

Austral Flamingo *Phoenicopterus chilensis* Sustaining an Injury Derived from Recreational Fishing Gear

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Abstract: Abandoned, lost and discarded fishing gear in coastal environments has become a growing concern. Countless species of waterbirds and seabirds that are found regularly along the coasts are threatened by monofilament lines that are lost (with or without hooks) or are discarded along resting areas. Fishing gear injuries, such as swallowed hooks and constriction wounds from line entanglement, are common in many birds. Here I report an injured individual of the Austral Flamingo (*Phoenicopterus chilensis*) in southeastern of Buenos Aires Province, Argentina. This constitutes the first report of this specie with fishing gear injury. Actually *P. chilensis* is listed as Near Threatened because it is suspected that it will undergo a moderately rapid population decline over the next three generations due, among other, to disturbance and the degradation of its habitat. Future research should include conducting a survey on abandoned, lost and discarded fishing gear given the threat they represent to the local wildlife and potentially coastal users. Particularly in species that use areas with strong anthropic pressure, species with compromised conservation states or charismatic such as *P. chilensis*.

Keywords: entanglement, injuries, flamingo, recreational fishing, threats

1. Introduction

Marine debris is usually defined as any persistent, manufactured or processed solid material discarded and/or abandoned in the marine and coastal environment (Coe et al. 1997). Such debris can be transported by ocean currents over long distances from its origin and is usually found in virtually all marine and aquatics environments, including in remote areas (Werner et al. 2016). A significant portion of marine debris is comprised by abandoned, lost and discarded fishing gear (ALDFG), which is known to cause substantial ecological and socio-economic problems worldwide (FAO 2016). ALDFG, especially when made of durable synthetic material, can affect marine fauna in two main ways: 1) Entanglement, either entangling or trapping animals on their habitats, and 2) Ingestion, when ingested intentionally or accidentally (Laist 1997, Good et al. 2009, FAO 2016). According to Laist (1997), mortality caused by entanglement in marine debris is more likely than ingestion (Macfadyen et al. 2011).

Abandoned, lost or discarded fishing gear such as fishing tackle, including buoys, hooks and fishing lines –the latter comprised by monofilament have become a growing concern in coastal environments around the globe. Countless species of waterbirds and seabirds that feed, rest or nest along the coasts, as well as other coastal and marine organisms, are threatened by monofilament lines that are either lost (with or without hooks) or discarded along beaches and breakwaters (Laist 1987, Lewin et al. 2006). Not surprisingly, one of the many problems encountered by wild birds inhabiting coastal zones and river regions is entanglement and hooking in ALDFG (Dau et al. 2009). Entangled organisms can be hindered in their ability to move, feed and breathe and often mistake debris with food and accidentally ingest it (Day et al. 1985, Laist 1997). Numerous cases of bird mortality resulting from the

interaction with abandoned, lost or discarded fishing gear have been reported worldwide (Laist 1987, Good et al. 2009, Gilardi et al. 2010, Hong et al. 2013, Carapetis et al. 2014, Kühn et al. 2015, Heath et al. 2017).

In the southern cone of South America, particularly in coastal Argentina, recreational fishing is practiced by people of all ages, occurs throughout the year and has become an activity of great socioeconomic importance (Llompart et al. 2012, Dellacasa and Braccinni 2016). Such activity takes place in several sectors of the country's coastline, especially highlighting the coast of the province of Buenos Aires (Dadón 2002, Pellegrino and Cousseau 2005, Pagani and Gualdoni 2018), most likely due to the number and the density of coastal cities, the breeding and feeding areas for a great diversity of target species of sport-recreational fishing and the lack of implementation of legislation compared to other areas such as Patagonia. However, little attention has been paid to its possible negative effects on coastal fauna (Seco Pon and Denuncio 2016). The few studies reporting birds injured by ALDFG are restricted to southern Buenos Aires Province and include the threatened Olrog's Gull (*Larus atlanticus*) (Berón and Favero 2009), the Kelp Gull (*Larus dominicanus*) (Yorio et al. 2014) and the Chimango Caracara (*Milvago chimango*) (Seco Pon et al. 2018).

