



Rediscovery of *Sporophila frontalis* (Verreaux, 1869) (Aves, Thraupidae) in the state of Rio Grande do Sul, southern Brazil

João Paulo Gava Just^{1,4}, Ricardo Dossa Colvero² & Jairo José Zocche³

¹Programa de Pós-Graduação em Biologia Animal, Departamento de Ecologia, Zoologia e Genética, Instituto de Biologia, Universidade Federal de Pelotas, Campus Universitário Capão do Leão, CEP 96010-900, Capão do Leão, RS, Brazil

²Curso de Ciências Biológicas, Universidade do Extremo Sul Catarinense, Av. Universitária, 1105, CEP 88806-000, Criciúma, SC, Brazil

³Laboratório de Ecologia de Paisagem e de Vertebrados, Curso de Ciências Biológicas, Programa de Pós-Graduação em Ciências Ambientais, Universidade do Extremo Sul Catarinense, Av. Universitária, 1105, CEP 88806-000, Criciúma, SC, Brazil

⁴Corresponding author. E-mail: joap_gava@hotmail.com

Abstract: The Buffy-fronted Seedeater, *Sporophila frontalis* (Verreaux, 1869) (Aves, Thraupidae), is a threatened passerine endemic to the Atlantic Forest of southeastern South America. Habitat loss and illegal capture for the pet trade has reduced the geographical distribution of this species. The Brazilian state of Rio Grande do Sul represents the southernmost limit of this species' range. There, *S. frontalis* was last recorded in 1883, and currently this species is thought to be as extirpated in this state. After 133 years, we report photographic and audiotape records of *S. frontalis*, made in the municipalities of Maquiné and Mampituba, Rio Grande do Sul.

Key words: Atlantic Forest; bamboo-specialist; Buffy-fronted Seedeater; endemic species; pixoxó

The Buffy-fronted Seedeater, *Sporophila frontalis* (Verreaux, 1869) (Aves, Thraupidae), is a passerine endemic to the Atlantic Forest of southeastern South America (BIRDLIFE INTERNATIONAL 2016). This species has nomadic habits associated with seeding events of bamboos and its diet is composed almost entirely of seeds of these plants (ARETA et al. 2013). The former range of *S. frontalis* extended from Bahia to Rio Grande do Sul (eastern Brazil) to the province of Misiones (northwestern Argentina), and the department of Alto Paraná (southeastern Paraguay) (BIRDLIFE INTERNATIONAL 2016). Habitat loss and illegal capture for the pet trade have severely reduced the global population of this species (BIRDLIFE INTERNATIONAL 2016). Consequently, it has been extirpated from several areas of its former range and the remaining populations are at risk of extinction globally, nationally, and regionally (e.g., CONSEMA 2011; MMA 2014; RIO GRANDE DO SUL 2014; BIRDLIFE INTERNATIONAL 2016).

In Rio Grande do Sul, the southernmost state in Brazil, *Sporophila frontalis* reaches its southern limit of its distribution; however, it is currently considered extirpated

(RIO GRANDE DO SUL 2014). The only confirmed record in the state is from Colônia Mundo Novo, a former colony of German immigrants located north of the municipality of Taquara (BENCKE et al. 2003). Based on reports by a resident (Theodor Bischoff), the naturalist Hermann von Ihering stated that the species occurred in astonishing numbers in rice fields at Picada Arroio Grande in 1883, a locality in the Colônia Mundo Novo currently known as Solitária, municipality of Igrejinha (BELTON 1985; BENCKE et al. 2003). Two undated specimens collected by Bischoff at this locality are so far the only tangible evidence available for Rio Grande do Sul (BELTON 1985; BENCKE et al. 2003). Here, we present the rediscovery of *S. frontalis* in Rio Grande do Sul, 133 years after the previous and only record. Our rediscovery is based on documented observations made in the municipalities of Maquiné and Mampituba, in northeastern Rio Grande do Sul.

