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ABSTRACT

The eighth dedicated systematic cetacean sighting survey will be conducted in the southwestern Sea of Okhotsk (sub-areas 12SW and 11) using a Russian research vessel, *ВЛАДИМИР САФОНОВ* (*VLADIMIR SAFONOV*), in 2022. The vessel is a stern trawl type research vessel with a barrel for observation. The objective of the survey is to obtain information on distribution and abundance of large whales using the normal closing mode. The period of survey will be from 4 August to 4 September (32 days). During the transit to the research area, the vessel will conduct the sighting survey in passing mode. The distance and angle estimation training and experiment will be conducted. Photo-identification of cetaceans such as northern right whales, gray whales and humpback whales will be attempted.

KEY WORD: SIGHTING SURVEY, SEA OF OKHOTSK

INTRODUCTION

The first sighting survey by the Russian research vessel was conducted in 2015 with a feasibility study in the central Okhotsk Sea and covered the northern most coastal waters (Myasnikov *et al.*, 2016). Consequently, most north-eastern area (including Sherikhov Bay) was covered by the vessel in 2016 (Gushcherov *et al.* 2017). In 2017, west of the Kamchatka Peninsula (i.e. eastern part of the Sea of Okhotsk) (Gushcherov *et al.* 2018) , in 2018 the north-western waters including the Shantar Islands (Gushcherov *et al.*, 2019), in 2019 the waters east of the Sakhalin Island (Gushcherov *et al.*, 2020), and in 2020 the central part of the Sea of Okhtosk (Gushcherov *et al.*, 2021) were covered, respectively. In these waters, the coverage in the northern most coastal waters west of the Sherikov Bay was not so good due to bad weather in both 2015 and 2016 (Myasnikov *et al.*, 2016, Gushcherov *et al.* 2017). In 2021, the northern most coastal waters were surveyed again (Gushcherov *at al.*, 2022). These past surveys covered the sub-area 12NE for the implementation of RMP for the common minke whales. Therefore, this 2022 season, the vessel intends to cover the remained sub-areas in the southwestern Sea of Okhotsk, namely, the sub-area 12SW and 11.

RESEARCH PLAN

Research vessel

As in the cases of the last surveys, the Russian research vessel, *ВЛАДИМИР САФОНОВ* (*VLADIMIR SAFONOV*) will be used in the survey. The vessel is equipped with a barrel (15 m from the sea level) where two observers can be allocated. Scientists are allocated to the upper bridge (12 m from the sea level) where they record sighting, effort and weather. A total of 24 crews is onboard the vessel. Specification of the vessel is shown in Table 1.

Research schedule

The total cruise period will be 32 days. A tentative cruise itinerary is as follows;

2 Aug.	Pre-cruise meeting in Vladivostok,
4 Aug.	Vessel departs from Vladivostok,
8 Aug.	Vessel arrives at the start way point,
1 Sep.	Vessel arrives at the final way point and leaves the research area
4 Sep.	Vessel arrives at Vladivostok and finishes the cruise
Around 11 Oct.	Post-cruise meeting in Vladivostok

Scientists on board

Six scientists will participate in the cruise. The following list is tentative one, but at least three scientists have experiences in the marine mammal surveys for a long time.

1. Pavel S. Gushcherov (Cruise leader/Chief Scientist - sighting, photo-ID);
2. Igor A. Naberezhnykh (Senior researcher - sighting),
3. Maxim D. Kenin (Researcher – sighting, meteo specialist),
4. Alexander N. Bashtovoy (Researcher – sighting),
5. Vladimir V. Obraztsov (Researcher – sighting),
6. Ivan F Belokobylskiy (Researcher – sighting).

Research area and track line

The research area is set in the southwestern Sea of Okhotsk, the sub-areas 12SW and 11 (Figure 1). The pre-determined track line was set from the random selected start point using Distance 6.2 Release 1 (Thomas *et al.* 2010) and shown in Figure 2. Planned positions of way points and distance between way points are shown in Table 2. The vessel will start at the northern most way point 1 in sub-area 12SW and cover the research area from north to south following the way point number. The survey will be finished at the final way point 18 in sub-area 11. Planned survey distance is 1,182.2 n.miles in the sub-area 12SW and 469.6 n.miles in the sub-aera 11, respectively. Necessary research permissions expect to be issued before starting the research. The way points and/or track lines are subject to change due to force majeure.

Sighting activity

Normal closing mode is primarily used in the research area. Two observers conduct searching using naked eye and confirm by binocular. Three observer teams with determined members operate in two hours shifts. The survey is to be conducted for a maximum of 14 hours (from 6 a.m. to 20 p.m. at local time) basically when the weather conditions are suitable for observations: visibility better than 1.5 n.miles and the wind speed less than 7.5m/s. The vessel speed is planned to be 9.5 knots with adjustment to avoid vibration of vessel.

Sighting information is recorded by the researcher on the upper bridge. Weather and effort information is also recorded by the researcher on the upper bridge. The date will be entered to the computer on board during the survey. GPS log will be gained during the survey time.

Experiments

Distance and angle measurement training is planned to be conducted at the earlier part of the survey. The experiment to evaluate the measurement error is to be conducted around the middle of the survey.

When gray whale, North Pacific right whale, humpback whale and killer whale are found, attempts will be made to take photograph for the individual photo-identification.

When peeled skin is found after breaching of humpback whales, the vessel will try to collect as DNA sample using a landing net.

Cruise report

The cruise result will be examined in the post-cruise meeting in October 2022. The cruise report will be submitted to the 69a Scientific Committee in 2023.