Here I report an injured individual of the Austral Flamingo (*Phoenicopterus chilensis*) in southeastern Buenos Aires Province. There are six extant species of flamingos worldwide, with three of them found within the Neotropical region. The Austral Flamingo is the most widely distributed species of the Phoenicopteridae family (Order Phoenicopteriformes) in South America (del Hoyo et al. 1992) and the most common species in the study area (Blanco et al. 2006). Its population was estimated at 200,000 individuals (del Hoyo 1992, Valqui et al. 2000); however, a coordinated census in recent times accounted for 283,000

individuals, thus giving a total population estimate of 300,000 individuals (Marconi et al. 2011). Still, despite its apparent regional abundance, data from the International Union for the Conservation of Nature (IUCN) indicate that its populations are in decline (BirdLife 2018). The geographic distribution of this species includes from Tierra del Fuego in Argentina to southern Brazil, much of Paraguay, Chile, southwestern Bolivia and western Peru, and can be found inhabiting salty and freshwater lagoons, as well as marine wetlands (Canevari 1983, Bucher 2006, Sosa and Martín 2012). A high proportion of the species populations move to central plains of Argentina during winter (Romano et al. 2005, Caziani et al. 2007), thus flamingos exhibit an alternative and complementary use of wetlands at a sub-continental scale (Barisón et al. 2014, Romano et al. 2017). The information published on the species is focused on reproductive aspects (Sosa 1999), geographical distribution and population fluctuations (Johnson et al. 1958, Caziani and Derlindati 2000, Caziani et al. 2007, Rocha 1997, Sosa and Martín 2012, Sosa et al. 2018), nesting habits, habitat use (Mascitti 2001, Mascitti and Bonaventura 2002, Mascitti and Castañera 2006), bill morphology (Mascitti and Kravetz 2002), diet (Tobar et al. 2014), and conservation status (Bucher 1992).

There is a well-established consensus about coastal areas that provide nutritional resources as well as resting areas for resident and migratory birds (Burger et al. 1997, Warnock et al. 2002, Newton 2008). Located in south-eastern Buenos Aires Province, the Mar Chiquita coastal lagoon, represents a significant wetland of the Pampas region of Argentina, due to its unique environmental characteristics, and therefore constitutes a recognized recreational area (Lucifora 2001, Pellegrino and Cousseau 2005), but also serves as one the main wintering sites for around 190 species of birds within the above referred province (Martínez et al. 2001, Savigny et al. 2005). For these reasons, it is crucial to understand in depth about the interactions and effects between sport-recreational fishing and the resulting ALDFG from this and birds as an outstanding biotic component.

Surveys conducted two decades ago within the Mar Chiquita coastal lagoon shown a local abundance of Austral flamingos estimated at about 600 individuals (Savigny et al. 2005). There are currently no existing publications about the abundance variation of flamingos in the study area. The species is considered to occur in the study area in variable abundances throughout the year (Martínez et al. 2001), and uses the lagoon both as a feeding and a resting site. There, sport-recreational fisherman frequently discard baits, offal from fish processing, broken fishing lines and nylon bags, abandoning them close to the water line or on the jetties and on the beach; such places are regularly used by numerous bird species either for resting or feeding purposes (Berón et al. 2007, Berón and Favero 2009). However, so far there are no reports on injured individuals of the Phoenicopteridae family within this important sport-recreational fishing site. Hence, this study constitutes the first report of the Austral flamingo injured by fishing tackle derived from its interaction with ALDFG. Actually *P. chilensis* is listed as Near Threatened due to a suspected moderately rapid population decline over the next three generations owing to

egg-harvesting, hunting, disturbance and the degradation of its habitat (BirdLife 2018).

