

Comments on the population status of Chilean flamingos at Lagoa do Peixe National Park, Southern Brazil

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Abstract

In South America, the Chilean flamingo (*Phoenicopterus chilensis*) is distributed from south of the Equator to southern Argentina, passing by the Brazilian coast. One of the locations where this species is present in southern Brazil is the Lagoa do Peixe National Park, between the cities of Mostardas and Tavares, in Rio Grande do Sul state. This area is a natural reserve implemented to conserve both coastal biodiversity and the many species of migratory birds that use the area in contranuptial periods. Although the flamingo is well known in the region, there is a lack, in scientific literature, of information about the population of flamingos living inside the park. In this paper, we comment on the current population and conservation status of Chilean flamingos in the Lagoa do Peixe National Park, bringing attention to the necessities to protect the park from political pressures and to increase research activity on these birds in this area.

Resumen

En América del Sur, el flamenco austral (*Phoenicopterus chilensis*) se distribuye desde el sur del Ecuador hasta el sur de Argentina, pasando por la costa brasileña. Uno de los lugares donde esta especie está presente en el sur de Brasil es el Parque Nacional Lagoa do Peixe, entre las ciudades de Mostardas y Tavares, en el estado de Rio Grande do Sul. Esta área es una reserva natural implementada para conservar tanto la biodiversidad costera como las muchas especies de aves migratorias que utilizan el área en períodos contranupciales. Aunque el flamenco es muy conocido en la región, existe una falta de información sobre la población de flamencos que viven dentro del parque en la literatura científica. En este trabajo, comentamos sobre la población actual y el estado de conservación de los flamencos australes en el Parque Nacional Lagoa do Peixe, llamando la atención sobre las necesidades de proteger el parque de las presiones políticas y aumentar la actividad de investigación de estas aves en esta área.

Résumé

En Amérique du Sud, le flamant du Chili (*Phoenicopterus chilensis*) est réparti du sud de l'équateur au sud de l'Argentine, en passant par la côte brésilienne. L'un des endroits où cette espèce est présente dans le sud du Brésil est le parc national de Lagoa do Peixe, entre les villes de Mostardas et Tavares, dans l'État de Rio Grande do Sul. Cette zone est une réserve naturelle établie pour conserver à la fois la biodiversité côtière et les nombreuses espèces d'oiseaux migrateurs qui l'utilisent pendant les périodes inter-nuptiales. Même si le flamant est bien connu dans la région, il y a un manque, dans la littérature scientifique, d'informations sur la population de flamants vivants à l'intérieur du parc. Dans cet article, nous documentons l'état de la population actuelle et l'état de conservation des flamants du Chili dans le parc national de Lagoa do Peixe, en attirant

L'attention sur la nécessité de protéger le parc des pressions politiques et d'augmenter l'activité de recherche sur ces oiseaux dans cette zone.

Introduction

Flamingos (Phoenicopteriformes) are known for their distinctive morphology and uniquely shaped bill adapted for filtering small particles (Mascitti and Kravetz, 2002). These birds live in salt lakes, lagoons, or coastal areas, feeding on microalgae and aquatic invertebrates (del Hoyo et al., 2017). The Chilean flamingo (*Phoenicopterus chilensis*) is one of the four flamingo species currently distributed in South America, from central Ecuador to Southern Chile (Derlindati et al., 2014). It breeds during the summer in central and northern Argentina, establishing colonies of thousands of individuals, and migrates, during winter, to humid areas of lower altitudes (Caziani et al., 2007), mainly in the eastern coast, reaching Uruguay and Southern Brazil outside of the breeding season (Antas, 1994).

In Brazil, the Chilean flamingo is seen in large and recurrent flocks at Lagoa do Peixe (31°29'S, 50°46'W); a coastal lagoon in the Lagoa do Peixe National Park (Knak, 1999), a 344.4 km² federal conservation area situated on the coastal plain in Rio Grande do Sul state. The Lagoa do Peixe National Park is the only place in Brazil where flocks of Chilean flamingo can be seen all year round (Antas, 1994; Somenzari et al. 2018). However, there is no existing research evaluating the current population or conservation status of the Chilean flamingos inside this reserve. Consequently, the goals of this paper are to discuss and comment on both the historic and current population records of the Chilean flamingo at the Lagoa do Peixe lagoon and propose strategies to contribute to the conservation of this bird and its habitat in Brazil.

Evaluation

The Lagoa do Peixe is a shallow lagoon (mean depth of 30 cm) with a regular width of 1 km, and an extension of about 35 km surrounded by representative ecosystems from this region, such as dunes, sandbanks, fresh waters lagoons, beaches, and salt marshes (Knak, 1999), see Figure 1. The National Park, with the same name as the lagoon, was established in 1986 to protect migratory birds that use this area as a breeding site or as a staging post outside of the breeding season (mainly for feeding and resting), such as the royal tern (*Thalasseus maximus*) and red knot (*Calidris canutus*) (Bencke et al., 2010; Grimm, 2013).

