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Research plan of the cetacean sighting survey in the northern Sea of Okhotsk in 2021

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ABSTRACT

The seventh dedicated systematic cetacean sighting survey will be conducted in the northern Sea of Okhotsk using a Russian research vessel, *ВЛАДИМИР САФОНОВ* (VLADIMIR SAFONOV), in 2021. 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 6 September (34 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. When a peeled skin is found after breaching, the vessel will try to collect as DNA sample using a landing net.

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 Shelikhov 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 Okhotsk (Gushcherov *et al.*, 2021) were covered, respectively. In these waters, the coverage in the northern most coastal waters west of the Shelikhov Bay was not so good due to bad weather in both 2015 and 2016 (Myasnikov *et al.*, 2016, Gushcherov *et al.* 2017). Therefore, in 2021, this waters will be surveyed again.

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 34 days. A tentative cruise itinerary is as follows;

2 Aug.	Pre-cruise meeting in Vladivostok,
4 Aug.	Vessel departs from Vladivostok,
10 Aug.	Vessel arrives at the start way point (WP1).
31 Aug.	Vessel arrives at the final way point (WP16) and leaves the research area
6 Sep.	Vessel arrives at Vladivostok and finishes the cruise
Around 7 Oct.	Post-cruise meeting in Vladivostok

Scientists on board

Six scientists will participate in the cruise. The following list is tentative one, but all scientists have experiences in the marine mammal surveys.

1. Pavel S. Gushcherov (Cruise leader/Chief Scientist - sighting, photo-ID);
2. Igor A. Naberezhnykh (Senior researcher - sighting),
3. Petr A. Tyupelev (Researcher - sighting),
4. Anton A. Novozhilov (Researcher – sighting),
5. Not yet decided,
6. Not yet decided.

Research area and track line

The research area is set in the northern Sea of Okhotsk where was covered twice in 2015 and 2016 (Figure 1). The research area is north of 57°N and east of around 157°E (east of Shelikhov Bay). 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. Positions of way points and distance between way points are shown in Table 2. The vessel will cover the research area from west to east. Planned survey distance is 1,302 n.miles in the research area and expected to be covered in 21 days. The days for transit are assumed to be 13 days.

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, northern right. humpback and killer whales 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 2021. The cruise report will be submitted to the 69a IWC Scientific Committee in 2022.

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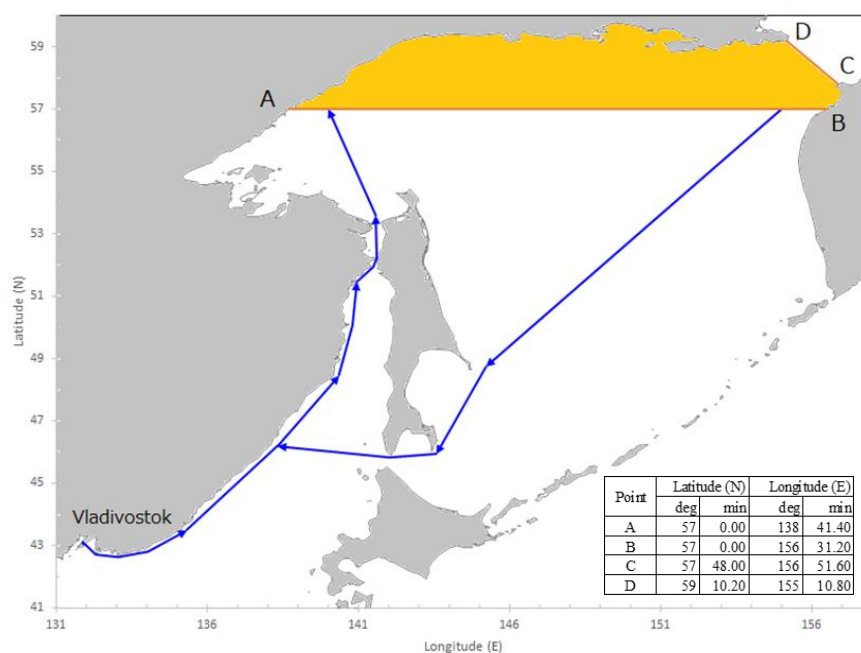


