

RESEARCH NOTE

Sighting of a Southern elephant seal *Mirounga leonina* in the Toltén River, southern Chile

Observación de un elefante marino del sur *Mirounga leonina* en el Río Toltén, sur de Chile

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Abstract.- The Southern elephant seal (SES) is a marine species that can be found at sea throughout the Southern Ocean on most sub-Antarctic islands. An unusual record of a solitary Southern elephant seal (*Mirounga leonina*) in freshwater habitat is reported. The seal was found 16 km upstream from the mouth of the Toltén River, in southern Chile (39°9'S; 73°10'W). The individual was classified as a sub-adult male approximately 3 m in length. Potential causes for the unusual presence of the seal in a river include feeding on native estuarine fishes and non-native Chinook salmon or resting. Long lasting resting (5 days) in the Toltén River by the seal may indicate suitable habitat and/or lack of disturbance.

Key words: Southern elephant seal, freshwater record, Toltén River, Chile

INTRODUCTION

The Southern elephant seal (SES, *Mirounga leonina* Linnaeus, 1758) is the largest pinniped in the world and the most sexually dimorphic mammal (Hindell 2018). Adult males can reach 3,700 kg, while adult females typically weigh between 400 and 800 kg (Hindell 2018). The annual cycle of this species presents two terrestrial and two marine phases (Laws 1956). During terrestrial phases, SESs haul out to breed (between August and November) and to molt (between December and February). During the post-breeding (2-3 months) and post-molting (7 months) marine phases, SESs disperse in the sea for foraging (Campagna *et al.* 1993).

The SES has a circumpolar distribution in the Southern Hemisphere, with breeding colonies found mainly in the Sub-Antarctic islands near the Antarctic Convergence, with others found in the coastal zone of the southern continents (Hindell 2018). Major breeding colonies are located in South Georgia Island, Kerguelen and Heard Islands, Macquarie Islands and Peninsula Valdés (Boyd *et al.* 1996, Lewis *et al.* 1998, Guinet *et al.* 1999, Slip & Burton 1999, McMahon *et al.* 2005). Vagrant individuals have been occasionally recorded north of the Antarctic circumpolar zone (Oosthuizen *et al.* 1988, Alava & Carvajal 2005, Lewis *et al.* 2006, Oliveira *et al.* 2011, Shaughnessy *et al.* 2012, Bublichenko 2015, Mayorga *et al.* 2015, Juri 2017). In the case of continental Chile, three breeding colonies are located south of 51°S in the Magallanes Region:

Ainsworth Fjord (54°24'S), Jackson Bay (54°26'S) (both located in Seno Almirantazgo in Tierra del Fuego Island) and Poca Esperanza Fjord (52°14'S) (Gibbons & Miranda 2001, Cáceres 2013, Acevedo *et al.* 2016). Recently, seven newborn pups were registered occasionally in six halout sites between latitudes 38°22'S and 45°24'S (Cárcamo *et al.* 2018). There are also records of solitary individuals along the Chilean coast recorded swimming in waters on the continental shelf from several regions (Sepúlveda *et al.* 2007, Pacheco *et al.* 2011, Acevedo *et al.* 2016, Cárcamo *et al.* 2018), including the sighting of an individual on Easter Island (Aguayo *et al.* 1995).

Almost all SESs sightings in continental Chile have been limited to coastal habitats (Acevedo *et al.* 2016), but there are some records of the presence of elephant seals in freshwater habitats (Sielfeld 1978, 1983; Torres 1981, Aguayo *et al.* 2006). The objective of this report was to provide evidence for the presence of a solitary SES found in the Toltén River, a major catchment area located in the Araucanía district in south-central Chile (39°S).