Flamingo ecology in this national park

Currently, in the Lagoa do Peixe National Park, Chilean flamingos are recorded in large numbers, especially between April and September, when these individuals fly out to spend the winter on the South American east coast (Antas, 1994). According to Somenzari et al. (2018), the Chilean flamingo colony in the park is made up of wintering birds coming from large populations in Mar Chiquita Lake in Argentina, seeking environments not affected by winter temperatures (Caziani et al., 2007), and who fly back to Argentina when the season changes (Antas, 1994). Despite this, it is possible to observe a resident colony of Chilean flamingos throughout the year in the Lagoa do Peixe National Park (FZBRS 2013; Somenzari et al., 2018; pers. obs. by the authors).

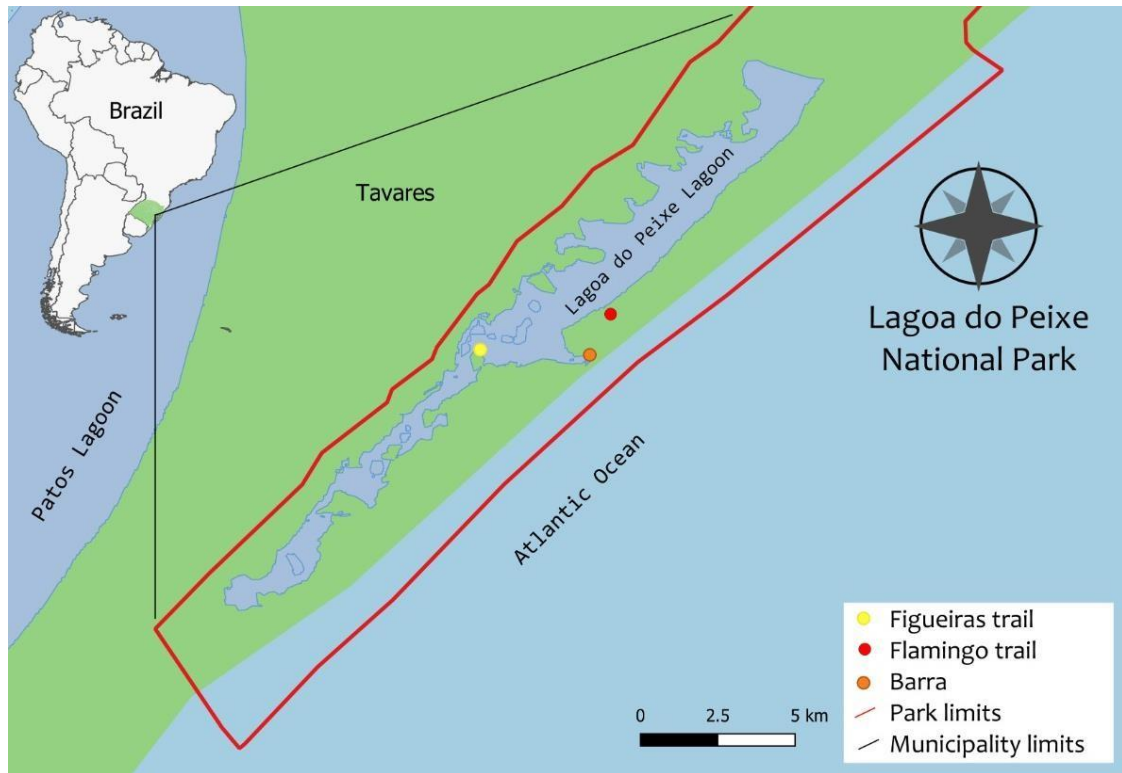


Figure 1: The location and dimension of Lagoa do Peixe National Park, between the cities of Mostardas and Tavares, in the Rio Grande do Sul state, southern Brazil. The three main locations of flamingos in the park are: the Figueira Trail (yellow), the Flamingo trail (red) and the Barra (orange). Figure provided by Oscar M. Aldana-Ardila.

Historical records of the Chilean flamingo in the Lagoa do Peixe reports its presence at least since 1970. Belton (1984) and Resende and Leeuwenberg (1987) listed more than 500 individuals between 1972 and 1981 and mentioned that a large number of individuals were observed in the spring. The Chilean flamingo colony in the park shows a high variation of individuals during the seasons, due to the park colony receiving a large number of other individuals from colonies elsewhere (Somenzari et al., 2018). But the lack of ringing of these birds makes it impossible to certify the origin or the route made by these birds. There is also still no evidence of breeding activity of Chilean flamingos in the park, leading to the inference that the population is formed mainly by young animals and non-reproductive males (FZBRS, 2013). Despite that, we also observed

behaviours usually reported during the breeding season, like synchronized wing-salutes, head flagging and other group rituals that lead us to believe that some breeding behaviours are possible in or near to the protected park area (Delfino and Carlos, in preparation), see Figure 2.