Figure 1. Research area and transit route for *ВЛАДИМИР САФОНОВ* (VLADIMIR SAFONOV) in the 2021 Okhotsk cetacean sighting survey.
Orange area shows the research area, and blue line shows the transit route.
Points (A-D) shows the definitions of research area.

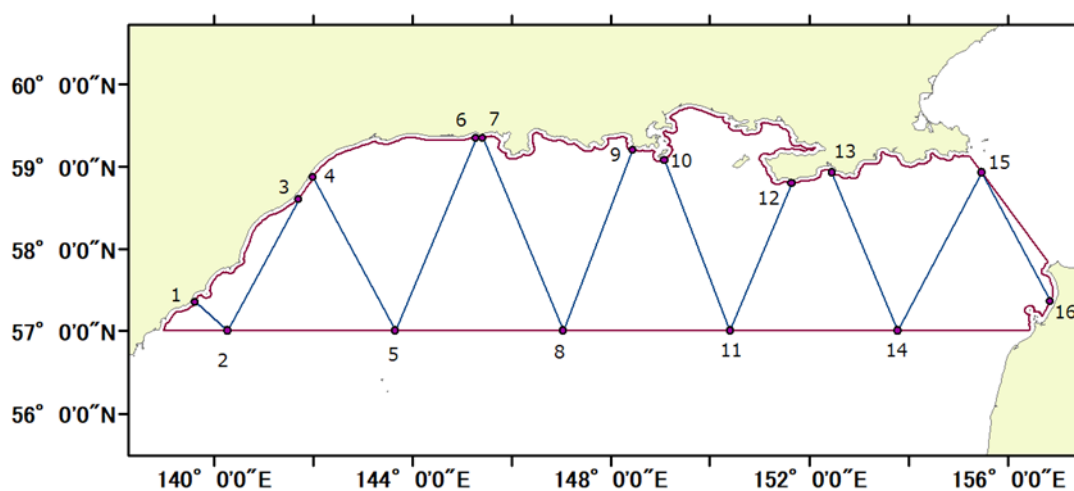


Figure 2. Pre-determined track line and way points for the 2021 Okhotsk cetacean sighting survey.
Blue line: pre-determined track line.
Way points close to the land were set at 3 n. miles off the land (red line).

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. Pre-determined track line, waypoints(WP) and distance for the 2021 sighting survey.

Line	From					To					Distance (n.miles)
	WP	Latitude(N)		Longitude(E)		WP	Latitude(N)		Longitude(E)		
		deg	min	deg	min		deg	min	deg	min	
L1_2	1	57	20.98	139	37.25	2	57	0.00	140	16.51	30.0
L2_3	2	57	0.00	140	16.51	3	58	35.98	141	42.08	106.5
L4_5	4	58	51.95	141	59.40	5	57	0.00	143	39.21	124.2
L5_6	5	57	0.00	143	39.21	6	59	20.51	145	16.40	149.9
L7_8	7	59	20.75	145	24.54	8	57	0.00	147	1.90	150.2
L8_9	8	57	0.00	147	1.90	9	59	11.91	148	25.86	139.5
L10_11	10	59	4.76	149	5.20	11	57	0.00	150	24.60	132.0
L11_12	11	57	0.00	150	24.60	12	58	47.70	151	38.84	115.0
L13_14	13	58	55.73	152	27.52	14	57	0.00	153	47.29	123.5
L14_15	14	57	0.00	153	47.29	15	58	55.65	155	28.64	127.9
L15_16	15	58	55.65	155	28.64	16	57	21.44	156	51.20	104.1
Total											1,302.8