Our first record was made near the Maquiné River (29°37'42" S, 050°15'00" W; 57 m above sea level) on the road to Barra do Ouro, municipality of Maquiné (Figure 1), on 8 January 2015. A single adult male was observed for 3 min and had its voice recorded (WA1573595, available at WikiAves, <http://www.wikiaves.com.br/1573595>) on the edge of a disturbed riparian forest surrounded by second-growth woodland, rice paddies, and pastures. No bamboo thickets were noted in this area, but slopes and hills to the southwest are extensively forested where bamboo stands are likely present. Our second and third records were in the surroundings of Cachoeira dos Borges (29°17'22" S, 049°58'56" W; 320 m above sea level), municipality of Mampituba (Figure 1), on 10 and 11 September 2016. At least 10 individuals were heard on a slope covered with submontane forest (Figure 2). An unidentified species of bamboo was common on the forest edges, but inaccessibility prevented us from determining whether it was seeding. An individual (Figures 3, 4) attracted with playback displayed aggressive interspecific behavior towards

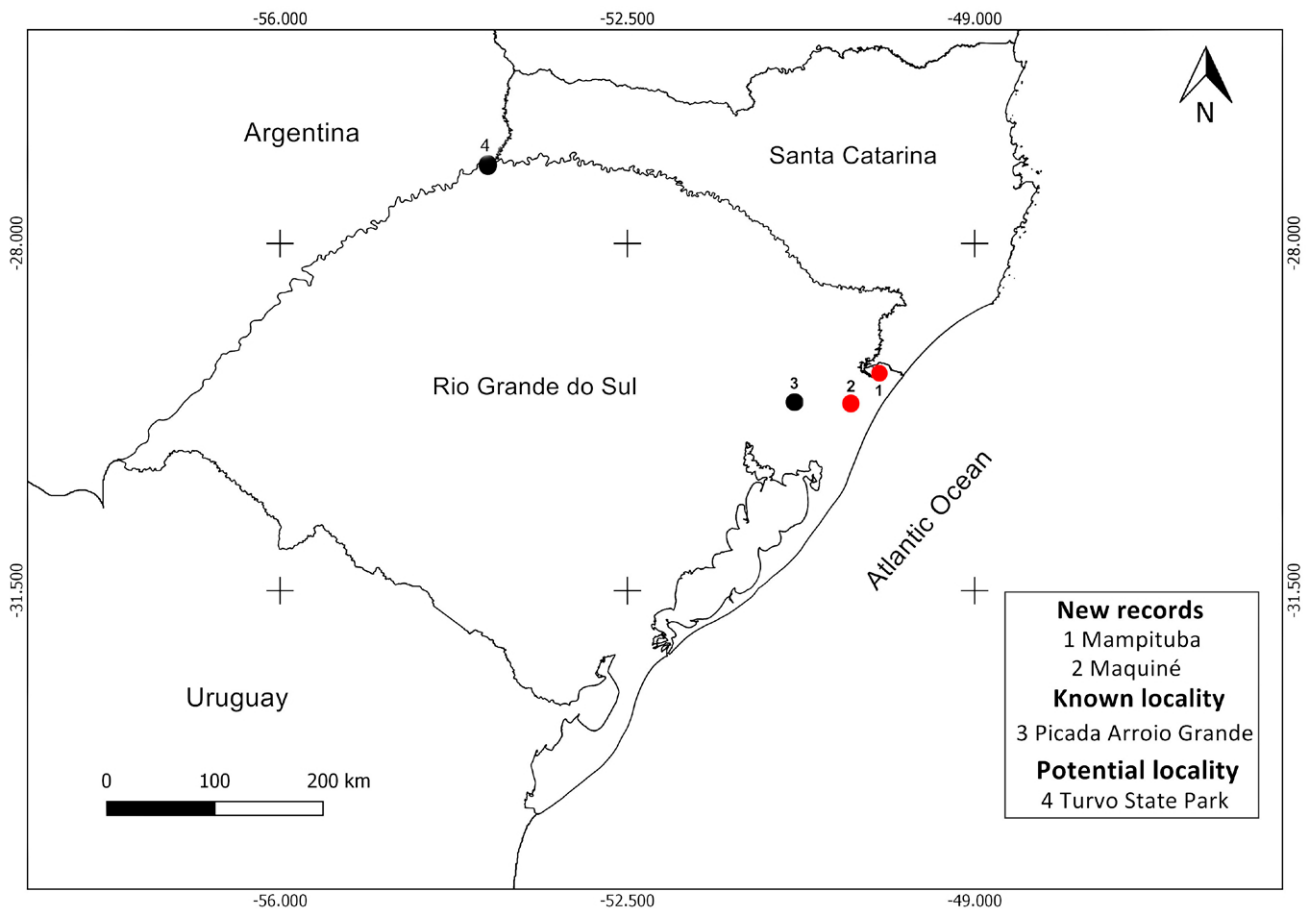


Figure 1. Known and potential localities of occurrence of *Sporophila frontalis* (Verreaux, 1869) in the state of Rio Grande do Sul, southern Brazil.



Figures 2–4. Habitat and photographic records of *Sporophila frontalis* (Verreaux, 1869) in the surroundings of Cachoeira dos Borges, municipality of Mampituba, Rio Grande do Sul, Brazil. **2.** Submontane forest in the surroundings of Cachoeira dos Borges where the species was found. **3, 4.** Adult male *Sporophila frontalis*, 11 September 2016. Photographs by R. D. Colvero.

