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Research plan for a cetacean sighting survey in the western North Pacific in 2016

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ABSTRACT

A systematic vessel-based sighting survey is planned in the North Pacific for 2016 by Japan as a part of the Japanese Whale Research Program under Special Permit in the western North Pacific (JARPNII). The main objective of this cruise is to examine the distribution and estimate the abundance of common minke whales for management and conservation purposes. The survey will be conducted using the research vessels *Yushin-Maru* and *Yushin-Maru No.2* between 29 July and 6 September, and will involve the area comprised between 35°N-43°N and 140°E-150°E (a part of sub-areas 7CS, 7CN, 7WR and 7E for minke whales). For the objective of whale abundance estimation, distance and angle estimation experiments will be conducted. Biopsy skin samples of blue, fin, sei, Bryde's, humpback and North Pacific right whales will be collected. Photo-identification experiments on blue, North Pacific right and humpback whales will be also conducted. The report of the sighting survey will be submitted to the 2017 IWC SC meeting.

KEY WORD: MINKE WHALE, SIGHTING SURVEY, NORTH PACIFIC

INTRODUCTION

In the western North Pacific dedicated cetacean sighting surveys based on the survey procedures of the International Whaling Commission/Southern Ocean Whale and Ecosystem Research (IWC/SOWER) have been conducted since 1995 as a part of the Japanese Whale Research Program under Special Permit in the Western North Pacific (JARP/N/JARPNII). Based on the collected data the distribution patterns of large whales such as blue, fin, sei, Bryde's, common minke, humpback, right and sperm whales and abundance estimates of common minke, sei and Bryde's whales were investigated and reported to the IWC SC (IWC, 2001; 2010; 2016).

The National Research Institute of Far Seas Fisheries (NRIFSF) has also conducted dedicated sighting survey for cetaceans in the North Pacific since the 1980s (Buckland *et al.*, 1992; Miyashita and Kato, 2004; 2005).

The Government of Japan plans to continue the sighting surveys in the North Pacific in 2016. The collection of sighting data to estimate abundance and biopsy/photo-identification data to examine stock structure will contribute to the work on management and conservation of large whales by the IWC SC. This paper outlines the research plan for the Japanese dedicated sighting surveys in the western North Pacific in 2016.

RESEARCH PLAN

Research vessels

Yushin-Maru (YS1) and *Yushin-Maru No.2 (YS2)* will be engaged as a dedicated sighting survey vessels (SV). They are equipped with a top barrel platform (TOP) and upper bridge. The ICR research data collecting system is set on each vessel. Specifications of the vessels are shown in Table 1.

Research schedule

The number of the research days is planned for 40 days (*YS1* and *YS2*). A detail of the cruise itinerary is shown in Table 2.

Researchers on board and oversight person

Experienced researchers on line transect whale sighting surveys, biopsy and photo-id experiments were selected as researchers: Ryuichiro Moriyama (*YS1*); Hiroya Mure (*YS2*). Koji Matsuoka (Institute of Cetacean Research) is the responsible person for these surveys. He will be the oversight person on behalf of the IWC SC.

Research area and track line design

The research area for the survey is comprised between 35°N-43°N and 140°E-150°E (sub-areas 7CN, 7CS, 7WR and 7E for the common minke whales). The survey blocks and pre-determined track lines are shown in Tables 3a and 3b and Figures 1. *YS1* will start the survey at WP101 and end at WP143. *YS2* will start the survey at WP201 and end at WP238. Both vessels will survey in ascending order of WP number. The start point of the track lines are decided at random using the Distance program ver.6.2 (Thomas *et al.*, 2010) and the number of lines (width in the longitude) is decided by the research schedule based on the IWC survey guideline (IWC, 2012).

