

Sighting records of blue whales from 2013 aerial and boat-based surveys in Chilean waters

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INTRODUCTION

During the 20th century, blue whales (*Balaenoptera musculus*) became a principal target of the whaling industry worldwide (Clapham *et al.*, 1999). Off Chile, the first commercial catches occurred in 1908 from a land station in San Carlos, Corral (Pastene and Quiroz, 2010). Between 1926 and 1971, catches of almost 3,000 blue whales were taken off Chile, including 1,129 taken in the 1960's (Aguayo-Lobo *et al.*, 1998).

In the past, blue whales taken from Chilean waters were classified as either Antarctic blue whales (*Balaenoptera musculus intermedia*) or pygmy blue whales (*B. m. brevicauda*) (Aguayo, 1974). However, based on total lengths of adult, female blue whales taken in Chilean waters, Branch *et al.* (2007a) showed that the whales off Chile are a unique population or even an unnamed subspecies. In addition, LeDuc *et al.* (2007) analysed genetic samples from off southwestern Australia, the southeastern Pacific (Chile), and the Antarctic and found that the genetic differentiation between Antarctic blue whales and pygmy blue whales was not markedly greater than between Australian and Chilean blue whales.

Since 1970, blue whales have been reported, and often seen feeding, in southern Chilean waters during the austral summer and fall. They have been seen from the waters off the northern Los Lagos region, south to the outer coast of Isla Grande de Chiloé, around Isla Guafo and eastward into the Golfo de Corcovado around the northern islands of the Chonos Archipelago, Chile (Gilmore, 1971; Cummings and Thompson, 1971a, b; Findlay *et al.* 1998; Hucke-Gaete *et al.* 2004; Cabrera *et al.* 2005; Galletti Vernazzani *et al.*, 2012a). Recently, additional sightings have been reported during fall and early winter in the inlet waters east of Isla de Chiloé near the mainland (Abramson and Gibbons, 2010; Försterra and Häussermann, 2012).

The Alfaguara (blue whale) Project developed by Centro de Conservación Cetacea (CCC) has been monitoring the occurrence of blue whales off Isla Chiloé, southern Chile, since 2004 (Galletti Vernazzani *et al.*, 2012a). In 2012 it documented an additional feeding aggregation of blue whales off Isla de Chañaral, northern Chile (Galletti Vernazzani *et al.*, 2012b). Here, we report on 2013 results of the Project's blue whale field season, including location of individuals, photo-ID, biopsy sampling, collection of feces and behavioral observations.

METHODS

In collaboration with the Chilean Navy, two aerial surveys were conducted when Beaufort Sea State was less than 4. Aerial surveys were conducted on board a helicopter from approximately 40°S to 44°S. Surveys were conducted between 30 nm to 15 nm from shore. A line transect survey protocol could not be followed due to logistical limitations.

Dedicated marine surveys for photo-identification and other research activities were conducted, primarily off northwestern Isla de Chiloé, between the Chacao Channel (41°45'S) and south of Isla Metalqui (42° 21'S), within 20 nm of the coastline, on board the 7 m *Alfaguara* research vessel. For the second consecutive year, Isla de Chañaral, (29°S, 73°W) in northern Chile was surveyed using a 9m boat (Figure 1).

Data collected during marine surveys included photo-ID, biopsy samples, group composition, behavior, weather and sea conditions, associated fauna and sea surface temperatures (SST). The position of a whale or group of whales was determined using a GPS.

RESULTS

During ten marine surveys conducted off northwestern Isla de Chiloe totaling 69 hr from February to April 2013, 98 groups of blue whales comprised of 138 individuals were encountered. Biopsy samples of skin and blubber were collected from 31 blue whales and one fin whale (*Balaenoptera physalus*) on four days. Four sightings totaling six humpback whales (*Megaptera novaeangliae*), one sighting of one fin whale, and one sighting of 15 to 20 Peale's dolphins (*Lagenorhynchus australis*) also were recorded. Samples of krill, stomach content (apparently regurgitated) and feces were also collected. A probable mother-calf pair, based on body length difference and the behaviour of the calf near its mother, was observed on 13 March off northwestern Isla de Chiloé. SST ranged from 13 to 16°C, the lowest since 2005.

During four marine surveys conducted between 14 to 17 February off Isla de Chañaral totaling 31.55 hr, 23 groups of blue whales containing 30 animals were encountered. Five sightings of seven humpback whales, seven sightings of 27 fin whales and two sightings of 18 bottlenose dolphins (*Tursiops truncatus*) also were made. SST temperature ranged from 16 to 19°C.

Feeding behaviour of baleen whales was observed at both of the above study locations.

On 27 and 28 February, aerial surveys were conducted on board a Chilean navy helicopter and therefore the survey track varied from 30 to 15 nm offshore, parallel to the coastline. Twenty-one groups of whales totaling 30 animals were encountered, including 12 groups of 18 blue whales, eight groups of 11 probable blue whales, and one humpback whale. Blue whale sightings primarily occurred around 20nm miles offshore. The furthest distance from land since the project started in 2004.

