

Regular appearance of otariid pinnipeds along the Colombian Pacific coast

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Abstract

A compilation of 34 records of otariid pinnipeds along the Pacific coast of Colombia for the period 1970–2001 is presented. The species involved are the South American sea lion (*Otaria flavescens*), the Galápagos sea lion (*Zalophus wollebaeki*), the Galápagos fur seal (*Arctocephalus galapagoensis*), and the South American fur seal (*A. australis*). The observations suggest that vagrant individuals of these species make regular excursions into the tropical waters of the Colombian Pacific, traveling distances of 900–2400 km from their normal geographic range. These apparently unusual occurrences could be related to environmental variability resulting from El Niño or other climatic events.

Key words: Otariidae, sightings, Colombia, Panamá Bight, eastern tropical Pacific, El Niño.

Introduction

The tropical shores of the Colombian Pacific coastline are not part of the present distributional range of any otariid species. However, since 1983 there have been scattered reports of sea lions (*Otaria flavescens*, *Zalophus wollebaeki*) and fur seals (*Arctocephalus* sp.) from subtropical austral latitudes (Prahl, 1987; Flórez-González & Capella, 1995; Mora-Pinto *et al.*, 1995; Palacios *et al.*, 1997). These animals appear to be vagrants and breeding colonies or permanent haul-out rookeries have not been established. Further investigation by the authors resulted in additional observations that indicate that the appearance of otariid pinnipeds along the Pacific coast of Colombia is more prevalent than previously thought. In this note, we present a compilation of 34 records for four otariid species spanning the period 1970–2001, and suggest

possible explanations for these apparently unusual occurrences.

Materials and Methods

Twenty-one otariid sightings were collected during humpback whale field research operations by our group, between 1985 and 2001. Four additional sightings were reported by local fishermen and one by local inhabitants, but their descriptions only allowed us to identify them to the family level. The sightings were made between the localities of Tumaco (1°50'N) and El Almejal (6°08'N), spanning about 460 km of coastline, and including the offshore islands of Gorgona (2°58'N, 78°11'W) and Malpelo (3°58'N, 81°35'W). Information for eight previously published records is also included.

Results

The 34 records thus compiled are listed chronologically by species in Table 1. Figure 1 is provided for geographic reference. The species involved are the South American sea lion (*O. flavescens*), the Galápagos sea lion (*Z. wollebaeki*), the Galápagos fur seal (*Arctocephalus galapagoensis*), and the South American fur seal (*A. australis*) (Fig. 2).

Discussion

Although South American sea lions are normally distributed from the southern tip of South America all the way to about 3°40'S, in Perú (Rice, 1998), their northernmost breeding limit is at Isla Foca (5°13'S) (Majluf & Trillmich, 1981). The latter locality is about 960 km from Tumaco and 1520 km from El Almejal beach, the southernmost and northernmost localities for the species in Colombia, respectively. Isolated records of this species have been documented in the Galápagos Islands

Table 1. Records of sea lions and fur seals along the Pacific coast of Colombia, 1970-2001.

