SC/67A/ASI/05

Result of the Japanese dedicated cetacean sighting survey in the western North Pacific in 2016

Koji Matsuoka, Takashi Hakamada, Ryuichiro Moriyama, Hiroya Mure , Nobuo Abe , Chikamasa Ohkoshi and Tomio Miyashita

INTERNATIONAL WHALING COMMISSION

Result of the Japanese dedicated cetacean sighting survey in the western North Pacific in 2016

KOJI MATSUOKA[1], TAKASHI HAKAMADA[1] RYUICHIRO MORIYAMA [2], HIROYA MURE [2], NOBUO ABE [2], CHIKAMASA OHKOSHI[2] AND TOMIO MIYASHITA[3]

[1]*Institute of Cetacean Research, Toyomi 4-5, Chuo-ku Tokyo, 104-0055, JAPAN*
[2]*Kyodo Senpaku Co. Ltd., Toyomi 4-5, Chuo-ku Tokyo, 104-0055, JAPAN*
[3]*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 large-scale and vessel-based sighting survey was conducted in 2016 by Japan to examine the distribution and abundance of large whales in the western North Pacific. The research area was set between 35° N and 43° N and between 140° E and 150° E (sub-areas 7CN, 7CS, 7WR and 7E for common minke whale). The survey was conducted between 29 July and 6 September. The research vessels *Yushin-Maru* and *Yushin-Maru No.2* were engaged for this survey. A total of 2,791.8 n.miles was searched in the research area. Coverage of the searching efforts of the planned cruise track line was 94.6% for the 7CN and 7CS and 67.6% for the 7WR and 7E, respectively. In total, five large whale species including fin (4 schools / 6 individuals), Bryde's (125/160), common minke (12/12), humpback (2/2) and sperm (103/393) whales were sighted during the cruise. Photo-ID images was collected from one humpback whale. Biopsy skin samples using a Larsen system were successfully collected from fin (1) and humpback (1) whales, respectively. These data submitted to the IWC secretary based on the SC guideline and will contribute to the work on management and conservation of large whales by the IWC SC.

KEY WORD: COMMON MINKE WHALE, BRYDE'S WHALE, SPERM WHALES, SURVEY VESSEL, 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 (JARPN/JARPNII). Based on the collected data the distribution patterns of large whales such as blue, fin, sei, Bryde's, common minke, humpback, North Pacific 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, Pastene *et al*., 2009, Hakamada *et al.*, 2009, Matsuoka *et al*., 2016, Murase *et al*., 2009). 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 *et al.*, 1995., Miyashita and Kato, 2004; 2005, Shimada, 2004, Kanaji, 2012). In 2016 the Government of Japan planned to continue the sighting surveys in the North Pacific. The collection of sighting data to estimate abundance and biopsy/photo-identification data to examine stock structure have been contributed to the work on management and conservation of large whales by the IWC SC (IWC, 2010, 2016a). This paper reports the result of the Japanese dedicated sighting surveys conducted during mainly July to August in 2016. The plan for this survey had been presented to the 2016 IWC/SC meeting (Hakamada *et al*., 2016) and endorsed by the SC (IWC, 2016b).

MATERIALS AND METHODS

The surveys were conducted in 2016 in the part of the western North Pacific by the research vessel *Yushin-Maru* (YS1) and *Yushin-Maru No.2* (YS2). The vessels were equipped with a top barrel platform (TOP) and upper bridge. Specifications of these vessels are shown in Appendix A.

Research area and period

The research area was set between 35° N and 43° N and between 140° E and 150° E (sub-areas 7CN, 7CS, 7WR and 7E for common minke whale, see Figure 1), during 29 July to 6 September (Table 1).

Track line design
The Survey blocks and pre-determined track lines are shown in Table 2 and Figure 1. The start point of the track lines are decided at random using the "Distance program (ver.6.2)" and the number of the line (width in the longitude) is decided by the research schedule based on the IWC survey guideline (IWC, 2012).

Sighting procedure
Passing mode with abeam closing was used, which followed the protocol endorsed for the IWC/SOWER cruise (IWC, 2008). There were two primary observers in the top barrel (TOP) and the upper bridge (captain and helmsman), respectively. On the TOP, two observers conducted searching for cetaceans by using scaled binoculars (7x). On the upper bridge, two primary observers also searched for cetaceans and recorded sighting information. The survey was conducted 12 hours per day from 6:00 a.m. to 6:00 p.m. basically when the weather conditions were suitable for observations: visibility better than 2.0 n.miles and wind speed less than 21 knots. The vessel searching speed was planned to be 11.5 knots with slight adjustment to avoid vibration of vessel.

Research personnel
One researcher was on board of each research vessel. The researchers had considerable experience on whale line transect surveys in the North Pacific and Antarctic as well as experience conducting photo-ID and biopsy experiments through participation in the IWC/IDCR-SOWER and JARPN II Programs.