other birds, including Buff-fronted Foliage-gleaner, *Philydor rufum* (Vieillot, 1818); Golden-winged Cacique, *Cacicus chrysopterus* (Vigors, 1825); and Uniform Finch, *Haplospiza unicolor* Cabanis, 1851. The last species is also a bamboo-specialist and was fairly common at the time of our observations. The two localities are 45 km apart.

Individuals were identified based on their overall olive plumage, whitish marks on the throat and head, and distinctive voice (RIDGELY et al. 2015). Such morphological features are absent in any other potentially syntopic *Sporophila* seedeater, namely Double-collared Seedeater, *S. caerulescens* (Vieillot, 1823); Rusty-collared Seedeater, *S. collaris* (Boddaert, 1783); and Lined Seedeater, *S. lineola* (Linnaeus, 1758) (BELTON 1985; BENCKE 2010; WikiAves, <http://www.wikiaves.com/>) and can be readily seen in the individual depicted on Figures 3, 4.

Including our recent records, *S. frontalis* is now known with certainty from three localities in Rio Grande do Sul (Figure 1). In addition, there is an unconfirmed historical record in the mid-1980s from the Camaquã River, municipality of Encruzilhada do Sul (BENCKE et al. 2003). Furthermore, the species is expected to occur in Turvo State Park (BENCKE et al. 2003), a protected area near the Argentine province of Misiones where this species has been recorded (CHEBEZ 2008).

Our records are near recent records in southern Santa Catarina state (JUST et al. 2015; WikiAves, http://www.wikiaves.com.br/mapa_pixoxo). This suggests that the forested slopes of the Serra Geral have the only confirmed recent occurrences of *S. frontalis* in Rio Grande do Sul. Interestingly, all the records in southern Santa Catarina were made in the last eight years (ROSÁRIO 1996; ARETA et al. 2013; JUST et al. 2015; WikiAves, http://www.wikiaves.com.br/mapa_pixoxo) which may suggest a recent range expansion or recolonization by *S. frontalis* along the Serra Geral of southern Santa Catarina and northeastern Rio Grande do Sul.