Primary searching activity

Sighting surveys follow the protocol endorsed for the IWC/SOWER cruise (IWC, 2008). There are two primary observers in the both top barrel platform (TOP) and the upper bridge (Captain and Helmsman), respectively. On the TOP, two observers conduct searching for cetaceans by using scaled binoculars (7x). On the upper bridge, two primary observers also search for cetaceans and record sighting information. The survey is to be conducted 12 hours per day from 6:00 a.m. to 6:00 p.m. basically when the weather conditions are suitable for observations: visibility better than 2.0 n.miles, and the wind speed less than 21 knots. The vessel speed is planned to be 11.5 knots with slight adjustment to avoid vibration of vessel.

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 around the last stage of the survey following the protocol for the IWC/SOWER cruise (IWC, 2008). When large cetaceans such as blue, North Pacific right and humpback whales are found, photographs are to be taken for photo-identification. Biopsy skin sampling of blue, fin, sei, Bryde's, common minke, humpback, North Pacific right and sperm whales will be collected with effort data including weather data for investigating stock structure.

Data entry and analysis

The researcher will input data collected (weather, effort, sighting and from experiments data) to the computer on board during the survey as was done for previous IWC-SOWER cruises. These data will be stored at the Institute of Cetacean Research (ICR) and submitted to the IWC secretariat based on the IWC/SC Guidelines (IWC, 2012). The report of the sighting survey will be submitted to the 2017 IWC SC meeting. Scientists at the ICR also will analyze these data using the methods developed and modified by Hakamada *et al.*, (2009), Matsuoka *et al.*, (2011) and by Okamura *et al.* (2004). Collaboration work with NRIFS will be conducted for abundance estimation of cetaceans in the surveyed area.

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Table 1. Specification of the research vessels used for this survey.

Vessel name	<i>Yushin-Maru</i>	<i>Yushin-Maru No.2</i>
Call sign	JLZS	JPPV
Length overall [m]	69.61	69.61
Gross tonnage (GT)	720	747
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

Table 2. Expected cruise itinerary of this survey.

Date	Event
29-July-2016	Vessels depart Tokyo, Japan
1-August	Vessels arrive at the starting point in the research area
2-September	Vessels complete the research (33 days in the research area)
6-September	Vessels arrive Shioyama, Japan

Table 3a. Waypoint (WP) in the research area 7CN and 7CS surveyed by *YSI*

7CN	WP	Lat.				Long.				7CS	WP	Lat.				Long.			
	101	42	-	25.0	N	146	-	11.0	E		131	41	-	00.0	N	142	-	27.6	E
	102	42	-	21.0	N	146	-	04.8	E		132	40	-	39.0	N	141	-	35.0	E
	103	43	-	02.0	N	145	-	31.2	E		133	40	-	06.3	N	143	-	13.4	E
	104	41	-	54.9	N	145	-	04.9	E		134	39	-	33.2	N	142	-	12.0	E
	105	42	-	50.0	N	144	-	36.2	E		135	39	-	00.4	N	142	-	59.8	E
	106	41	-	29.2	N	144	-	06.3	E		136	38	-	38.2	N	141	-	37.0	E
	107	42	-	30.0	N	143	-	36.2	E		137	38	-	15.0	N	141	-	13.0	E
	108	41	-	03.3	N	143	-	07.7	E		138	37	-	53.5	N	142	-	42.8	E
	109	42	-	03.0	N	142	-	39.6	E		139	37	-	19.3	N	141	-	05.0	E
	110	40	-	59.9	N	142	-	09.1	E		140	36	-	45.5	N	142	-	25.9	E
	111	42	-	30.0	N	141	-	39.6	E		141	36	-	10.1	N	140	-	40.0	E
	112	42	-	00.5	N	141	-	28.3	E		142	35	-	36.4	N	142	-	09.0	E
											143	35	-	00.0	N	140	-	05.0	E

Table 3b. Waypoint (WP) in the research area 7WR and 7E surveyed by *YS2*.

