

## AN UNUSUALLY LARGE AGGREGATION OF BURMEISTER'S PORPOISE *PHOCOENA SPINIPINNIS* OFF PERU, WITH A REVIEW OF SIGHTINGS FROM THE EASTERN SOUTH PACIFIC

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### RESUMEN

Se describe un avistaje excepcional de aproximadamente 150 marsopas espinosas cerca de la Isla Guñaape Sur frente a la costa centro-norte de Perú (08°28'04"S, 78°58'16.7"W) en setiembre de 2001. Los pescadores intentaron tender una red agallera, siendo la primera prueba directa comprobada por un biólogo de que planes de manejo de este cetáceo deben considerar no sólo capturas accidentales sino también dirigidas, por ende ilegales. Se revisan avistamientos confirmados de la marsopa espinosa para la costa pacífica de América del Sur (N=28), 78% de los cuales involucran pequeños grupos de sólo 1-4 individuos (moda y mediana=2) siendo inusuales las manadas grandes. Todos los avistamientos ocurrieron en aguas neríticas.

**Palabras Clave:** *Phocoena spinipinnis*, Cetacea, Marsopa de Burmeister

### ABSTRACT

A highly unusual sighting is described of a group of *ca.* 150 Burmeister's porpoises near Isla Guñaape Sur (08°28'04"S, 78°58'16.7"W) off the north-central Peruvian coast, in September 2001. The fishermen prepared to set a gillnet on the porpoises with the intention to catch some. This is the first observation supporting the concept that management measures of Burmeister's porpoises must take into account at least occasional (illegal) directed takes. We critically review confirmed sightings (N=28) from Pacific coasts of South America, 78% of which involved small groups of 1-4 individuals (mode and median=2). Large groups are rare. All sightings occurred in neritic habitat.

**Key Words:** *Phocoena spinipinnis*, Cetacea, Burmeister's porpoise

### INTRODUCTION

Inconspicuous surfacing, long submersions, a low posterior located dorsal fin easily hidden by a sea state of 2 Beaufort or higher, and a lack of dedicated survey effort explain the scarcity of information on the behavioural ecology of Burmeister's porpoise *Phocoena spinipinnis* Burmeister 1865, endemic to South American continental waters (Goodall *et al.* 1995; Reyes and Van Waerebeek 1995; Brownell and Clapham 1999). It is one of very few Delphinoidea for which no photographs of free-ranging individuals have been published.

Goodall *et al.* (1995) compiled the then known sightings from southern South America and noted that most groups counted less than six individuals, however the same authors also cautioned (p.229) that 'several sightings are suspect because they were not made by trained observers'.

### MATERIAL AND METHODS

In order to obtain reliable descriptive statistics for Burmeister's porpoise group size in Pacific South America we conservatively reviewed information and retained 15 published sighting records\* that are supported by sketches, positive descriptions and/or were made by trained marine mammal scientists (Tables 1, 2). In addition, we document 11 new or formerly unpublished sightings from Peru (Table 1) and describe the to date largest known aggregation of *P. spinipinnis* involving *ca.* 150 individuals, a group size more typically associated with delphinids.

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\* Six of these are taken from two unpublished working documents (see reference list) which are however publicly available from the International Whaling Commission (The Red House, 135 Station Road, Impington, Cambridge CB4 9NP, UK).

## RESULTS AND DISCUSSION

On September 3, 2001 at 09:36 h, position 08°28'04"S, 78°58'16.7"W and with a sea state of 1 Beaufort, one of us (LS) departing from Isla Guañape Sur, on board the open fishing boat *Mambo* (speed 4-5 knots), heading towards the port of Salaverry on the mainland, encountered a highly unusual aggregation of approximately 150 Burmeister's porpoises (min. 100-max. 200) in subgroups of 1-5 individuals (mode 2 or 3), traveling south on parallel tracklines. The group was widely dispersed, extending an estimated 0.5 nmi at each side of the boat. Several mother/calf pairs were seen but it remained unclear whether these were neonates or calves of a few months old. While gestation in *P. spinipinnis* from Peru lasts 11-12 months and mating and calving peaks in summer months, evidence from diffuse seasonality in foetus size indicates that at least some successful mating occurs out of the main reproductive season (Reyes and Van Waerebeek 1995). A second, smaller, group of ca. 40 Burmeister's porpoises, accompanied by South American sealions *Otaria byronia*, was spotted at 09:58 h at position 08°26'04.4"S, 78°58'16.8"W. Although considered separate sightings, the relative closeness and similar behaviour, including direction of travel, suggests the two groups were not entirely independent. The only other case of a significantly larger than average group occurred in 1982 when an estimated 70 Burmeister's porpoises were observed in the Bay of Mejillones, northern Chile (Guerra *et al.* 1987).

