

Short Note

Northerly Births of the Southern Elephant Seal (*Mirounga leonina*) in Their Former Southeast Pacific Distribution

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An abundant southern elephant seal (SES) population (*Mirounga leonina*; Linnaeus, 1758) historically occurred in the Juan Fernández Archipelago (Juan Fernandez Island; 33° 38' S; 78° 49' W) and along the mainland from 37° S to south of the Cape Horn Archipelago (55° S) in the eastern South Pacific (Dampier, 1729; Anson, 1748; Molina, 1782; Burney, 1813; Péron, 1816; Vicuña, 1883). Like other pinniped populations in the Southern Hemisphere, the eastern South Pacific elephant seal population was extirpated by sealers and whalers (Gay, 1847; Philippi, 1892). The latest available record is a narration of Philippi (1892) that states “the last individual was hunted in 1840” (p. 4); and after 50 years without any sightings, the Chilean SES population was reported as extinct (Albert, 1901; Allen, 1905; Trouessart, 1907; Murphy, 1914; Cabrera & Yepes, 1940; Osgood, 1943).

One hundred years later, an individual of unknown origin (mistakenly taken as a dugong) was shot, killed, and photographed in Punta Arenas, Chile, in 1944 (Magallanes, 1944), but it was only in 1971 that a small group of seven SESs was again observed in Tierra del Fuego, Chile (Markham, 1971). Since then, additional sightings occurred in the 1970s along the Chilean coast, evidence from which Torres (1981) interpreted that this species may be recolonizing its former Pacific distribution. Currently, the sightings of SESs in the eastern South Pacific range from Cape Horn, Chile, to Ecuador, with 97.5% of all sightings along the Chilean coast (Acevedo et al., 2016), including some records in remote oceanic islands such as Easter Island (Aguayo-Lobo et al., 1995) and Robinson Crusoe of the Juan Fernández Archipelago (Lewis et al., 2006; Acevedo et al., 2016). Recently, there are

two new records of SESs in Ecuador (Félix, 2018; Páez-Rosas et al., 2018) and even further north in Panama (Redwood & Félix, 2018). There are also three stable and small breeding sites in southern Chile (south 51° S) where a total of 20 to 24 pups are born annually between October and November (Acevedo et al., 2016; Capella et al., 2017; Figure 1). Although the SESs are sighted year-round in some specific areas of Chile, and the frequency of sightings in other places along the Pacific coast of South America is growing (e.g., Cárcamo et al., 2019), the absence of stable breeding or birthing sites north of 51° S suggests that the recolonization process of its former distribution has not been completely successful (Acevedo et al., 2016). Recently, Cárcamo et al. (2019) report the occurrence of seven pups (characterized mainly by lanugo and size), all observed between latitudes 38° 22' S and 45° 24' S from 2007 to 2016; however, no further details of those births are provided. Herein, we provide information of three of those births and add a new record occurring north of 51° S in line with the hypothesis raised by Torres (1981) of this species' possible recolonization of its former Pacific distribution.

The birth records provided here were obtained opportunistically by one of us (RV) and by the personnel of the National Fisheries Service (SERNAPESCA) through direct observation of the SESs north of 51° S between 2012 and 2016 (Figure 1). The records of these births were carefully examined based on reports, newspapers, and available photographs or videos.

The first pup was reported near Mañihueico (~41° 45' 52" S; 72° 40' 46" W) by Puerto Montt city's SERNAPESCA personnel in October 2012 (specific day is not available). The mother–pup

