



Nota

ON THE PRESENCE OF A VAGRANT JUAN FERNÁNDEZ FUR SEAL (*Arctocephalus philippii*) IN THE PACIFIC COAST OF COLOMBIA: A NEW EXTRALIMITAL RECORD

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ABSTRACT. We report the first record of a male Juan Fernández fur seal, *Arctocephalus philippii* (Peters, 1866), in the Colombian Pacific coast. The animal was mainly identified according to the external morphology of the head and snout. This observation is the first northernmost record for *A. philippii* in the Southeastern Pacific, with an extreme movement covering a total distance of approximately 3700-4600 km from its normal geographic range, including the Juan Fernández Archipelago and Desventuradas Islands (San Félix and San Ambrosio), Chile. This finding indicates that vagrant individuals can reach new sites in the Northern Hemisphere and could have a broader geographical displacement than previously thought.

RESUMEN. Sobre la presencia de un lobo peletero de Juan Fernández (*Arctocephalus philippii*) en la costa del Pacífico de Colombia: un nuevo registro extra-limital. Informamos el primer registro de un macho del lobo fino peletero Juan Fernández, *Arctocephalus philippii* (Peters, 1866), en la costa Pacífica de Colombia. El animal fue identificado principalmente de acuerdo a la morfología externa de la cabeza y del hocico. Este registro es el más septentrional para *A. philippii*, con un gran desplazamiento que cubre una distancia total de aproximadamente 3700-4600 km desde su rango de distribución normal que incluye el Archipiélago de Juan Fernández e Islas Desventuradas (San Félix y San Ambrosio), Chile. Este hallazgo indica que animales errantes de esta especie pueden llegar a nuevos sitios en el hemisferio norte y, por ende, podrían exhibir un desplazamiento geográfico más amplio que lo descrito previamente.

Key words: Colombia. Juan Fernández fur seal. Otariidae. Pinniped. Southeastern Pacific.

Palabras claves: Colombia. Lobo fino de Juan Fernández. Otariidae. Pacífico sureste. Pinípedo.

In the Pacific coast of South America, the recurrent presence of several species of pinnipeds from remote locations and oceanic islands has been usually observed and confirmed in new locations out of their normal distribution ranges, mainly in coastal areas of Colombia, Galápagos Islands, Ecuador, Peru, Chile and Antarctica (e.g. Wellington and De Vries, 1976; Von Prahl, 1987; Merlen, 1993; Palacios et al., 1997; Flórez-González and Capella, 2001; Capella et al., 2002; Alava and Carvajal, 2005; Alava and Salazar, 2006; Félix et al., 2007; Collyns, 2010; Acevedo et al., 2011; Torres et al., 2012). In addition, some populations of seals from the North Hemisphere are currently expanding their ranges and spreading to new localities, where they have not been recorded in the past (Alava and Carvajal, 2005). A similar scenario is obviously occurring for pinniped species from the South Hemisphere based on the existing literature available elsewhere (see references aforementioned). In this context, we report the occurrence of a Juan Fernández fur seal specimen, *Arctocephalus philippii* (Peters, 1866), in Colombia's mainland coast.

On July 4, 2007 an unidentified pinniped (otariid) was found in the beach of San Francisco neighborhood in the Buenaventura Port, Colombia (3° 53' N, 77° 4' W, **Fig. 1**). The otariid was a fur seal rescued by the CVC (Corporación Autónoma del Valle del Cauca) and Navy functionaries, who transferred it offshore, but the fur seal came back to the beach in the same area; two additional attempts were undertaken, but the animal returned to the coast again. On July 13, the otariid was taken to the Cali Zoo, where it received medical care and 7 days of intravenously hydration. The animal that arrived was quiet emaciated with poor health body condition and severe dehydration at such point that some internal bone structures (e.g., vertebral spine, ribs cage and hips) under the skin could be observed at naked eye, but it did not present bone injuries or fractures. The animal was an adult male with a length and weight of 150 cm and 120 kg, respectively, and died on July 22, 2007 at the zoo. At the moment of death, the animal released a very dark stool with a fetid smell. The necropsy revealed a possible chronic infection

associated with gastroenteritis and presence of a gastric ulcer, and pulmonary congestion (pulmonary emphysema), which might have been exacerbated with prolonged and severe anorexia and starvation/dehydration leading to a multi-systemic organ failure. The analysis of fecal matter also revealed the presence of an unidentified cestode (Platyhelminthes: Cestoda), indicating parasitic infection by flatworms (Villa, 2007).