Our observations may directly affect the conservation status of *S. frontalis* in Rio Grande do Sul and may reallocate it from “regionally extinct” to other category (RIO GRANDE DO SUL 2014). Nevertheless, conservation strategies for nomadic species associated with bamboo-seeding events may be especially difficult, and conserving a network of natural areas with bamboo seeding at different times and places may be the most effective strategy to ensure viable populations (ARETA & COCKLE 2012). In the region of our records, for example, forests along the Serra Geral remain continuous from near Serra do Tabuleiro in central Santa Catarina to the Maquiné river valley in northern Rio Grande do Sul (BENCKE et al. 2006). This area encompasses five protected areas, namely Serra do Tabuleiro State Park, Serra Furada State Park, Aguai Biological Reserve, Aparados da Serra National Park, and Serra Geral Biological Reserve. Most of these parks are considered Important Bird Areas due to the presence of populations of several threatened species endemic to the Atlantic Forest (BENCKE et al. 2006). The records presented here, in addition to

those from Santa Catarina, suggest that the region can sustain a significant population of *S. frontalis* and that habitat continuity may be maintaining the resources that this species depends on.

As most for *Sporophila* species (BENCKE et al. 2003; VIZENTIN-BUGONI et al. 2013), *S. frontalis* is highly targeted and captured for the pet trade in some regions of Brazil (ARETA et al. 2013). However, *S. frontalis* is absent from most inventories of trafficked birds in Rio Grande do Sul (FERREIRA & GLOCK 2004; ARAÚJO et al. 2010), and thus, we argue that the possibility that our observations represent escapees of captive individuals is unlikely. Indeed, records of single individuals in areas without evident presence of bamboo patches (such as one of ours) may likely represent isolated individuals searching for bamboo patches (ARETA et al. 2013). We recommend that further search effort be undertaken for *S. frontalis* in potential places in Rio Grande do Sul. Such places would include the Serra Geral slopes and Turvo State Park, and searches should especially be done during seeding-bamboo events.

ACKNOWLEDGEMENTS

We thank Rafael Antunes Dias, Caio J. Carlos, Jeferson Vizentin-Bugoni and two anonymous reviewers for valuable suggestions on a first draft of the manuscript, Karoline Ceron for help with the map, Ricardo Montenegro Colvero for logistic support and Caroline Borges Teixeira for company during fieldwork.

LITERATURE CITED

- ARAÚJO, A.C.B., E.R. BEHR, S.J. LONGHI, P.T.S. MENEZES & M.R. KANIESKI. 2010. Diagnóstico sobre a avifauna apreendida e entregue espontaneamente na Região Central do Rio Grande do Sul, Brasil. *Revista Brasileira de Biociências* 8(3): 279–284. <http://www.ufrgs.br/seerbio/ojs/index.php/rbb/article/viewFile/1413/959>
- ARETA, J.I. & K. COCKLE. 2012. A theoretical framework for understanding the ecology and conservation of bamboo-specialist birds. *Journal of Ornithology* 153: S163–S170. doi: [10.1007/s10336-012-0861-z](https://doi.org/10.1007/s10336-012-0861-z)
- ARETA, J.I., A. BODRATI, G. THOM, A.E. RUPP, M. VELAZQUEZ, I. HOLZMANN, E. CARRANO & C.E. ZIMMERMANN. 2013. Natural history, distribution, and conservation of two nomadic *Sporophila* seedeaters specializing on bamboo in the Atlantic Forest. *The Condor* 115(2): 237–252. doi: [10.1525/cond.2013.120064](https://doi.org/10.1525/cond.2013.120064)
- BELTON, W. 1985. Birds of Rio Grande do Sul, Brazil. 2. Formicariidae through Corvidae. *Bulletin of the American Museum of Natural History* 180: 1–241. <http://digitallibrary.amnh.org/handle/2246/577>
- BENCKE, G.A., G.N. MAURÍCIO, P.F. DEVELEY & J.M. GOERCK (orgs.). 2006. Áreas prioritárias para a conservação de aves no Brasil. Parte I—estados do domínio da Mata Atlântica. São Paulo: SAVE Brasil. 494 pp.
- BENCKE, G.A. 2010. New and significant bird records from Rio Grande do Sul, with comments on biogeography and conservation of the southern Brazilian avifauna. *Iheringia Série Zoologia* 100(4): 391–402. doi: [10.1590/S0073-47212010000400014](https://doi.org/10.1590/S0073-47212010000400014)
- BENCKE, G.A., C.S. FONTANA, R.A. DIAS, G.N. MAURÍCIO & J.K.F. MAHLER JR. 2003. Aves; pp. 189–478, in: C.S. FONTANA, G.A. BENCKE & R.E. REIS (orgs.). *Livro Vermelho da fauna ameaçada*