MATERIALS AND METHODS

On October 08, 2017, recreational fishers from Nueva Toltén recorded the presence of a large mammal swimming in the area of Puente Peule (39°8.97'S; 73°9.73'W). This area is located 16 km upstream from the mouth of the Toltén River (Fig. 1). The river flows into the sea at the north of Punta Nihue, and has a total length of 123 km, a maximum

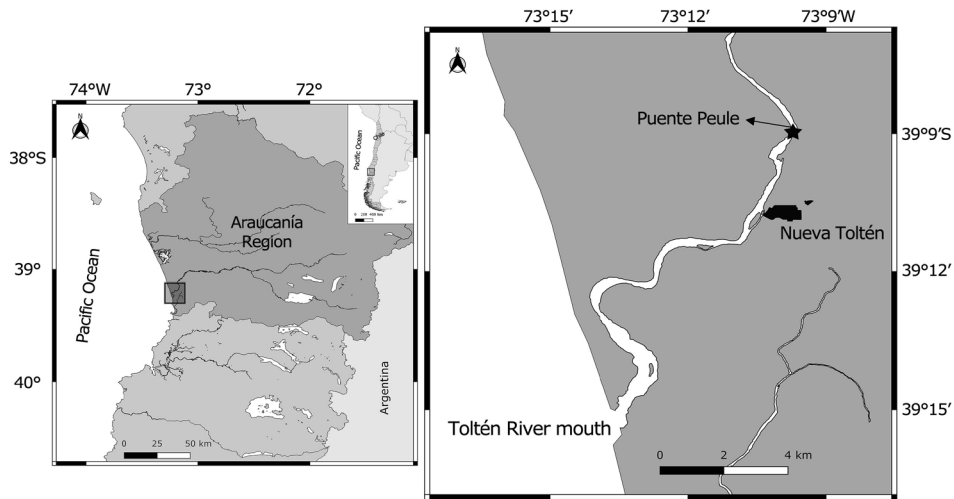


Figure 1. Map showing the location of the mouth and basin of the Toltén River. The star indicates the point of sighting of *Mirounga leonina* near Nueva Toltén village, southern Chile / Mapa que muestra la ubicación de la boca y de la cuenca del Río Toltén. La estrella indica el punto del avistamiento de *Mirounga leonina* cerca de la villa Nueva Toltén, sur de Chile

width of 300 m, a depth of 1.5 to 12 m, and a homogeneous temperature of around 13.7 °C (Gomez-Uchida *et al.* 2016). The Toltén River basin is composed of flat or slightly undulating land. The soil texture is fine clay sand of dark gray color.

The individual was repeatedly sighted on 09, 10 and 13 October in the same location. Jorge Oyarce Krugen first took photographs of this individual. The unusual presence of this large mammal caused commotion in the local fishing community, and photographs and video recordings taken by fishers and locals allowed us to identify the species as well as the sex and age class of the individual.

RESULTS AND DISCUSSION

By using available photo-video records⁽¹⁾, and following the description made by Laws (1956), the specimen was classified as a 3-m long sub-adult SES male in good condition of body mass (Fig. 2). It was repeatedly observed resting on land, between 3-5 m from the riverbank. SESs usually breed during this time of the year (Campagna *et al.* 1993, 2000). Immature SESs haul out on one or more occasions during the annual cycle, from autumn to early spring, for a few days or weeks at a time (Carrick *et al.* 1962, Kirkman *et al.* 2001).

One of the most important details of this finding is the fact the animal was found in a river, 16 km upstream from the river mouth. Almost all records of SESs are from coastal locations (*e.g.*, Oosthuizen *et al.* 1988, Setsaas *et al.* 2008, Shaughnessy *et al.* 2012, Acevedo *et al.* 2016), and to our knowledge there are only a few reports of individuals seen in rivers, and very few in Chilean waters (Sielfeld 1978, 1983; Torres 1981, Aguayo *et al.* 2006). A report from other country described a male seen almost 4 km upstream of the Breed River off the Southern African coast in 1959 (Oosthuizen *et al.* 1988). A second record was of one individual (unidentified sex) registered in 1998 along the Babahoyo River (~70 km from the river mouth), located on the Gulf of Guayaquil, Ecuador (Alava & Carvajal 2005). These authors also reported the presence of a second individual (unidentified sex) seen in 2002 from an estuarine zone called “El Estero Salado”, located south of Guayaquil City, Ecuador. However, with both sightings in Ecuador there was no confirmation whether the animals were northern (*M. angustirostris*) or SESs. Recently, Juri (2017) recorded four SES sightings in the Uruguay River, Uruguay, between the 1980s and 2016. One of these individuals was surprisingly found ~370 km upstream, near the Salto Grande dam.