2. Methods / Approach

Observations on injured Austral flamingos were carried out on April of 2019 at Mar Chiquita coastal Lagoon (37°40'S, 57°22'W) as part of a long-term study on the diversity of birds and their interactions with human activities that has been developing for several years. Mar Chiquita is a body of brackish water of some 46 km² located in south-eastern Buenos Aires Province, Argentina (Fasano et al. 1982). This lagoon is listed as a UNESCO 'Man and the Biosphere' Reserve (MAB), and is also considered a Provincial Reserve (1996). Moreover, it's categorized as an Important Bird Area (IBAs) (Savigny et al. 2005), constituting a main wintering area for many migratory birds (Martínez et al. 2001). The coastal lagoon of Mar Chiquita constitutes a recognized recreational area due to its environmental characteristics and its proximity to other touristic areas such as the city of Mar del Plata, located at a distance of 37 km. Mar Chiquita is also a strategic place for the developing of commercial and sport fishing and the practice of water sports including kayaking, kite-surfing, SUP, and windsurfing. Approximately 60 fishermen have been observed during weekdays and up to more than 100 in weekends (author, unpublished data). Furthermore, many visitors (around 400 during some weekends) seek to contemplate nature and practice other recreational activities like taking walks and bird watching (Friedman 2018).

3. Results and Discussion

On 24 April 2019, one adult Austral flamingo was sighted and photographed while feeding and resting in shallow waters on the banks of the lagoon near the fishing club. The bird was sighted standing on the banks of a crab bed, with a transparent nylon line (monofilament) wrapped around the end of the left leg (Fig. 1A, B). The bird had totally damaged fingers of such leg and a hook entangled in the tarsus. Due to the type of entanglement and laceration observed in this bird it is highly likely that the injury was caused by fishing tackle abandoned or discarded from recreational fishing activities in the area. The injured bird was sighted in conjunction with another individual of the same species, and several gulls and shorebirds species; none of which was spotted sustaining an injury derived from ALDFG fishing tackle.

Observations performed while conducting other avian studies in the study area indicate maximum abundances of 30 individuals (2004), 29 individuals (2005), 45 individuals (2008), 24 individuals (2016) and 7 individuals (2019) sighted at the mouth of the lagoon during autumn and winter seasons (April to September) (author, unpublished data). Although the population of *P. chilensis* has a wide range of distribution in Argentina, studies performed in non-breeding areas are scarce. This is the first report of an individual of this species sustaining an injury derived from recreational fishing tackle. This type of injuries may have negative implications in waterbird species such as flamingos, affecting their feeding, resting, locomotion behaviors, among others.

Although the species is present in the study area, to greater or lesser abundance throughout the year and uses the lagoon as a feeding and resting site, there are no studies that have evaluated aspects such as seasonal variations or area use. Several bird species regularly forage along the coastline of the Mar Chiquita coastal lagoon, taking advantage of discarded waste from recreational fishers. Therefore the chances of injuries caused by their interaction with ALDFG are very high (see Seco Pon et al. 2018).

4. Conclusion

The present study is the first report of a *Phoenicopterus chilensis* sustaining an injury derived from recreational ALDFG. Although there are no studies that reflect population variations of the species in non-breeding sites, it is suspected that the number of individuals in the area has decreased and therefore, emphasis should be placed on conducting research that includes long-term monitoring which may prompt management plans aim at reducing the effects of anthropogenic impacts on the use of wintering sites by birds, such as the Mar Chiquita coastal lagoon. Management plans should pay special attention to those species that are particularly affected, monitoring potential local extinctions and the expansion of those species that are adapted to human disturbance. Particularly in species that use areas with strong anthropic pressure, including those with threatened conservation status or considered charismatics such as *P. chilensis*.

Future research should include conducting a survey on ALDFG given the threat they represent to the local wildlife and potentially coastal users. Given that the study site is an important area for bird conservation, educational projects and programs tailored for reducing, recovering or recycling of monofilament lines should also be developed in order to increase public awareness and citizen participation in order to mitigate wildlife entanglement.

5. Acknowledgments

I thank Juan Pablo Seco Pon (CONICET, Argentina) for improving a draft of the manuscript. Financial support was provided by the Universidad Nacional de Mar del Plata (grant EXA948/19).

