

ON THE NATIVE STATUS OF THE SOUTHERN RIGHT WHALE *EUBALAENA AUSTRALIS* IN PERU

Koen Van Waerebeek¹, Luis Santillán¹ and Edith Suazo^{1,2}

¹ Peruvian Centre for Cetacean Research (CEPEC- Centro Peruano de Estudios Cetológicos),
Museo de Delfines, Pucusana, Lima 20, Peru.

e-mail: cepec@speedy.com.pe

² e-mail: suazoedith@yahoo.com

ABSTRACT

The native status of the southern right whale in Peruvian waters is now firmly supported by six confirmed sightings, including four cow-calf pairs, the northernmost at Pucusana (12°29'S, 76°48'W) and off San Bartolo (12°24'S, 77°11'W). An unconfirmed report exist from northern Peru. Five of six observations were shore-based, underscoring the importance of neritic habitat for *E. australis* also in Pacific South America. As sighting intervals have shortened over a period of two decades (near significant trend, $P = 0.054$) without indication of improved reporting, a guarded optimism for the recovery of *E. australis* in Peru may be warranted. However, a near-collision event with a fishing boat warns of conservation challenges ahead. As applies to three other cetacean species, the coast of Peru is proposed as the most boreal habitual range for *E. australis* on the planet, enabled by the cooling effects of the strongest of eastern boundary currents.

Keywords: southern right whale, northern distribution, Peru, habitat, collision

RESUMEN

Sobre el estatus nativo de la ballena franca austral en el Perú. El estatus nativo de la ballena franca austral en aguas del Perú está firmemente apoyado por seis avistamientos confirmados, incluyendo cuatro pares de madre-cría. Los avistamientos más boreales se registraron en Pucusana (12°29'S, 76°48'W) y frente a San Bartolo (12°24'S, 77°11'W). Existe, además, un informe no confirmado para el norte de Perú. Cinco de las seis observaciones se hicieron desde la orilla, lo que subraya la importancia del hábitat nerítico de *E. australis* también en la costa del Pacífico de América del Sur. Se acortaron los intervalos entre observaciones durante un período de dos décadas (tendencia cerca de significancia, $P = 0.054$) sin evidencia de que el índice de reportes incrementó, por ende un cauto optimismo para la recuperación de *E. australis* en el Perú podría estar justificado. Sin embargo, un conato de colisión con un barco pesquero advierte de retos de conservación. Como aplica en tres otras especies de cetáceos, se propone que la costa del Perú es el área de distribución habitual de *E. australis* más norteño en la planeta, gracias al efecto de enfriamiento de la más fuerte de las corrientes de frontera oriental.

Palabras clave: ballena franca austral, distribución norteño, Perú, habitat, colisión

In the 19th century large numbers of southern right whales *Eubalaena australis* (Desmoulins, 1822) were captured off the coast of Chile (Bolau, 1895; Harmer, 1928). A workshop organized by the International Whaling Commission (IWC) in 1983 that focussed on a global review of the species provisionally identified a 'Chilean stock' in the Southeast Pacific (IWC, 1986). However not until a second workshop in 1998 did the IWC (2001) recognize a 'Chile/Peru' stock. Since Robert Clarke's (1965) pioneering paper published information on the spatial and temporal distribution and breeding of southern right whales in Chile has steadily increased (Aguayo, 1974; Aguayo

and Torres, 1986; Cárdenas *et al.*, 1987; Guerra *et al.* 1987; Canto *et al.*, 1991; Aguayo *et al.*, 1992; Gibbons *et al.*, 2006). The latest comprehensive review for Chile identified 124 sightings for a total of 232 whales over the period 1976-2008 (Aguayo *et al.*, 2008). Here we review the status and habitat of the species in Peru, include new sighting records and discuss its apparently expanding northern distribution range.¹

The catalogue of whaling grounds by Lieutenant M.F. Maury (1851) charted right whales off northern Peru in two 5° latitude/longitude blocks, between 05°-15°S and 80-85°W, however the reliability of Maury's charts has recently been questioned (Reeves *et al.*, 2004). In 1952, León Kostritsky, chief of Peru's former Division for Fisheries and Hunting, mentioned *E. australis* for southern Peru², also in relation to whaling, but without indication of source. Clarke (1965) discussed at some length the whale's possible occurrence and concluded that, based on whaling data, no definite records existed. According to Grimwood (1968) right whales may occasionally reach southern Peruvian waters but then also echoed Clarke's conclusion. Major reviews have assumed that *E. australis* is absent from Peru, or failed to mention it (*e.g.* Cabrera, 1961; Hershkovitz, 1966; Cummings, 1985; Klinowska, 1991; Rice, 1998; Reilly *et al.*, 2008; Kenney, 2009).