According to the external description and examination of the specimen and archived photos (**Fig. 2**), the otariid was identified as a Juan Fernández fur seal (*A. philippii*), exhibiting a dark brown coloration with a mane from the top of the head to the top of the shoulders, showing golden yellow to tan-tipped guard hairs (**Fig. 2**). Of particular attention was the long, slender and pointed snout and shape of the head (**Figs. 2b** and **2c**), which is a characteristic trait for this species showing the longest snout among southern fur seal species (Arnould, 2009). Although it is comparable to that observed in one of its closest and more similar relatives, the Guadalupe fur seal (*Arctocephalus townsendi*), found in the Northern Hemisphere. Another characteristic was the short hindflipper compared to the moderately long hindflippers of *A. townsendi*. While the two species separate about 0.3 million years ago (Higdon et al., 2007), *A. townsendi* was previously known as *A. philippi townsendi*, in past species reviews (Repenning et al., 1971). Likewise, the dental formula (i.e. I 3/2, C 1/1, PC 6/5) and the arrangement of teeth (i.e. 10 pairs of teeth in the upper jaw and 8 pairs in the lower) is basically the same in both species (Jefferson et al., 1993; Reeves et al., 2002). While it is challenging and complex to discriminate morphologically the Juan Fernández fur seal from the Guadalupe fur seal, *A. philippii* can be distinguished from other species of fur seals by head shape, snout length and shape, and fur coloration differences (Reeves et al., 2002). A genetic study may have reconfirmed the species identity, but, unfortunately blood, skin and fur samples were lost.

To the best of our knowledge, there are no records of Juan Fernández fur seal on the Pacific coast of Colombia documented in the

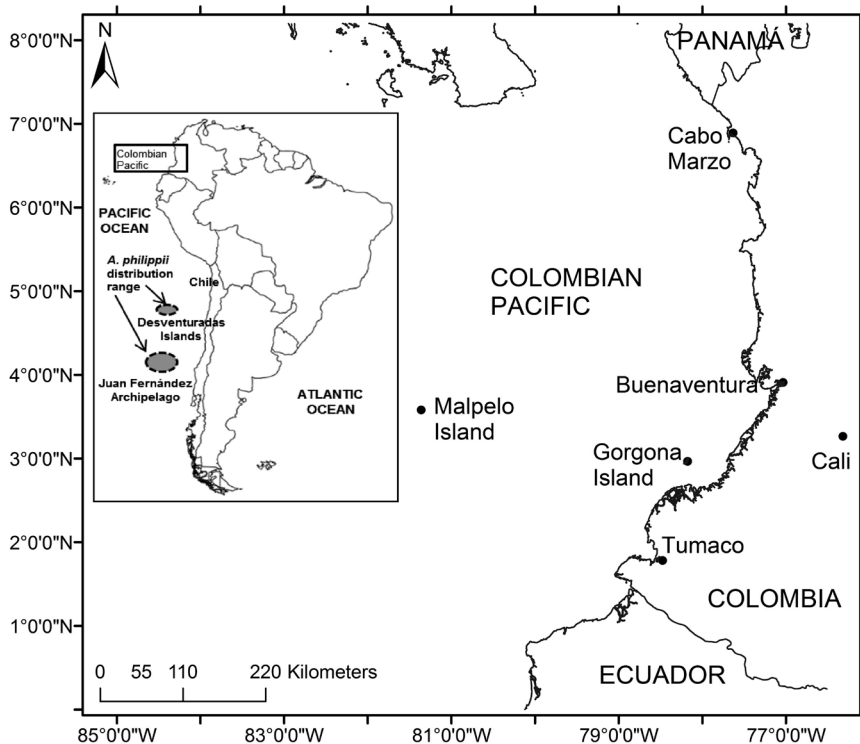


Fig. 1. Geographical location of the study area illustrating the Buenaventura Port in the Colombian Pacific where the Juan Fernández fur seal reported in this note was found. The South American continent and the current distribution range for *A. philippii* (based on Jefferson et al., 1993 and Reeves et al., 2002) including Juan Fernández Archipelago and Desventuradas Islands (San Félix and San Ambrosio Islands), are also shown for comparisons.

literature. However, vagrant Juan Fernández fur seals have been found on the west coast of South America from southern Peru to southern Chile (Reeves et al., 2002; Auriolos and Trillmich, 2008). Although the Colombian Pacific coastline is not part of the original distributional range of any otariid species, 4 species have been reported there: South American fur seal, *Arctocephalus australis* (Von Prael, 1987), Galapagos sea lion, *Zalophus wollebaeki* (Flórez-