Yushin-Maru (YS1)
Ryuichiro Moriyama (Japan) – sighting data, photo-ID, biopsy
Yushin-Maru No.2 (YS2)
Hiroya Mure (Japan)– sighting data, photo-ID, biopsy

Experiments
Distance and angle experiments were conducted earlier in the Surveys. The experiment to evaluate measurement error was conducted late in the survey following the protocol of the IWC/SOWER cruise (IWC, 2008). When large cetaceans such as blue, humpback and North Pacific right whales were found, photo-id experiments were conducted. Further, biopsy skin sampling using Larsen system, when blue, fin, sei, humpback, North Pacific right and sperm whales were sighted.

RESULTS AND DISCUSSION

Brief narrative of the Surveys
Research vessels (YS1 and YS2) departed from Tokyo, Japan on 29 July and started the survey in the research area on 30 July for YS1 and 31 July for YS2, respectively (Table 1). The YS1 surveyed in the western stratum and YS2 surveyed in the eastern stratum. They surveyed on the pre-determined trackline from north to the south in each stratum (Tables 2a and 2b, Figure 1). The vessels left the research area on 30 May and arrived at Tokyo on 6 June.

Searching effort
A summary of the period covered and sighting effort in each Survey block is shown in Table 3. A total of 1,406.2 n.miles (planned cruise track was 1,486.5 n.miles, 94.6 % searching effort coverage) in the sub-areas 7CN and 7CS, and 1,385.6 n.miles (planned cruise track was 2,049.3 n.miles, 67.6% covered) in the sub-areas 7WR and 7E were searched, respectively. A total of 2,791.8 n.miles were searched in the whole research area.

Sightings
Sightings made are summarized by the whole research period (Table 4) and sighting location of each species in the research area are shown in Figures 2a to 2e.

Estimated Angle and Distance
The Estimated Angle and Distance Training Exercise were conducted early in the Surveys. During the exercise the observers familiarized themselves with distance estimates from the TOP and Upper Bridge. The Estimated Angle and Distance Experiment were conducted on 25 August by YS1. Due to a succession of low atmospheric pressures, including large typhoons in the offshore area, YS2 could not conduct this experiment during the cruise.

Fin Whale
A total of 4 schools (6 individuals) of this species were sighted in the research area (Figure 2a). Observed mean

school size was 1.50 (n=4). Range of the estimated body length confirmed was 15.2 – 22.8 meters. Range of the sea temperature of the sighting position was 20.9°C – 26.4°C.

Bryde's Whale
Bryde's whales were the most frequently species of baleen whale sighted and were widely distributed in the whole research area (Figure 2b). A total of 125 schools (160 individuals) were observed in the research area. A total of 20 schools (31 individuals) including 6 mother and calf pairs were observed in the coastal sub-area (7CN and 7CS), and of 86 schools (106 individuals) including 12 mother and calf pairs were observed in the offshore sub-areas 7WE and 7E (Table 4). Observed mean school size was 1.24 (n=182). Range of the estimated body length was 8.8 – 13.6 meters except calves. Range of the sea temperature of the sighting position was 19.4°C – 27.0°C. Bryde's whales are widely distributed in summer in the western North Pacific north of 35ºN based on the recent JARPNII dedicated sighting surveys and JARPN/JARPN II catches (Shimada, 2004; Pastene *et al*., 2009; Hakamada *et al.*, 2017).

Common minke whale
Common minke whales were mainly sighted (11 schools and 11 individuals) in the coastal sub-areas (Figure 2c). No mother and calf pair was observed. Range of the estimated body length was 5.2-8.2 meters. Range of the sea temperature of the sighting position was 18.1°C – 19.2°C. In general, common minke whales were tended to distribute in the coastal area as surveyed in 2012 (Matsuoka *et al*., 2012).

Sperm Whale
Sperm whales were the most frequently sighted toothed whales in the whole research area (Tables 4 and Figure 2e). A total of 103 schools (393 individuals, at least one mother and calf pairs) were observed during the Survey. Observed mean school size was 3.82 (n=103). Because of limited approaching to the schools, there was little information for body length and calves. Range of the sea temperature of the sighting position was 18.7°C – 27.7°C.

Experiments
Photo-ID experiments
Photographs were taken from 1 humpback whale by YS2 (Table 5). All photographs were stored at the ICR catalogue such as North Pacific right whale database (Matsuoka *et al*., 2014) and will be used for investigating their stock structure in the future.

Biopsy
All of the biopsy attempts were made using the Larsen system (Larsen, 1998). Allocation of research time to biopsy attempts was initially restricted with the aim of maximizing the searching effort to cover the research area. A total of 2 biopsy samples were collected from 1 fin and 1 humpback whale individuals (Tables 6a and 6b). All samples were stored at the ICR laboratory and will be used for investigating their stock structure in the future.