¹A link with a video record with the specimen can be found at: <<https://youtu.be/uKWY4we-7es>>

²The link for this evidence can be found at: <<https://youtu.be/B6ExvRlvuT4>>

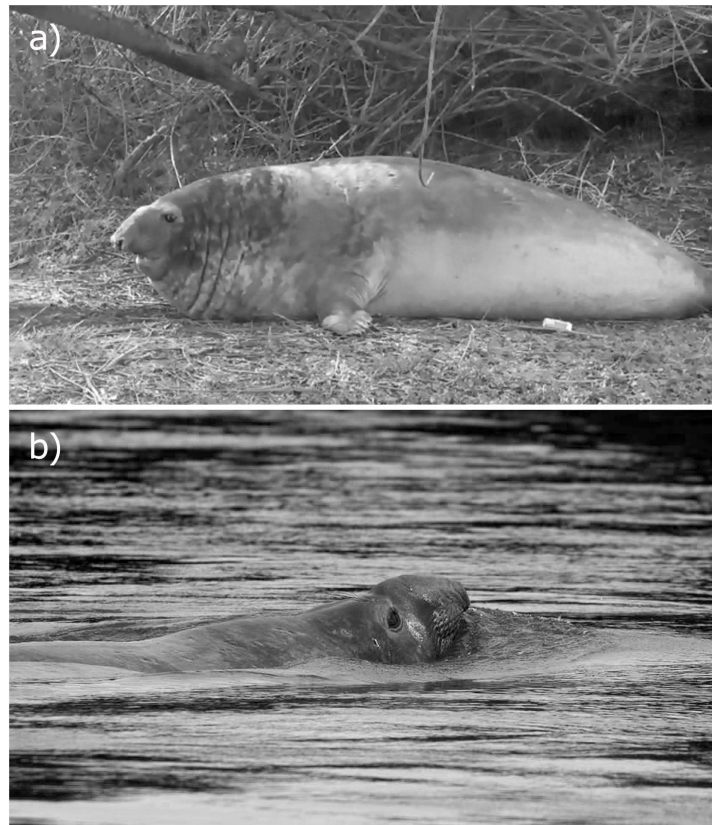


Figure 2. Photographs of the Southern elephant seal *Mirounga leonina*. a) resting on the riverside of the Toltén River and b) swimming in the waters of the Toltén River. Photos by Nelson Castro and Jorge Oyarce Kruger, with permission / Fotografías del elefante marino del sur *Mirounga leonina*. a) descansando en la orilla del Río Toltén y b) nadando en las aguas del Río Toltén. Fotos autorizadas de Nelson Castro y Jorge Oyarce Kruger

In Chile, sightings have been reported by Sielfeld (1978, 1983) and Torres (1981) in La Barra (Osorno) in 1978, and by Aguayo *et al.* (2006) in the Pangal River in Aysen in 2002. Besides, an unpublished record was reported on the internet in 2017⁽²⁾. In all of these cases, as well as in a review of observations of the SES in continental Chile (Acevedo *et al.* 2016), most of the sightings involved juveniles and sub-adult males, especially in locations north of 51°S. Dispersal of SESs beyond their usual distribution may reflect sex and stage differences in foraging patterns (Acevedo *et al.* 2016): females feed in deep waters in the open ocean, while males feed closer to the coast (Hindell *et al.* 1991, McConnell *et al.* 1992, Bennett *et al.* 2001, van den Hoff 2001). It is possible that the sub-adult male reported here was moving to lower latitudes, following the shelf-break front to the productive waters of the Humboldt Current (Acevedo *et al.* 2016).