References

- [1] Barisón C, Cruz N, Romano M, Barberis and IM (2014) Patrones de comportamiento de dos especies de Flamencos (*Phoenicoparrus andinus* y *Phoenicopterus chilensis*) y su relación con las condiciones meteorológicas de la Laguna Melincué, Argentina, durante el invierno. *Hornero* 29(2):61-71.
- [2] Berón MP and Favero M (2009) Mortality and injuries of Olrog's Gull (*Larus atlanticus*) individuals associated with sport fishing activities in Mar Chiquita coastal lagoon, Buenos Aires Province. *Hornero* 24: 99–102.
- [3] Berón MP, Favero M and Gómez-Laich A (2007) Use of natural and anthropogenic resources by the Olrog's Gull *Larus atlanticus*: implications for the conservation of the species in nonbreeding habitats. *Bird Conservation International* 17:351–357.
- [4] BirdLife International (2018) *Phoenicopterus chilensis*. The IUCN Red List of Threatened Species 2018: e.T22697365A132068236. <http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22697365A132068236.en>. Downloaded on 13 October 2019.
- [5] BirdLife International (2019) Species factsheet: *Phoenicopterus chilensis*. Downloaded from <http://www.birdlife.org> on 06/08/2019.
- [6] Blanco DE, Yorio P, Petracci PF, and Pugnali G (2006) Distribution and abundance of Non-Breeding Shorebirds along the coasts of the Buenos Aires Province, Argentina *Waterbirds* 29(3):381–390.
- [7] Bucher EH (1992) Population and conservation status of flamingos in Mar Chiquita, Córdoba, Argentina. *Colonial Waterbirds* 15:179–184
- [8] Bucher EH (2006) Flamencos. Pp. 151–261 en: Bucher EH (ed) *Bañados del Río Dulce y Laguna Mar Chiquita* (Córdoba, Argentina). Academia Nacional de Ciencias, Córdoba.
- [9] Burger J, Niles LJ and Clark KE (1997) Importance of beach, mudflat and marsh habitats to migrant shorebirds on Delaware Bay. *Biological Conservation* 79: 283–292.
- [10] Canevari P (1983) *El Flamenco común*. Centro Editor de América Latina, Buenos Aires.
- [11] Canevari P, Blanco DE, Bucher E, Castro G and Davidson I (1998) *Los humedales de la Argentina: clasificación, situación actual, conservación y legislación*. Wetlands International, Buenos Aires.
- [12] Carapetis ER, Machado A, Braun K and Byard RW (2014) Recreational fishing-related injuries to Australian Pelicans (*Pelecanus conspicillatus*) and other seabirds in a south Australian estuarine and river area. *International Journal of Veterinary Health Science Research* 02(03):24–27.
- [13] Caziani SM and Derlindati E (2000) Abundance and habitat of High Andes flamingos in northwestern Argentina. *Waterbirds* 23 (Suppl.):121–133.
- [14] Caziani SM, Rocha O, Rodríguez Ramírez E, Romano MC, Derlindati EJ, Tálamo A, Ricalde D, Quiroga C, Contreras JP, Valqui M and Sosa H (2007) Seasonal distribution, abundance, and nesting of Puna, Andean, and Chilean flamingos. *Condor* 109:276–287.
- [15] Coe JM, Andersson S and Rogers DB (1997) Marine debris in the Caribbean region. *Marine Debris* 25–33.
- [16] Dadon JR (2002) El impacto del turismo sobre los recursos naturales costeros en la costa pampeana. In: Dadon JR & Matteucci SD (Eds), *Zona Costera de la Pampa Argentina*. Buenos Aires: Lugar Editorial, pp. 101–121.
- [17] Dau BK, Gilardi KVK, Gulland FM, Higgins A and Holcomb JB (2009) Fishing gear-related injury in California marine wildlife. *Journal Wildlife Disease* 45:355–62.
- [18] Day RH, Wehle DHS and Coleman FC (1985) *Ingestion of plastic pollutants by marine birds. In Proceedings of the Workshop on the Fate and Impact of Marine Debris, 27-29 November 1984 Honolulu, Hawaii* (Shomura RS and Yoshida HO, eds), pp. 344–

