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MARINE MAMMAL OBSERVER PROGRAMME 2020 CLOSE-OUT REPORT

ПРОГРАММА НАБЛЮДЕНИЯ ЗА МОРСКИМИ МЛЕКОПИТАЮЩИМИ В 2020 ГОДУ ЗАКЛЮЧИТЕЛЬНЫЙ ОТЧЕТ

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**MARINE MAMMAL OBSERVER PROGRAMME 2020
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1 INTRODUCTION

Sakhalin Energy Investment Company Ltd. (Sakhalin Energy) was established in 1994 to develop the Piltun-Astokhskoye and Lunskoye oil and gas fields on the north-east shelf of Sakhalin Island, in the Sea of Okhotsk. 23 species of marine mammals, including 17 cetacean species (whales, dolphins and porpoises) and 6 pinniped species, can be observed in the coastal waters of the Sea of Okhotsk in the Sakhalin-2 project area. 8 of these species are listed in the Red Book of the Russian Federation: gray whale (Okhotsk-Sea population), the bowhead whale, the North Pacific right whale, the fin whale, the Cuvier's beaked whale, the harbour porpoise, Far East population of the carnivorous killer whale as well as pinnipeds such as the Steller sea lion.

Sakhalin Energy has identified the protection of marine mammals as a high-priority task for the whole period of its oil and gas field development. In particular, the Company has focused on the conservation of western gray whales (*Eschrichtius robustus*) which feed near offshore production facilities of Sakhalin Energy during the ice-free season. This species is listed under Category 1 in the Red Book of the Russian Federation (2012). High conservation status was applied due to the small population size and low number of reproductive females. According to international expert estimates, over recent years the population has been steadily increasing by 2–5 % per year, due to which in 2018 IUCN changed the status of western gray whales in the Red List from “critically endangered” (CR) to “endangered” (EN).

Although industrial whaling was thought to have caused extinction of the WGW population (Bowen, 1974), a small number of feeding whales was identified in 1983 (Blokhin et al., 1985) in the coastal waters of Sakhalin. In 1995 studies of the WGW started under the *Agreement on Cooperation in the Field of Environmental Protection* between Russia and the USA. In 1997 Sakhalin Energy began funding the studies, which to date have produced extremely valuable information on the ecology of these whales. Since the discovery of WGW offshore the north-eastern coast of Sakhalin in 1983, the total number of known WGW has been consistently increasing from approximately 20 to over 200. As of 2020 a total number of 332 individuals have been included in the Sakhalin WGW catalogue of the National Scientific Center of Marine Biology, the Far Eastern Branch of the Russian Academy of Sciences (NSCMB FEB RAS).

In 2010–2012 a programme of whales' satellite tagging was successfully conducted using satellite telemetry performed by the A.N. Severtsov Institute of Ecology and Evolution of the Russian Academy of Sciences (IEE RAS) and the Oregon State University (OSU) Marine Mammal Institute in collaboration with the U.S. National Marine Fisheries Service, Kronotsky State Nature Biosphere Reserve, and the Kamchatka Branch of the Pacific Institute of Geography. The research was contracted through the International Whaling Commission (IWC) and International Union for Conservation of Nature (IUCN) with funding from Exxon Neftegas Ltd. (ENL) and Sakhalin Energy Investment Company Ltd.

During the study period, several whales were tagged. In 2010, one gray whale known as Flex (Belokhvost—"White Tail") was tagged near the north-east coast of Sakhalin. According to the satellite data, after the summer the whale migrated to the North American coast and reached the coast of central Oregon. In 2011 tags remained on two out of six tagged whales by the time of migration; these two whales followed the same route made by Flex a year before. The most representative example was the migration of Varvara. After tagging and wintering near the coast of California, this whale returned to Sakhalin for feeding in 2012. The data gathered to date indicates that the whales feeding near the north-eastern coast of Sakhalin and the individuals observed near the North-American coast may represent one common Pacific population of gray whales consisting of 20,000 individuals.

Sakhalin Energy adheres to the requirements of the Marine Mammal Protection Plan (MMPP), first issued in 2003. The Plan was updated in 2020 in line with Russian and international requirements based on updated information on marine mammals and international best practices (Sakhalin Energy, 2020). The Plan defines general measures for protection of gray whales and other species within the areas of the Company activities. In general, these measures include:

- identification of protected zones (Piltun and Offshore feeding areas, see below);
- establishment of vessel corridors (navigation, construction, etc.);
- regulation of the acceptable distance between mammals and vessels (minimum distance) depending on the types of activities and animals;



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- limitation of the maximum vessel speed.

A crucial condition for implementation of the above measures is the Marine Mammal Observers Programme which has been executed by Sakhalin Energy since 2003. Marine Mammal Observers (MMO) who stay on board of main vessels employed on offshore operations:

- record all marine mammals' sightings and where possible identify the species, their location, numbers, and behaviour;
- give advice on practical measures to avoid collisions with marine mammals; and
- record the cases of any injured or dead animals and where possible identify the reasons for injury or death.

This information is used to assess the adequacy of protection measures and their adjustment.

1.1 GOALS AND OBJECTIVES

In order to minimise the risk of marine mammal collision during offshore activities, regular observation is carried out from Sakhalin Energy vessels. The results of the analysis of observations in 2020 are presented in this report.

The objectives of the report include presentation and discussion of the following issues:

- overview of mitigation measures employed by Sakhalin Energy and used by MMOs to reduce the risk of collision between vessels and marine mammals (Section 2);
- qualification and preparation of MMOs (Section 3);
- the list of Sakhalin Energy offshore activities during the year which required MMO support (Section 4);
- the analysis of the applied mitigation measures efficacy (Section 5); and
- overview of observation data and factors affecting the detectability of marine mammals (Section 6).



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2 OVERVIEW OF RISKS AND MITIGATION MEASURES

2.1 POTENTIAL RISKS

The main aspects of the Sakhalin-2 Project activities that can potentially impact marine mammals are anthropogenic noise, accidental oil spills, and the risk of collisions with vessels. The document “Analysis of Risks for Western Gray Whales (*Eschrichtius robustus*) from Shipping Traffic Associated with the Sakhalin-2 Project” developed by Sakhalin Energy (Sakhalin Energy, 2006) builds the foundation for the Marine Mammal Protection Plan (MMPP) (Sakhalin Energy, 2020). This describes the measures applied by Sakhalin Energy to mitigate the risk of collisions with whales and other marine mammals. A summary of these measures is presented below.

2.2 COLLISION MITIGATION MEASURES

Gray whale collision mitigation measures were developed according to the recent data on their migration, abundance and distribution in the coastal waters.

The number and distribution of gray whales in Sakhalin waters has been studied during the feeding, ice-free period, i.e. approximately from June until November, depending on the season. Two main feeding areas are known in the north-eastern coast of the island: a shallow coastal area adjacent to Piltun Bay (Piltun feeding area) and a deeper sea area adjacent to Chaivo Bay (Offshore feeding area), which are shown on the whale density map (Fig. 2.1). The Piltun feeding area is located in the immediate vicinity of the Sakhalin Energy license area, which places the whales close to industrial activities and vessel traffic.

Collision mitigation measures are described in Sakhalin Energy MMPP. In general, the risk of vessel-whale collisions can be effectively mitigated by:

- control of vessel routes;
- control of vessel speed;
- establishment of an exclusion zone for the vessels;
- setting the limitations for vessels operating in feeding areas;
- deployment of Marine Mammal Observers;
- development of the procedure for vessel response in case of the collision risk;
- briefing and training for vessel crews.

Although there is a low likelihood of a vessel-whale collision in the vicinity of the platforms, the pipeline routes, and along the designated vessel routes, a number of measures have been taken in accordance with the MMPP, continued to be employed in 2020 to further reduce this risk.



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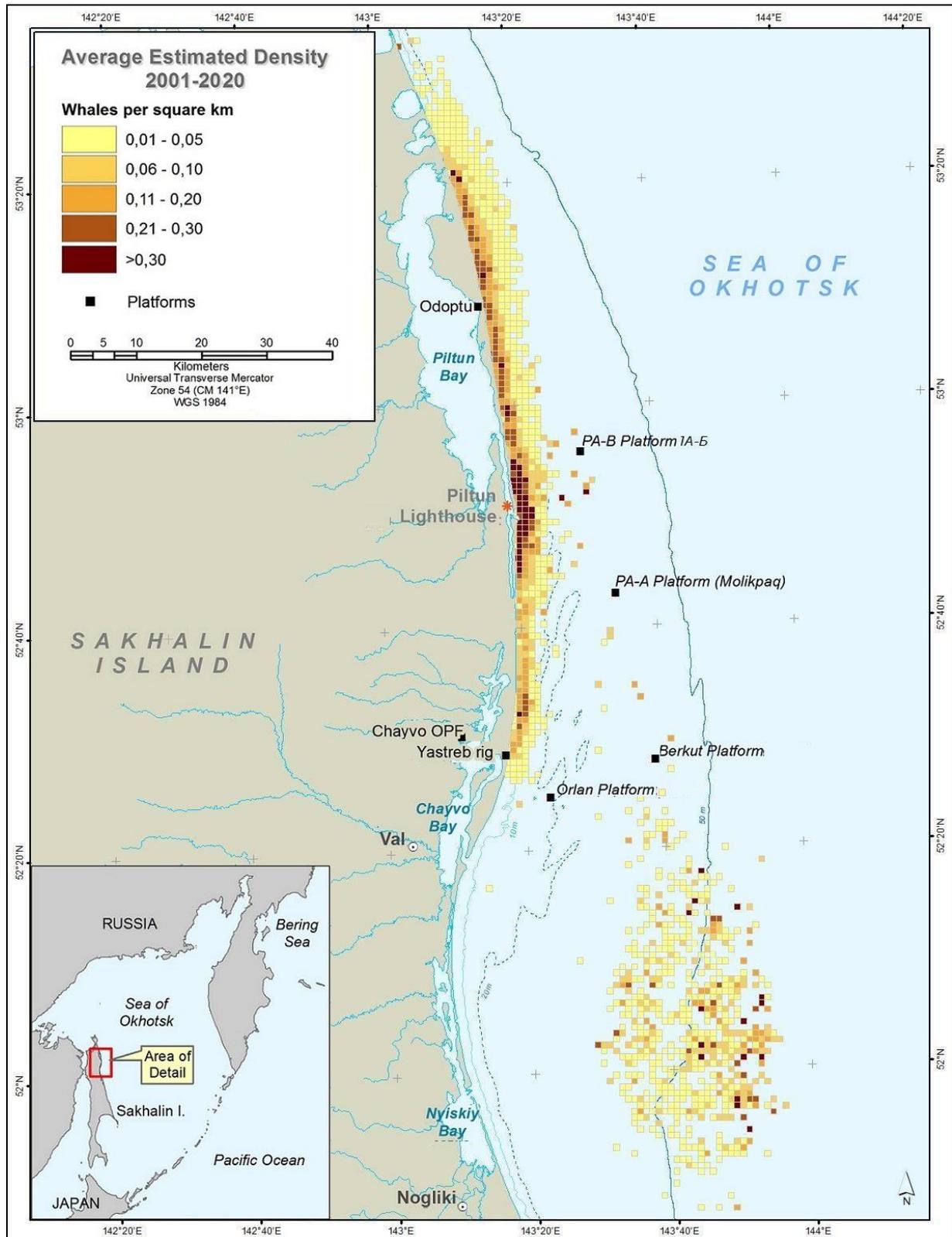


Fig. 2.1. Gray whale densities at the north-eastern coast of Sakhalin Island



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2.2.1 Control of Vessel Routes

As in previous years, vessels were not allowed to enter the Piltun and Offshore feeding areas (Fig. 2.1) unless it was essential for safety, monitoring, or other purposes, subject to making a request and obtaining an authorisation.

Special vessel corridors have been established for all Sakhalin Energy vessel traffic along the eastern coast of Sakhalin Island. All Sakhalin Energy vessels were required to stay within the designated corridors, unless deviation from this course was essential for safety reasons or a special request and an authorisation were obtained.

The following corridors were determined:

- crew transfer corridors for crew change vessels travelling from the Kaigan Port to LUN-A, PA-A, or PA-B platforms (Fig. 2.2 and 2.3);
- navigation corridors for all vessels transiting from Kholmsk and Korsakov to Lunskoye and Piltun areas (Fig. 2.2 and 2.3); and
- pipeline inspection corridor for all vessels involved in offshore pipeline inspection and offshore environmental monitoring. For example, dynamic positioning vessels equipped with sonar systems and remotely operated vehicles (ROV) should follow the established navigation corridors while on transit and the pipeline inspection corridors during work execution. Other examples include research vessels that perform environmental monitoring (Fig. 2.3).

In addition to the above-mentioned corridors, a safety zone with a radius of 5 km has been established around all the three platforms. As a rule, supply and rescue vessels drift or are anchored in this area. Vessels without an affiliation with Sakhalin Energy are not allowed to enter this zone, which is guarded by emergency response and rescue vessels (Fig. 2.3).

2.2.2 Speed Limitation

The speed limitations established in 2020 are given in Table 2.1. Vessels are obliged to avoid sudden changes in speed and course (other than for safety reasons). In agreement with the Western Gray Whale Advisory Panel (GWAP), a test speed increase from the previous 21 knots up to 35 knots was established within the transport corridors when the visibility was ≥ 1 km during daylight hours from 2017 for catamaran-type crew change vessels shuttling from the Kaigan Port to PA-A, PA-B, and LUN-A platforms. The following additional measures were applied on each of these vessels:

- A CCTV system (Full HD outdoor cameras with recording feature) was installed to monitor the sea surface.
- Purpose-built equipment has been installed for recording GPS, speed, and acceleration of the vessels.
- Observations were conducted by two Marine Mammals Observers (MMOs) simultaneously in all voyages.

Where necessary, an analysis was made of video materials and GPS records received from the installed equipment.

After trial period, analysis and risk assessment (Sakhalin Energy, 2019a, Appendix 1), an increase in speed limits for catamaran vessels in transport corridors was agreed by the GWAP experts at its 20th meeting (November 6-8, 2019) on an ongoing basis (Report GWAP 20, 2020)



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Table 2.1. Vessel speed limitation

Conditions	Crew transfer corridor	Within navigation corridors	Westward from corridors ¹ and within inspection and PA-A/PA-B approach corridors
Daylight conditions and visibility \geq 1 km	35 ² knots	17 knots	10 knots
Visibility < 1 km or at night	21 knots	17 knots	7 knots

2.2.3 Zonal Division of Eastern Sakhalin Coastal Waters

In order to compare different zones of marine mammal observations, Sakhalin Energy operational area was arbitrarily divided into four separate areas: Piltun, Lunskeye, Aniva Bay, and transit areas. Given the large size of the last area, it was divided into four observation areas: The North Transit area (between the Piltun and the Lunskeye areas), The Middle Transit area (from the Lunskeye area to the Terpeniya Bay), The South Transit area (from the Terpeniya Bay to the Aniva Bay) and the area south of Sakhalin (Fig. 2.4). In addition, observations in the coastal waters west of Sakhalin Island are grouped as belonging to a separate area west of Sakhalin.