Record No.	No. animals	Date	Location	Position	Type	Comments	Source
<i>Zalophus wollebaeki</i>							
1	1	18.11.1983	Isla Gorgona	2°58'N, 78°11'W	S	Female or immature male	Palacios et al. (1997)
2	1	21.12.1983	Isla Gorgona	2°58'N, 78°11'W	S	Female or immature male	Palacios et al. (1997)
3	1	18.04.1984	Isla Gorgona	2°58'N, 78°11'W	S	Female or immature male	Palacios et al. (1997)
4	1	22.09.1987	Isla Gorgona	2°58'N, 78°11'W	S/C	Immature male, released	Palacios et al. (1997)
5	1	End of 1988	Isla Gorgona	2°58'N, 78°11'W	S	Female or immature male	Palacios et al. (1997)
6	1	12.1997	Tumaco	1°50'N, 78°47'W	S	Female or immature male	Fundación Yubarta
7	1	05.1998	Tumaco	1°50'N, 78°47'W	S	Female or immature male	Fundación Yubarta
8	5	23.07.1998	Isla Malpelo	3°58'N, 81°35'W	S	One male, four females or immature males	Fundación Yubarta
9	1	03.2000	Isla Malpelo	3°58'N, 81°35'W	S	Female or immature male	Fundación Yubarta
<i>Otaria flavescens</i>							
10	1	unknown	Tumaco	1°50'N, 78°47'W	OR	Partial skull collected	Prahl (1987)
11	1	21.08.1990	Isla Gorgona	2°58'N, 78°11'W	S	Male	Fundación Yubarta
12	1	30.09.1991	Isla Gorgona	2°58'N, 78°11'W	S	Female or immature male	Fundación Yubarta
13	1	02.08.1992	Isla Gorgona	2°58'N, 78°11'W	S	Female or immature male	Fundación Yubarta
14	1	1993	Bocana Limones	2°40'N, 77°51'W	OR	Skull and skeleton collected	Mora-Pinto & Muñoz-Hincapié (1994)
15	1	28.08.1996	El Almejal beach	6°08'N, 77°18'W	SD	Partially decomposed	Fundación Yubarta
16	1	25.05.1997	Isla Gorgona	2°58'N, 78°11'W	S	Female or immature male	Fundación Yubarta
17	1	22.08.1998	Mulatos	2°38'N, 78°18'W	S	Female or immature male	Fundación Yubarta
18	1	10.04.2001	Cabo Corrientes	5°30'N, 77°40'W	S	Adult male	Local inhabitants
<i>Arctocephalus galapagoensis</i>							
19	1	13.05.1993	Isla Gorgona	2°58'N, 78°11'W	S	Mature male	Fundación Yubarta
20	2	05.1996	Tumaco	1°50'N, 78°47'W	S	Female or immature male	Fundación Yubarta
21	1	05.06.1997	Isla Gorgona	2°58'N, 78°11'W	S	Female or immature male, small individual	Fundación Yubarta
22	1	17.06.1997	Tumaco	1°50'N, 78°47'W	C	Adult female, died in Zoo of Cali	Fundación Yubarta
23	1	12.07.1997	Coqui	5°37'N, 77°23'W	K	Adult, sex unknown	Fundación Yubarta
24	1	16.09.1997	Isla Gorgona	2°58'N, 78°11'W	S	Female or immature male	Fundación Yubarta
25	1	11.03.1998	Tumaco	1°50'N, 78°47'W	S	Female or immature male	Fundación Yubarta
26	1	26.03.1998	Tumaco	1°50'N, 78°47'W	S	Immature male	Fundación Yubarta
27	1	10.05.1998	El Valle	6°07'N, 77°25'W	S	Male, released offshore	Fundación Yubarta
28	2	08.1998	Tumaco	1°50'N, 78°47'W	S	Females or immature males	Fundación Yubarta
29	5	03.1983	Isla Gorgona	2°58'N, 78°11'W	S	Adults, sex unknown	Prahl (1987)
<i>Otariidae</i> spp.							
30	1	03.1970	Isla Palma	3°54'N, 77°21'W	S	Sex and age unknown	Local fishermen
31	3	04.1972	Isla Palma	3°54'N, 77°21'W	S	Sex and age unknown	Local fishermen
32	2	06.1997	Tribugá Gulf	6°N, 77°20'W	S/K	Sex and age unknown, one killed	Local fishermen
33	1	01.06.1998	Ladrilleros	3°56'N, 77°22'W	S	Sex and age unknown	Local fishermen
34	1	08.1999	Isla Gorgona	2°58'N, 78°11'W	S	Adult, sex unknown, diving	Fundación Yubarta

Letters in Type column indicate S: sighting, SD: stranded dead, K: killed, C: captured, OR: osteological remains.

