Report of blue whale photo-identification from IWC-SOWER 2006-2007, Area IIIW

Paula A. Olson
Southwest Fisheries Science Center NOAA
8604 La Jolla Shores Dr.
La Jolla, CA 92037 USA
Paula.Olson@noaa.gov

ABSTRACT

Blue whale photographs were collected from the *Shonan Maru No. 2* during the IWC- SOWER Antarctic cruise conducted in Area IIIW (0° to 20°E), December 2006 to February 2007. 114 individual blue whales were photo-identified from 47 groups. Photographs of whales were compared between days to determine the number of re-sightings of individual whales over space and time during the cruise. The time interval and distance between re-sightings is presented. The proportion of re-sights is compared with the proportion from the 2005-2006 IWC-SOWER cruise (11%), also conducted in Area IIIW. The movement of whales in Area IIIW during both research seasons is examined. Photo-identification data from IWC-SOWER cruises contributes, *inter alia*, toward the assessment of blue whales in the Southern Ocean.

KEYWORDS: ANTARCTIC, SOUTHERN OCEAN, PHOTO-ID, MOVEMENT

INTRODUCTION

The natural marking photographs collected by the IWC during IDCR/SOWER cruises may yield new information on the status of blue whales (*Balaenoptera musculus*) in the Southern Hemisphere. Previously, the use of photographs to identify and re-sight individual whales has been successful in delineating feeding stocks and determining migration patterns of large whales (e.g. Dufault and Whitehead, 1993; Bannister *et al.*, 1997; Calambokidis *et al.*, 2001). In order to use photographic data from IDCR/SOWER cruises in this way, the blue whale photographs from the most recent SOWER cruise during 2006-2007 in Area IIIW were examined to establish the number of individuals photographed and the existence of any re-sights. This document is similar to a report on the photo-identification of blue whales from SOWER 2005-2006 (Olson, 2006) and part of a larger scope of work analyzing all blue whale photographs from IDCR/SOWER cruises 1987-1988 to the present (see SC/59/IA10).

METHODS

Blue whale photographs were collected from the *Shonan Maru No. 2*, during time allocated for blue whale research on the SOWER 2006-2007 cruise, 0° to 20°E (for details see Ensor *et al.*, 2007). Most of the blue whales were photographed in the vicinity of the ice edge from 4 January through 9 February; three whales were photographed north

of the ice edge: one on 30 December and two on 3 January. Photographs were usually taken in conjunction with biopsy operations and occasionally with separate approaches by the ship in order to obtain a perpendicular image. When possible, both sides of each whale were photographed. Digital Canon EOS 20D cameras were used, each equipped with a100-400mm image stabilized lens.

Blue whale photographs were examined for unique natural markings and identified as individuals following methods outlined in Sears *et al.* (1990). Individually unique features on a blue whale include the lateral mottling pattern, dorsal fin shape and any scar. Identifiable individual whales were given an identification number. Photographs of identified whales from 2006-2007 were compared to one another. Comparisons were also made to 45 blue whales photo-identified during the SOWER 2005-2006 cruise when blue whales were photographed in the vicinity of the ice edge in Area IIIW (Ensor *et al.*, 2006).

RESULTS

During 2006-2007, 15,572 photographs of blue whales were collected during 47 sightings. In the field it was estimated that 114 individual blue whales were photographed (Ensor *et al.*, 2007).

To date, 7,398 photographs have been examined from the first 28 sightings photographed during the cruise, 30 December to 30 January. Given the unusually large number of photos collected during this season and the relatively short time since the completion of the cruise, it was only possible to analyze a subsample of photos for this report. Work is continuing and a complete analysis of the photographs from the 2006-2007 cruise will be available later in 2007.

38 whales were uniquely identified from the photographs. Two of these whales were re-sighted during the 13 days of the subsample period. The two whales were first sighted as a pair on 7 January at 67°36'S, 002°50'E and then re-sighted as a pair 30 hours later on 8 January at 68°41'S, 000°14'E. The straight line distance between the two points is 87nmi.

The re-sighting rate for the first portion of the cruise, 30 December to 30 January, is 6%. Although the photographs from February have not yet been examined systematically, it was evident in the field that several blue whales were re-sighted multiple times during the last week in the research area (Ensor *et al.*, 2007). Therefore the re-sighting rate is likely to increase once all the photos from February have been examined.

None of the 38 whales identified matched to the 45 whales identified from SOWER 2005-2006.

DISCUSSION

The results from the subsample of 2006-2007 photographs are similar to what was found last year: a small proportion of whales were re-sighted within the season.

As reported in Olson (2006), a total of 45 individual blue whales were photo-identified from SOWER 2005-2006 and five were re-sighted within the season for a re-sighting rate of 11%. The five re-sightings from 2005-2006 were separated by 4 to 15 days and from 58 to 134 nmi. The distance between re-sightings of the pair from 2006-2007, 87nmi, falls within the range observed last year. However, the rate of travel of the pair from 2006-2007 (87nmi/day) is substantially greater since the maximum average distance per day observed last year was 24.5nmi. The whales in 2006-2007 moved to the southwest. The whales in 2005-2006 moved in several directions: west, southwest, east, and southeast.