Report of the IWC oversight and data submission to the IWC
Detailed report of the IWC oversight was shown in Appendix B. All equipment and the survey method were the same as in the past sighting surveys. The design of the survey blocks and track lines was improved to cover each survey block based on the IWC guidelines. The planned sighting procedure was in accordance with the guidelines agreed by the SC (IWC, 2012). Objectives and procedure of the survey were explained to the captains, officers, crew and researcher in advance. Sighting data was sent to the IWC secretary and confirmed on 8 April 2017.

ACKNOWLEDGEMENT
We acknowledge the Government of Japan's assistance in providing the research permits and funding for this cruise. We also thank the officers and crew of the *Yushin-Maru* and *Yushin-Maru No.2* for their hard work and dedication that led to the successful execution of this cruise. We thank Drs. Seiji Ohsumi, Yoshihiro Fujise, Luis Pastene, Tsutomu Tamura and the staff of the Institute of Cetacean Research (Tokyo) and Kyodo Senpaku Co. Ltd. for their assistance in arrangements and support for the cruise. We thank to Dan Goodman for his suggestions to improve the draft of this paper.

REFERENCES
Buckland, S.T., Cattanach, K.L. and Miyashita, T. 1992. Minke whale abundance in the northwest Pacific and

the Okhotsk Sea, estimated from 1989 and 1990 sighting surveys. *Rep. int. Whal. Comn* 42: 387-92.
Hakamada, T., Matsuoka, K. and Miyashita, T., 2009. Distribution and the number of western North Pacific common minke, Bryde's, sei and sperm whales distributed in JARPNII Offshore component survey area. SC/J09/JR15. 18pp. [Paper available at the IWC Office].
Hakamada, T., Matsuoka, K. and Miyashita, T., 2016. Research plan for a cetacean sighting surveys in the Western North Pacific in 2016. SC/66b/IA07. 5pp. [Paper available at the IWC Office].
Hakamada, T., Takahashi, M., Matsuoka, K. and Miyashita, T., 2017. Abundance estimate for western North Pacific Bryde's whale by sub-areas based on IWC-POWER and JARPNII sighting surveys. SC/M17/RMP2. 11pp. [Paper available at the IWC Office].
IWC, 2001. Report of the Workshop to Review the Japanese Whale Research Program under special permit for North Pacific minke whales (JARPN). *J. Cetacean Res. Manage.* 3 (Supp.):377-413.
IWC, 2008. IWC SOWER Cruise 2008/09, Information for Researchers. http://iwcoffice.org/_documents/sci_com/SOWER/Guide%20%20for%20Researchers%202008-09.pdf
IWC, 2010. The Report of the Expert Workshop to review the ongoing JARPN II Programme. *J. Cetacean Res. Manage.* 11 (Supp.2):405-450.
IWC. 2012. Requirements and Guidelines for Conducting Surveys and Analyzing Data within the Revised Management Scheme. *J. Cetacean Res. Manage.* 13 (Supp.):507-18.I
IWC, 2016a. The Report of the Expert Workshop to review the ongoing JARPN II Programme. *J. Cetacean Res. Manage.* XX (Supp.X):xxx-xxx.
IWC. 2016b. Report of the Scientific Committee. Annex G. 23pp. San Diego, USA, 2015. [Paper available at the IWC Office].
Kanaji, Y., Iwasaki, T., Kishiro, T. and Miyashita, T., 2012. Cruise report of the sighting and satellite tagging survey for common minke whales in the sub-area 7 in 2011. SC/64/O9. 10pp. [Paper available at the IWC Office].
Larsen, F., 1998. Development of a biopsy system primarily for use on large cetaceans. SC/50/O15. 8pp. [Paper available at the IWC Office].
Matsuoka, K., Hakamada, T. and Miyashita, T., 2016. Distribution of blue (*Balaenoptera musculus*), fin (*B. physalus*), humpback (Megaptera novaeangliae) and north pacific right (*Eubalaena japonica*) whales in the western North Pacific based on JARPN and JARPN II sighting surveys (1994 to 2014). SC/J09/JR35. 12pp. The IWC/SC JARPNII review meeting, Yokohama, 26-30, January. [Paper available at the IWC Office].
Matsuoka, K., Hakamada, T. and Miyashita, T., 2014. Recent sightings of the North Pacific Right (*Eubalaena japonica*) whales in the western North Pacific based on JARPN and JARPN II surveys (1994 to 2013). SC/65b/BRG11. 8pp. [Paper available at the IWC Office].
Miyashita, T., Kato, H. and Kasuya, T., 1995. Worldwide Map of Cetacean Distribution based on Japanese Sighting Data (Volume 1). pp43-56.
Miyashita, T. and Kato H. 2004. Plan for the North Pacific minke whale sighting surveys in 2004. SC/56/RMP3. 3pp. [Paper available at the IWC Office].
Miyashita, T. and Kato H. 2005. Plan for the minke whale sighting surveys in the North Pacific in 2005. SC/57/NPM2. 5pp. [Paper available at the IWC Office].
Murase, H., Hakamada, T., Kiwada, H., Inagake, D., Okazaki, M., Tojyo, N. and Matsuoka, K., 2009. Preliminary results of estimation of sei whale (Balaenoptera borealis) distributuion and abudnace in the whole North Pacific basin. Appendix 2. 11pp. *In:* Hakamada, T., Examination of the effects on whale stocks of future JARPN II catches. SC/J09/JR36. 56pp.
Pastene, L,A., Hatanaka, H., Fujise, Y., Kanda, N., Murase, H., Tamura, T., Miyashita, T. and Kato, H., 2009. The Japanese Whale Research Program under Special Permit in the western North Pacific Phase-II (JARPN II): origin, objectives and research progress made in the period 2002-2007, including scientific considerations for the next research period. SC/J09/JR1 (Rev 1). 73pp.
Shimada, 2004. Abundance estimate of the western North Pacific stock of Bryde's whales using sighting data from 1998 to 2002. SC/56/PIF6. 8pp.