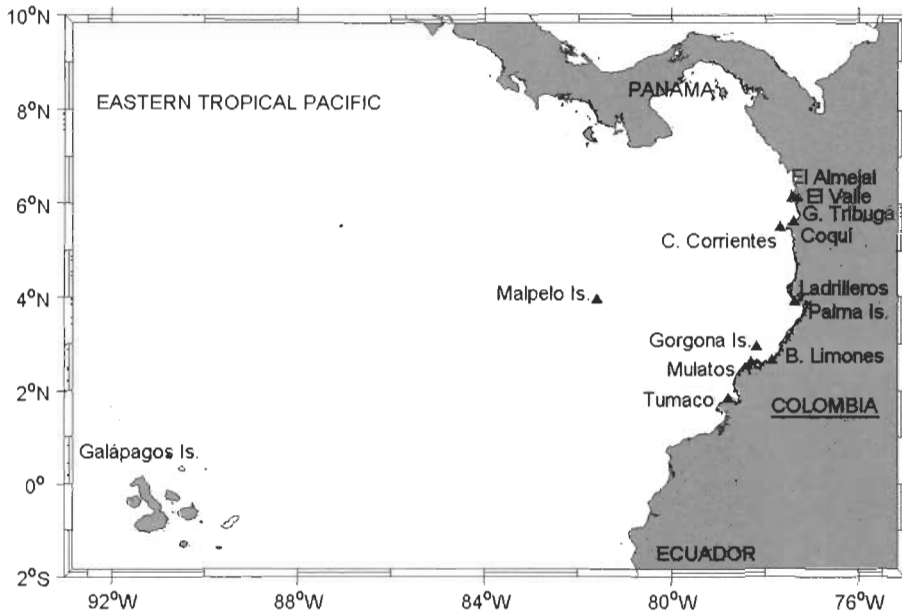


Figure 1. Localities of otariid pinniped records along the Pacific coast of Colombia, as listed in Table 1.

(Wellington & De Vries, 1976; Merlen, 1993; Félix *et al.*, 1994), on the coast of Ecuador (Félix *et al.*, 1994), and even as far north as Panamá (Méndez & Rodríguez, 1984).

The Galápagos sea lion is primarily found in the Galápagos Islands (Reeves *et al.*, 1992; Rice, 1998), although a small rookery of this species was established on Isla de la Plata, 30 km off the coast of Ecuador, after the 1982–1983 El Niño event (Nowak, 1986; Curry, 1993). The sightings of Galápagos sea lions on Isla Malpelo, Tumaco, Isla Gorgona, and El Valle are 1050 km, 1300 km, 1420 km, and 1570 km from the Galápagos Islands, respectively. Presumed Galápagos sea lions also have been documented from the central coast of Ecuador, 1120 km from the Galápagos (Palacios *et al.*, 1997), and from Isla del Coco, Costa Rica, 750 km northeast of the Galápagos (Acevedo-Gutiérrez, 1994). It is unlikely that any of the nine sightings reported here could belong to California sea lions (*Zalophus californianus*), whose present southernmost breeding rookery is at Isla Los Islotes (24°35'N, 110°23'W), in the Gulf of California, México (Reeves *et al.*, 1992; Rice, 1998). These animals would have had to travel more than 3900 km to Isla Malpelo and 4200 km to Isla Gorgona.

The geographic range of the Galápagos fur seal is restricted to the Galápagos Archipelago (Reeves *et al.*, 1992; Rice, 1998). The records of Galápagos fur seals in Colombia, more than 1300 km to the

northeast of the Galápagos, are the first observations of their occurrence outside their native archipelago. From external appearance, all individuals sighted were small-sized and had a lighter coloration on the face, both characteristics of the Galápagos fur seal (Reeves *et al.*, 1992). It is possible that some of these sightings could belong to *A. australis*, because these two species can be difficult to tell apart without specimens on hand. We note, however, that the Galápagos fur seal is the only tropical species of the genus and that its normal geographical range is closer to the Colombian Pacific than that of the South American fur seal. DNA analysis of the skin from one individual (No. 22 in Table 1) established its genetic identification as *A. galapagoensis* (S. Caballero & G. Lento, unpublished data).

The sighting of the South American fur seal reported by Prah (1987) is the only one known for Colombia. Although there are haul-out rookeries at Isla Lobos de Tierra (6°30'S), Perú, the species has its northernmost breeding colony at Paracas (13°54'S) (Bonner, 1981; Rice 1998), about 2400 km from Isla Gorgona. Vidal (1990) suggested that this record could belong to the Galápagos fur seal. Unfortunately, there are no photographs or other evidence available for evaluation. Félix *et al.* (1996) reported a specimen of *A. australis* from Ecuador.