The movement of blue whales within the Antarctic is not well-understood on either a large or fine scale (Branch *et al.*, 2006). Generally it is not known if blue whales show site tenacity for feeding areas and/or if they forage widely and randomly. Re-sights during 2005-2006 and 2006-2007 suggest that blue whales exhibit some degree of residency within a summer season. Notably, one of the whales in 2005-2006 remained in or returned to the same general area after 15 days. The movement of the whales in varying directions indicates a dynamic use of the area on a scale of tens of miles, similar to blue whales observed on feeding grounds off California, USA by Fiedler *et al.* (1998) and Mate *et al.* (1999). It may be that blue whales in the Antarctic exhibit patterns consisting of smaller scale movements interspersed with longer range movements covering hundreds of miles as described by Fiedler *et al.* (1998), Mate *et al.* (1999) and Croll *et al.* (2005) in the northeastern Pacific. The continued analysis of photographs from IDCR/SOWER cruises will yield more information on these patterns.

ACKNOWLEDGEMENTS

Sincere thanks and appreciation for the hard work of Captain Komiya and the crew of the *Shonan Maru No. 2*, the cruise leader Paul Ensor and fellow researchers. I thank the IWC for funding support allocated at SC58 for the analysis of IDCR/SOWER blue whale photographs.

LITERATURE CITED

Bannister, J., Burnell, S., Burton, C. and Kato, H. 1997. Right whales off South Australia: direct evidence for a link between onshore breeding grounds and offshore probable feeding grounds. *Rep. Int. Whal. Commn*. 47: 441-4.

Branch, TA, Palacios, DM, Stafford, KM, Allison, C, Bannister, JL, Burton, CLK, Gill, PC, Jenner, KCS, Jenner, M-NM, Miyashita, T, Morrice, MG, Sturrock, VJ, Anderson, RC, Baker, AN, Best, PB, Borsa, P, Childerhouse, S, Findlay, KP, Ilangakoon, AD, Joergensen, M, Kahn, B, Maughan, B, Mikhalev, YA, Oman Whale and Dolphin Research Group, Thiele, D, Tormosov, D, Van Waerebeek, K and Warneke, RM. Past and present distribution of blue whales in the Southern Hemisphere and northern Indian Ocean. 2006. International Whaling Commission. SC/58/SH 16.

Calambokidis, J., Steiger, G.H., Straley, J.M., Herman, L.M., Cerchio, S., Salden, D.R., Urbán R., J., Jacobsen, J.K., Von Ziegesar, O., Balcomb, K.C., Gabriele, C.M., Dahlheim, M.E., Uchida, S., Ellis, G., Miyamura, Y., Ladrón de Guevara P., P., Yamaguchi, M., Sato, F., Mizroch, S.A., Schlender, L., Rasmussen, K., Barlow, J. and Quinn, T.J. II. Movements and population structure of humpback whales in the North Pacific. 2001. *Mar. Mam. Sci.* 17(4): 769-794.

Croll, D.A., Newton, K., Calambokidis, J., Mate, B., Harvey, J.T. and Oleson, E. 2005. Size matters: foraging strategies of rorquals in the California current. 16th Biennial Conference on the Biology of Marine Mammals. San Diego, CA, USA, 12-16 December 2005. p. 64.

Dufault, S. and Whitehead, H. 1993. Assessing the stock identity of sperm whales in the eastern equatorial Pacific. *Rep. Int. Whal. Commn.* 43: 469-75.

Ensor, P., Komiya, H., Beasley, I., Fukutome, K., Olson, P. and Tsuda, Y. 2007. 2006-2007 IWC-SOWER cruise. IWC Paper SC/59/IA 1.

Ensor, P., Komiya, H., Olson, P., Sekiguchi, K. and Stafford, K. 2006. 2005-2006 IWC-SOWER cruise. IWC Paper SC/58/IA 1.

Fiedler, P.C., Reilly, S., Hewitt, R.P., Demer, D., Philbrick, V.A., Smith, S., Armstrong, W., Croll, D.A., Tershey, B.R. and Mate, B.R. 1998. Blue whale habitat and prey in the Channel Islands. *Deep Sea Research II*. 45: 1781-1801.

Mate, B.R., Lagerquist, B.A. and Calambokidis, J. 1999. Movements of north Pacific blue whales during the feeding season off southern California and their southern fall migration. *Mar. Mamm. Sci*. 15(4): 1246-1257.

Olson, P.A. 2007. Status of the archival and analysis of blue whale photographs from IWC IDCR/SOWER cruises. SC/59/IA10.

Olson, P.A. 2006. Preliminary report of blue whale photo-identification from IWC-SOWER 2005-2006. SOWER/06/WP/16. 10pp. (Available from the author.)

Sears, R.J., Williamson, M.J., Wenzel, F.W., Bérubé, M., Gendron, D. and Jones, P. 1990. Photographic identification of the Blue Whale (*Balaenoptera musculus*) in the Gulf of St. Lawrence, Canada. *Rep. Int. Whal. Commn*., Special Issue 12, pp. 335-342.