

SC/69A/SH/01

Sub-committees/working group name: SH

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ABSTRACT

Twenty blue whales (16 left sides, 8 right sides) were individually identified from photographs collected during the 1996 IWC/SOWER survey on the Madagascar Plateau, and from field work off of northwest Madagascar in 2012. There were no matches within or between years. The photographs have been uploaded into the collaborative Southern Hemisphere Blue Whale Catalogue for comparisons to photographs from the northwest Indian Ocean, in particular, and elsewhere throughout the Indian Ocean. Documented exchange between regions would contribute to the understanding of the population structure of blue whales in the Indian Ocean.

KEYWORDS: BLUE WHALE, PHOTO-ID, MADAGASCAR

INTRODUCTION

The population structure of blue whales (*Balaenoptera musculus*) in the Indian Ocean is understood primarily from acoustic song types, where five different acoustic populations (other than Antarctic blue whales) occur and appear to overlap geographically in their distribution (Branch et al., 2021). These are defined by five different song types that are each distinctly different from each other and from Antarctic blue whales: the south-west Indian Ocean (SWIO, Madagascar), the north-west Indian Ocean (NWIO, Oman), central Indian Ocean (CIO, Sri Lanka), south-eastern Indian Ocean (SEIO, Australia to Indonesia), and south-western Pacific Ocean (SWPO, New Zealand) song types. Much remains unknown about these specific populations including movement between regions of the Indian Ocean. It is suspected that SWIO pygmy blue whales that migrate past Madagascar in Autumn (northward) and Spring (southward), winter north of Madagascar (Kenya to the Seychelles) and spend the summer in the south of Madagascar on the Madagascar Plateau/Ridge (Cerchio et al., 2020, 2022). Overall there are few data from the southwest region, including the waters adjacent to Madagascar. Photo-identification data from the area may provide information on residency and/or movement patterns.

In 2021 the IWC Scientific Committee **strongly encouraged** the collection and matching of blue whale identification photographs from the SWIO to other regions in the Indian Ocean (IWC, 2021). After submission to the collaborative Southern Hemisphere Blue Whale Catalogue (Galletti Vernazzani et al., 2022), the comparison of SWIO photographs to those from the NWIO is considered a priority to assess connectivity.

Here we report on the analysis of photographs from the waters around Madagascar.

METHODS

Photographs were available from the IWC/SOWER survey on the Madagascar Plateau in December 1996 (Best et al., 2003), which had not been previously analyzed. The photographs were digitized from black and white film prior to analysis. Photographs were also available from field work conducted by one of us (SC) during research off Nosy Be, northwest Madagascar, in November 2012 (Cerchio et al., 2020). In all, 457 photographs were available.

The photographs were examined for individually identifiable blue whales and identification photos selected for each identifiable whale. Only photos containing a whale's dorsal fin were used. Identification photographs were compared to one another within season and between the two collections (1996 and 2012) following methods outlined in Sears et al. (1990) and Gendron and Ugalde de la Cruz (2012).

RESULTS and DISCUSSION

A total of 20 individual blue whales (16 left sides, 8 right sides) were identified from the photographs (Table 1). There were no matches within or between years.

Table 1. Number of individually identified Madagascar blue whales.

Date	No. of left side IDs	No. of right side IDs
09 Dec 1996	1	0
12 Dec 1996	0	1
16 Dec 1996	2	2
19 Dec 1996	1	0
21 Dec 1996	0	1
22 Dec 1996	1	0
23 Dec 1996	2	0
24 Dec 1996	0	1
25 Dec 1996	4	0
26 Dec 1996	3	1
12 Nov 2012	2	2
Total	16	8

All of the identification photographs were uploaded into the Southern Hemisphere Blue Whale Catalogue for comparisons with other regional photo-ID catalogues, exploring potential exchange of individuals between geographic areas and yielding information on population structure. Specifically, the Madagascar photos can now be compared to other blue whale ID photographs from the CIO. Blue whales are long-lived, up to 80-90 years (Sears and Perrin, 2018). Despite the IWC-SOWER photographs dating from 1996, some of the whales identified in this study from that year will continue to be recognizable into the future.

ACKNOWLEDGEMENTS

Funds were granted to the lead author (PAO) at SC68C for the analysis of Madagascar blue whale photographs. Warm thanks to the captain, crew, and researchers aboard the Shonan Maru and the Shonan Maru No. 2. Thanks also to the Wildlife Conservation Society, the Institut Halieutique et des Sciences Marines, Norbert Andrianarivelo, and Boris Andrianantenaina for contribution to the 2012 field work in Madagascar.

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