In fact, the occurrence of *E. australis* in Peru has been well-documented since a 1987 sighting. A first cow-calf pair was seen in 1996 (Van Waerebeek *et al.*, 1992, 1998; Santillán *et al.*, 2004). To date, evidence consists of six confirmed sightings (including a probable re-sighting) and one possible sighting (Table 1). No museum specimens are available in Peru. Five records were made incidentally from shore *versus* a single one out at sea, underscoring the value of land-based coastal surveys. Half of records (N° 2, 3, 4; see Figure 1) originated from relatively unpopulated stretches of coast and bays. Below we elaborate on new sightings, including a near-collision event with a vessel and we discuss distribution.

Sighting N° 5

The senior author incidentally spotted a cow-calf pair travelling north about 1 km SW from the observation platform at the Peruvian Centre for Cetacean Research (*ca* 26 m above sea level) in Pucusana, central Peru, on 30 July 2005. The whales were observed, aided by 10x50 binoculars, from 13:22-14:00 h under fair conditions including good visibility, sea state 2 (Beaufort) and moderate swell. Diagnostic external features of *E. australis* (massive body, lack of dorsal fin, callosities, black colouration, V-shaped blow) were repeatedly confirmed. The whales slowly travelled nearshore (<500 m) on a NNW course, following the general outline of the cliff-lined coastline. At 13:50 h, an industrial purse-seiner which headed towards the port of Pucusana approached from the south in what appeared to be a collision course with the whales, then at *ca* 800 m from the observer. The seiner without deviating nor slowing crossed the 'footprints' of the whales where they had submerged seconds earlier. When re-surfacing the large whale changed behaviour as if startled by the near-miss: it exposed much of its head and anterior body, markedly increased swim speed and changed course to NWW, in offshore direction. At 14:20 h, the observer boarded a 5 m outboard-powered artisanal fishing boat in an attempt to intercept and photo-identify the whales. At 16:25 h, however, a fruitless search was aborted due to low fuel, increasing swell and dwindling light.

Sighting N° 6

Photos of two whales sighted opportunistically in the vicinity of several humpback whales *Megaptera novaeangliae* off Punta Sal, Tumbes, northern Peru in late July or early August 2005 were provided for identification by Liesel Stahr-Arrarte to Gunnar Engblom (in email, 5 August 2005) who consulted one of us (KVV). The two photos were consistent with *E. australis*, however due to low resolution and great distance we concluded that only a tentative identification ('like-southern right whale') was possible. While the subequatorial location would be remarkable, an association between humpback and southern right whales is not unusual (see Goodall and Galeazzi, 1986). In Drake Passage³ at 61°33'S, 31°29'W, KVV and Russell Leaper observed with a 2-minute interval two mixed groups of each a southern right whale and a humpback whale travelling side-by-side on 4 February 2003. Many more humpback whales and another four southern right whales were present in the same general area, all thought to be feeding on a massive krill swarm.

¹ A preliminary draft of this paper (SC/60/BRG33) was presented to the IWC Scientific Committee at the 60th Annual Meeting in Santiago de Chile, June 2008.

² [p.35] "...La mayor concentración existe entre 30° y 50° de latitud sur, pudiendo llegar algunos ejemplares hasta frente a la costa sur del Perú, " ... "En el Perú, dicha especie por su número, es de menor interés utilitario".

³ Observations were made from research vessel RRS *James Clark Ross* during the 2003 Scotia Sea Cruise.