The presence of SES in the Toltén River could be related to a foraging behavior during the post-molting period (February to September; Campagna *et al.* 1993, 2000). Some dietary studies on the SES have reported that cephalopods are the main prey (Clarke & MacLeod 1982, Green & Burton 1993, Brown *et al.* 1999, Daneri *et al.* 2000, Bradshaw *et al.* 2003). Others, however, have reported small myctophid

and nototheniid fishes as the dominant prey (Daneri & Carlini 2002, Cherel *et al.* 2008). These studies, however, were conducted in Sub-Antarctic and Antarctic Regions, and information regarding SES feeding behavior far from their breeding grounds is lacking. It is possible that the SES solitary male may be feeding on some small estuarine fishes, like Patagonian blennie (*Eleginops maclovinus*), corvina (*Cilus gilberti*) or flathead grey mullet (*Mugil cephalus*), which are especially abundant close to the study area (Habit & Victoriano 2005).

Alternatively, the SES may be feeding on the abundant non-native populations of Chinook salmon (*Oncorhynchus tshawytscha*), which during this time of the year form large aggregations near the coast and migrate upstream Toltén River to breed (Gomez-Uchida *et al.* 2016). South American sea lions (*Otaria flavescens*) are commonly seen swimming up Toltén River to feed on Chinook salmon; the number of sea lions increases during the austral summer at the peak of the Chinook salmon run (author's fieldwork observations). Although there is no evidence that the SES was feeding, this observation suggests that the behavior of this solitary seal may be opportunistic and triggered by encountering non-native Chinook salmon.

An alternative hypothesis is that the SES seen in the Toltén River was using the site for resting. Hofmeyr (2000) and Mulaudzi *et al.* (2008) noted that juveniles and sub-adults select their hauling out sites, and thus they can disperse to sites far from their birthplaces (Acevedo *et al.* 2016). The selection of Toltén River may reflect favorable environmental features, such as suitable habitat (*e.g.*, sandy and pebble beaches, Setsaas *et al.* 2008), or a lack of disturbance given the significant distance from the coast and/or human settlements.

The origin of SES identified in Toltén River could not be determined. Different studies have shown that SESs may travel very long distances, usually ranging from 1,000 to 3,000 km from their breeding colonies (Hindell *et al.* 2016), and even reaching 5,200-8,400 km (Campagna *et al.* 2007, Falabella *et al.* 2009). Hückstädt *et al.* (2008)³ reported a feeding trip from a female pup tracked from Ainsworth Bay to open ocean waters and reaching the open waters of the Pacific Ocean at 51°42'S. Falabella *et al.* (2009) showed that a pre-reproductive female travelled more than 8,000 km between the Valdés Peninsula, Argentina, and the Chilean Pacific coast. Two subadult males tagged in Jackson Creek, in southern Chile (54°26'S), travelled along the inner coastal waters of the channels and fjords of southern Chile and the open Pacific Ocean (Acevedo *et al.* 2016). Finally, Hindell *et al.* (2016) reported that SESs tagged in the South Pacific travelled to southern Chile (close to 48°S). Thus, the individual observed in the Toltén River could potentially have originated from seal colonies in southern Chile, the Valdés Peninsula in Argentina or even from the Sub-Antarctic or Antarctic Convergence.

Finally, it is notable that sightings of SESs on the Chilean coast are becoming more and more frequent. Authorities and the general public should be cautious when encountering SES, maintaining a prudent distance from it for ethical and safety reasons, given the potential threat of this large mammal.

³Hückstädt LA, J Hassrick, C Olavarría, J Acevedo & DP Costa. 2008. Patrón de movimiento y buceo durante el primer viaje de una cría de elefante marino del sur (*Mirounga leonina*). In: Libro de Resúmenes del XIII Reunión de Trabajo de Especialistas en Mamíferos Acuáticos de América del Sur y 7° Congreso SOLAMAC: 'Estatus de los Mamíferos Acuáticos en Latinoamérica'; 2008 October 13-17; Montevideo, Uruguay; Abstract 229, p. 152.

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