The information presented above indicates that vagrant individuals of at least three (and perhaps four) otariid species make regular excursions into

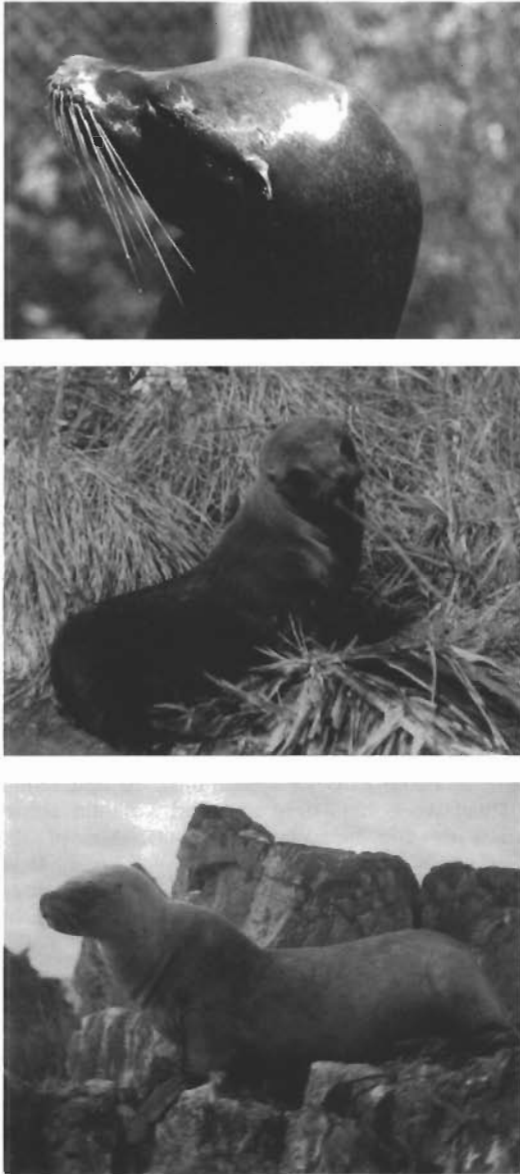


Figure 2. Individuals of *Zalophus wollebaeki* (top), *Arctocephalus galapagoensis* (middle), and *Otaria flavescens* (bottom) sighted on Isla Gorgona.

the tropical waters of the Colombian Pacific, traveling distances of 900–2400 km from their normal geographic range. Reports abound in the literature of extralimital records for many pinniped species (e.g., Payne, 1979; Shaughnessy & Ross, 1980; Torres *et al.*, 1984; Gallo-Reynoso & Solorzano-Velasco, 1991; Garrigue & Ross, 1996; Hanni *et al.*, 1997; Aurióles *et al.*, 1999; Bree, 2000). Juveniles are particularly adept at undertaking

long-range movements and showing-up in unlikely places (Reeves *et al.*, 1992). From this perspective, the appearance of subtropical otariids on Colombian shores is not necessarily extraordinary. However, the fact that specimens belonging to at least three species are being seen with some regularity (every year or every other year) raises the question of whether there is an underlying cause, in addition to the wide-ranging behaviour of young animals.

The effects of the El Niño phenomenon on populations of eastern Pacific pinnipeds have been rather well documented (Trillmich & Ono, 1991; Trillmich, 1993). During El Niño, animals are forced to undertake longer foraging trips in response to reduced local food availability or they may abandon their colonies altogether. Colonies can experience high reproductive failures and mass mortalities of adults, particularly during strong events. Eight El Niño events (1969–1970, 1972–1973, 1976–1977, 1979–1980, 1982–1983, 1986–1987, 1991–1994, and 1997–1998) took place in the period covered by this report (1970–2001), including the two strongest events of the 20th century. Such strong and/or frequent perturbations could reduce the long-term carrying capacity of the normally productive habitats preferred by these otariids. Therefore, dispersal and distributional shifts induced by El Niño could be important for long-term population persistence, as new geographical ranges or areas where extinction has occurred previously are settled (Trillmich, 1993). For example, South American fur seals that emigrated from the highly perturbed Peruvian upwelling system in pursuit of cooler waters and their prey during the 1982–1983 event, were reported to settle permanently and breed in northern Chile (Guerra & Portflitt, 1991).