Sighting N° 7

On 5 April 2007, at 17:46 h, an adult southern right whale was sighted by one of us (ES) 23 nmiles west off San Bartolo, central Peru (Table 1) at 500 m radial distance from the 3D-seismic survey vessel R/V *Gulf Supplier*. Conditions were favourable with good visibility, sea state 3 Beaufort and low swell (wave height <2 m). The species was positively identified from the whale's V-shaped blow, very broad, flat *dorsum* without dorsal fin and black colour. The animal moved slowly in offshore (210°) direction while the vessel transited with silent air guns at a constant 3-4 knots. Between 3-30 April 2007 total sighting effort by ES was 229.12 hours in an area referred to as Block Z33 located off the Departamentos of Lima and Ica. This effort resulted in 62 cetacean sightings including this single observation of a southern right whale (SRW sighting rate= 0.0044 individuals/hour).

At 12°24.3'S, 50 km south of Callao (Lima), sighting N° 7 currently stands as the northernmost confirmed occurrence of *E. australis* in the eastern Pacific Ocean as well as worldwide. Although latitudinally equivalent to the SW Atlantic northernmost record at 12°58'S, 38°29'W off Salvador da Bahia (Baracho *et al.*, 2002), the typical northern distribution in Brazil extends from 18°S to 25°S (Lodi *et al.*, 1996; Santos *et al.*, 2001) implying that Salvador da Bahia is an unusual extralimital record. In comparison, the six confirmed sightings in Peru (12°24'S-17°38'S; median = 15°47'S) ranged more boreal and have shifted northward over the past two decades (Figure 1). Cow-calf pair N° 5 skirted the coastline in NW direction when the near-collision incident caused the whales to flee offshore (west). Possibly the whales later resumed their original course and may have travelled way north of Pucusana. The latest sightings suggest that central Peru is not extralimital for the Chile/Peru population. Moreover, they put Clarke's (1965) notable premise 'whether in a few cases southern right whales may take advantage of the cold Humboldt Current to move into very low latitudes in the region of Ecuador' into a new perspective. The same cool neritic ecosystem found on Peru's central coast extends north to about Cabo Blanco (04°15'S, 81°14'W), Tumbes (Gunther, 1936; Brainard and McLain, 1987).

In comparison, in the eastern Atlantic Ocean, right whales may rarely penetrate equatorial waters. In 1951, a female right whale of 14.9 m ('49 peds') was taken by the shore-based whaling operation off Cap López, Gabon, at ca 01°S (Budker, 1952). IWC (1986) cautioned that this individual cannot be attributed to either Northern or Southern Hemisphere (SH) stocks. However, circumstantial evidence strongly suggests a southern right whale. Whaling effort off Gabon, targeting mainly SH humpback whales on their breeding grounds, occurred seasonally from June-November (Budker, 1954), coinciding with the period when *E. australis* is found in lower latitudes. Bahía de Cintra (23°N, 16°14'W) and Bahía de Gorrei (22°50'N, 16°20'W) in Western Sahara (see Reeves and Mitchell, 1990) constitute the least distant areas from Gabon for which evidence exists of the historical presence of the North Atlantic right whale *Eubalaena glacialis* (Müller, 1776). The shortest distance as a whale could swim between Bahía de Gorrei and Cap López is approximately 4590 km. It would need traverse a vast tropical region, including the entire Gulf of Guinea, for which there is no indication of either historical or present occurrence of right whales (e.g. Robineau and Vély, 1998; Bamy *et al.*, 2006; Van Waerebeek *et al.*, 2000, 2009). In contrast, the linear distance between Cap López and Angola's Baía dos Tigres (16°37'S, 11°44'E), an important whaling ground for southern right whales in the late 18th and early 19th centuries (Best, 1981) is only about 1800 km (39% of 4590 km). Moreover, *E. australis* concentrations may have occurred north of Baía dos Tigres as at least one right whale was taken at Porto Alexandre (15°48'S, 11°52'E) (Best and Ross, 1986). Roux *et al.* (2001) reported 36 incidental sightings of *E. australis* off the Namibian coast since 1971, and calving was recorded between 1996 and 1999. In recent years the northernmost sightings in the SE Atlantic and the SW Indian Oceans are, respectively, near Kunene (Cunene) River mouth (17°16'S) at the Namibia/Angola border (Roux *et al.*, 2001) and Antongil Bay (centered at 15°45'S, 49°50'E), eastern Madagascar (Uyeda, 2007).