González and Capella, 1995), Galapagos fur seal, *A. galapagoensis* (Capella et al., 2002), and South American sea lion, *O. flavescens* (Capella et al., 2002). These species are rarely sighted in the Colombian Pacific without resident popu-

Fig. 2. Photographs of a male of Juan Fernández fur seal, *Arctocephalus philippii*, from Colombian Pacific: a, b) dorsal view of the head: note the long, pointed snout/muzzle with bulbous downward nose and long, white whiskers; c) the entire animal showing a dark brown coloration of the pelage and mane fur exhibiting golden-yellowish and silver tipped-guard hair; note the severe emaciation state of the fur seal; d) the fur seal was transferred and kept in the Cali zoo for rehabilitation and treatment, but it did not survive. Photos by C. A. Galvis.



lations (Palacios et al., 1997; Flórez-González and Capella, 2001; Capella et al., 2002), and have been found and temporally established in beaches, rocky islets and rocky bottom from Tumaco (1° 48' N, 78° 45' W) to Cabo Marzo (6° 59' N, 78° 15' W), including Gorgona and Malpelo islands, remaining in these regions from a few days to several months (Fig. 1; Palacios et al., 1997; Capella et al., 2002; Avila et al., 2008; Herrera et al., 2011). The sighting of these species in Colombia indicates a traveling distance of 900 to 2400 km from their normal geographic range (Capella et al., 2002). The presence of vagrant animals in the Colombian Pacific waters is accidental because it is likely that they perform exploratory or foraging movements searching for food, which can be depleted in Ecuadorian, Galápagos, Peruvian and southern waters associated with El Niño Southern Oscillation (ENSO) events (Trillmich and Dellinger, 1991; Mora-Pinto and Muñoz-Hincapié, 1994; Capella et al., 2002; Alava and Salazar, 2006; Soto et al., 2006). Moreover, Merlen (1995) reported the possible presence of a Juan Fernández or Guadalupe fur seal on the southwest side of San Cristóbal, Galápagos Islands. This observation may support the notion of extralimital records for either species in the Southeastern Pacific. However, records for both of these species have not been reported again (Alava and Salazar, 2006).

Additionally, in Ecuador's mainland coast, there have been several observations of otariids in the last two decades, including several records of South American sea lions (*O. flavescens*), Galápagos sea lions (*Z. wollebaeki*), Galapagos fur seals (*A. galapagoensis*), and, possibly, South American fur seals (*A. australis*), as reported elsewhere (Ortiz, 1980; Felix et al., 1994; Alava and Salazar, 2006; Félix et al., 2007). Likewise, potential sightings of southern elephant seals (*Mirounga leonina*) were recently recorded in the Gulf of Guayaquil, highlighting a total dispersion over a geographic range of about 8000 km (Alava and Carvajal, 2005).

Similar to the vagrant behaviour of *A. philippii*, the Galápagos fur seal has also been recorded on the coasts of Colombia (Capella et al., 2002) and Mexico (Aurioles et al., 2004), indicating long movements of 1320-1625 km

(Capella et al., 2002) and 1832-2240 km (Aurioles et al., 2004) from its original home range, respectively. The Galápagos fur seal is also likely to occur at Foca Island (5° 47' S) in the northern Pacific coast of Peru (Piura), located at 1500 km from their normal habitat (i.e., Galápagos Islands), based on a preliminary study of mitochondrial DNA (mtDNA), as well as possible hybridization with *A. australis* (Camaratta et al., 2008). Moreover, a colony of Galápagos fur seals is likely to be residing at Isla Foca since January 2010 (C. Yaipen-Llanos, pers. comm., Organization for Research and Conservation of Aquatic Animals-ORCA, 8 February 2010; Collyns, 2010), supporting the prior study. There are also reports of long movements performed by individuals of the subantarctic fur seal, *A. tropicalis*, from their nearest breeding colonies, reaching distances up to 16 500 km in the South Atlantic Ocean (Ferreira et al., 2007). As is often the case elsewhere, these findings indicate that pinnipeds from the South Hemisphere are conducting long movements not only to the south, but farther north and observed in geographical location far away of their home ranges, above of the equatorial line, as further corroborated here for *A. philippii*. The presence of *A. philippii* in Colombia reported in this note could have been associated to the 2006-2007 El Niño episode, which started late and ended early showing unusual warming from mid-2006 to early 2007, with a weak to moderate strength El Niño, possibly influenced by global warming (McPhaden, 2008).

