An updated comparison of the humpback whale photo-id catalogues from the Antarctic Peninsula and the Abrolhos Bank, Brazil.

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ABSTRACT

The migratory route and feeding grounds of the humpback whale population from the Abrolhos Bank, Brazil, have not yet been determined. Previous comparisons of photographs from the Antarctic Peninsula and the Abrolhos Bank showed no matches. In this paper, we report an updated comparison between the two areas using a larger sample size. We compared fluke photographs of 375 individually identified whales from the Antarctic Peninsula (295 from Area I, and 80 from Area II) with 983 whales from the Abrolhos Bank. The Antarctic photographs were collected by Projeto Baleias/Brazilian Antarctic Program between 1997 and 2003, and the Abrolhos photographs were collected by Projeto Baleia Jubarte/Instituto Baleia Jubarte between 1989 and 2000. No matches were observed between the catalogues, suggesting that the Brazilian humpback whales do not feed in the western and northwestern areas of the Antarctic Peninsula (Gerlache and Bransfield straits). The sample size for the Weddell Sea, however, is too small (n=15) to allow any conclusions as to whether the Brazilian humpbacks feed in this area or not. Ten new re-sightings of humpback whales in the Antarctic Peninsula, including an individual photographed in the Weddell Sea in two consecutive feeding seasons, are also reported.

KEYWORDS: HUMPBACK WHALES, PHOTO-ID, BREEDING GROUNDS, FEEDING GROUNDS, MIGRATION, ANTARCTIC, ATLANTIC OCEAN, SOUTHERN HEMISPHERE.

INTRODUCTION

Humpback whales, *Megaptera novaeangliae*, migrate seasonally from high latitude summer feeding grounds to winter breeding and calving grounds in the tropics (*e.g*. Chittleborough, 1965; Dawbin, 1966). Seven humpback whale breeding populations and six IWC management areas are recognized for the Southern Hemisphere (*e.g*. Donovan, 1991; IWC, 1998). The feeding destination of the humpback whale population that winters in the Abrolhos Bank (16°40'S to 19°30'S; 37°25'W to 38°57'W), northeastern Brazil, has not yet been determined.

Previous comparisons of photographs from the Antarctic Peninsula and the Abrolhos Bank showed no matches (Muñoz *et al*., 1998; Stevick *et al*., in press). However, sample sizes were relatively small for the Abrolhos Bank. In this paper, we report an updated comparison between the two areas using a larger sample size. We also report new inter-seasonal re-sightings for the Antarctic Peninsula and the Weddell Sea.

MATERIAL AND METHODS

Fluke photographs of 375 individually identified humpback whales from the Antarctic Peninsula (295 from IWC Management Area I and 80 from Area II) were compared with 983 whales from the Abrolhos Bank, northeastern Brazil, to investigate the potential feeding grounds and migratory destination of the humpback whales breeding off Brazil. The Antarctic photographs were collected by Projeto Baleias/Brazilian Antarctic Program between 1997 and 2003, and the Abrolhos photographs were collected by Projeto Baleia Jubarte/Instituto Baleia Jubarte between 1989 and 2000. Both catalogues were organized according to decreasing amounts of white on the underside of the flukes, and photographs were compared serially with the entire dataset. The same procedure was used for inter-seasonal comparisons of the Antarctic catalogue, aiming to investigate site fidelity to the feeding grounds.

RESULTS

No matches were observed between the Antarctic and the Abrolhos Bank, suggesting that the Brazilian humpback whales do not migrate to the western and northwestern areas of the Antarctic Peninsula (Gerlache and Bransfield straits). The sample size for the Weddell Sea, however, is too small (n=15) to allow any conclusions as to whether the Brazilian humpbacks feed in this area or not.

Ten new inter-seasonal re-sightings of humpback whales were recorded for the Antarctic Peninsula. Figure 1 shows the sighting locations of these individuals, including those reported by Dalla Rosa *et al*. (2001). One whale, PB124, was photographed in the Weddell Sea in two consecutive feeding seasons. The other re-sightings occurred in the Gerlache Strait, where photo-id effort was considerably higher. However, one animal (PB060) re-sighted twice in the Gerlache Strait had been previously sighted at the northernmost tip of the Antarctic Peninsula.

DISCUSSION

Our findings agree with other recent photo-identification and genetic studies. Stevick *et al*. (in press) also found no photo-id matches between the west of the Antarctic Peninsula (n = 535) and the northeastern Brazil (n = 288). Engel *et al*. (2003) compared the mtDNA of humpback whales from the Abrolhos Bank and the Antarctic Peninsula (Areas I and II), and found a greater similarity between Areas I and II than between Brazil and any of these areas. These authors then suggested that the feeding area of the Brazilian humpback whale population is not located around the Antarctic Peninsula, but probably in the Weddell Sea or near the South Georgia Island.

In fact, both photo-identification and genetic studies provide strong support for a connection between the Antarctic Peninsula and the northwest coast of South America (Stone *et al*., 1990; Olavarría *et al*., 2000; Dalla Rosa *et al*., 2001; Stevick *et al*., in press). Forty-three individuals from western South America were identified off the Antarctic Peninsula by Stevick *et al*. (in press).

Although several authors suggest the area around the South Georgia Island and further south as the potential feeding ground of the Brazilian humpback whale population (*e.g*. Slijper, 1962; Siciliano *et al*., 1999), this hypothesis remained uncertain. More recently, Zerbini *et al*. (2004) recorded the migration of two satellite tracked individuals between northeastern Brazil and the area near the South Georgia and the South Sandwich Islands.