The colony of Chilean flamingos in the Lagoa do Peixe National Park offers a significant opportunity to know the population situation of these birds, but also represents a great challenge. Activities like capture and ringing of these birds can help to identify and to determine the sex and age of the individuals (Anderson and Green, 2011). Nevertheless, this methodology requires trained and qualified field biologists (Lakhani, 1985).



Figure 2: The Lagoa do Peixe National Park supports a dynamic population of Chilean flamingos, mainly in the Barra area, with flocks that vary from tens to hundreds of individuals. On the left, a flock of Chilean flamingos performing ritualistic behaviours like head-flagging at the Barra; on the right, three individuals, of different ages (photo credit: Oscar M. Aldana-Ardila).

Pressures on this flamingo population

Currently, birdwatchers, tourists and ornithologists can observe Chilean flamingos when visiting three places in the park: the Figueiras Trail, the Flamingo Trail, and the Barra, the most visited place among these (Figure 1). The region of the Barra is where the communication between the lagoon and the sea occurs (Knak, 1999; ICMBio, 2020). This region is possibly one of the richest places for flamingo numbers and other migratory bird diversity due to high food availability (Knak, 1999).

In addition, the Barra is seasonally used by local shrimp fishers, and apparently, the usual behaviour of Chilean flamingos seems to be unaffected by their presence. However, the increased presence of human activities in the park, such as tourism, illegal agriculture and livestock presence (Almudi and Kalinoski, 2009), threatens the stability of the Chilean flamingo colony in this protected area. Despite the absence of a periodic census of the Chilean flamingo colony, reports by park rangers and tourist guides have related a potential decrease in Chilean flamingo numbers over the last years.

Due to changes in the environmental policy of the current Brazilian federal government, environmental and conservation laws are

softening, allowing the transformation of integral protected areas such as National Parks into Environmental Protection Areas, which consent human occupation and sustainable use of natural resources, placing the Lagoa do Peixe National Park (as well as other National Parks) in the middle of a controversy between government and conservationists, biologists and activists (Moraes, 2009; Fruet and Heurich, 2019; Kervalt, 2019; Wenzel, 2019; Wenzel 2020).

The execution of economic activities such as tourism, agriculture, and fishing could become a threat to the great diversity of resident and migratory birds that coexist in the park, including the flamingos (Almudi and Kalinoski, 2009).

The absence of a reliable and periodic census obstructs any action to know the real state of conservation of this bird, and that is why the Chilean flamingo is not considered an endangered species in Brazil (FZBRS, 2013; ICMBio, 2013). Despite a considerable amount of evidence that indicates the threat of the Chilean flamingo population, it is necessary to carry out direct actions that will allow the execution of a conservation plan for this species, and this must begin with knowledge of the real state of its population as well as protection of its habitat.

Conclusions

The Chilean flamingo population in South America is about 300,000 individuals, according to the IUCN Red List (BirdLife International, 2018). These numbers have decreased over the past 20 years, mainly due to habitat loss by human activity, such as increasing tourism pressures and extensive farming.

The Lagoa do Peixe National Park is the only non-reproductive area where the Chilean flamingo is seen throughout the year in Brazil, so it is imperative to know the real population status of these birds in the park area to ensure successful habitat management and conservation action can be implemented.

It is necessary to join forces between park rangers, researchers, and Brazilian wildlife protection authorities to create a conservation plan for this bird that includes a year-long monitoring and research program, surveys, and course the protection and preservation of their park habitat. Finally, environmental education programs should be focused on responsible tourism, promoting respect for wildlife, and the conscious use of their habitats.

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References

Almudi, T. and Kalikoski, D.C. (2009). *Homem e "Natureza" em um Parque Nacional Do Sul Do Brasil: Meios De Vida E Conflitos Nos Arredores Da Lagoa Do Peixe*. Masters thesis. Programa de Pós-Graduação em Meio Ambiente e Desenvolvimento.

Anderson, G.Q.A. and Green, R.E. (2009). The value of ringing for bird conservation. *Ringling & Migration*, 24 (3), 205-212.

Antas, P.T.Z. (1994). Migration and other movements among the lower Paraná River valley wetlands, Argentina, and the south Brazil/Pantanal wetlands. *Bird Conservation International*, 4 (2-3), 181-190.

Belton, W. (1984). Birds of Rio Grande do Sul, Brazil. Part 1, Rheidae through Furnariidae. *Bulletin of the American Museum of Natural History*, 178, 371-631.