Table 1. Cruise itinerary of this survey.

Date	Event
29-July-2016	Vessels departed Tokyo, Japan
30-July-2016	YS1 arrived at the starting point in the research area (coastal area)
31-July-2016	YS2 arrived at the starting point in the research area (offshore area)
2-September-2016	YS2 completed the research at 35º00'N (33 days in the research area)
3-September-2016	YS1 completed the research at 35º00'N (35 days in the research area)
6-September-2016	Vessels arrived Shimonoseki, Japan

Table 2a. Waypoint (WP) in the research area 7CN and 7CS surveyed by *YS1*.

7CN	WP	Lat.				Long.			
	101	42	-	25.0	N	146	-	11.0	E
	102	42	-	21.0	N	146	-	04.8	E
	103	43	-	02.0	N	145	-	31.2	E
	104	41	-	54.9	N	145	-	04.9	E
	105	42	-	50.0	N	144	-	36.2	E
	106	41	-	29.2	N	144	-	06.3	E
	107	42	-	30.0	N	143	-	36.2	E
	108	41	-	03.3	N	143	-	07.7	E
	109	42	-	03.0	N	142	-	39.6	E
	110	40	-	59.9	N	142	-	09.1	E
	111	42	-	30.0	N	141	-	39.6	E
	112	42	-	00.5	N	141	-	28.3	E

7CS	WP	Lat.				Long.			
	131	41	-	00.0	N	142	-	27.6	E
	132	40	-	39.0	N	141	-	35.0	E
	133	40	-	06.3	N	143	-	13.4	E
	134	39	-	33.2	N	142	-	12.0	E
	135	39	-	00.4	N	142	-	59.8	E
	136	38	-	38.2	N	141	-	37.0	E
	137	38	-	15.0	N	141	-	13.0	E
	138	37	-	53.5	N	142	-	42.8	E
	139	37	-	19.3	N	141	-	05.0	E
	140	36	-	45.5	N	142	-	25.9	E
	141	36	-	10.1	N	140	-	40.0	E
	142	35	-	36.4	N	142	-	09.0	E
	143	35	-	00.0	N	140	-	05.0	E

Table 2b. Waypoint (WP) in the research area 7WR and 7E surveyed by *YS2*.

7WR	WP	Lat.				Long.			
	201	42	-	00.5	N	145	-	17.7	E
	202	40	-	53.5	N	147	-	00.0	E
	203	39	-	45.7	N	143	-	11.4	E
	204	38	-	35.9	N	147	-	00.0	E
	205	37	-	25.6	N	142	-	35.9	E
	206	36	-	13.8	N	147	-	00.0	E
	207	35	-	01.0	N	142	-	00.4	E
	208	35	-	00.0	N	142	-	05.0	E

7E	WP	Lat.				Long.			
	231	35	-	00.0	N	147	-	56.7	E
	232	35	-	20.2	N	147	-	00.0	E
	233	36	-	24.2	N	150	-	00.0	E
	234	37	-	27.3	N	147	-	00.0	E
	235	38	-	29.6	N	150	-	00.0	E
	236	39	-	30.9	N	147	-	00.0	E
	237	40	-	31.4	N	150	-	00.0	E
	238	40	-	49.1	N	149	-	06.8	E

Table 3. Summary of the survey periods and searching effort (n.miles).

Research vessels	Cruise period (y/m/d)	Research area period	Planned cruise track (n.miles)	Searching effort (n.miles)	Coverage of effort (n.miles)
Coastal (7CN+7CS) (YS1)	2016/7/29-9/6	2016/7/30- 9/3	1,486.5	1,406.2	94.6%
Offshore (7WR+7E) (YS2)	2016/7/29-9/6	2016/7/31- 9/2	2,049.3	1,385.6	67.6%
Total	2016/7/29-9/6	2016/7/30- 9/3	3,535.8	2,791.8	79.0%

Table 4. Number of sightings by species and stratum in the research area including transit survey between port and the research area.

