

Proposal for the cetacean sighting survey in the Antarctic in the 2011/12 austral summer season.

KOJI MATSUOKA¹, HIROSHI KIWADA¹, HIROTO MURASE¹, SHIGETOSHI NISHIWAKI¹ AND TOMIO MIYASHITA²

¹*Institute of Cetacean Research, Toyomi 4-5, Chuo-ku Tokyo, 104-0055 JAPAN*

²*National Research Institute of Far Seas Fisheries, Fukuura 2-12-4, Kanazawa, Yokohama, Kanagawa 236-8648, JAPAN*

Contact e-mail: matsuoka@cetacean.jp

ABSTRACT

A systematic cetacean sighting survey for abundance estimation is planned in the Antarctic in the 2011/2012 season as a part of the Japanese Whale Research Program under special permit in the Antarctic (JARPAII). The research area is south of 60°S in the Antarctic, eastern part of Area III, Area IV and western part of Area V between 35°E and 175°E during December 2011 to March 2012. *Yushin-maru No.2* and *Yushin-maru No.3* would be used based on the survey procedures of “the International Whaling Commission / Southern Ocean Whale and Ecosystem Research (IWC/SOWER)”. Distance and angle estimation training as well as some experiments will be conducted. Abundance of Antarctic minke whales will be estimated using these data and recent analysis methods of the Scientific Committee (SC). Biopsy skin sampling of blue, fin, humpback, southern right, and sperm whales will be opportunistically collected for assessing stock structure. Photographs for photo-identification studies of large cetaceans such as blue, southern right and humpback whales will also be taken. The cruise report will be prepared by researchers and submitted to the 64th IWC/SC meeting.

KEY WORD: ANTARCTIC MINKE WHALE, SIGHTING SURVEY, ABUNDANCE

BACKGROUND

In the 2003/04 season, the IWC/SOWER completed the third circumpolar survey (CPIII). From the 2004/05 season, IWC/SOWER experiment cruises have been conducted in a limited research area to get additional information for analysis methods, and collection of the “Area base population estimates data” was interrupted until the 2009/10 season (Sekiguchi *et al.*, 2010).

At the 61st (2009) IWC meeting, the Scientific Committee agreed the new research program in the North Pacific. Japan is to provide the research vessel and crew for this program instead of for the Antarctic SOWER program. Based on this situation, it becomes difficult to get new population estimates and stock structure information in the Antarctic under the SOWER program.

On the other hand, JARPAII which began in the 2005/06 season in the Antarctic has a dedicated sighting survey component by the line transect survey procedure for population estimation as well as the collection of stock structure information such as biopsy and photo-id experiments. The 2010/11 season, the plan of this cruise had presented to the 62th SC (SC/62/O17) and endorsed by the Scientific Committee (IWC, 2010). However, the dedicated sighting survey was completely cancelled from the beginning of the survey, because of the violent action by anti-whaling vessels in the Antarctic (SC/63/O1). In the 2011/12 season, we will carry out the following sighting survey plan based on IWC/SOWER survey procedures using two research vessels in the research area.

SURVEY PLAN

Following is a tentative cruise plan because budget from Government of Japan is a provisional at this moment.

Priority for the survey

Priority of this sighting survey should be given to the abundance estimates for Antarctic minke whales and other baleen whale species.

Research vessels

One or two dedicated sighting survey vessels, *Yushin-Maru No.2* (YS2) and *Yushin-Maru No.3* (YS3) would be engaged for this survey. Both vessels are equipped with a top barrel (TOP) and IO (IOP) platforms. Specifications and photographs of the YS2 and YS3 are shown in Table 1.

Research schedule

December 2011	Vessels leave Japan.
Late December 2011	Start survey in the research area (Approximately 70-80days in the Antarctic).
Early March 2012	Complete survey in the research area.
March 2012	Vessels return to Japan.

Research area

This survey will be conducted south of 60° S in the IWC management Area, the eastern part of Area III (35°E-70°E), Area IV (70°E-130°E) and western part of Area V (130°E-175°E) in a longitudinal span of 140° on the western side of the JARPA II research area in this season (Figure.1). The research area is divided into northern strata and southern strata in each Area.

Researchers on board

Two Japanese researchers will be onboard each vessel (personnel not determined). These researchers must have considerable experience conducting line transect surveys, biopsy and photo-id experiments in the Antarctic through the IWC/IDCR-SOWER and JARPA and JARPA II Programs. Koji Matsuoka (Institute of Cetacean Research) will be the responsible person for the oversight of this survey as same as 2010/11 season.

Survey track line design

An improved type of survey trackline will be employed. The survey track line for each vessel will consist of two legs in the northern stratum at 5° longitudinal degree intervals and four legs in the southern stratum for 2°30' longitudinal degree intervals (Nishiwaki *et al.*, 2009). Two vessels alternately survey the northern and southern strata each crossing the track line at the way-point between two strata (Figure.2). Track lines were decided based on the origin longitude line which was selected at random and the interval of legs and number of legs for the each stratum can be changed according to progress of the survey. As discussed in SC/62, a small group was established for the survey design (eg. Survey mode, survey order etc.), which taking into account of consistency of the previous JARPA II and IWC/SOWER surveys and analyses (IWC, 2010).