Arctocephalus philippii is a Near Threatened (NT) fur seal under the IUCN-red list of threatened species (Aurioles and Trillmich, 2008), with a population of 12 000-18 000 individuals (Reeves et al., 2002; Aurioles and Trillmich, 2008; Arnould, 2009). Thus, understanding both the natural and anthropogenic causes triggering long dispersions is critical for conservation purposes of the species. This finding is the first northernmost record for a male of Juan Fernández fur seal in the Southeastern Pacific beyond the Equator, dispersing a distance of approximately 3700 km from Desventuradas Islands or 4600 km from Juan Fernández Archipelago, which is the longest recorded movement for an individual of

A. philippii and implies that this species might be expanding its geographical range more than previously thought.

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LITERATURE CITED

- ACEVEDO J, R MATUS, D DROGUETT, A VILA, A AGUAYO-LOBO, and D TORRES. 2011. Vagrant Antarctic fur seal, *Arctocephalus gazella*, in southern channels of Chile. *Polar Biology* 34:939-943.
- ALAVA JJ and R CARVAJAL. 2005. First records of elephant seals on the Guayaquil Gulf, Ecuador: On the occurrence of either a *Mirounga leonina* or *M. angustirostris*. *Latin American Journal of Aquatic Mammals* 4:195-198.
- ALAVA JJ and S SALAZAR. 2006. Status and conservation of Otariids in Ecuador and the Galapagos Islands. Pp. 495- 519, in: Sea lions of the world (AW Trites, SK Atkinson, DP DeMaster, LW Fritz, TS Gelatt, LD Rea, and KM Wynne, Eds.). Alaska Sea Grant College Program, University of Alaska Fairbanks.
- ARNOULD JPY. 2009. Southern fur seals (*Arctocephalus* spp.). Pp. 1079-1084, in: Encyclopedia of Marine Mammals (WF Perrin, B Wursig, JGM Thewissen, Eds.). Second Edition, Academic Press, California, USA.
- AURIOLES D, Y SCHRAMM, and S MESNICK. 2004. Galápagos fur seals, *Arctocephalus galapagoensis*, in México. *Latin American Journal of Aquatic Mammals* 3:77-80.
- AURIOLES D and F TRILLMICH. 2008. *Arctocephalus philippii*. IUCN SSC Pinniped Specialist Group, in: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.2. www.iucnredlist.org. Accessed on 27 December 2013.
- AVILA IC, F ALVAREZ-VARGAS, and A PARRA-VIDAL. 2008. Una aproximación a la presencia de mamíferos marinos en el Chocó, Pacífico colombiano. Resumen Bie 138, in: Memorias Seminario Nacional de Ciencia y Tecnología del Mar, San Andrés, Colombia.
- CAMARATTA D, R ALMEIDA, LR DE OLIVEIRA, S CÁRDENAS, JC MARQUEZ, D GARCÍA, and SL BONATTO. 2008. Status taxonômico dos lobos-marinhos de Isla Foca (Perú): *Arctocephalus australis*, *A. galapagoensis* (Carnivora: Otariidae) ou híbridos? Resumo 62430, in: 9 Salão de Iniciação Científica Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, RS, Brasil.
- CAPELLA J, L FLÓREZ-GONZÁLEZ, P FALK, and DM PALACIOS. 2002. Regular appearance of otariid pinnipeds along the Colombian Pacific coast. *Aquatic Mammals* 28:67-72.
- COLLYNS D. 2010. Galapagos fur seals head for Perú waters. BBC News. 2010/02/08 <http://news.bbc.co.uk/2/hi/americas/8503397.stm>
- FÉLIX F, B HAASE, J SAMANIEGO, and J OECHSLE. 1994. New evidence of the presence of the South American sea lion *Otaria flavescens* (Carnivora: Pinnipedia) in Ecuadorian waters. *Estudios Oceanológicos* 13:85-88.
- FÉLIX F, P JIMÉNEZ, J FALCONÍ, and O ECHEVERRY. 2007. New cases and first births of the Galapagos fur seal *Arctocephalus galapagoensis* (Heller, 1904) from the mainland coast of Ecuador. *Revista de Biología Marina y Oceanografía* 42:77-82.
- FERREIRA JM et al. 2008. Multiple origins of vagrant Subantarctic fur seals: A long journey to the Brazilian coast detected by molecular markers. *Polar Biology* 31:303-308.
- FLÓREZ-GONZÁLEZ L and J CAPELLA. 1995. Mamíferos acuáticos de Colombia: una revisión y nuevas observaciones sobre su presencia, estado del conocimiento y conservación. Informe Museo del Mar (Universidad de Bogotá Jorge Tadeo Lozano, Bogotá, Colombia) 39: 1-29.
- FLÓREZ-GONZÁLEZ L and J CAPELLA. 2001. Mamíferos marinos locales y regionales. Pp. 133-140, in: Gorgona Marina: contribución al conocimiento de una isla única (LM Barrios and M. López-Victoria, eds.). INVEMAR, Serie Publicaciones Especiales 7, Santa Marta.
- HERRERA JC, J CAPELLA, G SOLER, S BESSUDO, C GARCÍA, and L FLÓREZ-GONZÁLEZ. 2011. Ocurrencia y tasas de encuentro de mamíferos marinos en las aguas de la isla Malpelo y hacia el continente. *Boletín de Investigaciones Marinas y Costeras* 40:57-78.
- HIGDON JW, ORP BININDA-EMONDS, RMD BECK, and SH FERGUSON. 2007. Phylogeny and divergence of the pinnipeds (Carnivora: Mammalia) assessed using a multigene dataset. *BMC Evolutionary Biology* 7:216.
- JEFFERSON TA, S LEATHERWOOD, and MA WEBBER. 1993. FAO species identification guide. Marine mammals of the world. FAO, Rome.
- MCPHADEN MJ. 2008. Evolution of the 2006-2007 El Niño: The role of intraseasonal to interannual time scale dynamics. *Advances in Geosciences* 14:219-230.
- MERLEN G. 1993. Flotsam and jetsam. *Noticias de Galápagos* 52:4-5.
- MERLEN G. 1995. A field guide to the marine mammals of the Galápagos. Instituto Nacional de Pesca, Guayaquil, Ecuador.
- MORA-PINTO D and M MUÑOZ-HINCAPIÉ. 1994. Registro y análisis de las muertes y varamientos de mamíferos marinos en el Pacífico colombiano. Tesis de grado, Facultad de Ciencias, Universidad Nacional de Colombia, Bogotá, Colombia.
- ORTIZ F. 1980. Un registro de mamífero nuevo para el Ecuador continental. *Museo Ecuatoriano de Ciencias Naturales* 2:51-56.
- PALACIOS DM, F FÉLIX, L FLÓREZ-GONZÁLEZ, JJ CAPELLA, D CHILUIZA, and BJM HAASE. 1997. Sightings of Galapagos sea lions (*Zalophus californianus wollebaeki*) on the coast of Colombia and Ecuador. *Mammalia* 61:114-116.