- 386, US Dep. Commer., NOAA Tech. Memo., NMFS, NOAA-TM-NMFS-SWFC-54.
- [19] del Hoyo J (1992) Phoenicopteridae (Flamingos). In: del Hoyo J, Elliott A & Sargatal J (ed.). *Handbook of the birds of the world*, pp. 508–526. Lynx Edicions, Barcelona, Spain.
- [20] Dellacasa RF and Braccini JM (2016) Adapting to social, economic and ecological dynamics: changes in Argentina's most important marine angling tournament. *Fisheries Management and Ecology* 23:330–333.
- [21] FAO (2016) *Abandoned, lost and discarded gillnets and trammel nets: methods to estimate ghost fishing mortality, and the status of regional monitoring and management*, by Eric Gilman, Francis Chopin, Petri Suuronen and Blaise Kuemlangan. FAO Fisheries and Aquaculture Technical Paper No. 600. Rome. Italy.
- [22] Fasano JL, Hernández MA, Isla FI and Schnack EJ (1982) Aspectos evolutivos y ambientales de la laguna Mar Chiquita (Provincia de Buenos Aires, Argentina). *Oceanologica Acta* Número especial: 285–292
- [23] Friedman IS (2018) *Respuesta de aves costeras a las actividades recreativas en la Laguna Mar Chiquita*. Tesis de Licenciatura, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Mar del Plata, Buenos Aires, Argentina, 71 p.
- [24] Gilardi KVK and Cowan T (2010). Marine species mortality in derelict fishing nets in Puget Sound, WA and the cost/benefits of derelict net removal. *Marine Pollution Bulletin* 60(3):376–382.
- [25] Gómez SE and Toresani NI (1999) *Región 3: Pampa*. In, P. Canevari, D. E. Blanco, E. Bucher, G. Castro and I. Davison (Eds.): *Los Humedales de la Argentina: clasificación, situación actual, conservación y legislación*, pp. 97–114. Wetlands Internacional. Buenos Aires.
- [26] Good TP, June JA, Etnier MA and Broadhurst G (2009) Ghosts of the Salish Sea: threats to marine birds in Puget Sound and the Northwest Straits from derelict fishing gear. *Marine Ornithology* 37:67–76.
- [27] Heath SA, Dahlgren S, Simon D and Brooks DM (2017) Monofilament fishing line as a threat to American Oystercatchers (*Haematopus palliatus*) on the Texas coast, USA. *Waterbirds* 40(1):123–126. <https://doi.org/10.1675/063.040.sp101>. URL:<http://www.bioone.org/doi/full/10.1675/063.040.sp101>.
- [28] Hong S, Lee J, Jang YC, Kim YJ, Kim HJ, Donguk Han, Hong S H, Kang D, Shimet WJ (2013) Impacts of marine debris on wild animals in the coastal area of Korea. *Marine Pollution Bulletin* 66: 117–124. <http://dx.doi.org/10.1016/j.marpolbul.2012.10.022>.
- [29] Hurlbert SH (1982) Limnological studies of flamingo. Investigations and distributions. *National Geographic Research Reports* 14:351–356.
- [30] IUCN (2018) The IUCN Red List of Threatened Species. Version 2018-2. Available at: www.iucnredlist.org. (Accessed: 15 November 2018).
- [31] Johnson AW, Behn F and Millie W (1958) The South American flamingos. *Condor* 60:289–299.