Primary searching activity

The survey is to be conducted 12 hours per day between 06:00 a.m. and 07:00 p.m. basically when the weather conditions are suitable for observations: visibility better than 1.5 n. miles and the wind speed less than 20 knots

(northern strata) or 25 knots (southern strata). The vessel speed is planned to be 11.5 knots with slight adjustment to avoid vibration of the vessel.

The sighting survey will be conducted using (1) Closing mode (NSC) and (2) Passing with Independent Observer (IO) mode. Both survey modes follow the protocol endorsed for the IWC/SOWER surveys (Matsuoka *et al.*, 2003, IWC, 2008a and 2008b). There are two observer platforms in each vessels (a top barrel (TOP) and an independent observer platform (IOP)). On each platform, two primary observers conduct searching for cetaceans by using angle board and binoculars (7x), which include the distance estimate scales. Members of the two observer teams are fixed and operate in shifts of one hour. The observers report information to the upper bridge observers and researchers to record data. IO mode is used under the appropriate number of primary observers depend on the availability of the budget.

Experiments

Distance and angle measurement training is to be conducted at the first stage of the survey. The experiment to evaluate measurement error is to be conducted twice around the middle of the survey and at the last stage of the survey following the protocol in 1998 (IWC, 2009b, Branch and Butterworth, 2001a, 2001b). When large cetaceans such as blue, humpback and southern right whales are found, photographs are to be taken for the photo-identification, and biopsy samples are to be collected (Matsuoka and Pastene, 2009).

Data entry and analysis

Researchers input data collected (weather, effort, sighting and experiments data) to the computer on board during survey. These data will be stored at the Institute of Cetacean Research (ICR) and sighting data for abundance estimation will be submitted to the IWC secretariat for the RMP based on the IWC/SC Guidelines (Hammond and Donovan, 2004). Scientists at the ICR also will analyze these data using the methods developed and modified by Hakamada *et al.*, (2006) and by Okamura *et al.* (2004).

Cruise report

The cruise report will be prepared by researchers and submitted to the 64th IWC/SC.

REFERENCE

- Branch, T.A., and Butterworth, D.S. 2001a. Southern Hemisphere minke whales: standardised abundance estimates from the 1978/79 to 1997/98 IDCR/SOWER surveys. *J. Cetacean. Res. Manage.* 3(2): 143-174.
- Branch, T. A., and Butterworth, D., S., 2001b. Estimates of abundance south of 60oS for cetacean species sighted frequently on the 1978/79 to 1997/98 IWC/IDCR-SOWER sighting surveys. *J. Cetacean. Res. Manage.* 3(3):251-270.
- Hakamada, T., Matsuoka, K. and Nishiwaki, S. 2006. An updated of Antarctic minke whales abundance estimates based on JARPA data. IWC paper SC/D06/J6 presented to the IWC workshop on JARPA review. 36pp. [Paper available at the IWC Office].
- Hammond, P.S. and Donovan, G.P., 2004. Suggestions for updating the 'Requirements and Guidelines for Conducting Surveys and Analysing Data Within the Revised Management Scheme'. IWC Paper SC/56/RMP4. 13pp. [Paper available at the IWC Office].
- IWC, 2008a. Report of the planning meeting for the 2008/09 IWC/SOWER cruise and future cruises. [Paper available at the IWC Office].

- IWC, 2008b. IWC SOWER Cruise 2008/09, Information for Researchers. http://iwcoffice.org/documents/sci_com/SOWER/Guide%20%20for%20Researchers%202008-09.pdf [Paper available at the IWC Office].
- IWC, 2010. Report of the Scientific Committee, Annex G. 17pp. Agadir, 2010. [Paper available at the IWC Office].
- Matsuoka, K., P. Ensor, T. Hakamada, H. Shimada, S. Nishiwaki, F. Kasamatsu, and Kato, H. 2003. Overview of minke whale sightings surveys conducted on IWC/IDCR and SOWER Antarctic cruises from 1978/79 to 2000/01. *J. Cetacean. Res. Manage.* 5(2):173-201.
- Matsuoka, K. and Pastene, L.A., 2009. Summary of photo-id information of blue whales collected by JARPA/JARPA II and preliminary analysis of matches in the feeding grounds. SC/61/SH3. 5pp. [Paper available at the IWC Office].
- Nishiwaki, S. *et al.* 2009. Cruise Report of the Second Phase of the Japanese Whale Research Program under Special Permit in the Antarctic (JARPA II) in 2008/2009. SC/61/O3, 18pp. [Paper available at the IWC Office].
- Okamura, H. and Kitakado, T. 2004. Advance in an abundance estimation model of Antarctic minke whales. SC/56/IA9, 12pp. [Paper available at the IWC Office].
- Sekiguchi, K., Fukutome, K., Morse, L., Shinyashiki, Y. and Odekoven, C., 2010. 2009-2010 International Whaling Commission-Southern Ocean Whale and Ecosystem Research (IWC-SOWER) Cruise. SC/62/IA1, 56pp. [Paper available at the IWC Office].
- Thomas, L., S.T. Buckland, E.A. Rexstad, J. L. Laake, S. Strindberg, S. L. Hedley, J. R.B. Bishop, T. A. Marques, and K. P. Burnham. 2010. Distance software: design and analysis of distance sampling surveys for estimating population size. *Journal of Applied Ecology* 47: 5-14.