Non-transiting³ vessels should maintain course and speed unless there is an imminent risk of collision. If a whale is observed near the vessel and there is a risk of collision, the vessel is required to stop (if safe to do so), until the risk of collision with the whale has passed.

¹ Speed limits westward from the corridors (towards areas where encounters with WGW are more likely) are to be adhered to in all cases, unless the emergencies or safety considerations require otherwise.

² Agreed by WGWAP experts at its 20th meeting (November 6-8, 2019) for use on an ongoing basis. This speed is based on technical performance criteria, without significantly increasing the risk of collisions with marine mammals, and balances the risk of collision with operational and passenger safety.

³ Transiting vessels move between ports, usually Kaigan or Kholmsk, and the Sakhalin Energy offshore areas. Non-transiting vessels move between platforms within the Sakhalin Energy offshore areas.



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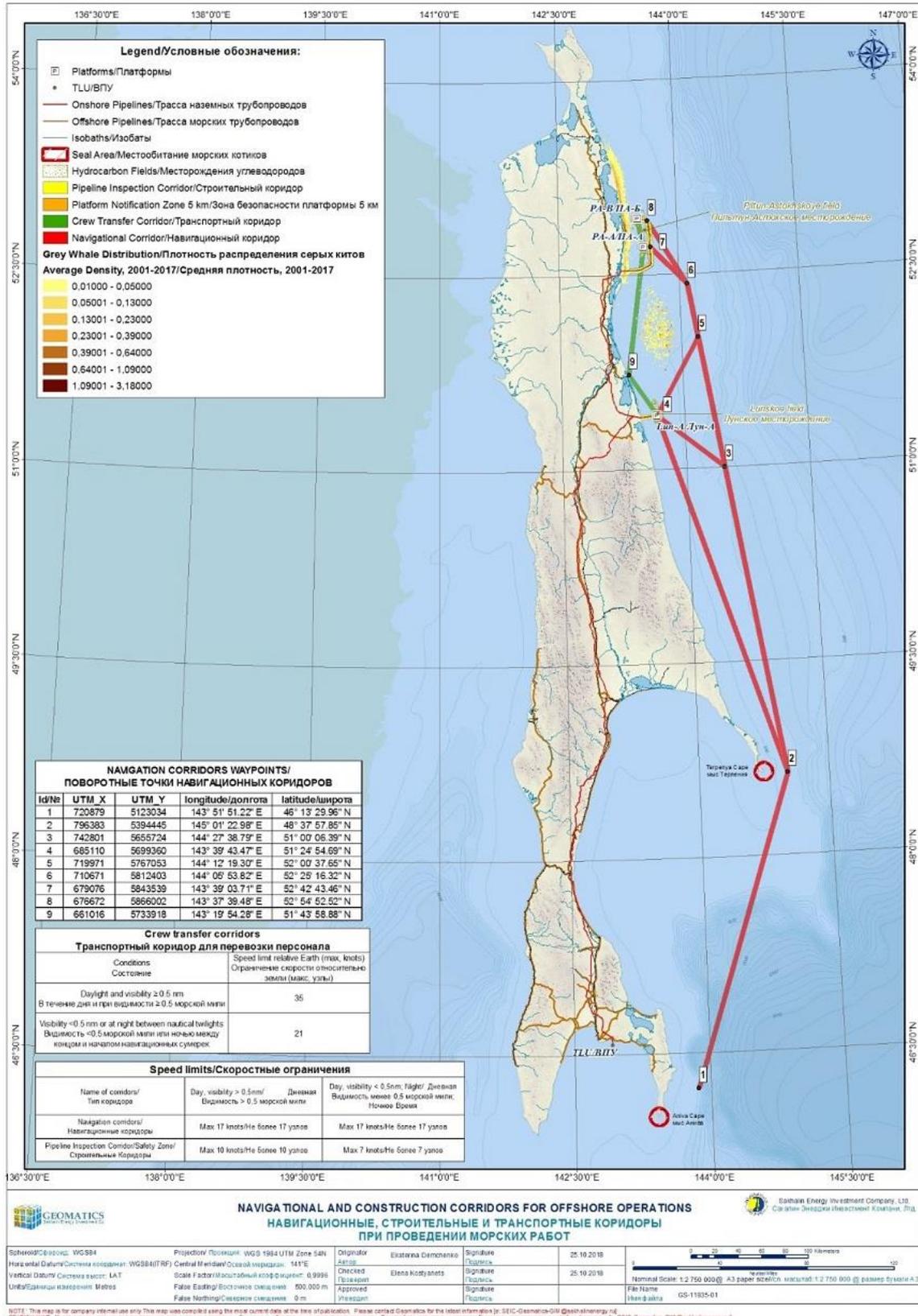


Fig. 2.2. Corridors for the vessels involved in offshore activities related to the Sakhalin-2 Project



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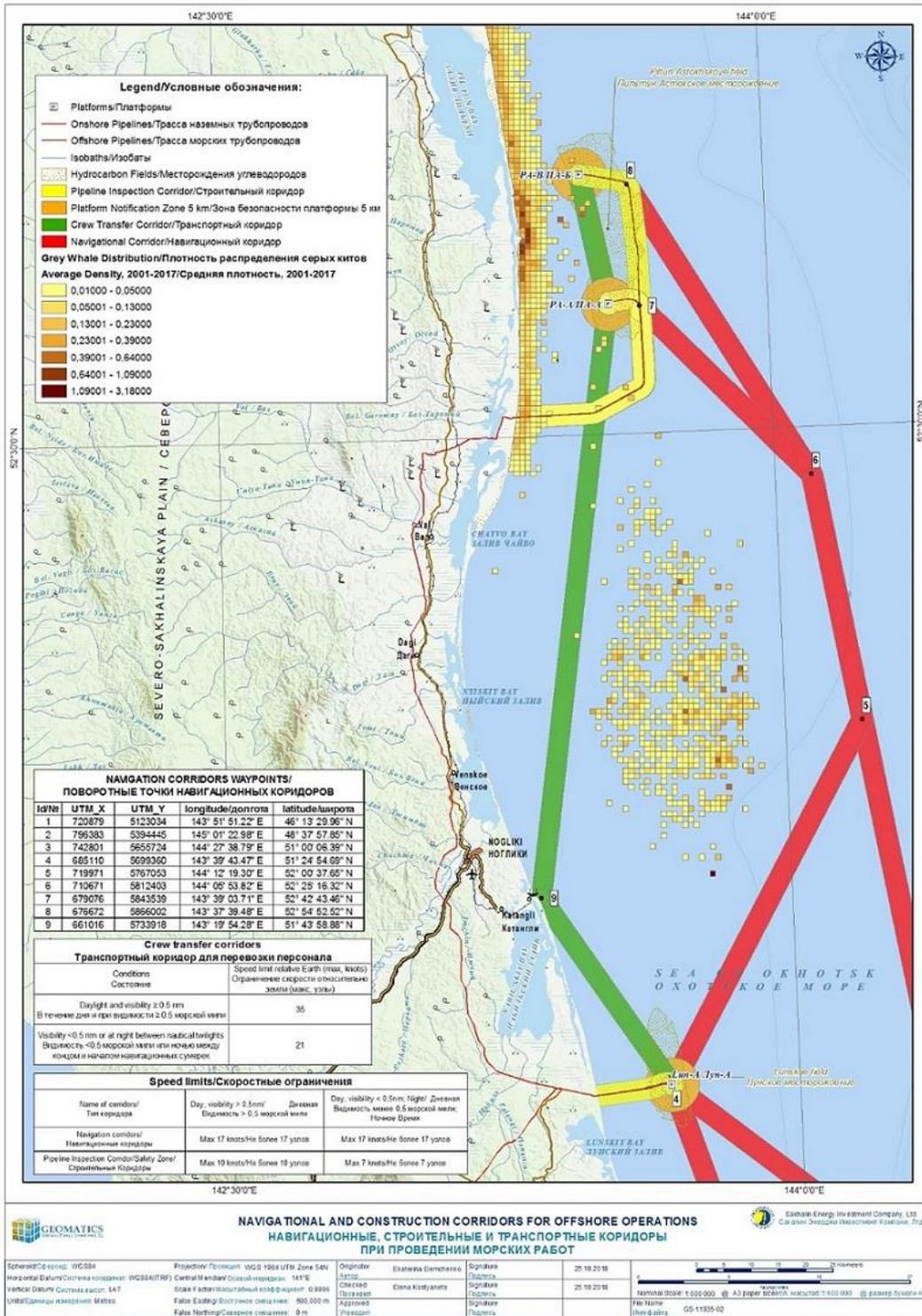


Fig. 2.3. Diagram of navigation, inspection, and crew transfer corridors in Piltun and Lunskeye areas

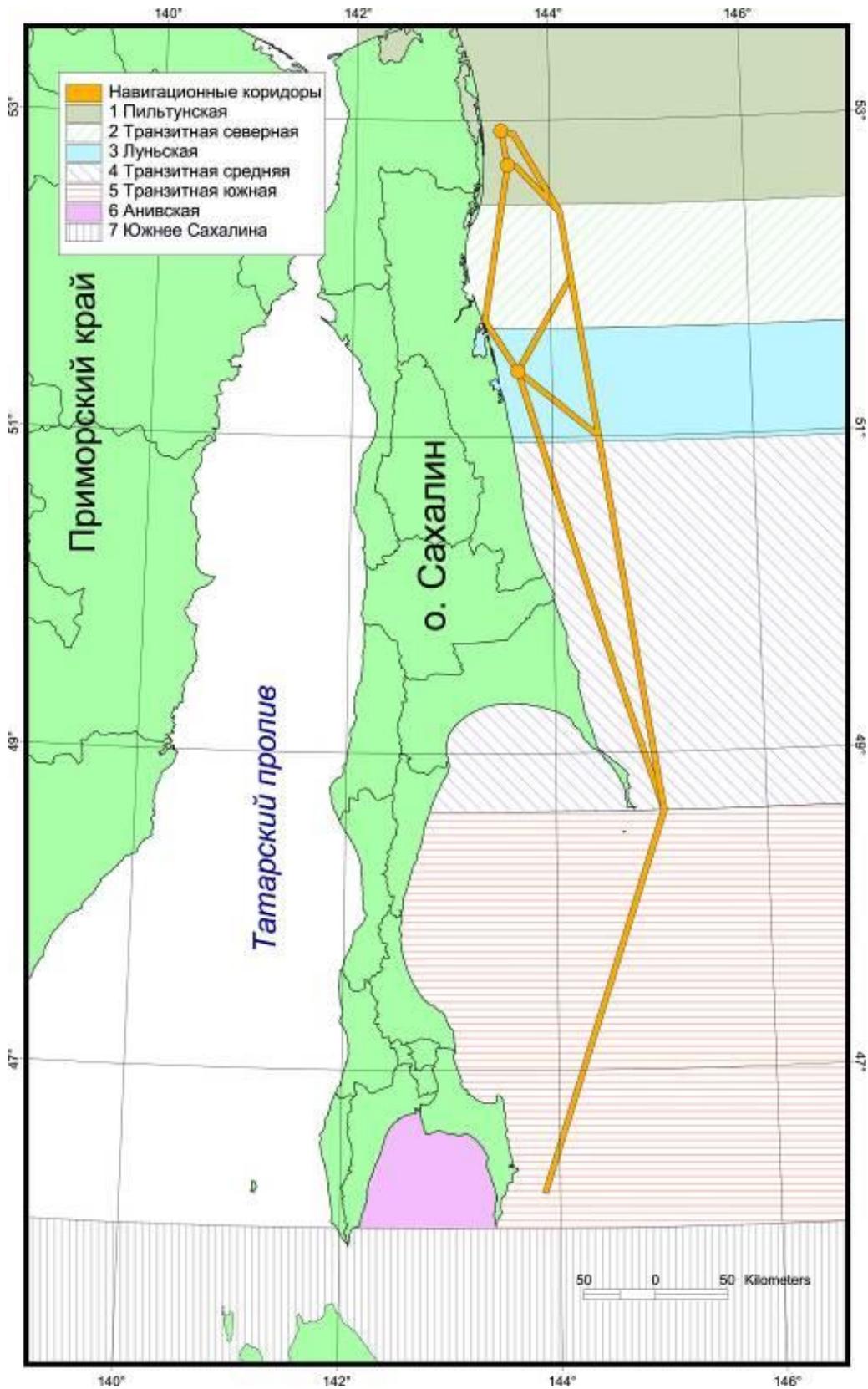


Fig. 2.4. Diagram of zonal division of eastern Sakhalin coastal waters



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2.2.4 Marine Mammal Observers

Sakhalin Energy MMPP requires trained MMOs to be present on each of the main vessels⁴ involved in offshore activities along the eastern coast of Sakhalin Island and to constantly watch for gray whales and other marine mammals. The number of MMOs assigned to each vessel depends mainly on duration and area of operations, as well as the type of activities conducted by the vessel.

MMO duties and scope of responsibilities are outlined below.

- Maintain diligent and systematic watch for marine mammals during daylight hours for the whole period of operational activities.
- Advise the Vessel Master (Sakhalin Energy representative) about practical measures that may be taken to avoid possible collision with a marine mammal sighted within insufficient safety distance⁵. This might include change of course, reduction of speed, or full stop of the vessel, if this can be done safely.
- Record location and number of marine mammals sighted, as well as their behaviour, where possible. This data may be used to improve mitigation measures. Upon detecting marine mammals, records shall be made on the standard data recording form. In addition, the records shall be made every 30 minutes, whether or not a marine mammal was sighted.
- Record all actions taken to mitigate the risk of collision and note the respective timings.
- Observe the area in the vicinity of the vessel for 30 minutes prior to start of noisy operations.
- Immediately report collision between vessel and marine mammal to the Sakhalin Energy representative aboard and to the MMO Programme Coordinator, record the event in a Marine Mammal Mortality-Injury Report.
- Where necessary, remind the Vessel Master to adhere to navigation, inspection, and other established corridors, to comply with the speed limits, especially in night hours and under poor visibility conditions, and not to traverse known feeding areas of gray whales unless it is essential for safety reasons, subject to making a request and obtaining an authorisation.
- Before anchoring, the MMO shall conduct a visual search of the area to make sure that this operation will not endanger any marine mammal.

Protocols

MMOs perform continuous observation of gray whales and other marine mammals during daylight hours. The observation is conducted when the Beaufort Sea State is 5 or less⁶. Since continuous observation is an exhausting task under often adverse weather conditions, its duration is restricted to four hours, after which the MMO takes a break for a minimum of two hours.

If the MMO needs to leave the post, he/she warns the bridge staff about his/her absence. If marine mammals are detected during this time, the MMO is required to continue observation; the MMO can only leave if another MMO replaces him/her. If several marine mammals are present in the area, all MMOs aboard the vessel shall be called on for observation.