- [32] Kühn S, Rebolledo EL and van Franeker JA (2015) Deleterious effects of litter on marine life. Pp 75–116 in Bergmann, M, L Gutow and Klages M (eds). *Marine anthropogenic litter*. Springer, Berlin, Germany.
- [33] Laist DW (1987) Overview of the biological effects of lost and discarded plastic debris in the marine environment. *Marine Pollution Bulletin* 18: 319–326.
- [34] Laist DW (1997) Impacts of marine debris: entanglement of marine life in marine debris including a comprehensive list of species with entanglement and ingestion records. Pp 99–139 in Coe, JM & DB Rogers (eds). *Marine debris: sources, impacts, and solutions*. Springer-Verlag, New York, New York, USA.
- [35] Lewin WC, Arlinghaus R and Mehner T (2006) Documented and potential biological impacts of recreational fishing: insights for management and conservation. *Reviews in Fisheries Science* 14: 305–367.
- [36] Llompart FM, DC Coulatti and Baigun CRM (2012) Assessment of a major shore-based marine recreational fishery in the southwest Atlantic, Argentina. *New Zealand Journal of Marine and Freshwater Research* 46:57.
- [37] Lucifora LO (2001) *Tiburones y pesca de tiburones en Mar Chiquita*. Pp 205–206 in Iribarne, O (ed). *Reserva de Biosfera Mar Chiquita: características físicas, biológicas y ecológicas*. Editorial Martín, Mar del Plata, Argentina.
- [38] Macfadyen G, Huntington T and Cappell R (2011) *Aparejos de pesca abandonados, perdidos o descartados*. Informes y Estudios del Programa de Mares Regionales, PNUMA N° 185; FAO Documento Técnico de Pesca y Acuicultura N° 523. Roma, PNUMA/FAO. 129p.
- [39] Marconi P, Sureda AL, Arengo F, Aguilar MS, Amado N, Alza L, Rocha O, Torres R, Moschione F, Romano M, Sosa H and Derlindati E (2011) Fourth simultaneous flamingo census in South America: preliminary results. *Flamingo* 18: 48–53.
- [40] Martínez MM (2001) Avifauna de Mar Chiquita. In, Iribarne, O. (Ed.): *Reserva de Biosfera Mar Chiquita: Características físicas, biológicas y ecológicas*, pp. 227–250. Editorial Martín. Mar del Plata.
- [41] Mascitti V (2001) Habitat changes in laguna de Pozuelos, Jujuy, Argentina: implications for South American Flamingo populations. *Waterbirds* 24:16–21.
- [42] Mascitti V and Bonaventura S (2002) Patterns of abundance, distribution and habitat use of flamingos in the high Andes, South America. *Waterbirds* 25:358–365.
- [43] Mascitti V and Castañera M (2006) Foraging depth of flamingos in single-species and mixed-species flocks at Laguna de Pozuelos, Argentina. *Waterbirds* 29:328–334.
- [44] Mascitti V and Kravetz FO (2002) Bill morphology of South American flamingos. *Condor* 104:73–83.
- [45] Narosky TE and Yzurieta D (2003) *Guía para la identificación de las aves de Argentina y Uruguay*. Edición de Oro. Vázquez Mazzini Editores, Buenos Aires.
- [46] National Oceanic and Atmospheric Administration (NOAA) (2014) *Entanglement of marine species in marine debris with an emphasis on species in the*