Bencke, G.A., Dias, R.A., Bugoni, L., Agne, C. E., Fontana, C.S., Maurício, G.N. and Machado, D.B. (2010). Revisão e atualização da lista das aves do Rio Grande do Sul, Brasil. *Iheringia, Série Zoologia*, 100 (4), 519-556.

BirdLife International. (2018). *Phoenicopterus chilensis*. The IUCN Red List of Threatened Species 2018: e.T22697365A132068236. <https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22697365A132068236.en>.

Caziani, S.M., Rocha, O.O., Rodríguez, R.E., Romano, M. and Derlindati, E.J. (2007). Seasonal distribution, abundance, and nesting of Puna, Andean, and Chilean Flamingo. *The Condor*, 109, 276-287.

del Hoyo, J., Collar, N. and Garcia, E.F.J. (2017). *Greater Flamingo (Phoenicopterus roseus)*. In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. and de Juana, E. (eds). *Handbook of the Birds of the World Alive*. Lynx Edicions.

Derlindati, E., Romano, M., Cruz, N., Barisón, C., Arengo, F. and Barberis, I. (2014). Seasonal activity patterns and abundance of Andean Flamingo (*Phoenicoparrus andinus*) at two contrasting wetlands in Argentina. *Ornitologia Neotropical*, 25, 317-331.

Fruet, N. and Heurich, J. (2019). Parque administrado pelo ICMBio no RS será chefiado por agrônoma indicada por deputado da bancada ruralista. Available at: <https://cutt.ly/DffM4vn>. Accessed 27/08/2020.

Delfino and Aldana-Ardila. Flamingo 2020, pages: 21-26.

Fundação Zoobotânica do Rio Grande do Sul (FZBRS). (2013). Revisão da Lista das Espécies da Fauna Silvestre Ameaçadas de Extinção no Rio Grande do Sul. Consulta Pública.

Available at:

www.fzb.rs.gov.br/upload/1396360907_fauna_ameacada.pdf. FZBRS e SEMA/RS.

Accessed 17/08/2020.

Grimm, R. (2013). Santuário das Aves: Parque Nacional da Lagoa do Peixe. Porto Alegre: Ed. do Autor. 232 pages.

Instituto Chico Mendes de Biodiversidade (ICMBio). (2020). Parque Nacional da Lagoa do Peixe. Available at:

<https://cutt.ly/OffMNiL>. Accessed 27/08/2020.

Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) (Org.). (2013). Livro Vermelho da Fauna Brasileira Ameaçada de Extinção: Volume III - Aves. Brasília: ICMBio.

Kervalt, M. (2019). Por que a Lagoa do Peixe está no centro de disputa no Ministério do Meio Ambiente. Available at:

<https://cutt.ly/ZffM1MV>. Accessed 27/08/2020.

Knak, R.B. (1999). Plano de Manejo do Parque Nacional da Lagoa do Peixe - Fase 2. Fundação Universidade Federal do Rio Grande (FURG), Rio Grande, RS.

Lakhani, K. H. (1985). *Inherent Difficulties in Estimating Age-Specific Bird Survival Rates from Ring Recoveries*. In: Morgan B.J.T. and

North, P.M. (eds). *Statistics in Ornithology. Lecture Notes in Statistics*, vol 29. Springer, New York, USA.

Mascitti, V. and Kravetz, F.O. (2002). Bill morphology of South American flamingos. *The Condor*, 104, 73-83.

Moraes, V.L. (2009). *Uso do solo e conservação ambiental no Parque Nacional da Lagoa do Peixe e entorno*. Masters thesis. Universidade Federal do Rio Grande do Sul, Porto Alegre-RS.

Resende, S.L. and Leeuwenberg, F. (1987). *Ecological studies of Lagoa do Peixe*. Final report to World Wildlife Fund, Washington, DC, USA.

Somenzari, M., Amaral, P., Cueto, V., Guaraldo, A., Jahn, A., Lima, D., Lima, P., Lugarini, C., Machado, C., Martinez, J., Nascimento, J., Pacheco, J., Paludo, D., Prestes, N., Serafini, P., Silveira, L., Sousa, A., Sousa, N., Souza, M., Telino-Júnior, W. and Whitney, B. (2018). An overview of migratory birds in Brazil. *Papéis Avulsos De Zoologia*, 58, e20185803.

Wenzel, F. (2019). Após ministro ameaçar servidores, presidente do ICMBio pede demissão. Available at: <https://cutt.ly/xff1qbr>. Accessed 27/08/2020.

Wenzel, F. (2020). Novo chefe da Lagoa do Peixe fez abaixo assinado para rebaixar o Parque. Available at: <https://cutt.ly/jffM2V2>. Accessed 27/08/2020.