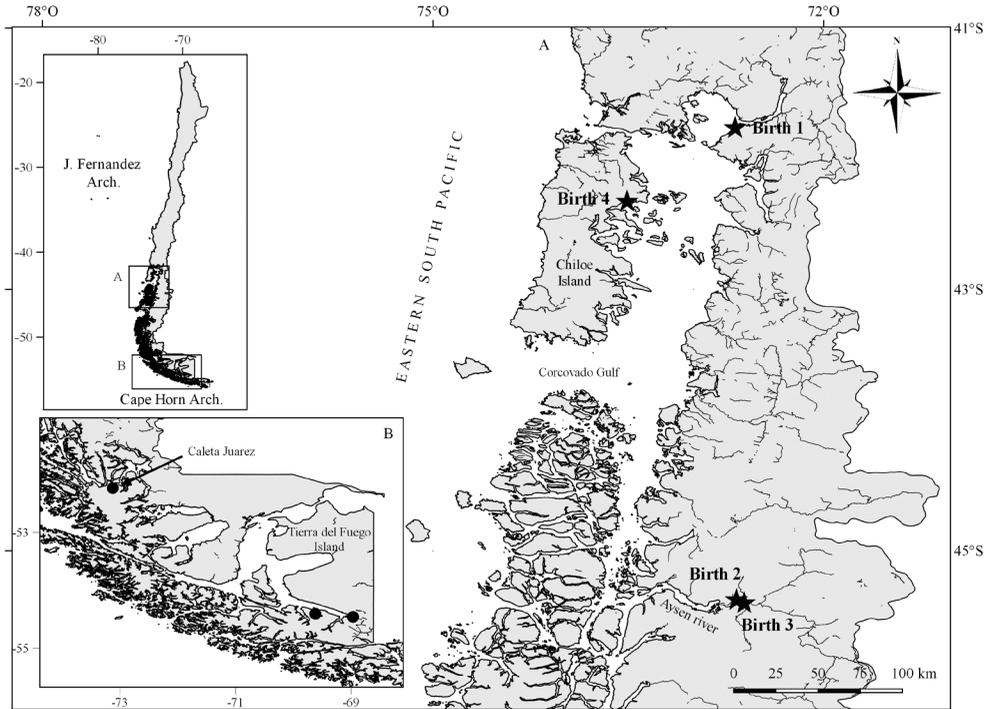


Figure 1. Locations where the southern elephant seal (SES) pups were reported to north of 51° S (star), and confirmed breeding rookeries (circle) to south of 51° S (lower left map [B])

pair of SESs was spotted in good physical condition, and no placenta was observed in the area, suggesting that the pup was born some days ago (Figure 2A). No other SES was observed in the vicinity. After a few weeks, the pup (unknown sex; probably weaned) was found dead on the beach with evidence suggesting that its death was caused by domestic dogs.

A second mother–pup pair was reported on the dock of the Cermaq Chile S.A. Company, Los Palos River, Puerto Aysén (45° 23' 47" S; 72° 42' 32" W; Figure 3). Based on the report, the pup was a female born near 0600 h on 19 October 2016 and weaned on 11 November 2016. Like the first pair, this mother–pup pair was reported to be in optimal physical condition. An adult and a subadult male were also observed in the vicinity during that period; and sometimes the adult male was seen in association with the mother–pup pair, although no information about mating was found in the report. The personnel of SERNAPESCA transferred the pup after it was weaned to Caiquenes islets next to the Salas Island (45° 45' 39" S; 74° 04' 50" W) to avoid possible attacks from domestic dogs.

During the same period, another mother–pup pair was sighted 8 km away (45° 24' 26" S; 72° 38'

33" W) on the banks of the Aysén River. This event was not reported until 2 mo later; thus, the scarce information compiled by SERNAPESCA suggests that the female may have arrived in October, and the pup died 3 wks later. Other SESs were also spotted sporadically in that area.

The fourth mother–pup pair was reported by the personnel of SERNAPESCA in the coastal wetland of Dallico–San Juan, Chiloe Island (42° 19' 37" S; 73° 30' 34" W), on 29 October 2016 (Figure 2B). Based on the report of the inhabitants compiled by the personnel of SERNAPESCA and DIRECTEMAR, the adult female arrived on 20 October, and the male pup was born 2 d later. No other SES was observed in the vicinity during the entire nursing period. The pup was weaned on 18 November, based on the observation that the adult female was not seen again in the area as of the following day. The pup remained in the same coastal area until 5 January 2017.

To our knowledge, the four SES pups reported herein together with the four other pups reported by Cárcamo et al. (2019) represent the first births recorded north of the 51° S since that Chilean elephant seal population was reported as extinct in the late 1800s. These four births occurred 766 to 1,430 km away from the known breeding colony

