(1): 69-79.
- Masello, J.F., M. Failla, P. Giovine and P. Quillfeldt. 2007. Reserve status: parrot colony aims for legal protection. *PsittaScene* 19(4): 13-15.
- Masello, J.F., T. Lubjuhn and P. Quillfeldt. 2008a. Is the structural and psittacofulvin-based colouration of wild Burrowing Parrots *Cyanoliseus patagonus* condition dependent? *Journal of Avian Biology* 39(6): 653-662.
- Masello, J.F., M. Marchesan and P. Quillfeldt. 2008b. Zehn Jahre Forschung in der größten Papageienkolonie der Welt – Teil 1. Die Felsensittiche im Nordosten Patagoniens. *Papageien* 12: 426-429.
- Masera, R.F. 1998. Breve caracterización de la Norpatagonia y el Somuncurá; p. 21-56 In R.F. Masera (ed.). *La Meseta Patagónica del Somuncurá. Un horizonte en movimiento. 2º edición revisada y ampliada.* Viedma: Secretaría de Estado de Acción Social de Río Negro.
- Masera, R.F. 2005. Fisonomía general del borde mar rionegrino; p. 19-40 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina.* Viedma: Ministerio de Familia, Gobierno de Río Negro.
- Mazar Barnett, J. and M. Pearman. 2001. *Lista comentada de las aves argentinas.* Barcelona: Lynx Edicions. 164 p.
- Narosky, T. and D. Yzurieta. 1989. *Birds of Argentina & Uruguay. A field guide.* Buenos Aires: Asociación Ornitológica del Plata. 337 p.
- Narosky, T. and D. Yzurieta. 2003. *Birds of Argentina & Uruguay. A field guide. Edición de oro.* Buenos Aires: Vazquez Mazzini Editores. 346 p.
- Narosky, T. and D. Yzurieta. 2010. *Birds of Argentina & Uruguay. A field guide. 16º edición.* Buenos Aires: Vazquez Mazzini Editores. 432 p.
- Navas, J.R. 1970. Nuevos registros de aves para la Patagonia. *Neotrópica* 16(1): 11-16.
- Navas, J.R. and N.A. Bó. 1990. Apuntes sobre la meseta de Somuncurá, provincia de Río Negro. *Neotrópica* 36(95): 45-53.
- Olivares, G. and A. Sisul. 2005. Hidrogeología de los campos costeros atlánticos rionegrinos; p. 235-247 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina.* Viedma: Ministerio de Familia, Gobierno de Río Negro.
- Olrog, C.C. 1959. *Las aves argentinas. Una guía de campo.* Tucumán: Universidad Nacional de Tucumán, Instituto "Miguel Lillo". 345 p.
- Paz Barreto, D. 1997a. *Aves de la provincia de Río Negro. I - Lista y bibliografía.* Bariloche: Consejo de Ecología y Medio Ambiente. 12 p. Booklet accessible at <https://sites.google.com/site/areasnaturalesyguardaparques/home/documentos/aves>. Captured on 01 November 2011.
- Paz Barreto, D. 1997b. *Aves de la provincia de Río Negro. II - Localidades confirmadas.* Bariloche, Consejo de Ecología y Medio Ambiente. 25 p. Booklet accessible at <https://sites.google.com/site/areasnaturalesyguardaparques/home/documentos/aves>. Captured on 01 November 2011.
- Paz Barreto, D. 1997c. *Un índice de valoración biogeográfica para sistemas de áreas protegidas, aplicado a la Provincia de Río Negro - Rca. Argentina.* Bariloche: Consejo de Ecología y Medio Ambiente, Provincia de Río Negro. 10 p.
- Paz Barreto, D. 1998. Somuncurá: Reserva de la Biosfera; p. 397-407 In R.F. Masera (ed.). *La Meseta Patagónica del Somuncurá. Un horizonte en movimiento. 2º edición revisada y ampliada.* Viedma: Secretaría de Estado de Acción Social de Río Negro.
