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ABSTRACT

The nineth dedicated systematic cetacean sighting survey will be conducted in the northeastern Sea of Okhotsk using a Russian research vessel, *ВЛАДИМИР САФОНОВ* (*VLADIMIR SAFONOV*), in 2023. 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.

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 Okhtosk (Gushcherov *et al.*, 2021) were covered, respectively. In these waters, the coverage in the northern most coastal waters west of the Shelikov 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 *et al.*, 2022). These past surveys covered the sub-area 12NE for the implementation of RMP for the common minke whales. In 2022, the vessel has covered the sub-areas 12SW and 11 (Gushcherov *et al.*, 2023), and the past surveys covered about 92% of the Sea of Okhotsk. In 2023, the survey will cover the Shelikhov Bay and coastal waters west of the Kamchatka Peninsula.

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,
11 Aug.	Vessel arrives at the start way point in block c,
1 Sep.	Vessel arrives at the final way point in the block d and leaves the research area
6 Sep.	Vessel arrives at Vladivostok and finishes the cruise
Around 25 Oct.	Post-cruise meeting in Vladivostok

Scientists on board

Six scientists will participate in the cruise. All scientists have experiences in the marine mammal surveys for a long time and they engaged in the 2022 survey.

1. Pavel S. Gushcherov (Pacific branch of «VNIRO» («TINRO»)) – Cruise leader/Chief Scientist - sighting, photo-ID;
2. Igor A. Naberezhnykh (Pacific branch of «VNIRO» («TINRO»)) – sighting, senior researcher; photo-ID;
3. Vladimir V. Obraztsov (Pacific branch of «VNIRO» («TINRO»)) – sighting;
4. Alexander N. Bashtovoy (Pacific branch of «VNIRO» («TINRO»)) – sighting;
5. Maksim D. Kenin (Pacific branch of «VNIRO» («TINRO»)) – sighting, meteo specialist;
6. Ivan F. Belokobylskiy (Russian Research Institute of Fisheries and Oceanography «VNIRO») – sighting.

Research area and track line

The research area is set in the northeastern Sea of Okhotsk, namely, Shelikhov Bay (block c) and the coastal waters west of the Kamchatka Peninsula (block d) (Figure 1). A small bay in the northeastern part of Shelikhov Bay was excluded from the survey because of its extremely shallow water depth and fast currents. 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. The vessel will start at the northern most way point 1 in block c and cover the research area from north to south following the way point number. The survey will be finished at the final way point 15 in block d. Planned survey distance is 444.2 n.miles in block c and 629.3 n.miles in block d, respectively (Table 2). The voyage to and from the research area will pass through the Laperuza Strait.

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.

Cruise report

The cruise result will be examined in the post-cruise meeting in October 2023. The cruise report will be submitted to the 69B Scientific Committee in 2024.

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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. Waypoints and distance for the 2023 Okhotsk Sea sighting survey

Block c

	From				To					Distance
WP	Lat d	Lat m	Long d	Long m	WP	Lat d	Lat m	Long d	Long m	(n.mile)
1	61	1.04	161	21.21	2	60	7.00	161	21.00	54.0
3	59	52.00	160	57.00	4	61	1.22	156	16.64	154.8
5	60	58.58	156	10.24	6	58.00	8	157.00	45.00	177.3
6	58	8.00	157	45.00	7	58	26.41	156	4.50	56.0
Total										442.1

Block d

	From				To					Distance
WP	Lat d	Lat m	Long d	Long m	WP	Lat d	Lat m	Long d	Long m	(n.mile)
8	57	0.00	152	32.34	9	55	59.61	155	34.88	117.6
10	55	21.93	155	28.54	11	54	12.93	152	0.00	138.9
11	54	12.93	152	0.00	12	52	54.82	156	2.67	164.2
13	52	35.95	156	11.02	14	51	15.16	152	0.00	174.9
14	51	15.16	152	0.00	15	51	0.00	152	47.73	33.6
Total										629.3

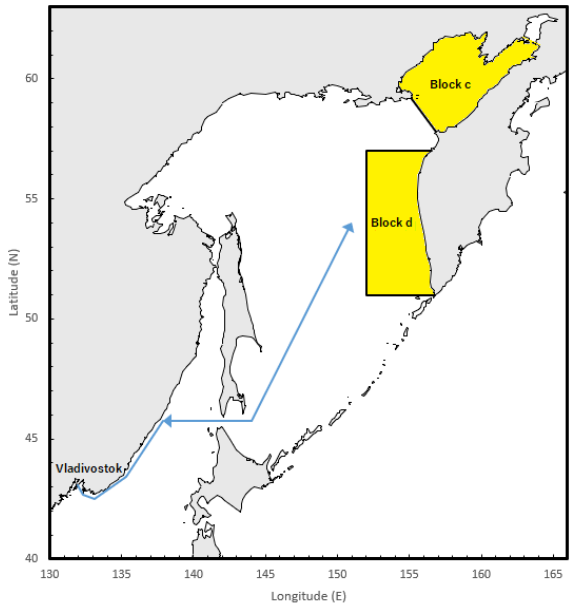

Figure 1. Research area for *ВЛАДИМИР САФОНОВ* (*VLADIMIR SAFONOV*) in the 2023 Okhotsk Sea cetacean sighting survey.

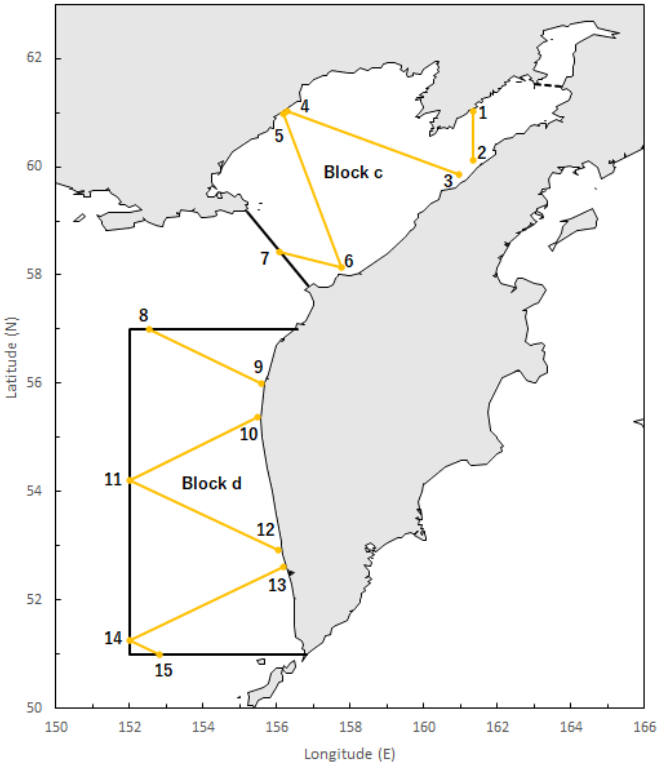

Figure 2. Pre-determined track line and way points for the 2023 Okhotsk Sea cetacean sighting survey.