The penetration of subtropical otariids into tropical waters, where food supply is presumably scarce and unpredictable, may seem puzzling. It should be recalled; however, that strong upwelling in the Panamá Bight, induced by northeast trade winds crossing the Isthmus of Panamá from the Caribbean Sea (e.g., Chelton *et al.*, 2000), results in locally enhanced productivity (e.g., Smayda, 1966; D'Croz *et al.*, 1991). Thus, the waters of the Panamá Bight (including the Colombian Pacific) could represent a potentially favorable habitat, particularly attractive to animals searching for food during times of El Niño.

Much research is needed before it can be concluded that these apparently unusual occurrences are directly linked to environmental change induced by El Niño (or other climatic events) in the eastern Pacific in the last three decades. It cannot be ruled-out that they are being influenced by demographic factors in the breeding colonies of the species, or that they are just being detected more

often due the growing presence of researchers in the area. However, given these species are highly sensitive to environmental perturbation, occurrences of this kind could be good indicators of changing ocean dynamics. A continued or increased influx of individuals into Colombian waters could result in the establishment of permanent or semi-permanent rookeries in areas relatively undisturbed by human presence (such as Isla Gorgona National Park), particularly for species with tropical affinities, like *Z. wollebaeki*. Finally, given potential conflicts with humans (particularly fishermen) unfamiliar with these animals, it is recommended that otariids be considered in local conservation and management plans.

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Literature Cited

- Acevedo-Gutiérrez, A. (1994) First record of a sea lion, *Zalophus californianus*, at Isla del Coco, Costa Rica. *Marine Mammal Science* **10**, 484-485.
- Auriolos-Gamboa, D., Hernández-Camacho, C. J. & Rodríguez-Krebs, E. (1999) Notes on the southernmost records of the Guadalupe fur seal, *Arctocephalus townsendi*, in México. *Marine Mammal Science* **15**, 581-583.
- Bonner, W. N. (1981) Southern fur seals, *Arctocephalus* (Geoffroy Saint-Hilaire and Cuvier, 1826). In: S. H. Ridgway & R. J. Harrison (eds.). *Handbook of Marine Mammals, Vol 1: The Walrus, Sea Lion, Fur Seals and Sea Otter*. Pp. 161-208. Academic Press, London.
- Bree, P. J. H. van (2000) A review of recent extralimital records of the bearded seal (*Erignathus barbatus*) on the west European continental coast. *Marine Mammal Science* **16**, 261-263.
- Chelton, D. B., Freilich, M. H. & Esbensen, S. K. (2000) Satellite observations of the wind jets off the Pacific coast of Central America. Part I: Case studies and statistical characteristics. *Monthly Weather Review* **128**, 1993-2018.
- Curry, R. L. (1993) Update from Isla de la Plata. *Noticias de Galápagos* **52**, 24-25.
- D'Croz, L., Del Rosario, J. B. & Gómez, J. A. (1991) Upwelling and phytoplankton in the Bay of Panamá. *Revista de Biología Tropical* **39**, 233-241.
- Félix, F., Haase, B. J. M., Samaniego, J. & Oechsle, J. (1994) New evidence of the presence of the South American sea lion *Otaria flavescens* (Carnivora, Pinnipedia) in Ecuadorean waters. *Estudios Oceanológicos* **13**, 79-82.
- Félix, F., Haase, B. & Chiluiza, D. (1996) Primer registro del lobo fino sudamericano (*Arctocephalus australis*) en Ecuador. In: *Programa y Resúmenes*. Pp. 95 (abstract) 7a. Reunión de Trabajo de Especialistas en Mamíferos Acuáticos de América del Sur and 1er. Congreso de la Sociedad Latinoamericana de Especialistas en Mamíferos Acuáticos, 22-25 October 1996, Viña del Mar, Chile.
- Flórez-González, L. & Capella, J. (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.
- Gallo-Reynoso, J. P. & Solorzano-Velasco, J. L. (1991) Two new sightings of California sea lions on the southern coast of México. *Marine Mammal Science* **7**, 96.
- Garrigue, C. & Ross, G. (1996) A record of the subantarctic fur seal, *Arctocephalus tropicalis*, from Madagascar, Indian Ocean. *Marine Mammal Science* **12**, 624-627.
- Guerra, C. G. & Portflitt, G. (1991) El Niño effects on pinnipeds in northern Chile. In: F. Trillmich & K. A. Ono (eds.). *Pinnipeds and El Niño, Responses to Environmental Stress*. Pp. 47-54. *Ecological Studies* **88**. Springer-Verlag, Berlin.
- Hanni, K. D., Long, D. J., Jones, R. E., Pyle, P. & Morgan, L. E. (1997) Sightings and strandings of Guadalupe fur seals in central and northern California, 1988-1995. *Journal of Mammalogy* **78**, 684-690.
- Majluf, P. & Trillmich, F. (1981) Distribution and abundance of sea lions (*Otaria hyronia*) and fur seals (*Arctocephalus australis*) in Perú. *Zeitschrift für Säugetierkunde* **46**, 384-393.
- Méndez, E. & Rodríguez, B. (1984) A southern sea lion *Otaria flavescens* (Shaw) found in Panama. *Caribbean Journal of Science* **20**, 105-108.
- Merlen, G. (1993) Flotsam and jetsam. *Noticias de Galápagos* **52**, 4-5.
- Mora-Pinto, D. & Muñoz-Hincapié, M. (1994) Registro y análisis de las muertes y varamientos de mamíferos marinos en el Pacífico colombiano. BSc thesis, Facultad de Ciencias, Departamento de Biología, Universidad Nacional de Colombia, Santafé de Bogotá, Colombia. 205 pp., 3 appendices.
- Mora-Pinto, D., Muñoz-Hincapié, M., Mignucci-Giannoni, A. & Acero-Pizarro, A. (1995) Marine mammal mortality and strandings along the Pacific coast of Colombia. *Reports of the International Whaling Commission* **45**, 427-429.
- Nowak, J. B. (1986) Isla de la Plata and the Galápagos. *Noticias de Galápagos* **44**, 17.
- Palacios, D. M., Félix, F., Flórez-González, L., Capella, J., Chiluiza, D. & Haase, B. J. (1997) Sightings of Galápagos sea lions (*Zalophus californianus wollebaeki*) on the coasts of Colombia and Ecuador. *Mammalia* **61**, 114-116.