- Paz Barreto, D. 2005. Listado de las áreas naturales protegidas de la costa rionegrina; p. 287-311 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina.* Viedma: Ministerio de Familia, Gobierno de Río Negro.
- Pezzola, A., C. Winschel and R. Sánchez. 2004. *Estudio multitemporal de la degradación del monte nativo en el partido de Patagones - Buenos Aires. Boletín Técnico Nro. 12.* Buenos Aires: Ediciones Instituto Nacional de Tecnología Agropecuaria. 11 p.
- Piacentini, H.A. and D. Paz Barreto. 2001. La Meseta Patagónica de El Cuy. Patagonia Extra Andina. Una introducción a la potencialidad de los recursos naturales; p. 385-398 In R.F. Masera (ed.) *La Meseta Patagónica de El Cuy. Una vasta soledad.* Viedma: Secretaría de Estado de Acción Social de Río Negro.
- Piacentini, H.A. and A. Dallorso. 2005. Listado y registro fotográfico de algunas especies faunísticas de la costa rionegrina; p. 313-319 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina.* Viedma: Ministerio de Familia, Gobierno de Río Negro.
- Rabuffetti, F. 2007. Reserva de Uso Múltiple de San Blas y Refugio de Vida silvestre complementario; p. 56-57 In A.S. Di Giacomo, M.V. De Francesco and E.G. Coconier (ed.). *Áreas importantes para la conservación de las aves en Argentina. Sitios prioritarios para la conservación de la biodiversidad.* Buenos Aires: Aves Argentinas / Asociación Ornitológica del Plata.
- Real, R. and J.M. Vargas. 1996. The Probabilistic Basis of Jaccard's Index of Similarity. *Systematic Biology* 45(3): 380-385.
- Roig, F.A., S. Roig-Juñent and V. Corbalán. 2009. Biogeography of the Monte Desert. *Journal of Arid Environments* 73(2): 164-172.
- Roig-Juñent, S., G. Flores, S. Claver, G. Debandi and A. Marvaldi. 2001. Monte Desert (Argentina): insect biodiversity and natural areas. *Journal of Arid Environments* 47(1): 77-94.
- Torrejón, C. and S. Sawicki. 2005. Un estudio turístico. Síntesis de atractivos en la costa rionegrina; p. 459-475 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina.* Viedma: Ministerio de Familia, Gobierno de Río Negro.
- Tubaro, P.L. and F.M. Gabelli. 1999. The decline of the Pampas meadowlark: difficulties of applying the IUCN criteria to neotropical grassland birds. *Studies in Avian Biology* 19: 250-257.
- Vinci, C. 1998. El por qué del Área Natural Protegida "Reserva Natural Integral Meseta de Somuncurá"; p. 383-395 In R.F. Masera (ed.). *La Meseta Patagónica del Somuncurá. Un horizonte en movimiento. 2º edición revisada y ampliada.* Viedma: Secretaría de Estado de Acción Social de Río Negro.
- Vuilleumier, F. 1994. Nesting behavior, distribution, and speciation of Patagonian and Andean ground tyrants (*Myiotheretes*, *Xolmis*, *Neoxolmis*, *Agriornis*, and *Muscisaxicola*). *Ornitología Neotropical* 5(1): 1-55.
- Wildlife Conservation Society (WCS) and Center for International Earth Science Information Network (CIESIN) *Last of the Wild Data Version 2,2005 (LWP-2): Global Human Footprint data set (HF).* Electronic Database accessible at <http://www.wcs.org/humanfootprint/>. Captured on 01 November 2011.
- Zabala, C. and H. Freije. 2005. Geología de los acantilados rionegrinos; p. 185-199 In R.F. Masera, J. Lew and G. Serra Peirano (ed.). *Las mesetas patagónicas que caen al mar: la costa rionegrina.* Viedma: Ministerio de Familia, Gobierno de Río Negro.

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