In Peru, chronologically successive records (Table 1) suggest a northbound tendency of the population's range as if reflecting a gradual re-occupation of pre-exploitation haunts in the eastern South Pacific (Figure 1). Temporal intervals between sightings (9, 7, 2, 0, 2 years) have decreased over the past two decades, but due to the small number of confirmed sightings the trend is still uncertain (linear regression, $R = 0.87$; $F(1,3) = 9.518$, $P = 0.054$; 95% CI for the slope: -4.266, 0.066). It could be argued that nearshore dwelling whales may be detected more readily following a substantial increase in artisanal fishermen operating along the Peruvian coast (Estrella, 2007) and a concomitant growth of coastal communities. However, recent nearshore sightings of humpback whales observed by both fishermen's families and a scientist (KVV) showed that whales typically elicit an ephemeral interest among locals and were not reported to port or other authorities.

Other southern right whale populations (Argentina, Australia and South Africa) have long shown increases of sightings with doubling of numbers per decade. The maximum 1-day count of only four whales in Chile (Aguayo, 1974; Aguayo *et al.*, 1992) and two whales in Peru (this paper) is very low compared to counts of 15, 40, 155 and 256

(2 days) off, respectively, SE Australia, SW Australia, Argentina and South Africa even two decades ago (see Table 3 in IWC, 1986). With the lack of dedicated coastal surveys and barely a nascent reporting habit, current records probably underestimate the frequency of occurrence in Peruvian waters in winter and spring. Systematic shore-based and boat-based coastal surveys will be required to assess trends in abundance, photo-identify individuals, reveal habitat use as well as document anthropogenic threats (mainly: collisions, entanglements, disturbance). No strandings or fisheries interactions, but one near-collision event (this paper) are recorded in Peru, and another in Chile (Canto *et al.*, 1991). The threat of ship strikes will require particular attention taken into account that *E. australis* was identified in the Southern Hemisphere as the cetacean suffering the highest mortality from collisions, with 56 cases reported until June 2007 (Van Waerebeek *et al.*, 2007).

E. australis has evolved from apparently very rare (but perhaps unreported) to being a more regular visitor of southern and central Peru, mainly in July-December, supporting our premise that *E. australis* is a native mammal of Peru, albeit still unrecognised by some authors (see Reilly *et al.*, 2008; Kenney, 2009). If the present pattern of regular sightings including cow-calf pairs and a widening range would consolidate in future years, a guarded optimism for the recovery of *E. australis* in Peruvian waters may be warranted.

As applies to three other Southern Hemisphere cetacean species adapted to cold-temperate waters, *i.e.* southern right whale dolphin *Lissodelphis peronii* (Lacépède, 1804), dusky dolphin *Lagenorhynchus obscurus* (Gray, 1828) and Burmeister's porpoise *Phocoena spinipinnis* Burmeister, 1865, Peru's coastal waters may comprise the northernmost habitual range of *E. australis* on the planet, enabled by the cooling effects of the Humboldt Current System, the strongest of eastern boundary currents (Penven *et al.*, 2005).

TABLE 1. Six confirmed sightings and one 'probable' sighting (N° 6) of *Eubalaena australis* in Peru, 1987- 2007 (chronologically ordered). Records N° 5, 6 and 7 are newly reported.