Additional sightings in the inlets were reported opportunistically by members of the National Marine Mammal Sighting Network. On 27 February, the pilot of the Chilean Navy helicopter, Lieutenant Delatorre, photographed two blue whales off Chaitén, in the continental part of Chile (42°37'S – 72°52'W). In addition, on 15 April we began to receive frequent reports of blue whale sightings between Puerto Montt (41°40'S – 72° 53'W)¹ and Chaitén (42°10'S - 72°36'W)². The whales used these locations until the beginning of May. Groups of one to three blue whales were reported.

A dead blue whale stranded on 26 April in Puerto Godoy, north of Chacao Channel (41°33'S – 73°46'W). The whale carcass was reported to have been fresh when it stranded, but when we (EC and BGV) examined it on 30 April it had already started to decompose. The specimen was an adult male of 21.5m total body length with no apparent cause of death based on our external observations. Skin samples were collected for analysis of skin lesions, genetics and isotopes.

DISCUSSION

Based on high overall annual return and sighting rates, the waters off northwestern Isla de Chiloé and northern Los Lagos are the most important aggregation areas currently known for this species in Chile and one of the largest in the Southern Hemisphere (Galletti Vernazzani *et al.*, 2012a). In 2012, a shift in blue whale concentration about 130km north and an increase in SST were reported (Galletti Vernazzani *et al.*, 2012b). In 2013, the largest concentration of blue whales in southern Chile was encountered from mid Isla de Chiloé up to the Chacao Channel, which is consistent with previous distributions from 2004-2010 (Galletti Vernazzani *et al.*, 2012a).

In addition, occasional sightings in the inlets reported in fall (April/May) 2013 further document the presence of blue whales in these areas. Occasional sightings of the species were reported in 2009, 2010 and 2012 in the inlets, mostly around Ancud Gulf and the Comau Fjord (Abramson and Gibbons, 2010; Försterra and Häussermann, 2012). Furthermore, comparisons between five individuals photographed in Comau Fjord in 2010 and the CCC's blue whale catalogue comprised of 301 individuals, revealed that two of the five Comau Fjord individuals were sighted

¹ Juan Pablo Rubilar, personal communication, April 2013.

² Pablo Castro, personal communication, May 2013

off the northwestern coast of Isla de Chiloé in April 2007 and April 2009, respectively (Försterra and Häussermann, 2012). This further substantiates that they are part of the same population and, although with lower sighting rates, use these areas to feed, primarily in the fall (Figure 2).

The high frequency of large vessels in the mouth of the Chacao Channel (along the north side of Isla de Chiloé) and the high number of blue whales in the area raises the possibility of vessel collisions (Galletti Vernazzani *et al.*, 2012a). Four strandings of blue whales have been reported for Chile (Branch *et al.*, 2007b), one was located in northwestern Isla de Chiloé (29 March 2005) and the other in northern Los Lagos (20 March 1997). Both of these locations are near the mouth of the Chacao Channel. In addition, one ship-strike if a sei whale has been documented from Puerto Montt (Brownell *et al.*, 2009). The stranding of another blue whale in the northern tip of Chacao Channel mouth occurred on April 2013. These strandings and our observations of live whales in this region further stress the urgency to address the potential ship strike threat in the area.

Based on the relatively small number of blue whales sighted per day off Isla de Chañaral compared to the southern Chile feeding area (off Isla de Chiloé), we previously suggested that Chañaral may be a secondary feeding area for the population or part of another larger feeding area north of Isla de Chiloé (Galletti Vernazzani *et al.*, 2012b). Sightings off Isla de Chañaral for the second consecutive year highlight the importance of continued monitoring of this feeding area and increased photo-identification efforts to better understand the dynamics of the blue whales that feed off Chile.

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Figure 1 – Blue whale study areas in northern and southern Chile. Circle: waters around Isla de Chañaral, northern Chile; Rectangle: southern Chile feeding area in the region of Isla Grande de Chiloé; Cross: Isla Grande de Chiloé field station

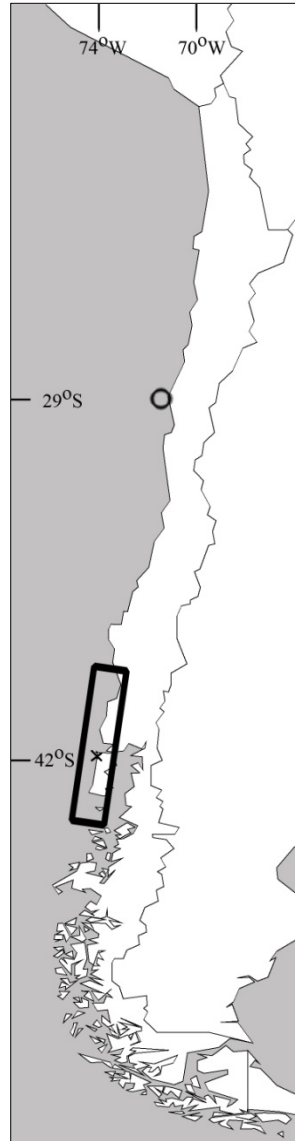


Figure 2 – Detail of southern Chile locations