7WR	WP	Lat.				Long.				7E	WP	Lat.				Long.			
	201	42	-	00.5	N	145	-	17.7	E		231	35	-	00.0	N	147	-	56.7	E
	202	40	-	53.5	N	147	-	00.0	E		232	35	-	20.2	N	147	-	00.0	E
	203	39	-	45.7	N	143	-	11.4	E		233	36	-	24.2	N	150	-	00.0	E
	204	38	-	35.9	N	147	-	00.0	E		234	37	-	27.3	N	147	-	00.0	E
	205	37	-	25.6	N	142	-	35.9	E		235	38	-	29.6	N	150	-	00.0	E
	206	36	-	13.8	N	147	-	00.0	E		236	39	-	30.9	N	147	-	00.0	E
	207	35	-	01.0	N	142	-	00.4	E		237	40	-	31.4	N	150	-	00.0	E
	208	35	-	00.0	N	142	-	05.0	E		238	40	-	49.1	N	149	-	06.8	E

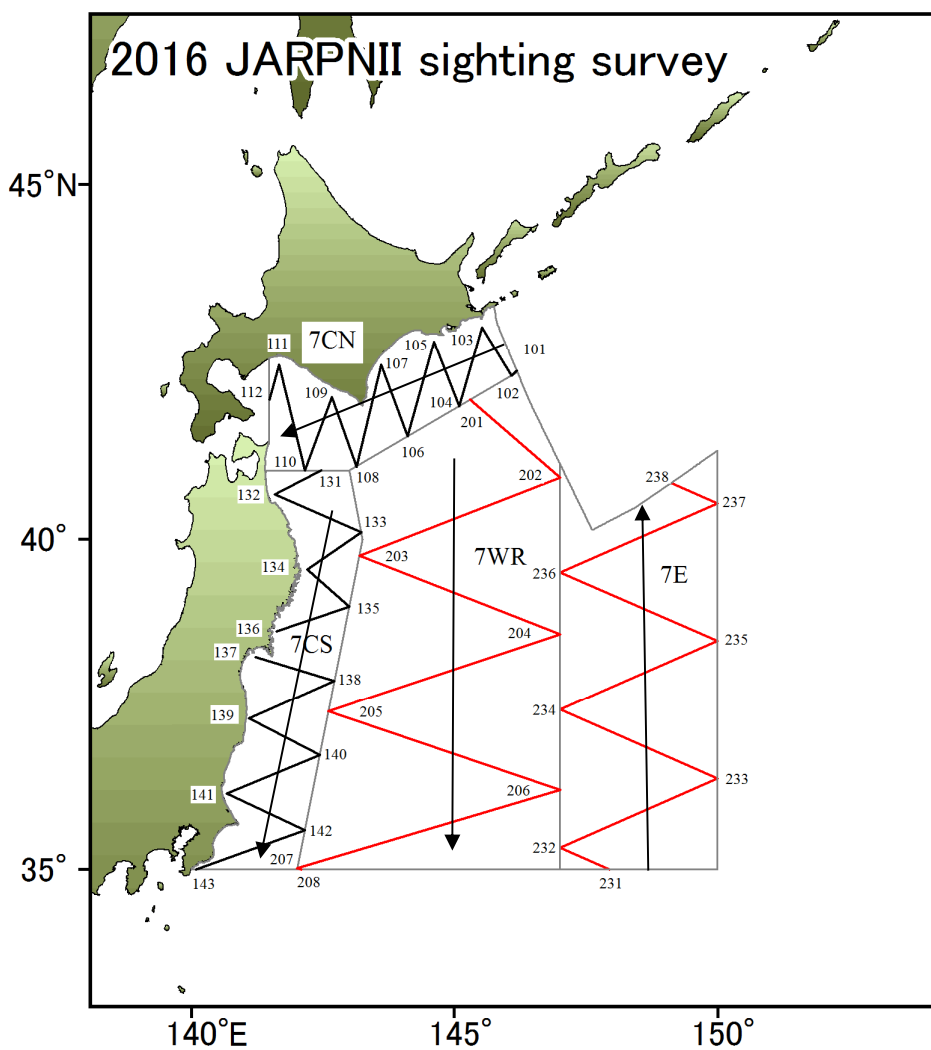


Figure 1. Research area of 2016 survey and pre-determined track line for this survey. Black lines indicate track lines covered by YS1. Red lines indicate tracklines covered by YS2. Black arrows show survey order of the planned cruise tracks.