Species	Transit to R.A.		Coastal (7CN+7CS)		Offshore (7WR+7E)		Transit from R.A.		Total	
	sch.	Ind.	sch.	Ind.	sch.	Ind.	sch.	Ind.	sch.	Ind.
Fin whale	0	0	1	1	3	5	0	0	4	6
Bryde's whale	19	23	20	31	86	106	0	0	125	160
Common minke whale	0	0	11	11	1	1	0	0	12	12
Humpback whale	0	0	0	0	2	2	0	0	2	2
Sperm whale	21	124	33	87	49	182	0	0	103	393
Unid. Large whale	24	27	7	7	9	9	0	0	40	43

Table 5. Number of photo-ID individuals photographed, by each stratum.

Photo-ID	Coastal (7CN+7CS) (YS1)	Offshore (7WR+7E) (YS2)	Total
Humpback whale	0	1	1

Table 6a. Number of biopsy samples collected, by each stratum.

Biopsy	Coastal (7CN+7CS) (YS1)	Offshore (7WR+7E) (YS2)	Total
Fin whale	1	0	1
Humpback whale	0	1	1

Table 6b. Number of biopsy samples collected, by each stratum. Including one mother and calf pair in the Southern strata.

Vesl.	Sheet	Date	Sight	Sp.	Scl.	Sighted Position				Area	Start time	End time	Experiment	Est. body length	number	number	Position	number	Sample	Shooting	
	number		No.		size	Lat.	[min.]	Long.	[min.]		of BX	of BX	duration	of target ind. [m]	of shoot	of hit	struck	of sample	No.	equipment	Notes.
YS1	BY140	20160901	1	F	1	35	43.05	141	51.64	7	8:01:22	8:30:15	00:28:53	15.2	5	1	RC1	1	J16NYS1F02	Larsen	-
YS2	BY234	20160807	17	H	1	38	33.19	146	49.93	7	11:48:12	12:12:48	00:24:36	7.3	2	1	LB1a	1	J16NYS2H04	Larsen	-
YS2	BY235	20160901	13	F	1	40	15.30	149	11.64	7	14:36:12	15:01:15	00:25:03	22.4	0	0	-	0	-	Larsen	-

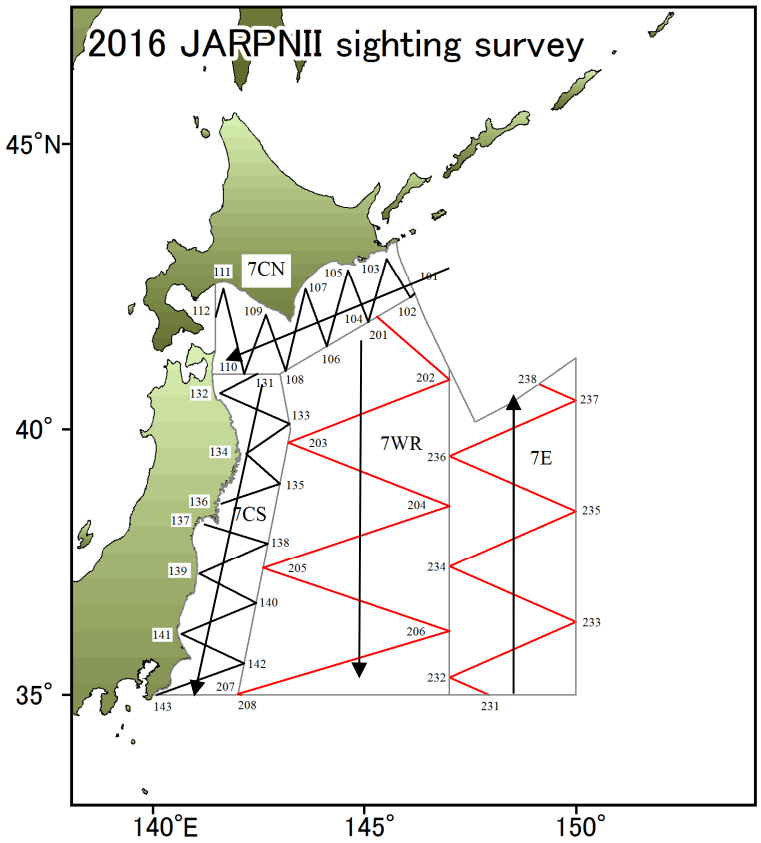

Figure 1. The 2016 research area and pre-determined track lines with their waypoint (WP) number (7CN: 101-112, 7CS: 131-143, 7WR: 201-208, 7E: 231-238). Survey order followed a WP number in sequence.

