



# A review of the recent records of pinnipeds (Mammalia, Carnivora) on the coast of Espírito Santo state, Brazil

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**Abstract:** To improve the knowledge of the occurrence of pinnipeds along the coast of Espírito Santo state, Brazil, we compiled occurrence data of pinnipeds from the period from 1987 to 2010 based on the scientific literature, newspapers and novel observations. Twenty-two records were found, which correspond to three species: South American Fur Seal (*Arctocephalus australis*), Subantarctic Fur Seal (*Arctocephalus tropicalis*), and Southern Elephant Seal (*Mirounga leonina*). All records of pinnipeds are limited to the state's southern coast (south of 20°07'S), which is consistent with the southern origin of these vagrant individuals. However, there may be bias due to the larger human population density in that region and the greater likelihood of observation. All records for which the date is known occurred during June to September, the austral winter. These records demonstrate that although the Espírito Santo coast is more than 2,000 km north from the nearest breeding colony of these species, it may still serve as wintering grounds for vagrant pinnipeds.

**Key words:** South America; marine mammal; migration; vagrant; Otariidae; Phocidae

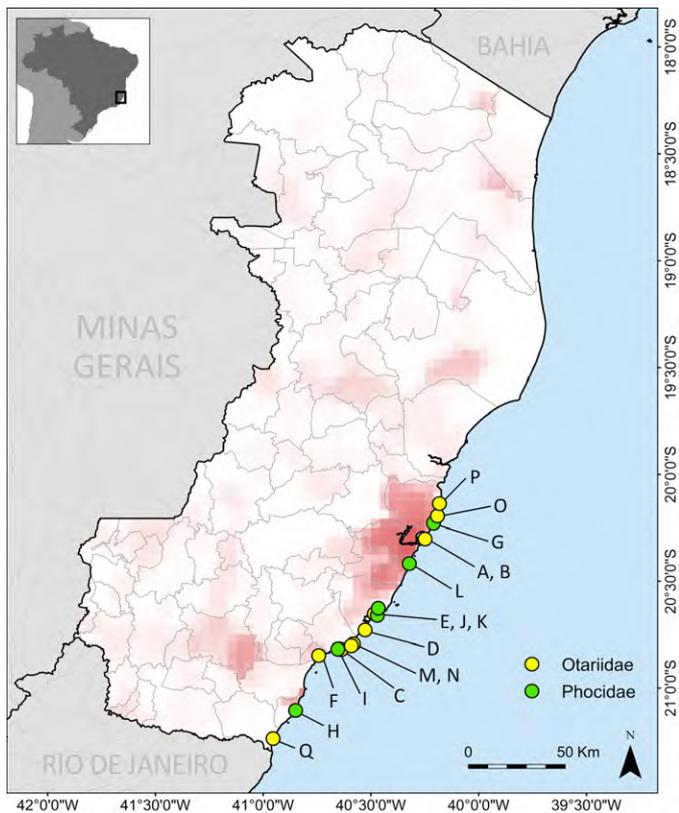
No species of pinnipeds breed in Brazil, however seven species have been reported as occasional or frequent vagrants along the country's coast: *Arctocephalus australis* (Zimmermann, 1783), South American Fur Seal; *Arctocephalus gazella* (Peters, 1875), Antarctic Fur Seal; *Arctocephalus tropicalis* (J.E. Gray, 1872), Subantarctic Fur Seal; *Otaria flavescens* (Shaw, 1800), South American Sea Lion; *Hydrurga leptonyx* (de Blainville, 1820), Leopard Seal; *Lobodon carcinophaga* (Hombron & Jacquinot, 1842), Crabeater Seal; and *Mirounga leonina* (Linnaeus, 1758), Southern Elephant Seal (CARVALHO 1975; PINEDO et al. 1992). Most of these species were recorded only in the southernmost states of Brazil, with records becoming sparser to the north (PINEDO et al. 1992; SILVA 2004; MOURA et al. 2010).