The MMO shall be stationed on the highest observation post available on the vessel. Observations of a 180° sector of the sea surface shall be made mostly by naked eye, alternated with binocular scans⁷ at regular intervals. When a marine mammal is detected, binoculars shall be used to confirm the sighting and to identify the species, its distance from the vessel, and direction of movement. Where whales are sighted in front of the vessel, the MMO immediately informs the bridge and advises on precautions to avoid collision.

⁴ "Main vessel" is defined as a vessel that has a high probability of a whale encounter or that provides the most appropriate base for marine mammal observations during the planned activity.

⁵ Safety distance of 1 km is used for endangered whale species (WGW, bowhead whale, North Pacific right whale, fin whale); safety distance of 0.5 km is set for other whales, dolphins, and porpoises; although safety distances are not specified for pinnipeds, vessels are required to proceed with caution.

⁶ The Beaufort scale defines force 5 as 17–21 knots wind speed, 1.8 to 2.8 m waves, many white caps, and some spray.

⁷ The binoculars in use are Fujinon 7X50 FMTRC-SX or similar types.



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The MMO records the observation results every 30 minutes regardless of whether marine mammals have been sighted. Records are made using data codes describing the vessel operations and speed, coordinates and course, time, sea state, visibility, species and number of marine mammals, their movements and activities, and if relevant, the distance between the vessel and the animals.

At the end of each day of observation, the MMO enters the data from the paper data recording forms into a Microsoft Access database. A daily report is then sent to the Sakhalin Energy MMO Programme Coordinator. The daily report summarises the data on marine mammal species detected, their number and distance from the vessel, time of day, location, and the vessel speed. It also describes all collision mitigation measures that were applied. Weekly reports are also sent to the MMO Programme Coordinator.

In addition, the MMO records the GPS track of the vessel in one-minute intervals using a hand-held GPS navigator.

Upon the voyage completion, MMOs receive a de-briefing by the MMO Coordinator and submit all paper data forms, electronic databases, and a brief summary of observations during the voyage in a close-out report.

Further details on protocols are included in the MMO Manual (Sakhalin Energy, 2020), in the MMPP (Sakhalin Energy, 2020), and in the Marine Operating Procedures and Methodical Recommendations (Sakhalin Energy, 2010).

2.2.5 Control of Vessel Movements

Transiting vessels are required to maintain, where possible, a minimum distance of 1,000 m from the detected whales belonging to endangered species (western gray whale, bowhead, Northern right whale, and fin whale); in addition, they should maintain a distance of 500 m from other non-endangered marine mammals. No minimum separation distance is established for pinnipeds, but vessels shall proceed with appropriate caution if pinnipeds are sighted close to the vessel.

If a whale surfaces in the vicinity of the vessel or moves towards it, the vessel is required to take all possible precautions to avoid collision until the collision risk has passed.

The MMPP forbids any vessel to pursue, intercept, encircle whales, or separate groups of whales.

Vessels are also required to avoid proceeding directly in front of moving or stationary whales, and when moving parallel to whales, vessels should maintain constant speed and course.



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3 MARINE MAMMAL OBSERVERS

3.1 QUALIFICATION OF MARINE MAMMAL OBSERVERS

In 2020, four Marine Mammal Observers (MMOs) were employed within activities on the vessels engaged in Sakhalin Energy offshore operations in the license areas and during transits to these areas. All MMOs had relevant experience, either gained on Sakhalin Energy vessels or doing other activities related to marine mammal observations in this region. All MMOs have a university degree in biology, and one MMO hold a Ph.D. degree in biology.

3.2 TRAINING PROGRAMME

The MMO's roles and responsibilities are described in the MMO Manual (Sakhalin Energy, 2020). This manual is a working document and amended annually to reflect changes to the Sakhalin Energy MMPP and in response to comments and proposals put forward by MMOs and other stakeholders with regard to the implementation of the MMO Programme. The main objectives of the MMO Manual are to:

- serve as a training manual for the MMO Programme;
- provide guidance and reference information to the trained MMOs participating in Sakhalin Energy offshore activities;
- provide information to vessel operators and vessel crews with regard to the Marine Mammal Observer roles and responsibilities.

The following documents were provided to MMOs and used during the field season:

- Marine Mammal Observers Manual;
- Database Instruction Manual;
- brief guidance for identification of marine mammals in Sakhalin waters;
- data code table; and
- data recording forms.

3.3 ORGANISATION AND METHODS

This document provides no detailed description of the MMO work arrangement, monitoring protocols, communication or reporting structure. The detailed description is provided in the Marine Mammal Observers Manual (Sakhalin Energy, 2020).



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4 OBSERVATION PROGRAMME

4.1 OFFSHORE OPERATIONS

In 2020, Sakhalin Energy performed offshore activities in the Piltun-Astokhskoye and Lunskoye areas. Activities which required vessel support and could potentially pose a risk of marine mammals' collision are described below.

Piltun-Astokhskoye Area

The operations in the Piltun-Astokhskoye area included hydrocarbon production using platforms PA-B and PA-A. These activities were also supported by supply vessels shuttling between Kholmsk and the platforms, emergency response and rescue vessels (ERR) and oil spill response (OSR) standby vessels located between PA-A and PA-B platforms. (In accordance with the MMPP mandatory presence of marine mammal observers (MMOs) on these vessels during routine works is not required). Crew change vessels shuttled between the Kaigan Port and the platforms. Five supply vessels were involved in the gray whale monitoring program

Lunskoye Area

As a part of the production programme, supply vessels, ERR and OSR vessels worked in the Lunskoye area. Environmental monitoring was conducted around the offshore pipeline and the platform. Crew change vessels shuttled between the Kaigan Port and the platform. Five supply vessels were involved in the gray whale monitoring program

Environmental monitoring was carried out from the Gennady Nevelskoy vessel near the Sakhalin Energy platforms at the Lunskoye and Piltun-Astokhsky areas (in accordance with the criteria established by the MMPP, the presence of MMOs is not required for this areas ant type of work on the vessel).

Aniva Bay

Aniva Bay was used as a transit area on vessel routes to the Sakhalin Energy license areas on the north-eastern coast of Sakhalin. Activities in Aniva Bay included tanker traffic to and from TLU through La Perouse Strait, as well as traffic of tug and line boats, OSR vessel, and survey vessel. In accordance with the MMPP mandatory presence of marine mammal observers (MMOs) on these vessels is not required.

4.2 VESSELS' ACTIVITY

The SCF Endurance, SCF Endeavour, SCF Enterprise, and Gennady Nevelskoy supply vessels alternately made voyages between Kholmsk and the Sakhalin Energy license areas. The vessels were ordered to strictly follow the navigation corridors.

Fyodor Ushakov, Stepan Makarov and Evgeny Primakov standby vessels performing the OSR functions and providing support and accommodation to crews were permanently stationed between PA-A, PA-B and LUN-A platforms.

Polar Piltun and Polar Baikal platform crew change vessels made voyages between the Kaigan Port and PA-A, PA-B, and LUN-A platforms during ice-free navigation period.

4.3 MARINE MAMMALS OBSERVERS

In accordance with the MMPP, in the navigation period 20120, marine mammal observers (MMO) were present and conducted regular monitoring from two crew change vessels Polar Piltun and P. Baikal. MMOs also were present on vessels operating near gray whale feeding areas for implement a gray whale monitoring program.

In total in 2020 navigation period, observation of marine mammals conducted from 7 vessels. In total observation lasted 115 vessel days (5 to 31 days on different vessels). The number of working days per month is given in Table 4.1.



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Table 4.1. The total number of working days by MMOs in 2020

Судно	June	July	August	September	October	Total
Polar Baikal	2	6	5			13
Polar Piltun	4	10	5	5	7	31
Gennadiy Nevelskoy			5			5
SCF Endeavour			4	3		7
SCF Endurance		2	10	9	3	24
SCF Enterprise			5			5
Yevgeny Primakov			11	19		30
Total days	6	18	45	36	10	115
Share,%:	5,22	15,65	39,13	31,3	8,7	100

In general, over the entire period of operations, the average number of working days per month on all vessels was 23 days. This value differed significantly from month to month: from 6 days in June to 45 days in August. The difference in number of working days due to crew-change vessels schedule and Gray whale monitoring (mainly in Augusta-September). The work duration of MMOs (in hours) on these vessels is given in Table 4.2.

Table 4.2. Total number of observation hours in 2020

Судно	Observations (hh)	Breaks in observations (hh)	Share %
Polar Baikal	85:05:00	10:00	11,75
Polar Piltun	170:47:00	1:40	0,98
Gennadiy Nevelskoy	59:30:00	0:00	
SCF Endeavour	78:00:00	0:00	
SCF Endurance	286:01:00	0:00	
SCF Enterprise	62:00:00	0:00	
Yevgeny Primakov	375:25:00	0:00	
Итого:	1116:48:00	11:40	1,04

Within the reporting period, the observations have lasted 1116 hours and 48 minutes. The total duration of breaks in the observations was 11 hours and 40 minutes (about 1 % of the total time). These were mainly due to adverse weather conditions and specific distribution and abundance survey of gray whales in the offshore feeding area (a component of the Joint Program scope of work), the results of which are presented in a separate report.

Types of vessel activities and MMOs' schedules of work are given in Table 4.3.



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Table 4.3. Vessel activities and the list of Marine Mammal Observers, 2020

Vessel	Area and type of activity	Names of MMOs	Date of commencement	Date of completion
Polar Baikal	Piltun/Lunskoye: crew change	V. Kavun, E. Lebedev	04.06.	29.08.
Polar Piltun	Piltun/Lunskoye: crew change		04.06.	21.10.
Gennadiy Nevelskoy	Gray whale PhID	A. Ermoshin, A. Pogonyshv	10.08.	14.08.
SCF Endeavour			17.08.	03.09.
SCF Endurance			30.07.	03.10.
SCF Enterprise			24.08.	28.08.
Yevgeny Primakov			08.08.	23.09.

Two MMOs were engaged in the observations from the Polar Piltun and Polar Baikal 19 voyages from Kaigan Port to LUN-A and back, 19 voyages Kaigan Port -PA-A and back; and 10 voyages from Kaigan Port to PA-B and back (Table 4.4).

Table 4.4. Number of voyages for crew change vessels, 2020

Area	Number of voyages		
	Polar Baikal	Polar Piltun	Total
Kaigan–LUN-A–Kaigan	3	16	19
Kaigan–PA-A–Kaigan	10	9	19
Kaigan–PA-B–Kaigan	0	10	10
Total	13	35	48

For each area, the number of observation hours was counted depending on the weather conditions (no observations were conducted during storm) and the daylight hours (Table 4.5).

Table 4.5. Number of observation hours by zones in 2020

Area of operations	Observations (hours)						Share %
	June	July	August	September	October	Total	
Area 0 - West of Sakhalin		3.17			39.00	42.17	3,8
Area 1—Piltun	6.50	30.82	229.75	71.50	6.18	344.75	30,9
Area 2—North Transit	13.83	60.37	92.50	35.43	14.38	216.52	19,4
Area 3—Lunskoye	6.92	14.48	160.58	272.75	6.63	461.37	41,3
Area 4 - Middle Transit			10.50	13.00		23.50	2,1
Area 5 - South Transit		11.50		8.00		19.50	1,7
Area 7 - south of Sakhalin		4.00		5.00		9.00	0,8
Total:	27.25	124.34	493.33	405.68	66.19	1116.79	100,00
Share %:	2,44	11,13	44,17	36,33	5,93	100,00	

Most of the total observation time was in the Lunskoye area (41,3%). The Piltun zone located next to it in terms of the duration of observations is in second place (30.9%), the North Transit - in third (19%). In general, the observation time in these three zones was more than 90% of the total.



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5 COLLISION MITIGATION MEASURES

The responsibility for marine mammals' collision mitigation measures was assigned to the MMOs, the Sakhalin Energy representatives, the masters and the crew members of the vessels chartered by Sakhalin Energy. The Vessel Masters were obliged to follow the Sakhalin Energy Marine Operating Procedures and Methodical Recommendations (Sakhalin Energy, 2010) including the mitigation measures from the MMPP.

The main role of MMOs was to inform the Vessel Master on the presence of marine mammals and to advise on actions to be taken if marine mammals were sighted within insufficient safety distance. These mitigation measures can include speed reduction, course change, or full stop of the vessel. The effectiveness of these measures depends on the reliability, the coordination and the responsiveness of the MMOs and the team as well as their ability to identify the animals and determine their species.

5.1 ADHERENCE TO VESSEL CORRIDORS

In 2020, MMOs were on board of 7 vessels (Table 4.1). MMOs took the records of the vessel position every 30 minutes or whenever a marine mammal was sighted. In total, MMOs have recorded 2699 vessel coordinates, which were used to map the voyage tracks. Using these records, the MMO Programme Coordinator checked the compliance of vessel movement with the designated corridors. Routes and coordinates were mapped for a daily report to check the compliance with the designated routes within the corridors.

In addition, observers on each vessel were equipped with GPS navigators (Garmin GPSMAP 60CSx). GPS tracks were recorded with one-minute intervals. MMOs downloaded the recorded tracks from the GPS to a computer and sent them to the MMO Coordinator. This GPS data was used when more thorough analysis of possible deviations from corridors was required.

In case of deviations from the specified corridors, MMO in daily reporting, necessarily indicate the reasons for exit. When deviations are found, the reasons for which are not specified in the report, or such reasons were found to be unsatisfactory to the requirements of the MMPP, the MMO Programme Coordinator had to initiate investigations to determine the reason for these deviations.

In general, the compliance of movement within the corridors, unless the vessel mission required otherwise, is considered satisfactory. Most of the crew change vessels tracks were inside the crew transfer corridors. (Fig. 5.1–5.2). The vessels on which the photo-ID team was based operated outside the corridors and in the feeding areas to implement of the gray whale monitoring program (Fig. 5.3-5.5).