N°	DATE	POSITION	LOCATION	COMPOSITION	NOTES	SOURCE
1	25 Nov 1987	17°38'S, 71°20'W	near Ilo port, Departamento de Moquegua	2 individuals, estimated length 10-15m	remained 3 days in vicinity before heading south	Van Waerebeek <i>et al.</i> (1992)
2	7 Sept 1996	16°13'S, 73°42'W	Atico, Departamento de Arequipa	Cow-calf pair	remained in same area until 12 November (2 months)	Van Waerebeek <i>et al.</i> (1998)
3	mid-Dec. 1996	16°26'S, 73°08'W	La Planchada, Departamento de Arequipa	Cow-calf pair	possible re-sighting of Atico pair (N°2) because of proximity of location	Van Waerebeek <i>et al.</i> (1998)
4	26 August 2003	15°08'S, 75°21'W	San Fernando Bay, Departamento de Ica	Cow-calf pair	reportedly left the bay at the end of September	Santillan <i>et al.</i> (2004)
5	30 July 2005	12°29'S, 76°48'W	Pucusana, Departamento de Lima	Cow-calf pair	moved NNW and then NWW after near-collision incident (details see text)	Van Waerebeek, pers. observ.; this paper
6	early August 2005	04°S, 80°58'W	off Punta Sal, Departamento de Tumbes	2 individuals side-by-side (one large)	unconfirmed sighting ('like-southern right whales') in the vicinity of several humpback whales	Photos (low-resolution) by L. Stahr-Arrarte examined by KVV; this paper
7	5 April 2007	12° 24.3' S, 77° 10.58' W	43km W off San Bartolo, Departamento de Lima	1 adult	observed from seismic vessel R/V Gulf Supplier	E. Suazo, pers. observ.; this paper

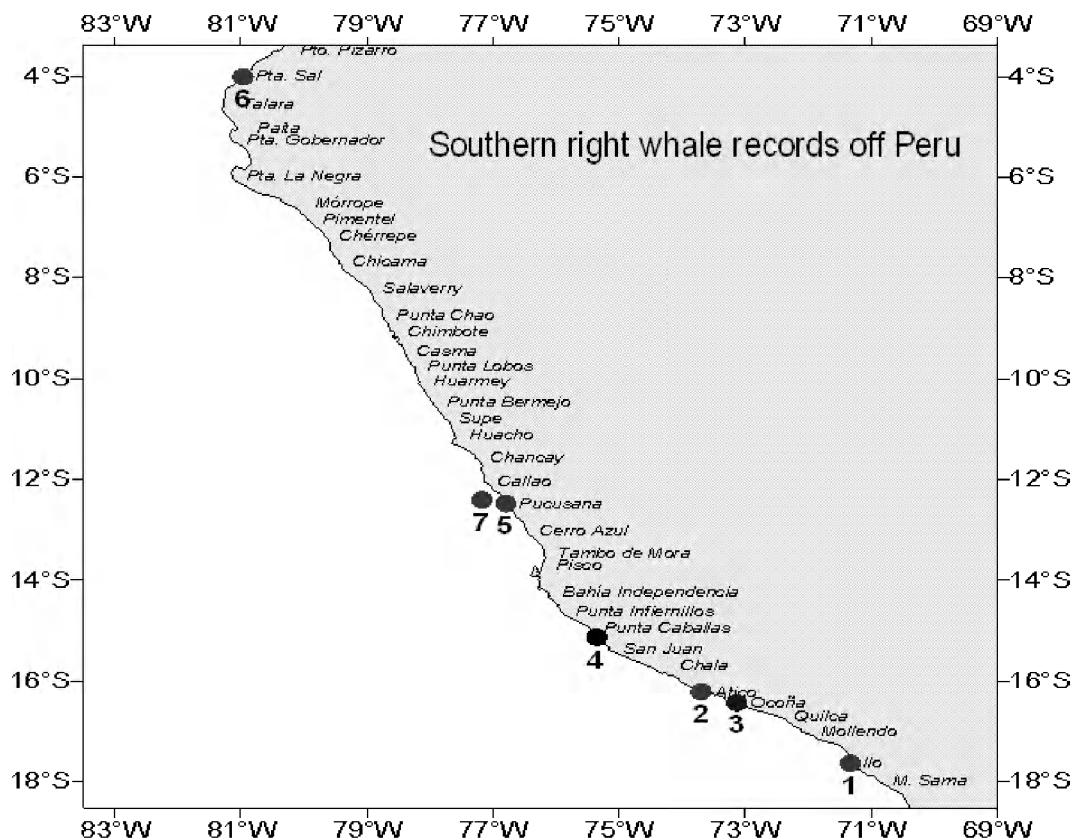


FIGURE 1. Distribution of *Eubalaena australis* sighting records off Peru in 1987-2008 (see Table). Sightings are all confirmed except for the northernmost N° 6 which is an unconfirmed ('probable') record