Espírito Santo state, lying between Bahia and Rio

de Janeiro states on the tropical coast of the Southeast Region of Brazil (Figure 1). The state's coastal waters are warm, dominantly influenced by the Brazil current (PIOLA & MATANO 2001), and belong to the Eastern Brazil ecoregion of the Tropical Southwestern Atlantic province (SPALDING et al. 2007). In contrast to the many reports of pinnipeds from the coast of the neighboring Rio de Janeiro state, data on pinnipeds from Espírito Santo is limited to only two brief records of *M. leonina* (MOURA et al. 2010). To improve the knowledge of the occurrence of pinnipeds from the Espírito Santo coast, we compile historical information from newspapers and unpublished records.

Aiming to obtain all available information on the occurrence of pinnipeds from the coast of Espírito Santo state (between 18°20'S, 039°39'W to 021°18'S, 040°57'W), we reviewed various sources of information up to 31 December 2010, including scientific papers, abstracts from conferences and meetings, newspapers, television news, personal communications, and field observations. We checked to determine whether observations were new sightings or just reiterations of prior sightings. Photographs were examined to verify species identity and to determine additional information such as sex, age group, and behavior. A conservative approach was adopted, and only information that could be confirmed was included. Species identifications were based on characters provided by Jefferson et al. (2008). Records were mapped.

Twenty-two records of pinnipeds made between 1987 and 2008 were obtained from 14 information sources (Figure 1; Table 1). Three species — *A. australis* ( $n = 2$ ), *A. tropicalis* ( $n = 5$ ), and *M. leonina* ( $n = 6$ ) — were recorded. Another four observations could not be reliably identified to species and were attributed as Otariidae. Figure 2 illustrates four of the most significant records. In five records (Table 1; records D, E, F, P and Q), documentation showed that animals were captured and taken to rehabilitation facilities but no further details were found on the success of rehabilitation and release back into the wild.



**Figure 1.** Geographic distribution of records of pinnipeds on the coast of Espírito Santo state, Brazil, 1987–2010. Municipalities are outlined in light grey, and red-shaded areas represent high human population density. Letters refer to the records detailed in Table 1.

Considering the dates and consistency in age group and sex, it seems probable that all six records of *M. leonina* (Table 1, records G to L,) represent a single individual; the same is likely for records M to O. Considering the possibility of one individual being recorded multiple times, we presume that all records represented just 10

individuals: two *A. australis*, three *O. flavescens*, one *M. leonina*, and four unidentified otariids.

**DISCUSSION**

There has long been lack of knowledge on the occurrences of pinnipeds along the coast Espírito Santo state. For example, SILVA (2004) compiled 116 records of pinnipeds from Brazilian coast (excluding Rio Grande do Sul state) but found no records from Espírito Santo state. In contrast, the adjacent Rio de Janeiro and Bahia states had 39 and 15 records respectively.

Most Brazilian pinniped records are from the southernmost states and sightings becoming rarer to the north (PINEDO et al. 1992; SILVA 2004; MOURA et al. 2010). Species diversity also diminishes northward, decreasing from seven species in Rio Grande do Sul to six species in São Paulo and Rio de Janeiro states, to just two or three species in Bahia and Alagoas (SILVA 2004). Our results (22 records; three species) for Espírito Santo state are consistent with this pattern. Because *O. flavescens* has been sporadically recorded in both Bahia and Rio de Janeiro states (SILVA 2004; MOURA et al. 2011), likely it occasionally occurs in Espírito Santo but has gone unrecorded.

Interestingly, our data shows that all historical and anecdotal pinniped records from Espírito Santo are restricted to south of 20°07' S. While this pattern may be partly related to the broader latitudinal trend on the distribution of these species along the Brazilian coast, a bias in observation effort is also likely. The state’s human population is greater along the southern coast (Figure 1), and on the north coast, access is restricted to many of the state’s sandy beaches because these are important nesting areas for *Dermochelys coriacea* (Vandelli, 1761), Leatherback Sea Turtles, and *Caretta caretta* (Linnaeus, 1758), Loggerhead Sea Turtles (MARCOVALDI et al. 2011).