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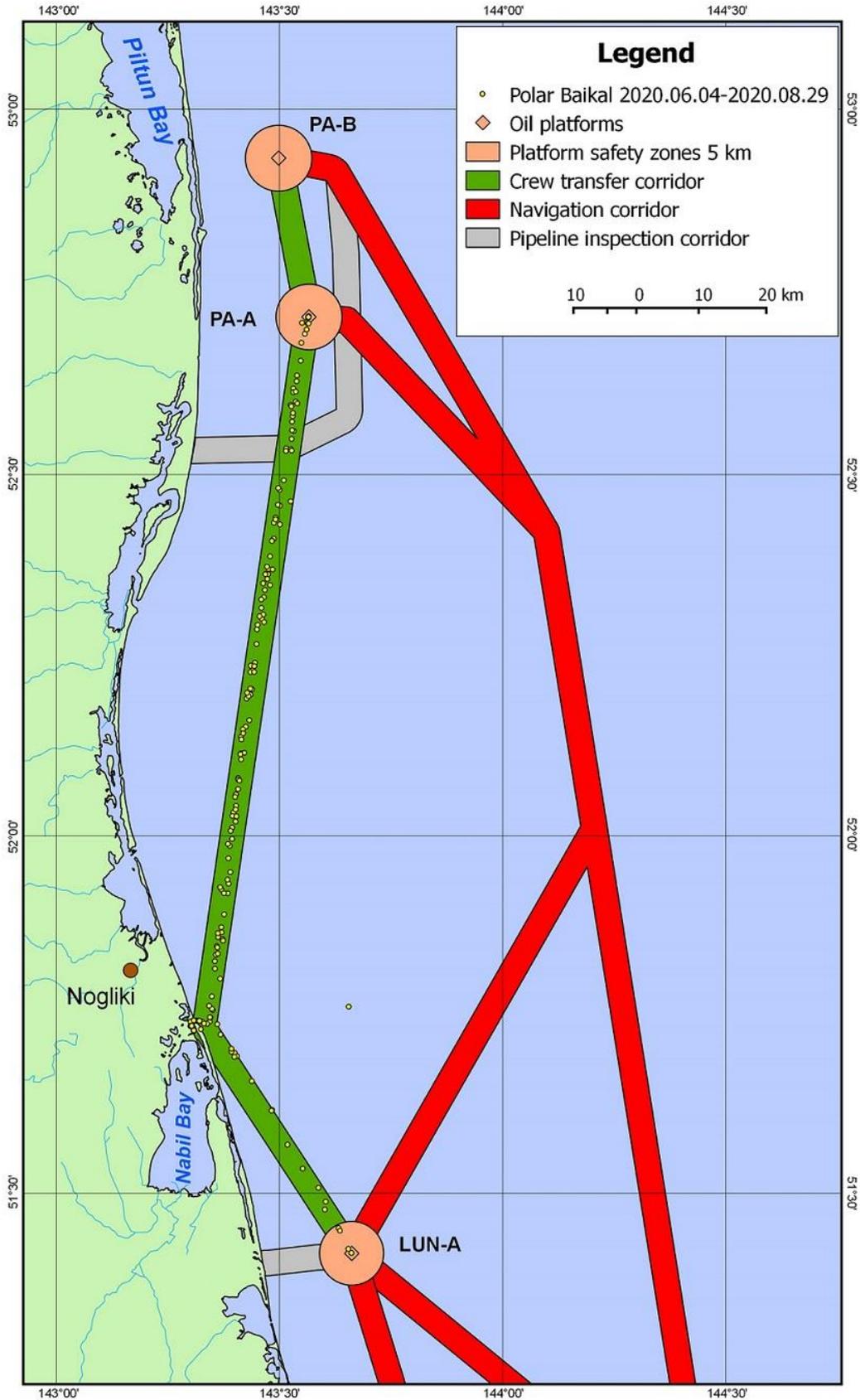


Fig. 5.1. Routes of Polar Baikal crew change vessel



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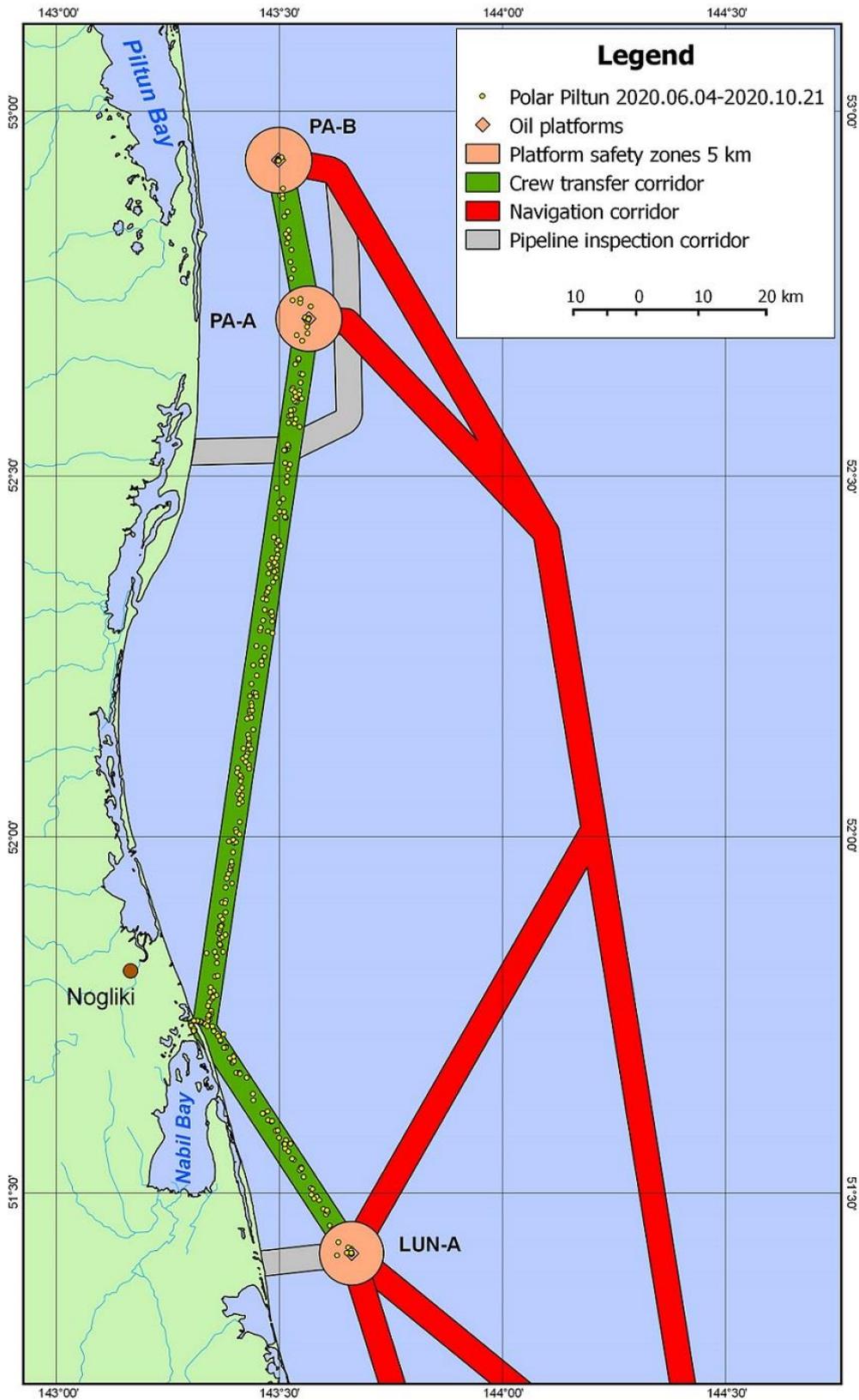


Fig. 5.2. Routes of Polar Piltun crew change vessel



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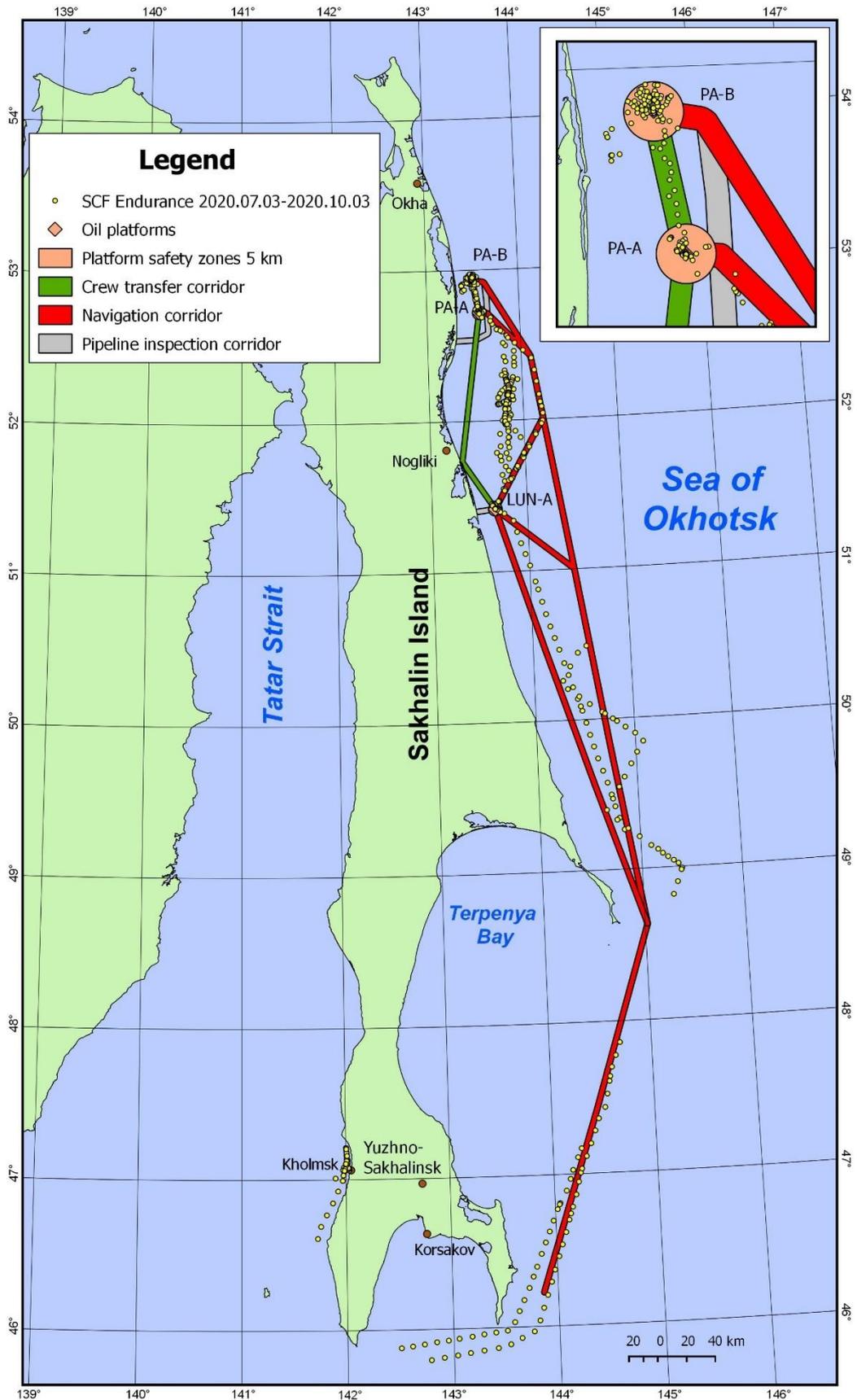


Figure 5.3. Routes of SCF Endurance (Gray Whale Photo-ID Team)



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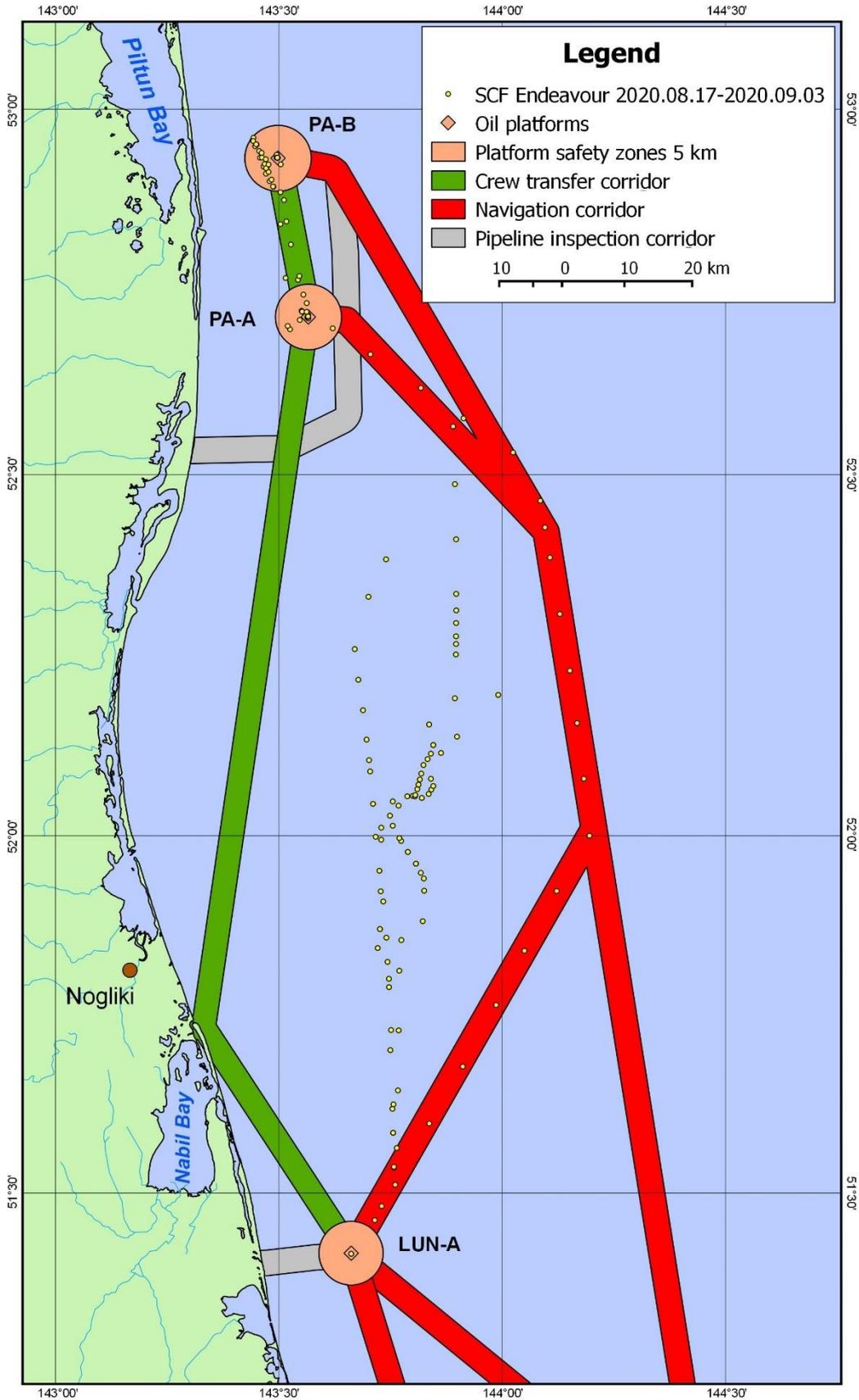


Figure 5.4. Routes of SCF Endeavour (Gray Whale Photo-ID Team)