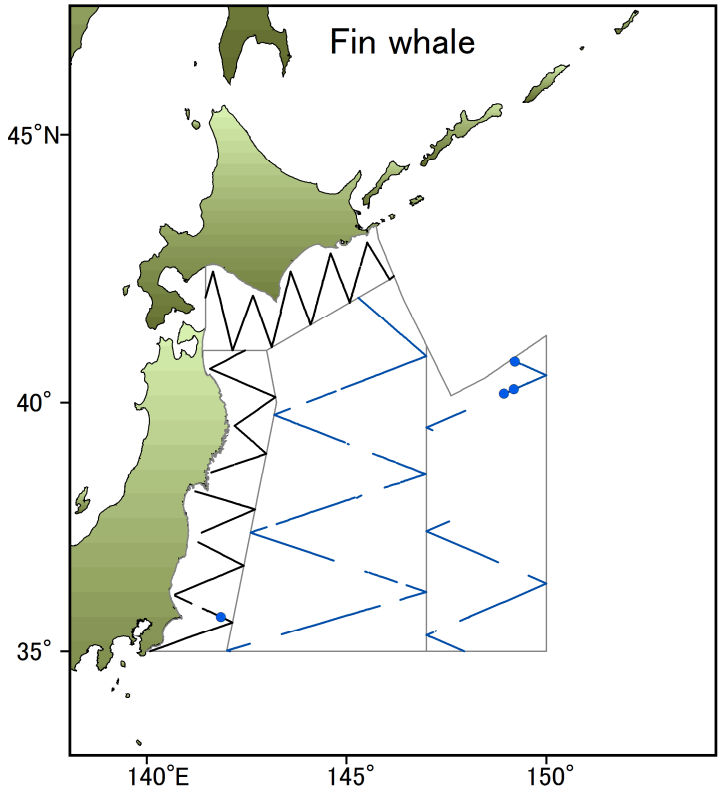

Figure 2a. Sighting locations of fin whales in the research area.

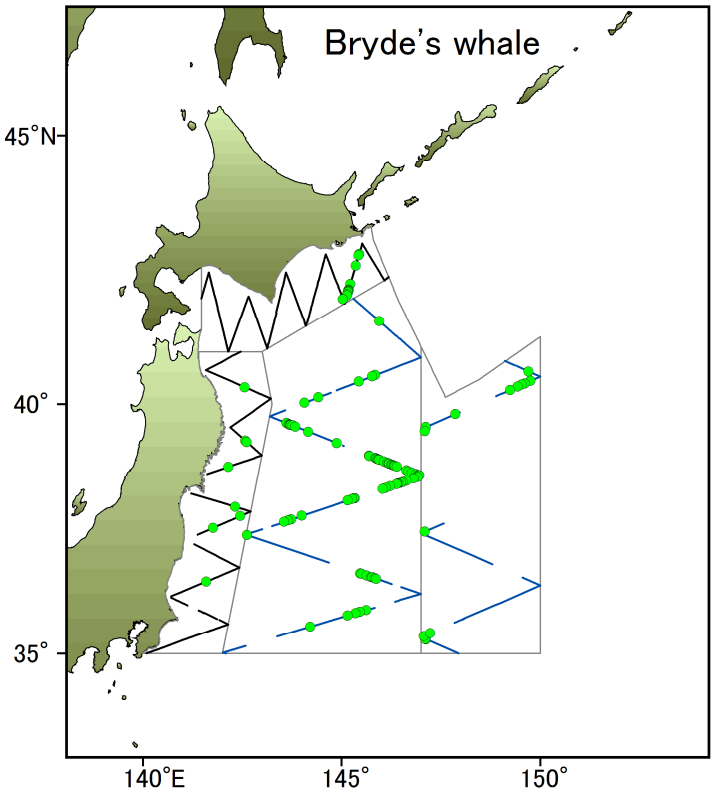

Figure 2b. Sighting locations of Bryde's whales in the research area.