The artisanal fishermen of the *Mambo* promptly U-turned the boat and prepared to set a drift gillnet amidst the school in an attempt to catch some porpoises. LS discouraged the fishermen from net-setting by pointing out that a direct capture would be illegal under current Ministry of Fisheries regulations (see Anonymous 1996). The incident represents the first documented account of intentional manoeuvres to capture *P. spinipinnis* and it raises the possibility that directed gillnetting may account for more takes of Burmeister's porpoises in the Southeast Pacific than presumed, contrary to the idea that accidental gillnet by-catches cause virtually all fisheries-related mortality (Van Waerebeek and Reyes 1990a, 1990b; 1994). Surely thanks to boat-avoidance behaviour, harpooned Burmeister's porpoises are a rare sight at fish landing beaches and markets along the coast of Peru. Four porpoises landed at the Pucusana wharf (12°30'S) in 1987, which showed piercing harpoon (or lance) wounds, had apparently been netted first as evidenced by net marks, and probably were hauled aboard alive, whence the need to kill them (Van Waerebeek and Reyes 1990b).

For the 27 confirmed sightings with a complete dataset both the mode and median of group size equals 2; more than three-quarters (78%) of sightings involved a small group of 1-4 individuals. While the arithmetic mean is an unrepresentative 12.67 (SD=31.24, n=27), if the above-described outlier is eliminated, mean group size drops to 7.38 (SD=15.21, n=26). Goodall *et al.* (1995) considered as doubtful, possibly distrusting cited group size, a sighting of over 50 animals some 10-15km off Miramar (about 38°30'S), Argentina, as reported by A. Messidoro. In view of recent positive observations by scientists of 70 and 150 Burmeister's porpoises off Chile and Peru respectively, the Miramar sighting may gain in credibility.

In comparison, vaquita, *Phocoena sinus* from the Gulf of California usually occurs in schools of three or less (Gerrodette *et al.* 1995) with only one 'large group' record registered in 1956 by Norris and McFarland (1958), however this may reflect more the present critically low abundance of vaquita than its 'normal' social behaviour before the species' precipitous decline over the past few decades. All positive sightings to date of spectacled porpoise *P. dioptrica* have been of 1-3 individuals (Goodall and Schiavini 1995; Ensor *et al.* 2001) and the species is thought 'probably not to form large schools' (Baker 1999); however we advise to await a larger sample before making definitive conclusions.

Mean group size of harbour porpoises *Phocoena phocoena* off the eastern coast of the USA was 2.9 with a mode of 1 (CETAP 1982, *in* Read 1999). Very large aggregations of tens to hundreds of individuals (maximum estimate is 800) have been recorded in late summer and fall in the western North Atlantic (Hoek 1992; Katona *et al.* 1993).

All 28 known *P. spinipinnis* sightings from Peru and Chile were made in continental waters, often near shore. One riverine case reported by J. Pinela Oyarzún (cited in Goodall *et al.* 1995) involved two animals swimming 18km upstream under the Pedro de Valdivia bridge in downtown Valdivia across the Río Calle Calle

## PERÚ

LOCATION	POSITION	GROUP SIZE	DATE	COMMENTS	SOURCE
Balneario Esmeralda, north of Paita, 0.5 km from shore	ca. 05°S; 81°05'W	2	10 Sept. 1968	water depth 10 m; about 18°C SST; ship-board sighting	K.S. Norris (Goodall <i>et al.</i> 1995)
Balneario Esmeralda, north of Paita	ca. 05°S; 81°05'W	3	10 Sept. 1968	later, crossing the bay, three more animals observed; shipboard sighting	K.S. Norris (Goodall <i>et al.</i> 1995)
Bahía de Sechura ca. 2 nmi off Bayovar	ca. 05°45'S	7	July 2000	boat-based sighting	A. García-Godos, pers. com. (this paper)
La Papelera, north of Huanchaco	07°58'07"S; 79°16'48"W	2	20 June 2001	11:13 h; sighting from F/V <i>Virgen de la Puerta</i> ; porpoises side-by-side travelling one direction	L. Santillán (this paper)
off Caleta Guañape, <15 km from shore	8°28'04"S, 78°58'16.7" W	ca. 150 (100-200)	3 Sept 2001	09:36 h; traveling south in subgroups of 1-5 porpoises; several mother/calf pairs seen; depth off-chart 27-31 m	L. Santillán (this paper)
off Caleta Guañape, < 15 km from shore	8°26'04.4" S; 78°58'16.8" W	ca. 40 (30-50)	3 Sept 2001	09:58 h. traveling south; porpoises accompanied by South American sea lions; depth 27-31 m	L. Santillán (this paper)
off Chancay	11°33'S; 77°46'W	3	2 Dec 1985	SST 17.7°C; depth off chart 90-130 m	R.L. Pitman, pers. com. (this paper)
off Chancay	11°35'S; 77°44'W	2	2 Dec 1985	SST 17.7°C; depth off chart 90-130 m	R.L. Pitman, pers. com. (this paper)
off Ancón	11°43'S; 77°36'W	3	2 Dec 1985	SST 17.7°C; depth off chart 90-130 m	R.L. Pitman, pers. com. (this paper)
off Ancón	11°44'S; 77°35'W	2	2 Dec 1985	SST 17.7°C; depth off chart 90-130 m	R.L. Pitman, pers. com. (this paper)
off Ancón	11°48'S; 77°28'W	4	2 Dec 1985	SST 17.6°C; depth off chart 90-130 m	R.L. Pitman, pers. com. (this paper)
off Punta Pancha	11°52'S; 77°25'W	2	2 Dec 1985	SST 16.6°C; depth off chart 90-130 m	R.L. Pitman, pers. com. (this paper)
off Callao	11°53'S; 77°23'W	2	2 Dec 1985	SST 17.1°C; depth off chart 90-130 m	R.L. Pitman, pers. com. (this paper)
ca. 1.5 km off playa Salinas, Paracas Marine Park	13°58'S; 76°16'W	2	22 Jan 1988	300 m from boat, with South American sea lions; porpoises fled when approached	Van Waerebeek and Reyes 1990b
between entrance of Bahía Paracas and Isla Blanca	ca. 13°46'S; 76°15'W	22	9 March 1988	loose association in subgroups of 1-3, probably feeding	Van Waerebeek and Reyes 1990b