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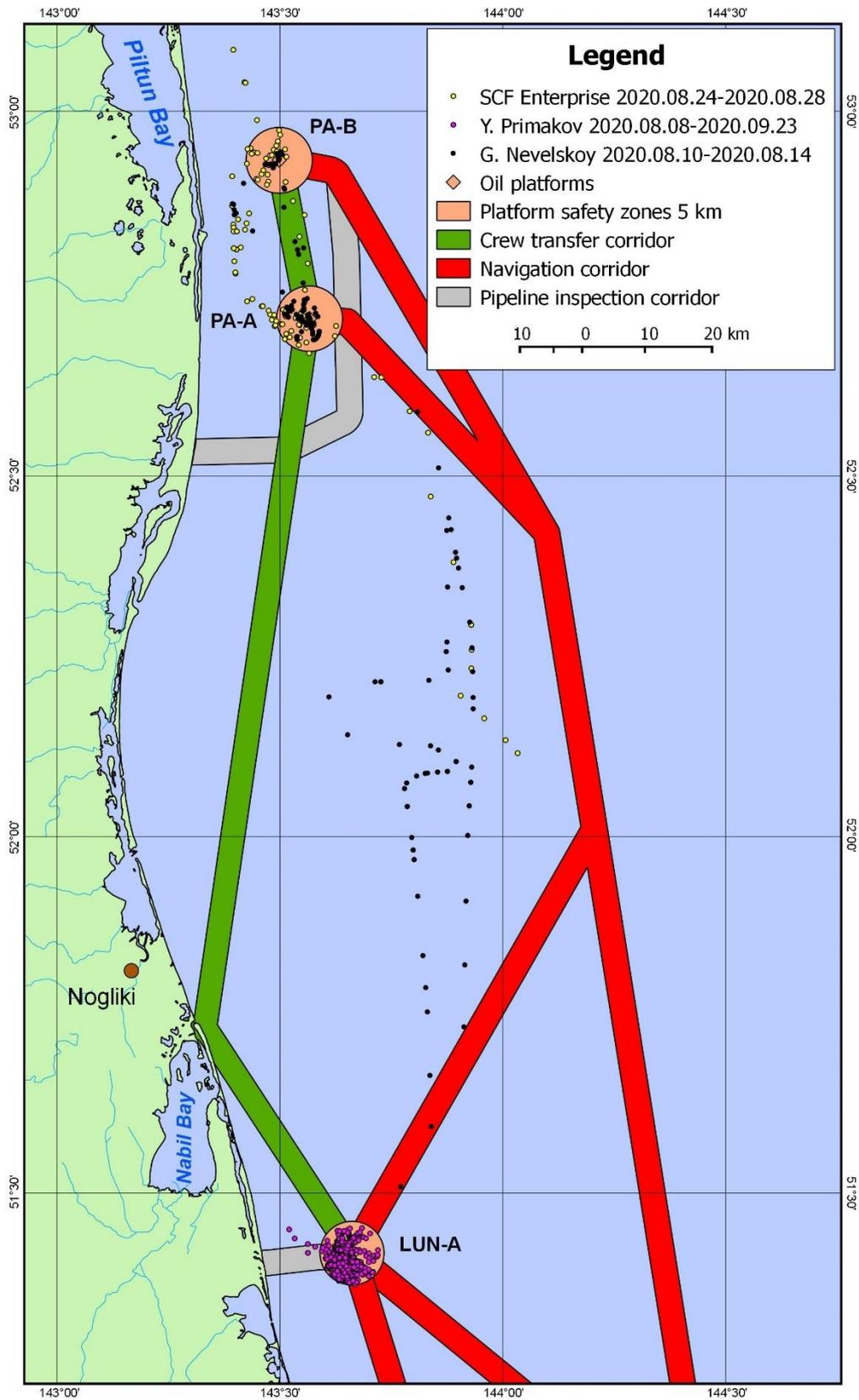


Figure 5.5. Routes of the vessels SCF Enterprise, Gennadiy Nevelskoy and Evgeny Primakov (gray whale Photo-ID Team)



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Duration of vessels deviation from the designated corridors is given in Table 5.1.

Table 5.1. Duration of deviations from corridors in 2020

Vessel	Total time of observations	Duration of deviation from the corridor	Share of total time, %
Gennadiy Nevelskoy	59:30	17:0	28.57
Polar Baikal	85:5	0:55	1.08
Polar Piltun	170:47	0:30	0.29
SCF Endeavour	78:0	20:57	26.86
SCF Endurance	286:1	131:21	45.92
SCF Enterprise	62:0	17:30	28.23
Yevgeny Primakov	375:25	1:30	0.40
Total:	1116:48	189:43	16.99

The vessels stayed outside the corridors for 189.7 hours or 17% of the total observation period.

The total time of staying outside the corridors was less than 0.3 % for Polar Piltun and about 1 % for Polar Baikal. All deviations from the corridors were related to the navigation rules for avoiding a collision with third parties' vessels.

The main contribution to the total time spent outside the corridors (more than 188 hours) was made by the vessels from which the work on photo-identification of gray whales was carried out. Basically, research team carried out of PhID survey from the SCF Endurance, which operated out of corridors about 45% of the total time. This is due to both the GW monitoring survey and the deviation from the corridor on the transit route due to unfavorable weather, when the vessel was forced to tack to ensure crew safety. The Yevgeny Primakov vessel was on standby at the LUN-A Platform and did not take direct part in the monitoring work. Photo-ID team was based on this vessel, waiting for other vessels

5.2 COMPLIANCE WITH THE SPEED LIMITS

No cases of exceeding speed limits were recorded during the entire observation period in 2020.

5.3 OBSERVATION RESULTS AND MEASURES TAKEN

5.3.1 Gray Whales

In 2020, during the Sakhalin Energy offshore operations, 205 gray whales' sightings were recorded from the vessels with MMO's onboard, with a total of 436 individuals (Tables 5.2, 5.3, fig. 5.6, 5. 7).

Gray whale sightings were recorded by MMOs from 5 of 7 vessels on which MMOs operated. The largest share of gray whales records (108 out of 205 sightings, or 52.7%) was made from the SCF Endurance, which carried out monitoring (photo-identification) of gray whales in the offshore feeding area. No gray whales were recorded from the Yevgeny Primakov vessel. In 2020, two gray whales sightings were recorded from crew change vessels, with both from the Polar Piltun. No gray whales were recorded from the Polar Baikal (Table 5.3).

Almost all gray whale's sightings were recorded within two months: in August (70%) and September (29.3%) and were due to monitoring studies in the offshore feeding area.



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Table 5.2. Gray whales' sightings by months, 2020

Vessel	Sightings by months					
	June	July	August	September	October	Total
Gennadiy Nevelskoy			44			44
Polar Piltun		1			1	2
Polar Baikal						0
SCF Endeavour			37			37
SCF Endurance			48	60		108
SCF Enterprise			14			14
Yevgeny Primakov						0
Total:	0	1	143	60	1	205

The distance of whales sighted by MMOs varied within 500–4500 m, with an average of 2332 m. There were 17 sightings or 8.3% at a distance, which is equal to or less than the safe distance. In 8 out of 17 cases, at the indicated distances, proactive measures were taken to reduce the impact. In other cases, no action was taken, since vessels moved a safe course., i.e. as the movement continued, the distance to the whale increased. During the entire ice-free navigation season there were no encounters with gray whales that posed a risk of collision. Thus, in 2020, presence of MMOs on the vessels allowed to take timely measures to minimise risk of collision or an adverse impact on gray whales. The summary data of encounters with gray whales for all vessels that occurred at distances equal and less than safe, including encounters from the Polar Piltun vessel, are given in Table 5.3.

Table 5.3. Gray whale sightings from the vessels at distances equal and less than safe during Sakhalin Energy offshore operations in 2020

Number of ind.	Date	Time	Vessel	Angle	MM Direction	Distance (m)	Latitude			Longitude			Measures taken
2	31.08.	12:21	Endaevour	285	9	800	143	48	60	52	3	89	No
1	31.08.	13:00	Endaevour	30	6	700	143	50	43	52	6	85	Course change
2	31.08.	13:11	Endaevour	353	9	1000	143	50	75	52	7	57	No
1	31.08.	14:36	Endaevour	60	6	500	143	53	81	52	16	61	No
1	02.08.	19:12	Endurance	345	12	500	143	47	75	52	1	31	Deceleration
1	02.08.	19:52	Endurance	308	6	500	143	50	0	52	5	52	Deceleration
2	02.08.	19:52	Endurance	75	6	1000	143	50	0	52	5	52	Deceleration
1	07.08.	19:00	Endurance	0	12	1000	143	49	33	52	6	26	Vessel stop
1	26.09.	14:40	Endurance	300	9	700	143	50	96	52	13	75	No
4	26.09.	15:56	Endurance	300	6	1000	143	48	47	52	2	58	No
2	26.08.	19:50	Enterprise	330	6	500	143	24	19	52	50	16	No
2	27.08.	11:25	Enterprise	300	6	800	143	23	86	52	47	70	No
2	28.08.	18:30	Enterprise	270	6	800	143	55	74	52	17	66	No
1	28.08.	18:42	Enterprise	60	6	600	143	55	80	52	15	58	Course change
3	14.08.	8:00	Nevelskoy	75	6	700	143	55	85	52	15	75	Course change
1	30.07	14:52	Пильтун	278	12	600	143	20	42	51	45	81	No
1	17.10	9:49	Пильтун	60	4	1000	143	26	51	51	37	86	Course change



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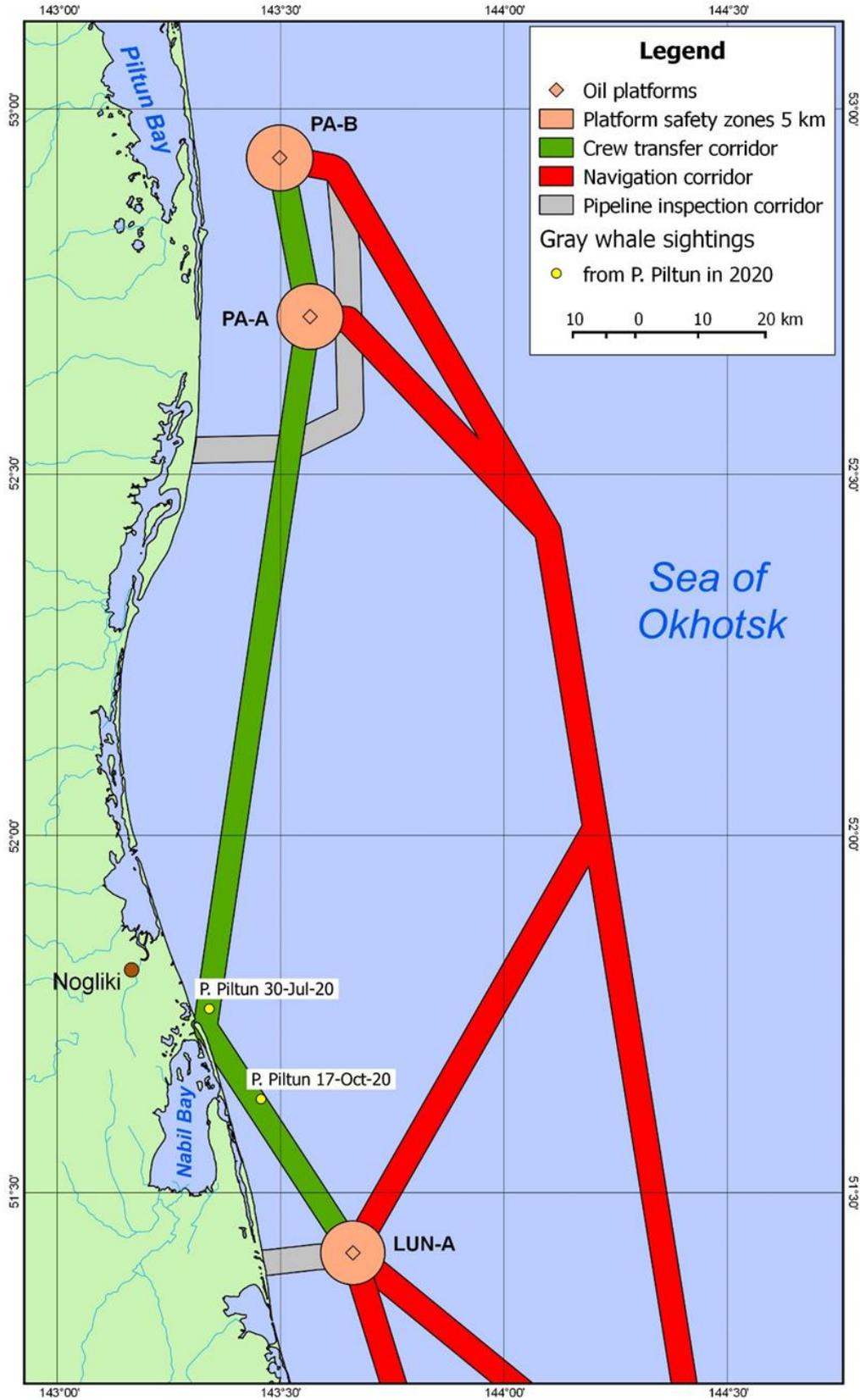


Fig. 5.6. Locations of gray whales sightings recorded by MMO from crew change vessel Polar Piltun



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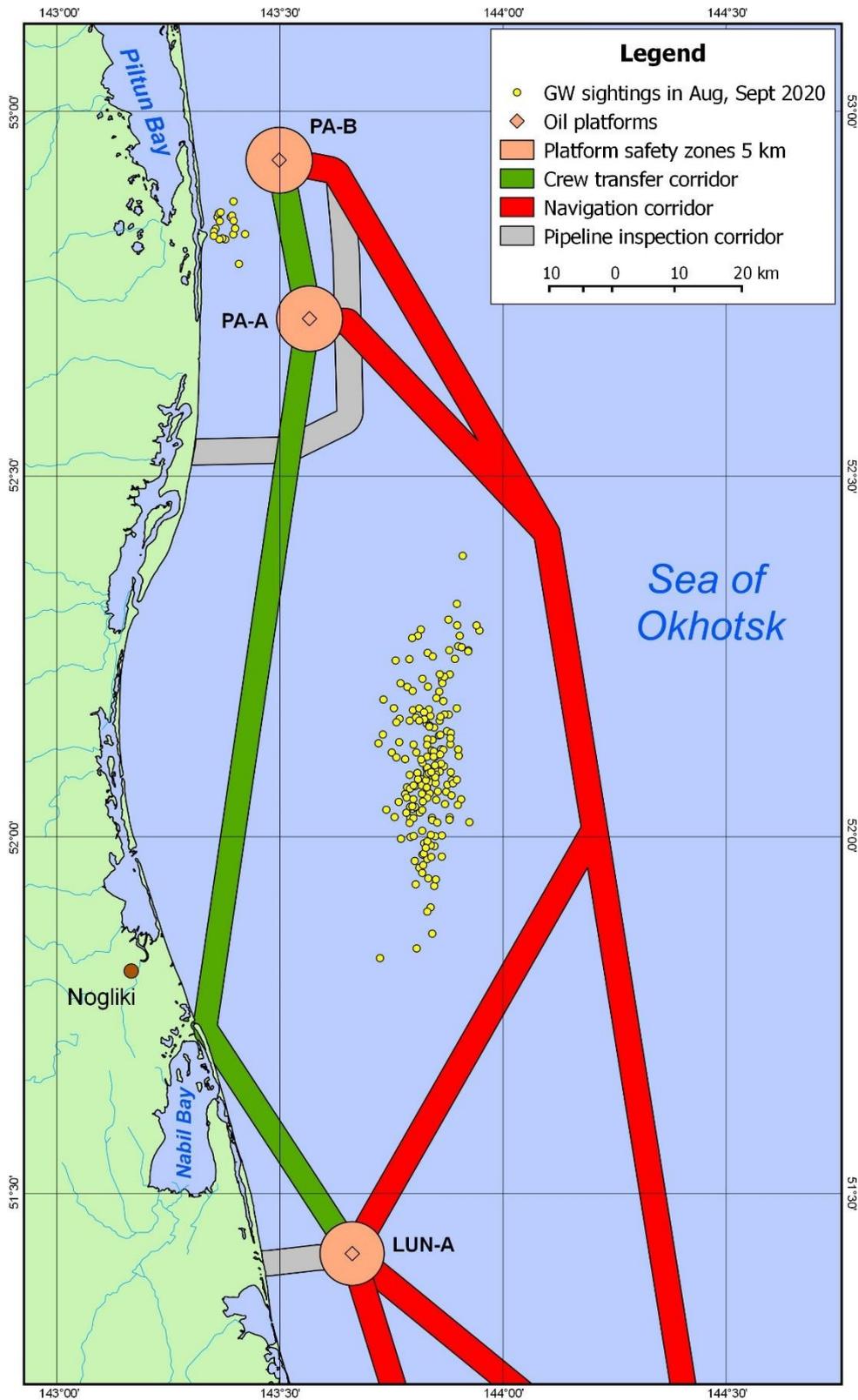


Fig. 5.7. Locations of gray whales sightings recorded by MMOs from vessels engaged in photo-identification of gray whales



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5.3.2 Fin Whales and Northern right whale

Over the entire observation period in 2020, 8 encounters with fin whales were recorded, all from the SCF Endurance during its transit to the area and back, a total of 20 individuals were recorded at distances from 500 to 6000 m. The average distance for all sightings was 2850 m. (Fig. 5.10, Table 5.3.).