**Table 1.** Pinniped records from the coast of Espírito Santo state, Brazil, 1987–2010.

Record	Date	Location	Coordinates	Species	Notes	Source
A	1987	Vitória	20°17' S, 040°17' W	Otariidae	–	1
B	1987	Vitória	20°17' S, 040°17' W	Otariidae	–	1
C	1991	Anchieta	20°48' S, 040°38' W	Otariidae	–	1
D	30 July 1992	Guarapari (Nova Guarapari)	20°43'19" S, 040°31'25" W	Otariidae	Immature, male, minor superficial wounds	1, 2
E	17 August 1999	Guarapari (Praia do Morro)	20°39'17" S, 040°29'14" W	<i>A. tropicalis</i>	Immature, body length approx. 1 m	1
F	17 August 2000	Piúma	20°51' S, 040°44' W	<i>A. tropicalis</i>	Pup, left eye wounded	3
G	20 July 2005	Serra (Praia Mole)	20°14'17" S, 040°12'49" W	<i>M. leonina</i>	Adult, apparently healthy	4, 5
H	21 June 2006	Marataízes	21°03' S, 040°50' W	<i>M. leonina</i>	Adult male, resting	6
I	27 June 2006	Anchieta	20°48' S, 040°38' W	<i>M. leonina</i>	Adult male, resting	6
J	28 June 2006	Guarapari (Morro da Pescaria)	20°39'27" S, 040°28'16" W	<i>M. leonina</i>	Adult male, body length approx. 4 m, resting	6, 7
K	18 August 2006	Guarapari (Praia do Perocão)	20°37'41" S, 040°27'59" W	<i>M. leonina</i>	Adult male, body length approx. 4 m, resting	7, 8, 9
L	21 August 2006	Vila Velha	20°21' S, 040°18' W	<i>M. leonina</i>	Adult male, resting	8
M	07 September 2006	Anchieta (Praia de Parati)	20°48'18" S, 040°36'23" W	<i>A. tropicalis</i>	Adult, resting	10
N	08 September 2006	Anchieta (Praia de Ubu)	20°48'7" S, 040°35'26" W	<i>A. tropicalis</i>	Adult, resting	11
O	27 September 2006	Serra (Manguinhos)	20°11'42" S, 040°11'28" W	<i>A. tropicalis</i>	Adult, resting	12
P	28 July 2007	Serra (Praia de Jacaraípe)	20°09'04" S, 040°11'05" W	<i>A. australis</i>	Pup	13
Q	October 2010	Presidente Kennedy	21°11' S, 040°44' W	<i>A. australis</i>	Beach-cast carcass, body length approx. 1 m	14

**Sources:** (1) A GAZETA (1999); (2) A GAZETA (1992); (3) A GAZETA (2000); (4) A GAZETA (2005); (5) L.F.S.P. MAYORGA, unpubl. data; (6) A GAZETA (2006a); (7) MOURA et al. (2010); (8) NOTÍCIA AGORA (2006); (9) A GAZETA (2006b); (10) A TRIBUNA (2006a); (11) A GAZETA (2006c); (12), A TRIBUNA (2006b); (13) I. BIANCHI, pers. comm.; (14) C. E. AMORIM & D. C. BRAGA, pers. comm.



**Figure 2.** Records of pinnipeds in Espírito Santo state, Brazil. **A.** *Mirounga leonina* adult male (Table 1, record J). **B.** *Arctocephalus tropicalis* adult (Table 1, record M). **C.** *Arctocephalus australis* beach-cast carcass (Table 1, record Q). Photographs reproduced, with permission, from: (A) José Luiz Pampanelli (A GAZETA 2006a), (B) Andressa Teixeira Cardoso Mian (A TRIBUNA 2006a), and (C) Carlos Eduardo Amorim (pers. comm.).

Therefore, it is possible that pinnipeds coming ashore on the northern coast are less likely to be sighted and reported on by the media.

All records for which dates were available were made between June and September, the austral winter. This is consistent with records from other Brazilian states and corroborates that the Brazilian coast serves as wintering grounds for subantarctic and antarctic marine mammals (MAGALHÃES et al. 2003; MOURA & SICILIANO 2007).

Although our data was mainly derived from non-academic sources, we were able to verify most records through photographs or written details. While this is suboptimal when compared to systematic and carefully documented beach surveys by researchers, the information obtainable from these historical and anecdotal records is a valid contribution when other data are not available. Such data may be useful for comparison to future studies employing more systematic methods of beach surveying.

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