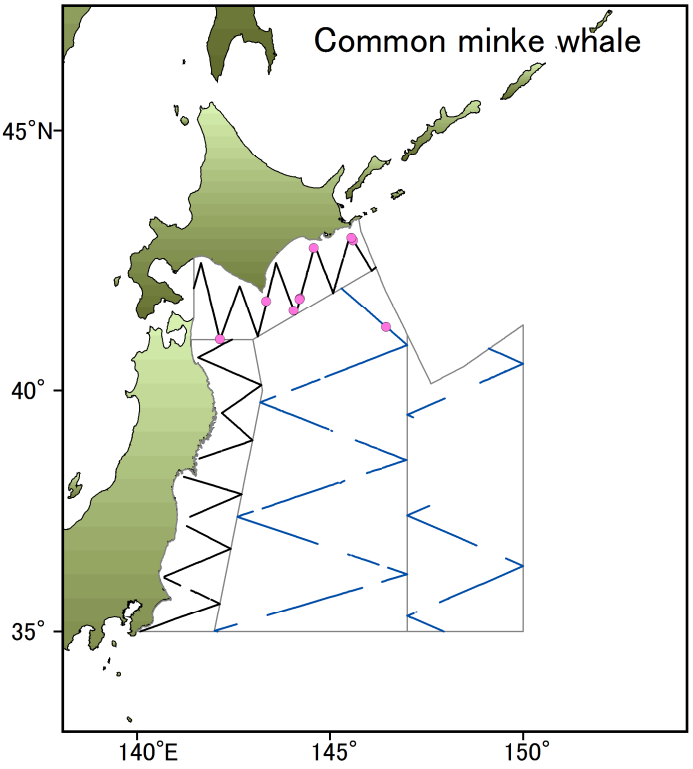

Figure 2c. Sighting locations of common minke whales in the research area.

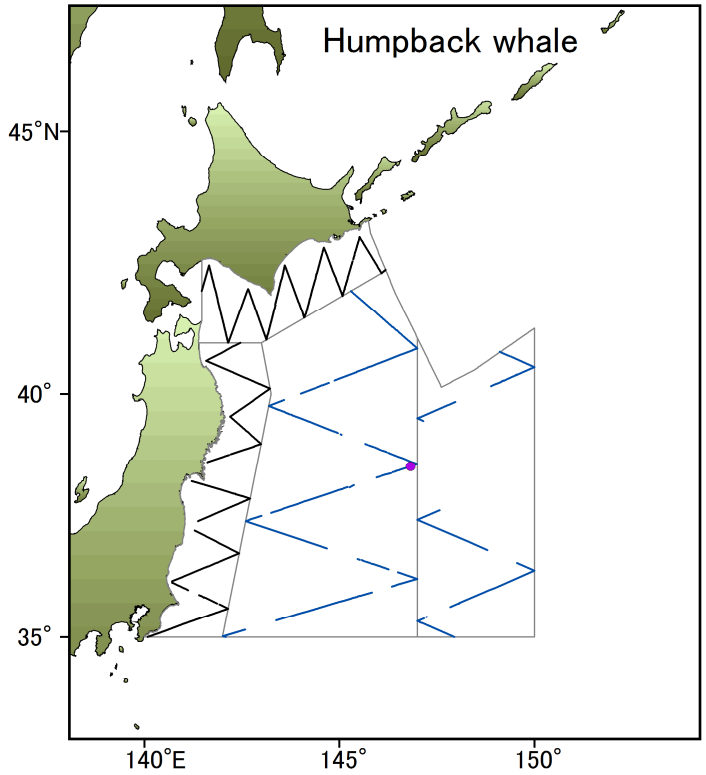

Figure 2d. Sighting locations of Humpback whale in the research area.

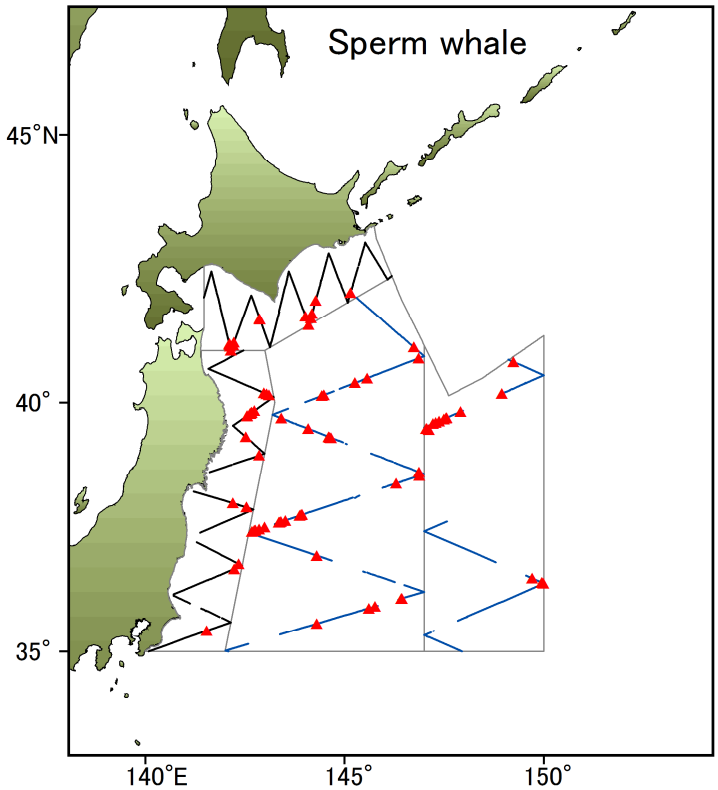

Figure 2e. Sighting locations of sperm whales in the research area.

APPENDIX A. SHIP SPECIFICATIONS AND CREW LIST OF *YUSHIN-MARU AND YUSHIN-MARU NO.2*.