At a distance of less than 1000 m, there were 2 encounters on 29.09.2020, in both cases whales were moving away from the vessel, there was no threat of collision, there was no need to take additional measures to reduce the risk of collision.

Table 5.4. Fin whale sightings from vessels during Sakhalin Energy offshore operations in 2020

Number of ind.	Date	Time	Vessel	Angle	MM Direction	Distance (m)	Latitude			Longitude			Measures taken
6	31.07	14:44	Endurance	45	12	6000	144	8	88	46	44	39	No
4	31.07	16:20	Endurance	300	12	5000	144	15	49	47	0	41	No
4	31.07	20:11	Endurance	45	6	1500	144	34	94	47	38	23	No
2	29.09	17:30	Endurance	45	3	800	145	6	11	49	8	99	No
1	29.09	17:49	Endurance	90	6	2500	145	10	9	49	7	32	No
1	29.09	18:15	Endurance	315	9	1500	145	15	81	49	4	17	No
1	29.09	18:42	Endurance	300	no	5000	145	21	79	49	1	36	No
1	29.09	18:57	Endurance	330	8	500	145	23	75	48	59	39	No

During the 2020 observation period, Northern right whale was sighted only once. At the same time, MMOs registered two whales at the same time on different sides of the vessel and made two records in the log. At the time of observations, the vessel was not moved, there was no threat of collision, no action was required.

Recording made by MMO "The vessel was drifting at distance about 3 km north of platform LUN-A, where an encounter with two Northern right whales occurred. The whales were at a distance of about 200 meters. The behaviour was calm, the whales swam slowly, often diving. The whales were practically in one place for an hour".

Table 5.5. Northern right whale sightings from vessels during Sakhalin Energy offshore operations in 2020

Number of ind.	Date	Time	Vessel	Angle	MM Direction	Distance (m)	Latitude			Longitude			Measures taken
1	24.09	18:30	Endurance	330	7	200	143	39	49	51	26	39	No
1	24.09	18:30	Endurance	30	9	200	143	39	49	51	26	39	No

5.3.3 Other Cetaceans

In 2020, four other species of cetaceans were recorded:

- Minke whale;
- Killer whale;
- Dall's porpoise;
- Harbour porpoise.

A total of 57 sightings were registered, of which in 50% of cases (29 out of 57), these cetacean species were observed at a distance of 500 m or less i.e. equal to or less than the established safety distance. With this, a significant range of these values for different species was noticed.

Large whales such as the Minke whale and the killer whale were usually sighted at long distances, with



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the encounter rate for these two species at distances less than 500 m were 33%, while 63% of encounters with porpoises (harbour and Dall's) (21 of 33) occurred at a distance of ≤ 500 m. This is quite typical for dolphins due to their high speed and lack of obvious avoidance of vessels.

Table 5.6 presents information of movement observations for these four cetacean species. When considering the direction of movement of these species in relation to the vessel, two types of their movement were observed most often— parallel to its course (49%) and away from the vessel (47%). These types of movements are identified as the main ones and occurred in a total of 96 % of all the sightings in 2020.

Table 5.6. Cetaceans sightings from the vessels during Sakhalin Energy offshore operations in 2020

Species	Number of sightings	Number of sightings in a distance of ≤ 500 m	Visibility ≤ 500 m	Movement	Away from the vessel	Parallel to the vessel	Toward the vessel	Movement in place	No movement	Unknown
Minke whale	19	7	0		8	10	1	0	0	0
Killer whale	5	1	0		1	3	0	1	0	0
Harbour porpoise	31	19	0		17	14	0	0	0	0
Dall's porpoise	2	2	0		1	1	0	0	0	0



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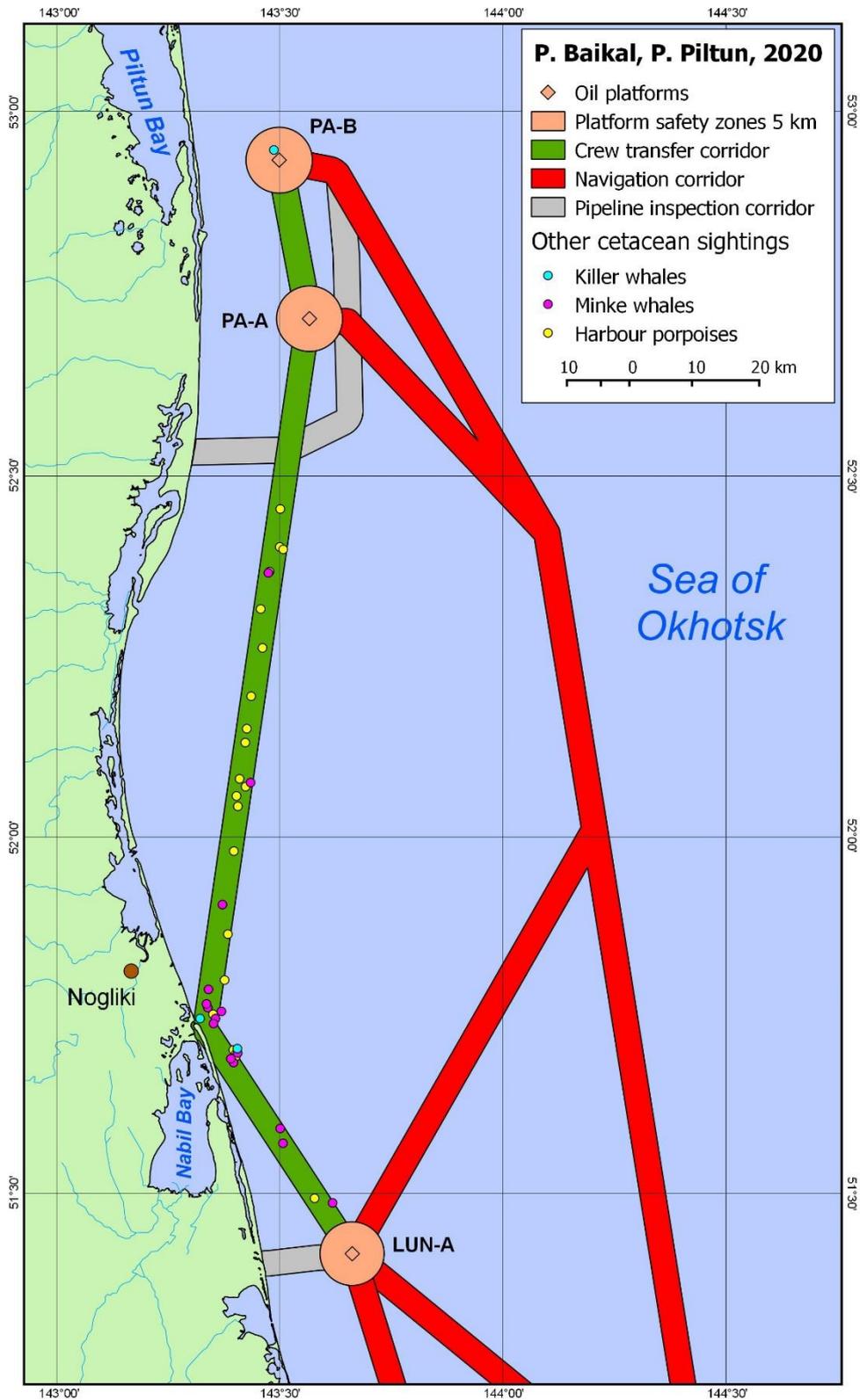


Fig. 5.8. Location of recorded cetaceans' sightings from Polar Baikal and P. Piltun vessels

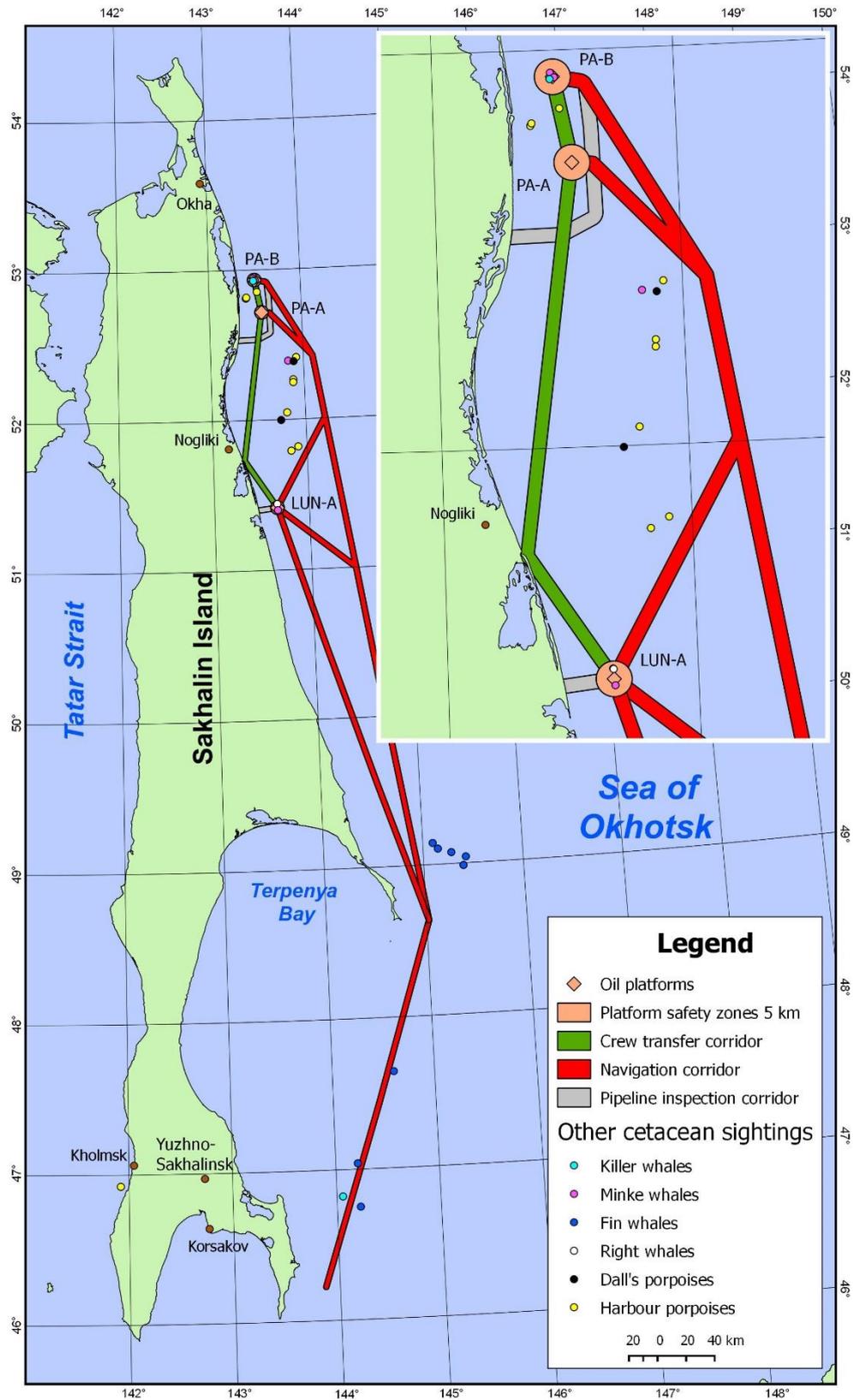


Fig. 5.9. Location of recorded cetaceans' sightings from vessels engaged in photo-identification of gray whales



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Below is a description, arranged by types of measures taken on all marine mammals observed in 2020 (Table 5.7). MMOs have reported a total of 395 encounters (sightings) with marine mammals, including gray whales. 272 observations out of them were of cetaceans. In some cases, when animals meet closer than a safe distance no measures were required to avoid the collision as the animals were moving parallel to the vessel course or away from the vessel. Although no cases of near collision with marine mammals were recorded, in 5 %cases (21 from 395) for minimize the potential collisions with whales and dolphins various preventive measures have been taken.

Full stop as measure to reduce the impact on marine mammals, in 2020 was taken once with a gray whale encounter . The deceleration measure was taken three times when a gray whales encounters. In all other cases, the vessels changed their course to mitigate the impact on marine mammals.

Table 5.7. Measures taken in 2020 to mitigate the impact on marine mammals

Species	Number of measures taken				No mitigation measures were taken.
	Deceleration	Full stop of the vessel	Course change	Course change and deceleration	
GW	3	1	4		197
FW					8
RW					2
MW			4		15
KW					5
DP					2
HP			9		22
SL					10
NF					47
RS					20
SS					46
Total	3	1	17	0	374

Note. Species: GW—gray whale, FW – Fin whale, RW - Northern right whale, MW—Minke whale, KW—killer whale, DP—Dall's porpoise, HP—Harbour porpoise, SL—Steller 's sea lion, NF—northern fur seal, RS—ringed seal, SS—spotted seal.



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6 OBSERVATION PROGRAMME EFFICACY

The number of observations depends on various factors, the most significant being the number of animals present in coastal waters, observation effort determined by the number of vessels and MMOs (i.e. the total number of observation hours and the number of observations per time unit), and weather conditions.