ACKNOWLEDGEMENTS

L. Stahr-Arrarte and G. Engblom (Kolibri Expeditions) are thanked for reporting Sighting N°6. We are grateful also to two anonymous reviewers for their constructive comments and to Robert Clarke and Obla Paliza (Pisco, Peru) for the critical reading of an earlier manuscript. Field research has benefited from long-term support by the International Fund for Animal Welfare. Van Waerebeek submitted a draft as SC/60/BRG33 to the IWC Scientific Committee meeting in 2008, while serving as head of the scientific delegation for Belgium's Federal Public Service, Public health, Food Chain security and Environment, Brussels.

REFERENCES

- AGUAYO, A.
 1974 Baleen whales off continental Chile. Pages 209-217 in W.E. Schevill (ed.). *The Whale Problem: a Status Report*. Harvard University Press, Cambridge, Massachusetts, USA.
- AGUAYO-LOBO, A., CÁRDENAS, J.C. and TORRES, D.
 1992 Análisis de los avistamientos de *Eubalaena australis* (Desmoulins, 1822) en aguas chilenas, desde 1983 hasta 1989. *Série Científica de INACH* 42:77-91.

- AGUAYO-LOBO, A. and TORRES, D.
1986 Records of the southern right whale, *Eubalaena australis* (Desmoulins, 1822) from Chile between 1976 and 1982. Reports of the International Whaling Commission (special issue 10): 159-160.
- AGUAYO-LOBO, A., ACEVEDO, J., BRITO, J.L., OLAVARRÍA, C., MORAGA, R. and OLAVE, C.
2008 La ballena franca del sur, *Eubalaena australis* (Desmoulins, 1822) en aguas chilenas: análisis de sus registros desde 1976 a 2008. Revista de Biología Marina y Oceanografía 43(3): 653-668.
- BAMY, I.L., VAN WAEREBEEK, K., BAH, S.S., DIA, M., KABA, B., KEITA, N., KONATE, S. and TALL, H.
2006 The cetaceans of Guinea, a first check-list of documented species. Paper SC/58/O15 presented to the Scientific Committee, IWC, St Kitts, May-June 2006. 7pp. [Available from the IWC Secretariat, Cambridge, UK].
- BARACHO, C. G., MÁ S ROSA, S. and MARCOVALDI, E.
2002 Primeiro registro da baleia-franca-do-sul (*Eubalaena australis*) no litoral norte da Bahia-Brasil. 10ª Reunion de Trabajo de Especialistas en Mamíferos Acuáticos de America del Sur. 4º Congreso de la Sociedad Latinoamericana de Especialistas en Mamíferos Acuáticos, 2002, Valdivia. (Abstract).
- BEST, P.B.
1981 The status of right whales (*Eubalaena glacialis*) off South Africa, 1969-1979. Investigational Report of the Sea Fisheries Institute of South Africa 123: 1-44.
- BEST, P.B. and ROSS, G.J.B.
1986 Catches of right whales from shore-based establishments in Southern Africa, 1792-1975. Reports of the International Whaling Commission (special issue 10): 275-289.
- BOLAU, H.
1895. Die Geographische Verbreitung der wichtigsten Wale des Stillen Ozeans. Abhandlungen des Naturwissenschaftliche Vereins, Hamburg, No.5.
- BRAINARD, R.E. and MCLAIN, M.C.
1987 Seasonal and interannual subsurface temperature variability off Peru, 1952-1984. Pages 14-45 in Pauly D. and Tsukayama I. (Eds). The Peruvian Anchoveta and its Upwelling Ecosystem: Three Decades of Change. ICLARM Studies and Reviews 15. ICLARM, IMARPE, GTZ, Manila.
- BUDKER, P.
1952 Quelques considérations sur la Campagne Baleinière 1951 au Cap López (Gabon). Mammalia 16(1): 1-6.
- BUDKER, P.
1954 Whaling in French Oversea Territories. The Norwegian Whaling Gazette 6: 320-326.
- CABRERA, A.
1961 Catálogo de los Mamíferos de América del Sur. Revista del Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Ciencias Zoológicas 4(2): 309-732.
- CANTO, J., RUIZ, P. and CÁRDENAS, J.C.
1991 Necropsia de ballena franca austral *Eubalaena australis* y consideraciones sobre sobre manejo de la especie. Boletín del Museo Nacional de Historia Natural, Chile 42: 105-111.
- CÁRDENAS, J.C., TORRES, D., OPORTO, J. and STUTZIN, M.
1987 Presencia de ballena franca (*Eubalaena australis*) en las costas de Chile. Anais da 2a Reunião de Trabalho de especialistas em mamíferos aquáticos da América do sul, Rio de Janeiro.
- CLARKE, R.
1965 Southern right whales off the coast of Chile. Norsk Hvalfangst-Tidende 54: 121-128.
- CUMMINGS, W.C.
1985 Right whales *Eubalaena glacialis* (Müller, 1776) and *Eubalaena australis* (Desmoulins, 1822). Pages 275-304 in Ridgway, S.H. and Harrison, R. (eds). Handbook of Marine Mammals. Volume 3, The Sirenians and Baleen Whales. Academic Press Inc. (London).
- ESTRELLA, C.
2007 Resultados generales de la segunda encuesta estructural de la pesquería artisanal en el litoral Peruano: II ENEPA 2004-2005 (unpublished). 8pp. [Available from Instituto del Mar del Perú, IMARPE, Callao, Peru]
- GIBBONS, J., CAPELLA, J.J., KUSCH, A. and CÁRCAMO, J.
2006 The southern right whale *Eubalaena australis* (Desmoulins, 1822) in the Strait of Magellan, Chile. Anales Instituto Patagonia (Chile) 34: 75-80.
- GOODALL R.N.P. and GALEAZZI, A.R.
1986 Recent sightings and strandings of southern right whale off Subantarctic South America and the