Table 1. Specifications of the YS2 and YS3.

	<i>Yushin-Mar</i> No.2	<i>Yushin-Mar</i> No.3
Call sign	JPPV	7JCH
Length overall [m]	69.61	69.61
Gross tonnage (GT)	720	742
Barrel height [m]	19.5	19.5
IO platform height [m]	13.5	13.5
Upper bridge height [m]	11.5	11.5
Bow height [m]	6.5	6.5
Engine power [PS / kW]	5280 / 3900	5280 / 3900

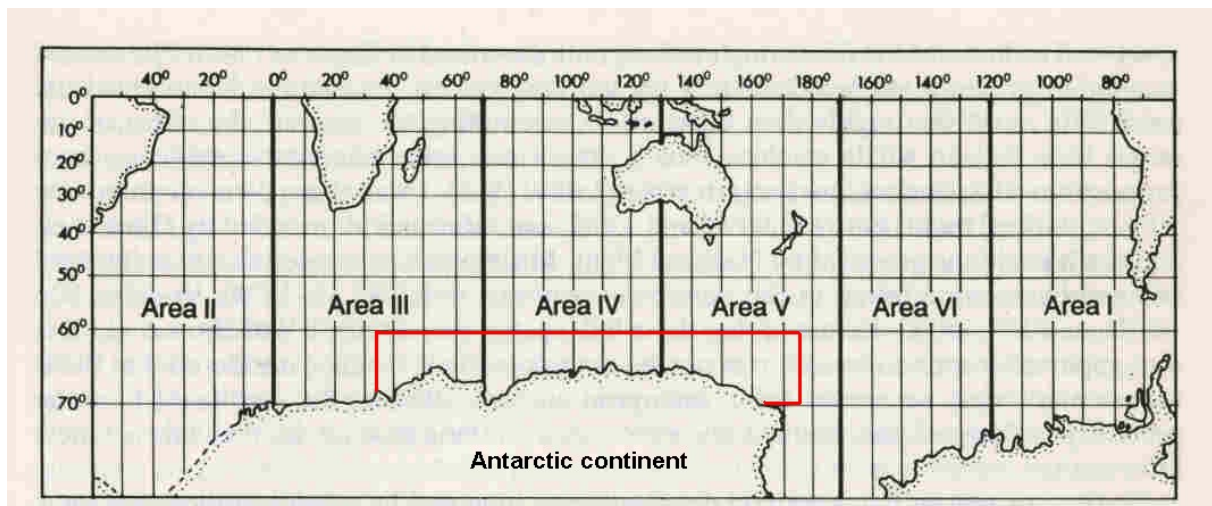


Figure.1. Research area for the 2011/12 dedicated sighting survey.

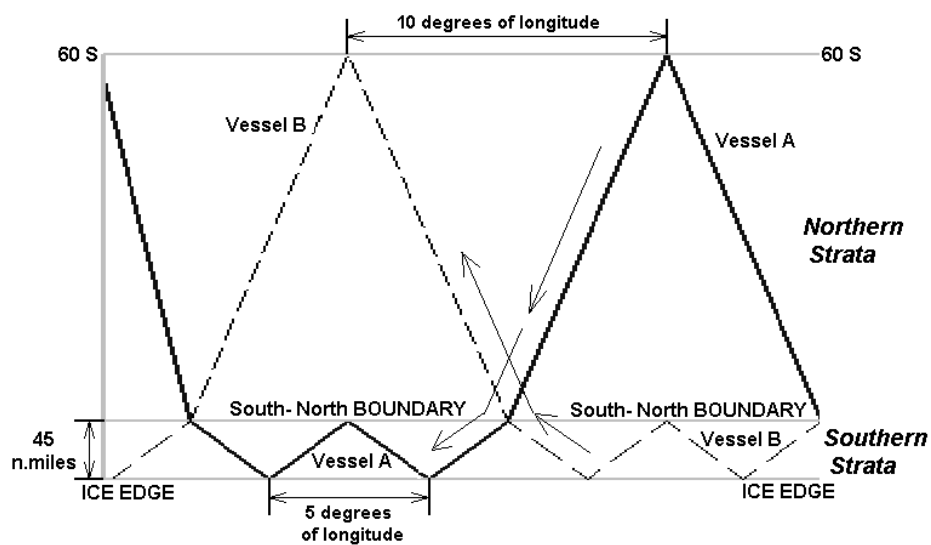


Figure. 2. Basic design of the pre-determined track line. Two vessels alternately survey the northern and southern strata each crossing the track line at the way-point between two strata.