- de extinção no Rio Grande do Sul. EDIPUCRS: Porto Alegre.
- BIRDLIFE INTERNATIONAL. 2016. Species factsheet: *Sporophila frontalis* (Verreaux, 1862). Accessed at <http://www.birdlifeinternational.org>, 10 September 2016.
- CHEBEZ, J.C. 2008. Los que se van. Fauna Argentina amenazada. Tomo 2. Aves. Buenos Aires: Albatros. 416 pp.
- CONSEMA. 2011. Lista oficial de espécies da fauna ameaçadas de extinção no Estado de Santa Catarina e dá outras providências —Resolução CONSEMA nº 002 de 06 de dezembro de 2011. Florianópolis: Diário Oficial, CONSEMA.
- FERREIRA, C.M. & L. GLOCK. 2004. Diagnóstico preliminar sobre a avifauna traficada no Rio Grande do Sul, Brasil. Revista Brasileira de Biociências 12(1): 21–30.
- JUST, J.P.G., R.S. ROMAGNA, J.R.R. ROSONI & J.J. ZOCHE. 2015. Avifauna na região dos contrafortes da Serra Geral, Mata Atlântica do sul de Santa Catarina, Brasil. Atualidades Ornitológicas 187: 33–54. http://www.ao.com.br/download/AO187_33.pdf
- MMA (MINISTÉRIO DO MEIO AMBIENTE). 2014. Lista nacional oficial de espécies da fauna ameaçadas de extinção—Portaria MMA nº 444 de 17 de dezembro de 2014. Brasília. Diário Oficial da União: 245: 121–126.
- RIDGELY, R.S., J.A. GWYNNE, G. TUDOR & M. ARGEL. 2015. Aves do Brasil. Vol. 2. Mata Atlântica do Sudeste. São Paulo: Editora Novo Horizonte. 417 pp.
- RIO GRANDE DO SUL. 2014. Lista das espécies da fauna ameaçadas de extinção no estado do Rio Grande do Sul. Instrução Normativa nº 3. Decreto No 51.797. Porto Alegre, Diário Oficial do Estado do Rio Grande do Sul, Secretaria do Meio Ambiente, 8 de setembro de 2014.
- ROSÁRIO, L.A. 1996. As aves em Santa Catarina: distribuição geográfica e meio ambiente. Florianópolis: FATMA. 326 pp.
- VIZENTIN-BUGONI J., J.I. ARETA, A.G. DI GIACOMO, A.S. DI GIACOMO, F.P. JACOBS, M.A.A. COIMBRA & R.A. DIAS. 2013. Breeding biology and conservation of the Marsh Seedeater (*Sporophila palustris*). Bird Conservation International 23 (2): 147–158. doi: [10.1017/S0959270913000221](https://doi.org/10.1017/S0959270913000221)
- Authors' contributions:** RDC collected the data, JPGJ wrote the manuscript, and RDC and JJZ made suggestions to the manuscript.
- Received:** 12 October 2016
- Accepted:** 4 March 2017
- Academic editor:** Caio J. Carlos