Table 1. Confirmed sightings (n=15) of Burmeister's porpoise *Phocoena spinipinnis* in Peruvian waters, 1968-2002, ordered latitudinally from north to south. Observers are indicated where different from published source. Abbreviation: sea surface temperature (SST).

CHILE

LOCATION	POSITION	GROUP SIZE	DATE	COMMENTS	SOURCE
near Bahía de Arica, I Región of Chile	18°25'S	indeterm.	1948	none	Donoso-Barros 1975
mouth of Río Loa	21°25'S; 70°04'W	8	Oct 1965	dark; knobs on anterior border of fin, 170 cm	Aguayo 1975
800m from shore off Cobija	22°33'S	2	10 Feb 1983	none	Guerra <i>et al.</i> 1987
inside Bahía Mejillones	23°06'S	70	22 Jan 1982	swam very close to shore	Guerra <i>et al.</i> 1987
off Antofagasta	23°21'S; 70°35'W	1	26 Aug 1986	sighted from purse-seiner F/V <i>Guanaye</i> (opportunistic cetacean survey)	K. Van Waerebeek (Guerra <i>et al.</i> 1987)
east of Isla Chiloé	42°00'S; 73°05'W	3	9 March 1994	sighted at 16:45 h	Pitman and Balance (1994)
E. of Isla Chiloé	42°10'S; 73°10'W	2	9 March 1994	sighted at 17:30 h	Pitman and Balance (1994)
E. of Isla Chiloé	42°10'S; 73°10'W	2	9 March 1994	sighted at 17:37 h	Pitman and Balance (1994)
E. of Isla Chiloé	42°30'S; 73°25'W	2	9 March 1994	sighted at 19:03 h	Pitman and Balance (1994)
Golfo de Ancud, Isla Chiloé	42°33'S; 73°10'W	1	31 Jan 1979	sketch made; exposed only dorsal fin, surfaced differently from <i>L. australis</i>	J. Perkins (Goodall <i>et al.</i> 1995)
Estrecho de Magallanes south of Punta Arenas	indeterminate	2	19 Feb 1968	sketched	Sir Peter Scott (Goodall <i>et al.</i> 1995)
Seno Lyall, isla Capitán Aracena (south of Estrecho de Magallanes)	Indeterminate (ca. 54° - 54°20'S; 71°-72°W)	2	Jan 1986	one with darkly pigmented calf, 10 m from kayak. Tranquil dives under kayak; seen on way out two days later	Adrian Domines (Goodall <i>et al.</i> 1995)
west side of Canal Pedro (south of Estrecho de Magallanes)	indeterminate	1	Jan 1986	black body and fin seen at a distance; from kayak	Adrian Domines (Goodall <i>et al.</i> 1995)

Table 2. Confirmed sightings (n=13) of Burmeister's porpoise *Phocoena spinipinnis* in Chilean waters, 1948-2002, ordered latitudinally from north to south. Observers are indicated where different from published source. Abbreviation: sea surface temperature (SST).

(a tributary of the Río Valdivia). However, highly unusual, unvalidated reports from untrained observers, such as in this case need to be treated with utmost caution and we conclude that, without negating its possibility, so far no firm evidence exists of *P. spinipinnis* even occasionally penetrating high up-river.

There is no evidence of seasonality in occurrence either off Peru nor off Chile; indeed sightings have been made at all seasons; which for Peru is in agreement with catch statistics (Van Waerebeek and Reyes 1990a,b, 1994).

### ACKNOWLEDGMENTS

We extend our sincere thanks to Aquiles García-Godos (CEPEC), R.N.P. Goodall, and Robert Pitman (SWFSC, NOAA) for their kind permission to use unpublished data and for offering useful comments on the manuscript. Small boat survey effort in Paracas was supported by the Leopold III Fund for Nature Exploration and Conservation and the Paracas Marine Park authorities. CEPEC small cetacean research is supported by IUCN Cetacean Specialist Group, Chicago Zoological Society, Gesellschaft zum Schutz der Meeressäuger and the New England Aquarium.

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