- Payne, M. R. (1979) Fur seal *Arctocephalus tropicalis* and *A. gazella* crossing the Antarctic Convergence at South Georgia. *Mammalia* **43**, 93–98.
- Prahl, H. von (1987) Penetración de elementos faunísticos de la Provincia Peruano-Chilena al Pacífico colombiano durante el fenómeno de El Niño 1982–1983. *CPPS. Boletín ERFEN* **20**, 9–11.
- Reeves, R. R., Stewart, B. S. & Leatherwood, S. (eds.) (1992) *Seals and Sirenians*. Sierra Club Books, San Francisco, CA.
- Rice, D. W. (1998) *Marine mammals of the world. Systematics and Distribution*. Special publication No. 4, Society for Marine Mammalogy, Lawrence, KS.
- Shaughnessy, P. D. & Ross, G. J. B. (1980) Records of Subantarctic fur seal (*Arctocephalus tropicalis*) from South Africa with notes on its biology and some observations of captive animals. *Annals of the South African Museum* **82**, 71–89.
- Smayda, T. J. (1966) A quantitative analysis of the phytoplankton of the Gulf of Panama. *Inter-American Tropical Tuna Commission Bulletin* **19**, 165–260.
- Torres, D., Guerra, C. & Cárdenas, J. C. (1984) Primeros registros de *Arctocephalus gazella* y nuevos hallazgos de *Arctocephalus tropicalis* y *Leptonychotes weddelli* en el Archipiélago de Juan Fernández. *Serie Científica INACH* **31**, 115–148.
- Trillmich, F. (1993) Influence of rare ecological events on pinniped social structure and population dynamics. *Symposium of the Zoological Society (London)* **66**, 95–114.
- Trillmich, F. & Ono, K. A. (eds.) (1991) *Pinnipeds and El Niño. Responses to Environmental Stress*. Ecological Studies 88. Springer-Verlag, Berlin.
- Vidal, O. (1990) Lista de los mamíferos acuáticos de Colombia. *Informe del Museo del Mar* (Universidad de Bogotá Jorge Tadeo Lozano, Bogotá, Colombia) **37**, 1–18.
- Wellington, G. M. & Tj. De Vries (1976) The South American sea lion, *Otaria byronia*, in the Galápagos Islands. *Journal of Mammalogy* **57**, 166–167.