- Antarctic Peninsula. Reports of the International Whaling Commission (Special Issue 10): 173-176.
- GRIMWOOD I.R.
1968 Notes on the distribution and status of some Peruvian mammals. Special Publication 21, American Committee for International Wild life Protection and New York Zoological Society, Bronx, NY. 86pp.
- GUERRA C., VAN WAEREBEEK, K., PORTFLITT, G. and LUNA, G.
1987 Presencia de cetáceos frente a la segunda región de Chile. Estudios Oceanológicos 6:87-96.
- GUNTHER, E.R.
1936 A report on oceanographical investigations in the Peru coastal current. Discovery Reports 13: 107-276.
- HARMER, S.F.
1928 The history of whaling. Proceedings of the Linnean Society of London 140: 51-95.
- HERSHKOVITZ, P.
1966 Catalog of Living Whales. Smithsonian Institution, Washington, U.S. Government Printing Office. 259pp.
- INTERNATIONAL WHALING COMMISSION
1986 Report of the workshop on the status of right whales. Reports of the International Whaling Commission (special issue 10): 1-33.
- INTERNATIONAL WHALING COMMISSION
2001 Report of the workshop on the comprehensive assessment of right whales: a worldwide comparison. The Journal of Cetacean Research and Management (special issue 2): 1-35.
- KENNEY, R.D.
2009 Right whales *Eubalaena glacialis*, *E. japonica* and *E. australis*. Pages 962-972 in Encyclopedia of Marine Mammals. W.F. Perrin, B. Würsig and J.G.M. Thewissen. (eds.). Academic Press. Second Edition.
- KLINOWSKA, M.
1991 Dolphins, Porpoises and Whales of the World. The IUCN Red Data Book. IUCN, Gland, Switzerland and Cambridge, U.K. 429pp.
- KOSTRITSKY, L.
1952 Las ballenas y su aprovechamiento en el Perú. Pesca y Caza, Lima 4: 33-48.
- LODI, L., SICILIANO, S. and BELLINI, C.
1996 Ocorrencias e conservação de baleias-francas-do-sul, *Eubalaena australis*, no litoral do Brasil. Papéis Avulsos de Zoologia, Sao Paulo 39(17): 307-328.
- MAURY, M.F.
1851 Whale Chart. National Observatory, Bureau of Ordnance and Hydrography, USA.
- PENVEN, P., ECHEVIN, V., PASAPERA, J., COLAS, F. and TAM, J.
2005 Average circulation, seasonal cycle, and mesoscale dynamics of the Peru Current System: A modeling approach. Journal of Geophysical Research 110: 1-21.
- REEVES, R.R., JOSEPHSON, E. and SMITH, T.D.
2004 Putative historical occurrence of North Atlantic right whales in mid-latitude offshore waters: 'Maury's Smear' is likely apocryphal. Marine Ecology Progress Series 282: 295-305.
- REEVES, R.R. and MITCHELL, E.
1990 Right whales, not humpbacks, taken in Cintra Bay. The American Neptune L(2): 119-126.
- REILLY, S.B., BANNISTER, J.L., BEST, P.B., BROWN, M., BROWNELL JR., R.L., BUTTERWORTH, D.S., CLAPHAM, P.J., COOKE, J., DONOVAN, G.P., URBÁN, J. and ZERBINI, A.N.
2008 *Eubalaena australis*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. <www.iucnredlist.org>. Downloaded on 16 May 2009.
- RICE, D.W.
1998 Marine Mammals of the World. Systematics and Distribution. The Society for Marine Mammalogy, Special Publication 4. 231pp.
- ROBINEAU, D. and VELY, M.
1998 Les cétacés des côtes de Mauritanie (Afrique du Nord-Est). Particularités et variations spatio-temporelles de répartition: rôle des facteurs océanographiques. Revue d'Ecologie: La Terre et La Vie 53:123-152.
- ROUX, J-P., BEST, P.B. and STANDER, P.E.
2001 Sightings of southern right whales (*Eubalaena australis*) in Namibian waters, 1971-1999. Journal of Cetacean Research and Management (special issue 2): 181-185.