Ship photo:

Ship specifications:

	Yushin-Maru	*Yushin-Maru No.2*
Call sign	JLZS	JPPV
Length overall [m]	69.61	69.61
Gross tonnage (GT)	724	747
TOP barrel height [m]	19.5	19.5
IO barrel 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

Crew list:

	Yushin-Maru	*Yushin-Maru No.2*
Researcher	Ryuichiro Moriyama	Hiroya Mure
Captain	Nobuo Abe	Chikamasa Okoshi
Chief Officer	Motonori Aki	Tomoya Hirai
Second Officer	Chikara Omukai	Masahiro Yamazaki
Junior Second Officer	Seiichiro Teruya	-
Chief Engineer	Hiroyuki Hagiwara	Akihide Oide
First Engineer	Shigeki Miyamoto	Ryuta Miyamoto
Second Engineer	Kenji Kawamoto	Koji Takamatsu
Third Engineer	Hiroyuki Nabekura	Takashi Matsubara
Chief Operator	Kenji Tsuda	Jun Kuwaoka
Second Operator	Hisaji Suzuki	-
Boatswain	Kenji Wakatsuki	Masahiko Abe
Quartermaster	Hisashi Katase	Kazuyuki Sugiyama
Quartermaster	Takato Sawabe	Kosuke Maehashi
Quartermaster	Hayata Nawa	Takahiro Nagai
Quartermaster	-	Takashi Kominami
Sailor	Shinya Torihara	Naoto Suzuki
Sailor	Takumi Kondo	Toshikazu Takahashi
Wiper	-	Yuji Isotani
Chief Steward	Akihiko Toyomura	Seichi Hamashita
Steward	Kento Baba	Masanobu Abe

Appendix B. **Oversight for the 2016 Japanese dedicated sighting survey in the western North Pacific**

Koji Matsuoka
Institute of Cetacean Research
4-5, Toyomi, Chuo, Tokyo, 104-0055, JAPAN

The plan of this survey was presented to the 2016 IWC/SC meeting (Hakamada *et al*., 2016) and endorsed by the Scientific Committee (IWC, 2016). On behalf of the IWC Scientific Committee I carried out the oversight work during the 2016 Japanese dedicated sighting survey in the western North Pacific. This is a brief report of the oversight activities conducted on that survey.

Preparatory work

The pre-cruise meeting carried out at Shimonoseki on 22 April 2016. The survey organizers, researchers and crewmembers also participated in that meeting. During the meeting the organizers explained the objective of the survey and the procedure to be used for both sightings and experiments. The planned sighting procedure was in order with that agreed by the Scientific Committee. The research vessels *Yushin-Maru* and *Yushin-Maru No.2* were engaged for this survey.

The research area was set between 35° N and 43° N and between 140° E and 150° E. The survey was conducted between 29 July and 6 September. The vessels were assigned to cover pre-determined transects in these areas by the passing with abeam closing mode (NSP). Two experienced researchers were assigned to work on board each vessel.

Oversight method and period

The research activities of the vessels were oversight by e-mail communication and by examining the daily report prepared by each researchers on board. In some instances Inmarsat satellite telephone calls were made for further clarification of the activities, procedure and sightings made. Further, geographical positions and weather information of each vessel were tracked each other per day. Over sight activity were carried between 29 July and 6 September.

Brief narrative of the oversight vessel

Research vessels (YS1 and YS2) departed from Shimonoseki, Japan on 29 July and started the survey in the research area on 30 July. The YS1 surveyed in the sub-areas 7CN and 7CS, and YS2 surveyed in the sub-areas 7WR and 7E. The vessels left the research area and arrived at Shimonoseki on 6 September.

Post-cruise meeting

I participated in a post-cruise meeting held on 6-7 September 2016 at Shimonoseki. Survey organizers, researchers and the Captain participated in that meeting. Apart to discuss and assess the results of the surveys, the researchers engaged in the verification and checking of data.

Conclusion

All equipment and the survey method of each vessel were the same as in the past sighting surveys. The design of the survey strata and track lines were improved to cover each strata completely. The planned sighting procedure was in accordance with the guideline agreed by the SC (IWC, 2012). Objectives and procedure of the survey were explained to the captains, officers, crew and researcher in advance. I then endorse the information and data obtained during the 2016 Japanese dedicated sighting survey in the western North Pacific.

Reference

IWC. 2012. Requirements and Guidelines for Conducting Surveys and Analysing Data within the Revised Management Scheme. J. Cetacean Res. Manage. (Suppl2.) 11:507-18.

IWC. 2016. Report of the Scientific Committee. Annex G. 23pp. Bled, Slovenia, 2016. [Paper available at the IWC Office].

Hakamada, T., Matsuoka, K. and Miyashita, T., 2016. Research plan for a cetacean sighting surveys in the Western North Pacific in 2016. SC/66b/IA07. 5pp. [Paper available at the IWC Office].