- United States. Final report, NOAA, Marine Debris Program, Silver Spring, Maryland.
- [47] Nevins H, Miller M, Henkel L, Jessup D, Carion N, Meteyer C, Schuler K, St. Leger J, Woods L, Skoglund J and Jaques D (2011) *Summary of unusual stranding events affecting Brown Pelican along the US Pacific Coast during two winters, 2008-09 and 2009-10*. Final Report, Marine Wildlife Veterinary Care and Research Center, Santa Cruz, CA.30 pp.
- [48] Newton I (2008) *The migration ecology of birds*. Elsevier Ltd., London.
- [49] Pagani A and Gualdoni P (2018) *Sector Pesquero*. In: Mar del Plata Entre Todos, Segundo Informe de Monitoreo Ciudadano. Para saber qué ciudad queremos, necesitamos saber qué ciudad tenemos, p 248–259. Buenos Aires: Red Mar del Plata Entre Todos. ISBN 978-987-46368-9.
- [50] Pellegrino JF and Cousseau MB (2005) *La pesca deportiva desde la costa en Mar del Plata: los peces costeros*. EMDER MGP, Mar del Plata, Argentina.
- [51] Perrota R, Ruarte C and Carozza C (2007) La pesca costera en Argentina. *Ciencia Hoy* Vol.17 N° 97.
- [52] Pierce GJ, Spary CJ and Stuart E (1993) The effect of fishing on the distribution and behaviour of waterbirds in the Kukut area f Lake Songkla, Southern Thailand. *Biological Conservation* 66:23–34.
- [53] Rocha O (1997) Fluctuaciones poblacionales de tres especies de flamencos en Laguna Colorada. *Revista Boliviana de Ecología* 2:67–76.
- [54] Romano M, Barberis I, Pagano F and Maidagan J (2005) Seasonal and interannual variation in waterbird abundance and species composition in the Melincué saline lake, Argentina. *European Journal of Wildlife Research* 51:1–13.
- [55] Romano M, Barberis I, Pagano F, Minotti P and Arengo F (2017) Variaciones anuales en la abundancia y en la distribución espacial del Flamenco Austral (*Phoenicopterus chilensis*) y la Parina Grande (*Phoenicoparrus andinus*) en el Sitio Ramsar Laguna Melincué, Argentina. *Hornero* 32(2):215–225.
- [56] Savigny C, Isaach JP and Favero M (2005) *Reserva de Biósfera Albúfera de Mar Chiquita*. En: AS Di Giacomo (editor), Áreas importantes para la conservación de las aves en Argentina. Sitios prioritarios para la conservación de la biodiversidad: 49-50. Temas de Naturaleza y Conservación 5. Aves Argentinas/Asociación Ornitológica del Plata, Buenos Aires, 514 p.
- [57] Seco Pon JP and Denuncio P (2016) *Impacto de los residuos en los ambientes marino-costeros de la República Argentina*. En: Los residuos antropogénicos en la zona marino-costera de Argentina: una revisión desde un enfoque ecosistémico y socio-cultural. Seco Pon JP (Ed). Editorial Académica Española, pp 15–40.
- [58] Seco Pon JP, Bó MS, Block C, Galván FE and García GO (2018) Chimango Caracara (*Milvago chimango*) entangled in fishing tackle in Southeastern Buenos Aires Province, Argentina. *Ornitología Neotropical* 29:271–274.
- [59] Sosa H (1999) Descripción del evento reproductivo del Flamenco Austral *Phoenicopterus chilensis* en la Reserva Faunística Laguna Llanquanelo, Malargüe, Mendoza, Argentina. *Multequina* 8:87–89.
- [60] Sosa H and Martín S (2012) Evaluación de la población del Flamenco Austral (*Phoenicopterus chilensis*) en la Reserva Provincial Laguna Llanquanelo, Mendoza, Argentina. *Nótulas Faunísticas* 104:1–8
- [61] Sosa RA, Bruno F and Dolsan M (2018) *Informe Colonia de Flamencos australes en el norte de La Pampa*. Ministerio de la Producción, Subsecretaría de Asuntos Agrarios, Dirección de Recursos Naturales, Gobierno de La Pampa, Universidad Nacional de La Pampa, 11 p.
- [62] Tobar C, Rau J, Fuentes N, Gantz A, Suazo CG, Cursach JA, Santibañez A and Pérez-Schultheiss J (2014) Diet of the Chilean flamingo *Phoenicopterus chilensis* (Phoenicopteriformes: Phoenicopteridae) in a coastal wetland in Chiloé, southern Chile. *Revista Chilena de Historia Natural* 87:art15.
- [63] Valqui M, Caziani SM, Rocha O and Rodriguez RE (2000) Abundance and distribution of the South American Altiplano flamingos. *Waterbirds* 23(Special publication): 110–113.
- [64] Warnock N, Elphick Cand Rubega MA (2002) Shorebirds in the marine environment. Pages 581- 615 in *Biology of Marine Birds* (Schreiber EA and Burger J, Eds.). CRC Press, Boca Raton, Florida.
- [65] Werner S, Budziak A, Van Fanneker JA, Galgani F, Hanke G, Maes T and Vlachogianni T (2016) *Harm caused by Marine Litter-European Commission*, JRC Technical Report. <https://doi.org/10.2788/690366>.
- [66] Yorio P, Marinao C and Suárez N (2014) Kelp Gulls (*Larus dominicanus*) killed and injured by discarded monofilament lines at a marine recreational fishery in northern Patagonia. *Marine Pollution Bulletin* 85:186–189.



Figure 1: Austral Flamingo (*Phoenicopterus chilensis*) entangled in monofilament sighted in April 2019, Mar Chiquita coastal lagoon (A). Entangled leg detail (B). Photos by María Paula Berón.