- SANTILLÁN, L., ROCA, M., APAZA, M., ROSA DE OLIVEIRA, L. and ONTÓN, K.
2004 New record of mother-calf pair of southern right whale, *Eubalaena australis*, off the Peruvian coast. The Latin American Journal of Aquatic Mammals 3(1):83-84.
- SANTOS, M.C. DE OLIVEIRA, SICILIANO, S., PACHECO DE SOUZA, S. and ALTMAYER PIZZORNO, J.L.
2001 Occurrence of southern right whales (*Eubalaena australis*) along southeastern Brazil. The Journal of Cetacean Research and Management (special issue 2): 153-156.
- UYEDA, C.
2007 Southern right whale (*Eubalaena australis*) 5-Year Review: Summary and Evaluation. National Marine Fisheries Service, Office of Protected Resources, Silver Spring, Maryland, USA. (Unpublished).
- VAN WAEREBEEK K., REYES, J.C. and ARANDA, C.
1992 Southern right whales (*Eubalaena australis*) off southern Peru. Marine Mammal Science 8(1): 86-88.
- VAN WAEREBEEK, K., REYES, J.C. and VAN BRESSEM, M.F.
1998 Sighting of a mother-calf pair of southern right whale *Eubalaena australis* in Peruvian waters. Estudios Oceanológicos 17: 105-107.
- VAN WAEREBEEK, K., NDIAYE, E., DJIBA, A., DIALLO, M., MURPHY, P., JALLOW, A., CAMARA, A., NDIAYE, P. and TOUS, P.
2000 A survey of the conservation status of cetaceans in Senegal, The Gambia and Guinea-Bissau. UNEP/CMS Secretariat, Bonn, Germany. 80pp.
- VAN WAEREBEEK, K., BAKER, A.N., FÉLIX, F., GEDAMKE, J., IÑIGUEZ, M., SANINO, G.P., SECCHI, E., SUTARIA, D., VAN HELDEN, A. and WANG, Y.
2007 Vessel collisions with small cetaceans worldwide and with large whales in the Southern Hemisphere, an initial assessment. The Latin American Journal of Aquatic Mammals 6(1): 43-69.
- VAN WAEREBEEK, K., OFORI-DANSON, P.K. and DEBRAH, J.
2009 The cetaceans of Ghana: a validated Journal checklist. West African Journal of Applied Ecology 15: 61-90 (In press).