- REPENNING CA, RS PETERSON, and CL HUBBS. 1971. Contributions to the systematics of the southern fur seals, with particular reference to the Juan Fernández and Guadalupe species. American Geophysical Union, Antarctic Research Series 18:1-34.
- REEVES RR, BS STEWART, PJ CLAPHAM, and JA POWELL. 2002. Guide to the marine mammals of the world. National Audobon Society, New York.
- SOTO K, AW TRITES, and M ARIAS-SCHREIBER. 2006. Changes in diet and maternal attendance of South American sea lions indicate changes in the marine environment and the abundance of prey. Marine Ecology Progress Series 312:277-290.
- TORRES D, J ACEVEDO, DE TORRES, R VARGAS, and A AGUAYO-LOBO. 2012. Vagrant Subantarctic fur seal at Cape Shirreff, Livingston Island, Antarctica. Polar Biology 35:469-473.
- TRILLMICH F and T DELLINGER. 1991. The effects of El Niño on Galápagos pinnipeds. Pp 66-74, in: Pinnipeds and El Niño: Responses to environmental stress (F Trillmich and KÁ Ono, eds.). Springer-Verlag, Berlin.
- VILLA RM. 2007. Informe de necropsia del lobo marino. Manuscrito inédito, Zoológico de Cali, Colombia.
- VON PRAHL H. 1987. Penetración de elementos faunísticos de la Provincia Peruano-Chilena al Pacífico colombiano durante el fenómeno de El Niño 1982-1983. CPSS, Boletín ERFEN 20:9-11.
- WELLINGTON GM and T DE VRIES. 1976. The South American sea lion (*Otaria byronia*) in Galápagos Islands. Journal of Mammalogy 57:166-167.