6.1 GENERAL DESCRIPTION OF SIGHTING STATISTICS

During the field season from 4 June to 21 October 2020, a total of 395 marine mammal sightings were recorded by MMOs (total 1,436 animals), including 272 sightings of cetaceans and 123 sightings of pinnipeds. Table 6.1 provides a summary of the recorded marine mammals. Seven species of cetaceans and four species of pinnipeds were recorded. Due to the specifics of the work, the gray whale was most often observed among cetaceans. Of the rest species the Minke whale and the harbour porpoise were the most frequently observed cetaceans; as regards to pinnipeds, the most frequently observed species were the spotted seal and the northern fur seal.

Table 6.1. Total number of marine mammal sightings and total number of marine mammals in 2020

English name	Latin name	Code	Number of sightings	Number of animals
Gray whale	<i>Eschrichtius robustus</i>	GW	205	436
Fin whale	<i>Balaenoptera physalus</i>	FW	8	20
Northern right whale	<i>Eubalaena japonica</i>	RW	2	2
Minke whale	<i>Balaenoptera acutorostrata</i>	MW	19	19
Killer whale	<i>Orcinus orca</i>	KW	5	10
Dall's porpoise	<i>Pocoenoides dalli</i>	DP	2	4
Harbour porpoise	<i>Phocoena phocoena</i>	HP	31	56
Steller's sea lion	<i>Eumetopias jubatus</i>	SL	10	11
Northern fur seal	<i>Callorhinus ursinus</i>	NF	47	54
Ringed seal	<i>Phoca hispida</i>	RS	20	127
Spotted seal	<i>Phoca largha</i>	SS	46	697
Total			395	1436

Among the cetaceans recorded in 2020, four species are listed in the Red Book of the Russian Federation. Gray whale (*Eschrichtius robustus*) and Northern right whale (*Eubalaena japonica*) are listed under Category 1 (endangered species). Fin whale (*Balaenoptera physalus*) and harbour porpoise (*Phocoena phocoena*) are listed under Category 4 (species with uncertain status).

Among the pinnipeds recorded in 2020, the Steller's sea lion (*Eumetopias jubatus*) is listed under Category 3 (rare) in the Red Book of the Russian Federation. In total, 10 encounters with Steller's sea lions (11 individuals) were recorded (see Table 6.1). In the reporting period, the Steller's sea lion, as usual, was recorded in this region by observers less often than the spotted seals (46 sightings and 697 individuals), which was often reported in accumulation of 10-30 species or more mostly at the mouth of Nabil Bay, at exit of crew change vessels from the port of Kaigan.

6.2 NUMBER OF OBSERVATIONS BY MONTHS

Since the number of vessels with observers aboard and the duration of their activities varied per area and per month, the numbers of observed animals were compared by month and area (Table 6.2).

In 2020, among cetaceans - gray whale (0.184 sightings/hour) and Harbour porpoise (0.028 sightings/hour), among pinnipeds - Northern fur seal (0.042 sightings/hour) and spotted seal (0.041 sightings/hour), were observed most frequently.



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Table 6.2. Number of marine mammal sightings in relation to the observation period (number of sightings/total monthly hours of observation) in 2020

Species*	Area**	Total		June	July	August	September	October	Total
		sighting	hours						
GW	2	186	216.52	0.000	0.017	1.351	1.693	0.000	0.859
GW	3	1	461.37	0.000	0.000	0.000	0.000	0.151	0.002
GW	1	18	344.75	0.000	0.000	0.078	0.000	0.000	0.052
GW	Total:	205	1116.800	0.000	0.008	0.290	0.148	0.015	0.184
FW	4	5	23.50	0.000	0.000	0.000	0.385	0.000	0.213
FW	5	3	19.50	0.000	0.261	0.000	0.000	0.000	0.154
FW	Total:	8	1116.800	0.000	0.024	0.000	0.012	0.000	0.007
RW	3	2	461.37	0.000	0.000	0.000	0.007	0.000	0.004
RW	Total:	2	1116.800	0.000	0.000	0.000	0.005	0.000	0.002
MW	1	2	344.75	0.000	0.000	0.009	0.000	0.000	0.006
MW	2	13	216.52	0.072	0.149	0.022	0.028	0.000	0.060
MW	3	4	461.37	0.289	0.069	0.006	0.000	0.000	0.009
MW	Total:	19	1116.800	0.110	0.080	0.010	0.002	0.000	0.017
KW	5	1	19.50	0.000	0.000	0.000	0.125	0.000	0.051
KW	1	2	344.75	0.000	0.000	0.004	0.014	0.000	0.006
KW	2	2	216.52	0.000	0.017	0.000	0.000	0.070	0.009
KW	Total:	5	1116.800	0.000	0.008	0.002	0.005	0.015	0.004
DP	2	2	216.52	0.000	0.000	0.022	0.000	0.000	0.009
DP	Total:	2	1116.800	0.000	0.000	0.004	0.000	0.000	0.002
HP	2	26	216.52	0.217	0.182	0.043	0.085	0.348	0.120
HP	1	3	344.75	0.000	0.000	0.009	0.014	0.000	0.009
HP	3	1	461.37	0.000	0.000	0.000	0.000	0.151	0.002
HP	0	1	42.17	0.000	0.316	0.000	0.000	0.000	0.024
HP	Total:	31	1116.800	0.110	0.097	0.012	0.010	0.091	0.028
SL	2	2	216.52	0.000	0.000	0.022	0.000	0.000	0.009
SL	3	6	461.37	0.000	0.069	0.006	0.015	0.000	0.013
SL	1	2	344.75	0.000	0.032	0.004	0.000	0.000	0.006
SL	Total:	10	1116.800	0.000	0.016	0.008	0.010	0.000	0.009
NF	1	10	344.75	0.000	0.000	0.035	0.028	0.000	0.029
NF	2	21	216.52	0.000	0.000	0.162	0.141	0.070	0.097
NF	3	9	461.37	0.000	0.000	0.037	0.011	0.000	0.020
NF	4	3	23.50	0.000	0.000	0.095	0.154	0.000	0.128
NF	5	4	19.50	0.000	0.087	0.000	0.375	0.000	0.205
NF	Total:	47	1116.800	0.000	0.008	0.061	0.037	0.015	0.042
RS	2	18	216.52	0.000	0.099	0.086	0.085	0.070	0.083
RS	1	2	344.75	0.000	0.000	0.009	0.000	0.000	0.006
RS	Total:	20	1116.800	0.000	0.048	0.020	0.007	0.015	0.018
SS	2	45	216.52	0.434	0.248	0.108	0.198	0.487	0.208
SS	1	1	344.75	0.000	0.000	0.004	0.000	0.000	0.003
SS	Total:	46	1116.800	0.220	0.121	0.022	0.017	0.106	0.041

* Table 6.1 shows the correspondence of the codes with marine mammal species names.

**Areas: Area 0 - West of Sakhalin, Area 1—Piltun, Area 2—North Transit, Area 3—Lunskoye, Area 4 - Middle Transit, Area 5 - South Transit, Area 7 - south of Sakhalin.



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6.3 WEATHER CONDITIONS

Weather conditions play an important role in sighting marine mammals. Data were therefore grouped according to favourable and unfavourable weather conditions. Favourable weather conditions were defined as those where (a) visibility was ≥ 1 km, and (b) sea state was ≤ 3 on the Beaufort scale. Weather conditions that did not meet any of these criteria or their combination during the observation period were considered unfavourable.

During the reporting year, the observations were mostly performed in favourable visibility conditions (82%). The observations in unfavourable weather conditions about 18% of the total duration of observations (Table 6.3).

Table 6.3. Visibility conditions during observation in 2020, by areas of operations

Area of operations	Hours		Share, %	
	< 1 km	≥ 1 km	< 1 km	≥ 1 km
Area 0 - West of Sakhalin	3,5	38,67	8,3	91,7
Area 1—Piltun	73,25	271,5	21,25	78,75
Area 2—North Transit	25,42	191,1	11,74	88,26
Area 3—Lunskoye	92,33	369,03	20,01	79,99
Area 4 - Middle Transit	5,68	17,82	24,18	75,82
Area 5 - South Transit	0,5	19	2,56	97,44
Area 7 - south of Sakhalin	1	8	11,11	88,89
Total:	201,68	915,12	18,06	81,94

The sea swell did not significantly affect the course of observation in 2020; the duration of observations during the sea swell considered favourable for observation (3 or less on the Beaufort scale) constituted 95 % (see Table 6.4).

Table 6.4. Sea swell during observation in 2020, by areas of operations

Area of operations	Hours		Share, %	
	≤ 3	> 3	≤ 3	> 3
Area 0 - West of Sakhalin	29,17	13,00	69,17	30,83
Area 1—Piltun	327,25	17,50	94,92	5,08
Area 2—North Transit	206,02	10,50	95,15	4,85
Area 3—Lunskoye	449,12	12,25	97,34	2,66
Area 4 - Middle Transit	23,50	0	100	0
Area 5 - South Transit	19,50	0	100	0
Area 7 - south of Sakhalin	9,00	0	100	0
Total:	1063,55	53,25	95,23	4,77

The ratio of records made in favourable and unfavourable weather conditions did not differ significantly in 2020 on the area and the month (Fig. 6.1–6.7).



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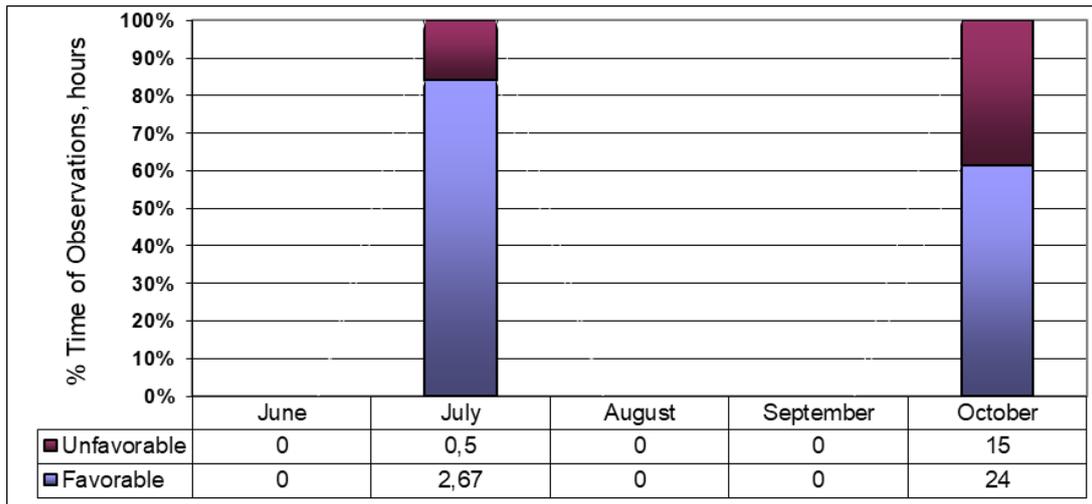


Figure 6.1. Ratio of favourable and unfavourable weather conditions in area 0 - West of Sakhalin

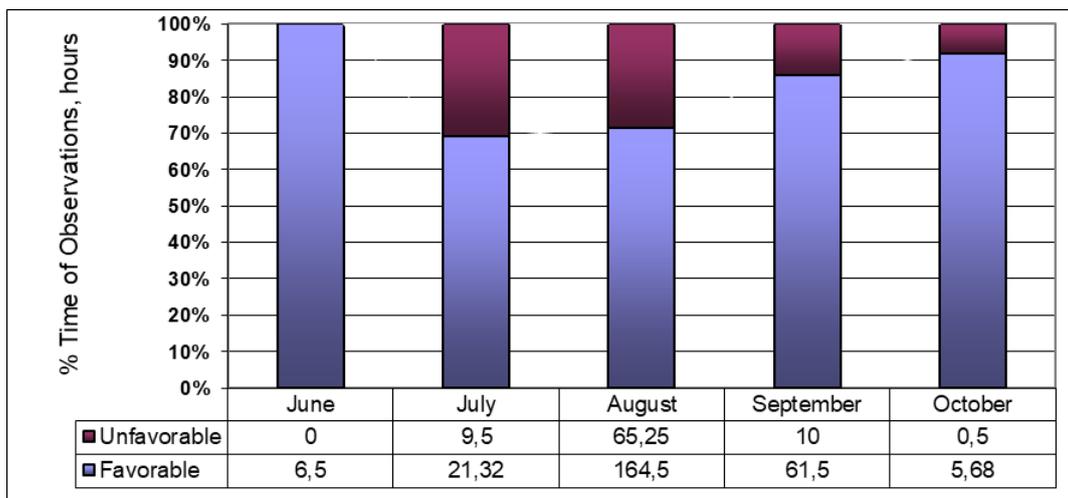


Figure 6.2. Ratio of favourable and unfavourable weather conditions in area 1—the Piltun

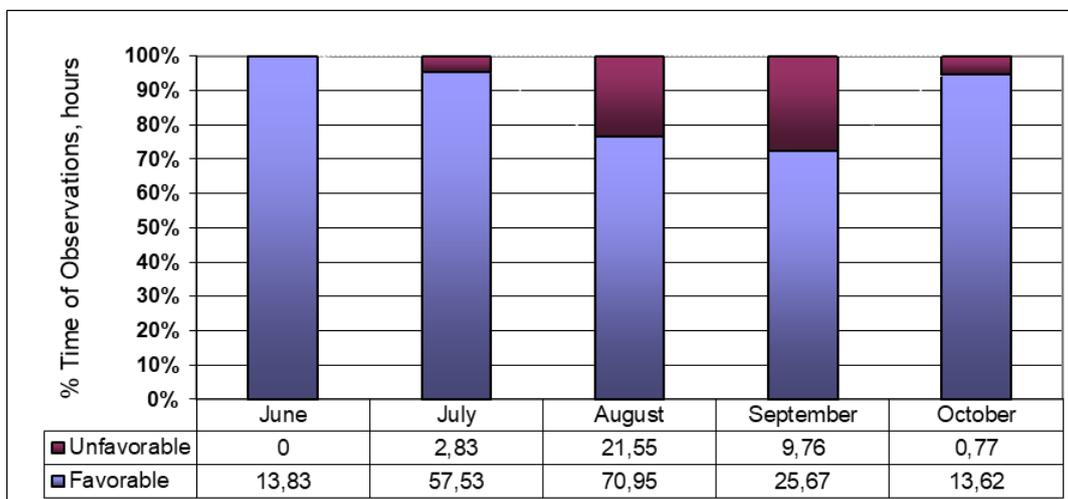


Figure 6.3. Ratio of favourable and unfavourable weather conditions in area 2—the North Transit