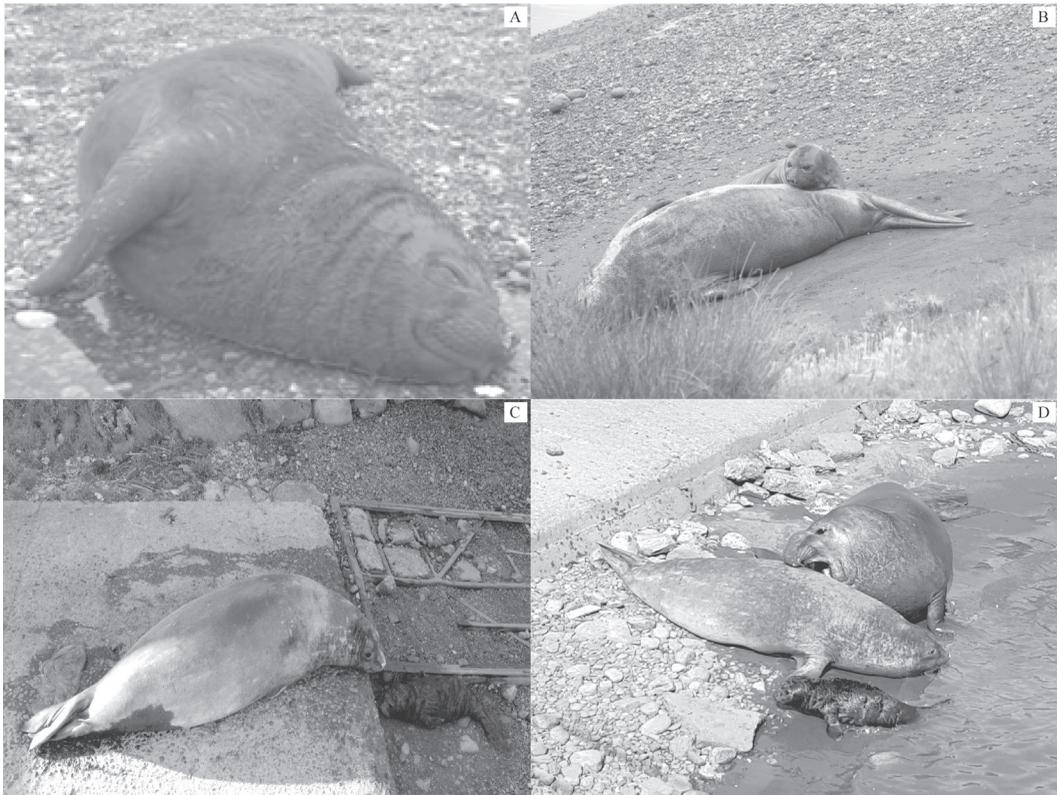


Figure 2. SES pups reported at (A) Mañihueico in 2012; (B) coastal wetland of Dallico, Chiloe Island, in 2016; and (C & D) on the dock of the Cermaq Chile S.A. Company, Los Palos River, Puerto Aysén in 2016 (Photos courtesy of L. Martínez, R. Vargas, and N. Leiva)

reported for Chile (Acevedo et al., 2016; Capella et al., 2017; Figure 1B). Although all these records can be interpreted as isolated events, it is important to note that at least these four mother–pup pairs were concentrated in a range of 400 km, and all were seen in good physical condition.

SESs are highly polygynous and breed on the coast where one dominant male presides over a large aggregation of females (known as harems) (Hindell, 2002). However, isolated births involving only one mother with a pup have also been previously reported at a low frequency (e.g., Kettlewell & Rand, 1955; Davies, 1961; Bowring & Stonehouse, 1968; Le Boeuf & Panken, 1977; Mills et al., 1977). This could also be the case of those other four pups reported in middle latitudes of Chile by Cárcamo et al. (2019). Even though these described isolated events may seem insignificant, they could constitute evidence of possible precursors for new breeding rookeries in Chile.

This pattern of animals colonizing their former distribution range has been reported for other pinnipeds such as northern elephant seals (*Mirounga*

angustirostris; Gill, 1866). The northern elephant seal expansion after their near extinction in the late 1880s (Bartholomew & Hubbs, 1960; Le Boeuf et al., 1974, 2011) has been explained primarily by the influx of young breeding females dispersing from larger colonies that have reached their carrying capacity (Le Boeuf et al., 2011). However, the current breeding rookeries of SESs at the southern tip of Chile are small and virtually all have suitable space for breeding. Another explanation is that some elephant seals can occupy a novel island or mainland site along their feeding trips and, once a female seal reaches its sexual maturity, it moves to those sites previously visited and gives birth (Le Boeuf & Mesnick, 1991; Le Boeuf et al., 2011). We do not know the reasons for these females' isolated births in the middle latitudes of Chile, but these events are not completely surprising given that sightings of adult and juvenile SESs of both sexes were reported in the last few years near these birthplaces at Aysén (e.g., Births 2 & 3 in Figure 1; Diario El Llanquihue, 2007; *El Divisadero*, 2012; Haussermann et al., 2012; Acevedo et al., 2016; N. Toledo, pers. comm.,

22 May 2017). Additionally, satellite telemetry studies of some subadult males from one rookery at Tierra del Fuego, Chile, showed coastal movements towards those middle latitudes (NCYT, 2012; *La Prensa Austral*, 2015). It is likely that some young females may disperse in a similar way, acting as the pioneers of the colonization process (Le Boeuf & Panken, 1977; Reiter et al., 1981).

Regardless of the limited observations, it is important to note that these events are the first births reported north of 51° S after the extinction of the Chilean SES population in that latitude (Torrejon et al., 2013), and that it is possible that this species may be reoccupying its former breeding sites along the Pacific coast of South America as suggested by Torres (1981). These records are also relevant for consideration of early conservation efforts for places that may soon be required to be turned into coastal protected areas if new records of births or new and stable breeding rookeries are formed in or near these places.

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