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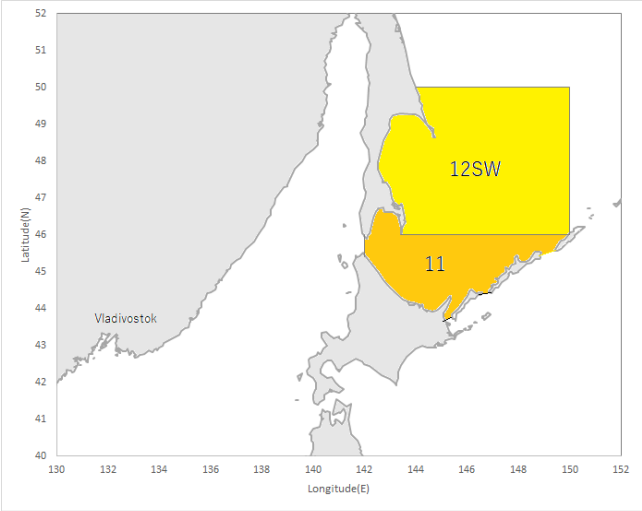

Figure 1. Research area for *ВЛАДИМИР САФОНОВ* (*VLADIMIR SAFONOV*) in the 2022 Okhotsk cetacean sighting survey.
Orange area shows the sub-area 11 and yellow 12SW, respectively.

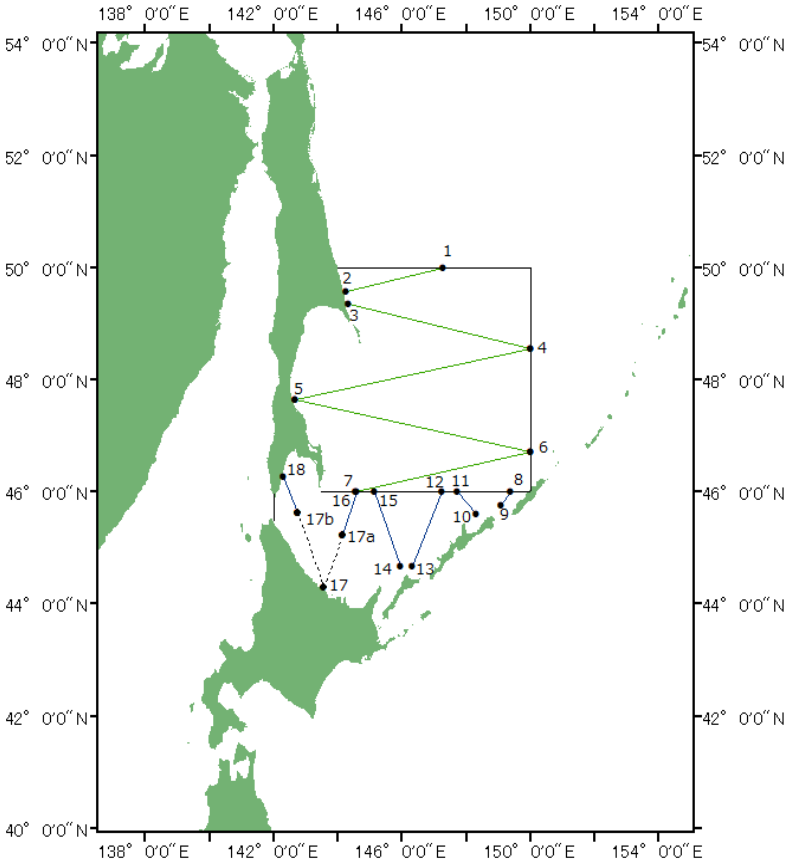

Figure 2. Planned track line and way points for the 2022 Okhotsk cetacean sighting survey (dotted line – possible track of research).

Table 1. Specification of the research vessel *ВЛАДИМИР САФОНОВ* (*VLADIMIR SAFONOV*)

Length overall [m]	48.12
Molded breadth [m]	10.50
Gross tonnage (GT)	462.0
Barrel height [m]	15.0
Upper bridge height [m]	12.0
Engine power [kW]	970

Table 2. Way points and distance for 2022 survey.

Sub-area 12SW

Line	From					To					Distance
	WP	Lat d	Lat m	Long d	Long m	WP	Lat d	Lat m	Long d	Long m	(n.mile)
1-2	1	50	0.00	147	16.80	2	49	34.62	144	15.59	120.0
3-4	3	49	20.68	144	20.37	4	48	33.11	150	0.00	228.7
4-5	4	48	33.11	150	0.00	5	47	38.28	142	40.66	299.4
5-6	5	47	38.20	142	40.71	6	46	43.37	150	0.00	229.7
6-7	6	46	43.37	150	0.00	7	46	0.00	144	34.22	304.5
Total											1,182.2

Sub-area 11

Line	From					To					Distance
	WP	Lat d	Lat m	Long d	Long m	WP	Lat d	Lat m	Long d	Long m	(n.mile)
8-9	8	46	0.00	149	24.00	9	45	45.00	149	5.00	20.0
10-11	10	45	35.71	148	19.64	11	46	0.00	147	44.35	34.6
12-13	12	46	0.00	147	15.47	13	44	40.54	146	20.27	88.5
14-15	14	44	40.05	145	57.63	15	46	0.00	145	8.48	87.1
16-17a	16	46	0.00	144	34.95	17a	45	14.00	144	9.00	49.5
17a-17	17a	45	14.00	144	9.00	17	44	18.14	143	34.69	61.0
17-17b	17	44	18.14	143	34.69	17b	45	37.00	142	45.00	86.4
17b-18	17b	45	37.00	142	45.00	18	46	15.59	142	19.41	42.5
Total											469.6