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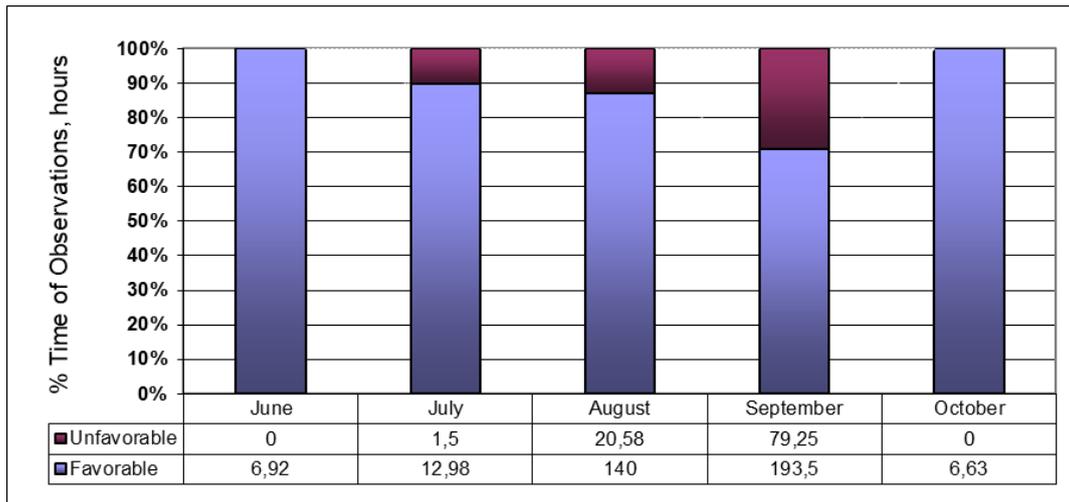


Figure 6.4. Ratio of favourable and unfavourable weather conditions in area 3—the Lunskoye

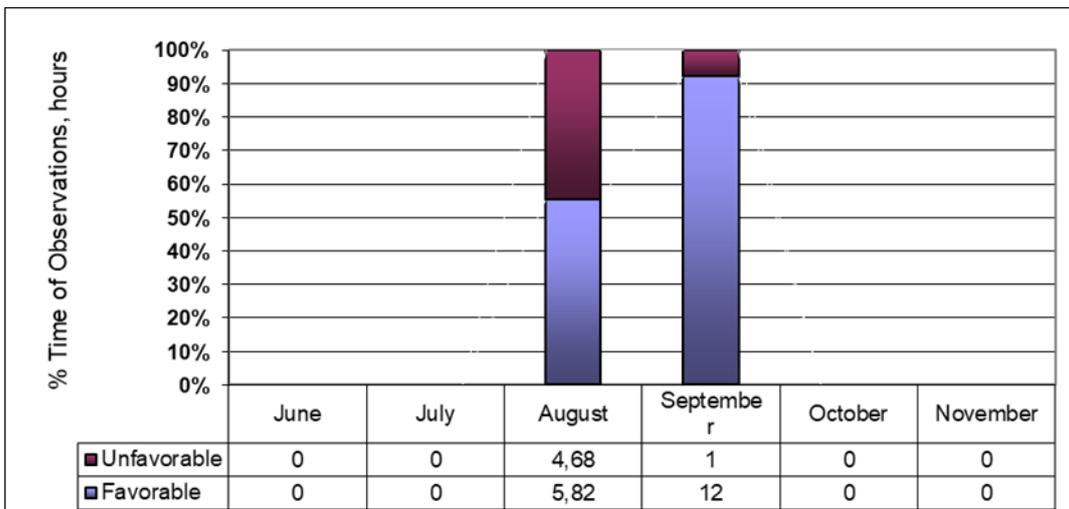


Figure 6.5. Ratio of favourable and unfavourable weather conditions in area 4 - Middle Transit

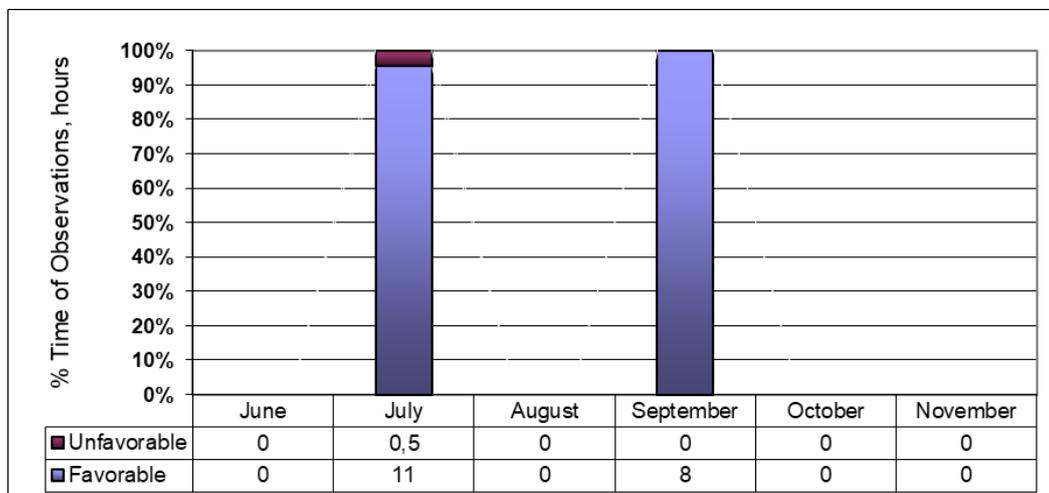


Figure 6.6. Ratio of favourable and unfavourable weather conditions in area 5 - South Transit



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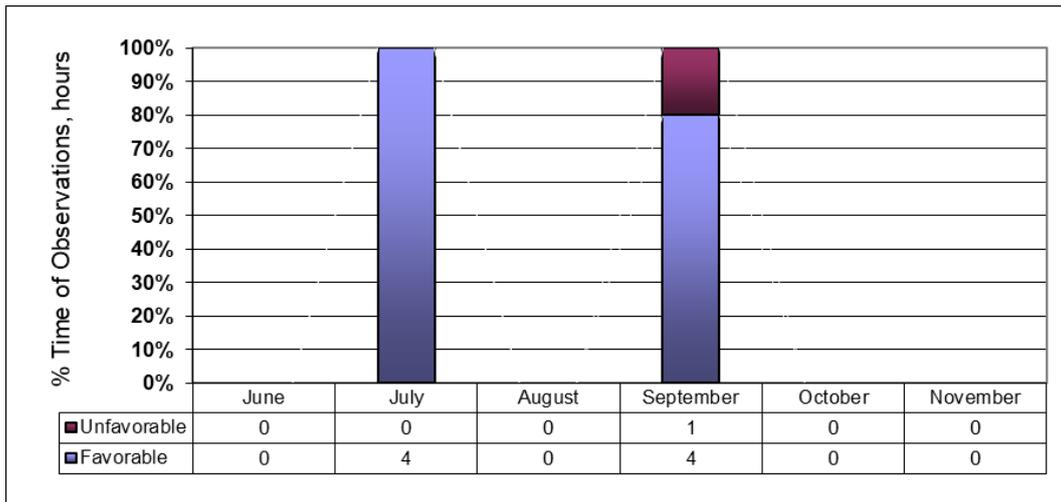


Figure 6.7. Ratio of favourable and unfavourable weather conditions in area 7 - south of Sakhalin

In general, favourable weather conditions significantly prevailed over unfavourable during the entire observation period. August-October of 2020 were the least favourable months for observations; the most favourable conditions for observations were in June through July (see Fig. 6.8).

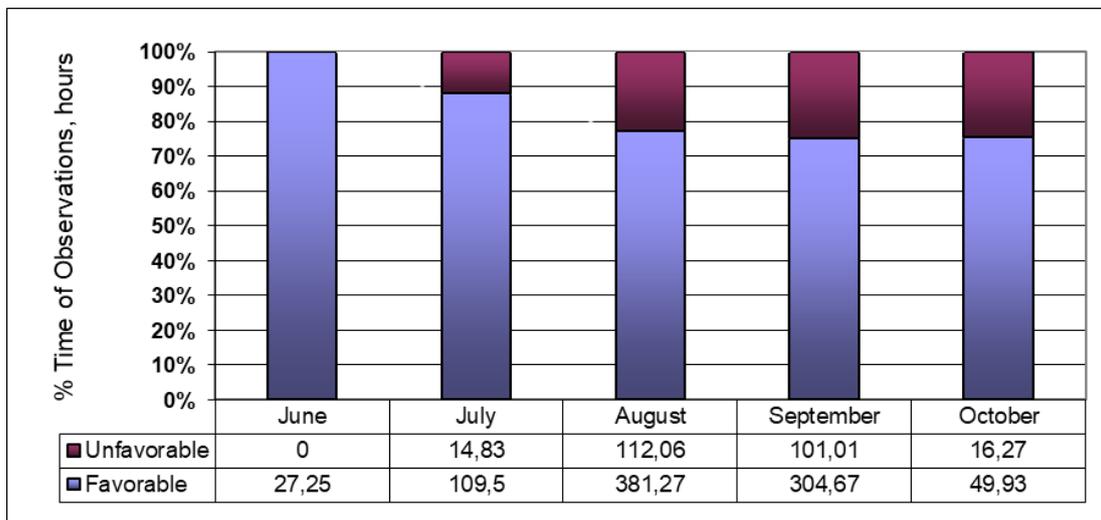


Figure 6.8. The ratio of favourable and unfavourable weather conditions during the entire observation period.

6.4 SIGHTING OF ANIMALS DEPENDING ON WEATHER CONDITIONS

Marine mammals sighting varies under changing weather conditions, differing between species according to their size and distance from the vessel. Behaviour of animals also matters; for example, some mammal species leave an area as a storm approach.

During field season in 2020, 94 % of marine mammal sightings were recorded under favourable weather conditions (Table 6.5). The unfavourable observation conditions (visibility less than 1 km and/or sea state over 3) reduced the number of marine mammal sightings by 17 times on average.



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Table 6.5. Number and frequencies of marine mammals sighted in favourable and unfavourable weather conditions in 2020

Species	Favourable conditions, 872.62 h.		Unfavourable conditions, 244.18 h		Total 1116.8 h	
	Sightings	Sightings/hour	Sightings	Sightings/hour	Sightings	Sightings/hour
GW	201	0,2303	4	0,0164	205	0,1836
FW	8	0,0092			8	0,0072
RW	2	0,0023			2	0,0018
MW	19	0,0218			19	0,0170
KW	5	0,0057			5	0,0045
DP	2	0,0023			2	0,0018
HP	31	0,0355			31	0,0278
SL	9	0,0103	1	0,0041	10	0,0090
NF	41	0,0470	6	0,0246	47	0,0421
RS	19	0,0218	1	0,0041	20	0,0179
SS	36	0,0413	10	0,0410	46	0,0412
Total:	373	0,4275	22	0,0901	395	0,3537

Note. Species: GW—gray whale, FW – Fin whale, RW - Northern right whale, MW—Minke whale, KW—killer whale, DP—Dall's porpoise, HP—Harbour porpoise, SL—Steller 's sea lion, NF—northern fur seal, RS—ringed seal, SS—spotted seal.



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7 CONCLUSION

In 2020 four Marine Mammal Observers were employed on 7 vessels engaged in Sakhalin Energy offshore activities in Lunskeye and Piltun areas. Observations began on 4 June and continued until 21 October. In 2020 the observations lasted a total of 1116 hours 48 minutes during 115 vessel days. During the season, 7 species of cetaceans and 4 species of pinnipeds were encountered.

Gray whales were observed 205 times (436 animals in total) at distance 500-4500 m. The average distance from all sightings was 2332 m. There were 17 sightings at a distance equal to or less than the safe distance. In 8 out of 17 cases at the indicated distances, preventive measures were taken to reduce the impact. In other cases, no action was taken when a gray whale was spotted, as the vessels were movement a safe course i.e. while vessels continuing to move, the distance to the whale increased. During the entire ice-free navigation season there were no sightings with gray whales that posed a risk of collision. Thus, in 2020, presence of MMOs on the vessels allowed the vessels' crew to take timely measures to minimise risk of collision or an adverse impact on gray whales.

Fin whales were observed 8 times (20 individuals in total) at distances from 500 to 6000 m. The average distance for all sightings was 2850 m. There were 2 sightings at a distance less than the safe, in which the whales moved in the direction away of the vessel, there was no threat of collision; there was no need to take measures.

The Northern right whales were observed once. MMOs registered two whales at the same time on different sides of the vessel's side and made two records in the log. The distance to the whales was 200 m, but at the time of observations the vessel was no move, so there was no risk of collision, no action was required

In 2020 MMOs registered a total of 395 sightings with marine mammals (1436 animals) including 272 sightings (547 individuals) with cetaceans and 123 sightings (889 individuals) with pinnipeds. In 50 cases cetaceans were encountered at a distance equal to or less than the established safety distance. In some cases, no measures were required to avoid a collision as the animals were moving parallel to the vessel course or away from the vessel. Although no cases of near collision with marine mammals were recorded, in 21 cases preventive measures were taken in order to minimize the potential for collision with whales and dolphins.

In total, compliance with movement along the corridors was acceptable if the implementation of the vessel's schedule did not require different. Most of the routes of crew change vessels (99%) were within transport corridors. The vessels for the photo-ID team operated outside the corridors in the feeding areas to implemented of gray whale monitoring program. The total share of movement outside the corridors for these vessels was 22%

Measures taken to protect gray whales and other marine mammals during 2020 can be considered successful; no cases of collision with gray whales or other marine mammals were recorded.

The programme implemented conforms with environmental requirements and the Company commitments towards stakeholders; it adheres to WGWAP recommendations.

From the beginning of the Company's operations in coastal waters of the north-eastern Sakhalin, no collisions of vessels with marine mammals were recorded. Thanks to the risk mitigation measures, the possibility of vessel collision with marine mammals is estimated as low.



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8 REFERENCES

Blokhin, S. A., Maminov, M. K., Kosygin, G. M. 1985. Bowen, S. L. 1985. On the Korean-Okhotsk Population of Gray Whales. Report of the International Whaling Commission. Vol. 35. Pp. 375–376.

Bowen, S. L. 1974. Probable Extinction of the Korean Stock of the Gray Whale (*Eschrichtius robustus*). Journal of Mammalogy. Vol. 55, pp. 208–209.

Red Book of the Russian Federation (animals): website of the Ministry of Natural Resources and Environment of the Russian Federation. 2012. Published on: 21 February 2012 (16:44). URL: ww.mnr.gov.ru/regulatory/detail.php?ID=128273&print=Y

Hilton-Taylor, C. 2000. IUCN Red List of Threatened Species, Gland, Switzerland and Cambridge, United Kingdom. www.redlist.org

WGWP-20, 2020. Report of the western gray whale advisory panel at its 20th meeting. 6-8 November 2019. Moscow

Sakhalin Energy, 2006. Analysis of Risk to Western Gray Whales (*Eschrichtius robustus*) from Shipping Traffic Associated with the Sakhalin-2 Project. Doc. No. 0000-S-90-04-T-8004-00-E.

Sakhalin Energy, 2009. Instruction for Marine Mammal Observers on the Reporting and Field Database Management. Document No. 1000-S-90-04-M-0003-00-E.

Sakhalin Energy, 2010. Marine Operating Procedures and Guidelines. Document No. 1000-S-90-90-P-0017-0006.

Sakhalin Energy, 2018. Marine Mammal Protection Plan. Rev. 9. Doc. No. 1000-S-90-04-P-0048-00-E.

Sakhalin Energy, 2019. Marine Mammal Observations programme 2019. Close-out Report. Doc. No. 1000-S-90-04-T-0930-00-E.