The inter-seasonal re-sightings from this study suggest that some individuals may show fidelity to the feeding grounds of the Antarctic Peninsula, as it has been observed in the Northern Hemisphere (*e.g*. Baker *et al*., 1986; Katona and Beard, 1990).

Caballero *et al*. (2000) and Engel *et al*. (2003) observed no clear genetic differentiation between individuals sampled in Area I and in the western part of Area II, in the Antarctic Peninsula, and for this reason suggested that the boundary between them might be shifted to the east, at least to 58°W. Our results seem to give support to this belief, as none of 68 individuals photographed in Area II, between 60°W and 56°45'W, matched with the Brazilian whales.

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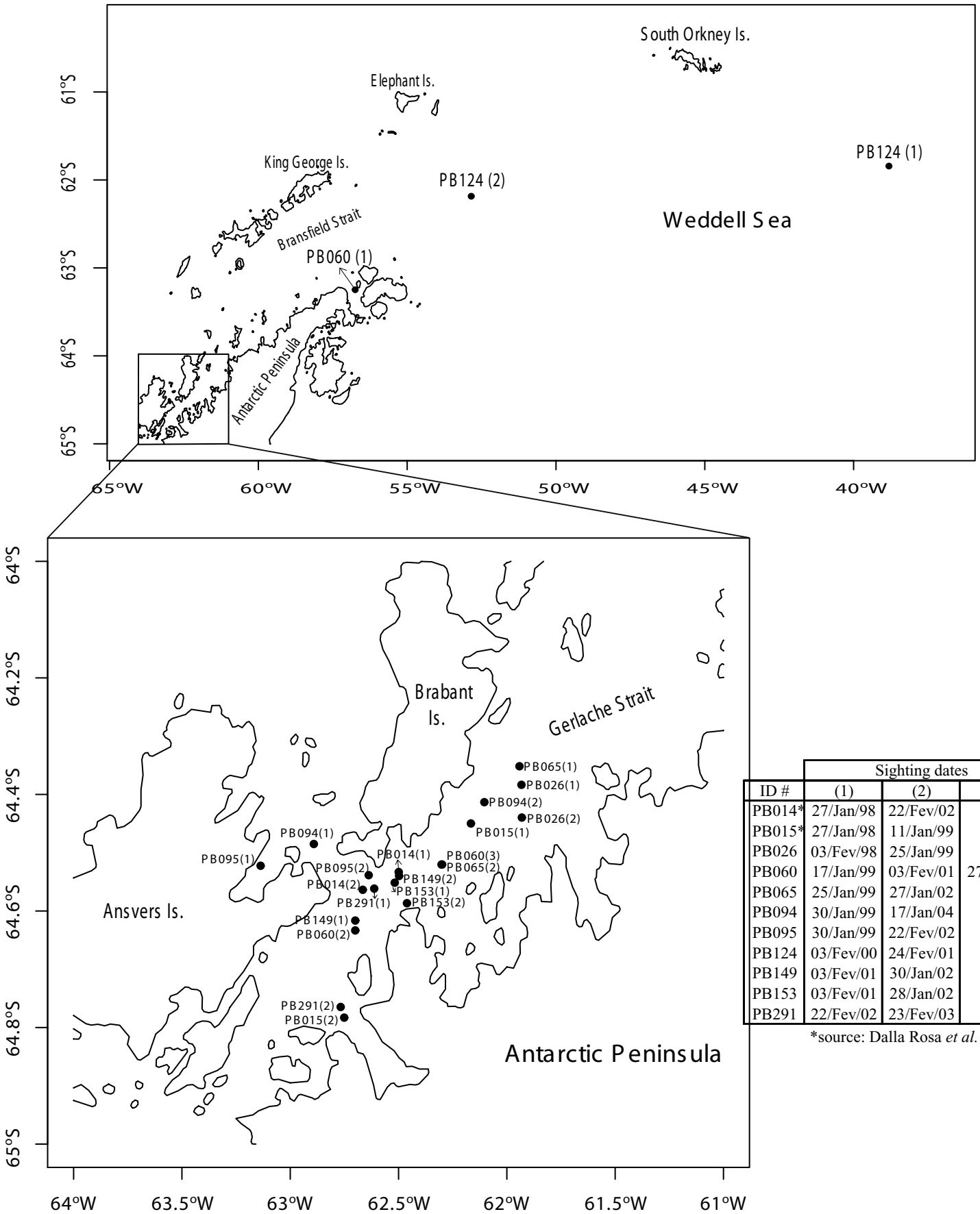

ID #	Sighting dates (1)	(2)	(3)
PB014*	27/Jan/98	22/Fev/02	
PB015*	27/Jan/98	11/Jan/99	
PB026	03/Fev/98	25/Jan/99	
PB060	17/Jan/99	03/Fev/01	27/Jan/02
PB065	25/Jan/99	27/Jan/02	
PB094	30/Jan/99	17/Jan/04	
PB095	30/Jan/99	22/Fev/02	
PB124	03/Fev/00	24/Fev/01	
PB149	03/Fev/01	30/Jan/02	
PB153	03/Fev/01	28/Jan/02	
PB291	22/Fev/02	23/Fev/03	

*source: Dalla Rosa *et al.* (2001)

Fig.1 - Inter-seasonal matches of individually identified humpback whales off the Antarctic Peninsula and in the Weddell Sea. Sighting positions are represented by dots. The Gerlache Strait is shown on detail.