SC/67B/ASI/08

Report of the Norwegian 2017 survey for minke whales within the Small Management Area EB - the Barents Sea

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INTERNATIONAL
WHALING COMMISSION

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ABSTRACT

As part of a six-year program over the period 2014-2019 with the aim to get a new estimate of minke whale abundance in the Northeast Atlantic at the end of the period, the Barents Sea east of 28ºE, comprising the *Small Management Area* EB, was surveyed with one vessel during the summer June-August 2017. The intended total survey area was divided into five blocks of which one (EB5) was not covered at all. The others received a reasonable coverage. About 2,944 nautical miles of primary search effort was conducted within the survey blocks. The most common species sighted were minke whale, white-beaked dolphin and harbour porpoise. Apparently minke whale sighting rates have increased about 30 % since the previous survey in 2013 in the area and thus may confirm that major distributional shifts are going on at least with regards to minke whales in the northeastern Atlantic. Fin and humpback whales have remained the same sighting rates and distributional patterns. A group of Greenland right whales was sighted in open waters around 78°55'N, 55°51'E on 18 July 2017.

MONITORING, SURVEY - VESSEL, ATLANTIC OCEAN, COMMON MINKE WHALE

INTRODUCTION AND OBJECTIVES

The management of Norwegian minke whaling is based on the Revised Management Procedure (RMP) developed by the IWC Scientific Committee (IWC 1994). RMP requires a monitoring program, since input data for RMP include time series of annual catches and of absolute abundance estimates with associated variance statistics. Abundance estimates for use in this context have been based on sighting surveys. Large-scale synoptic sighting surveys to estimate the abundance of minke whales in the Northeast Atlantic were conducted in 1988, 1989 and 1995 (Schweder et al. 1997). Based on the experiences from the 1995 survey in which 11 vessels and 140 people were involved, it was chosen for the following years to cover the northeast Atlantic by small-scale annual surveys over six-year periods (Øien & Schweder 1996). One obvious problem associated with this approach is how to account for the additional variance introduced in multiyear sighting surveys relative to a synoptic survey (Skaug et al. 2004), a feature which they share with other surveys discussed within the Scientific Committee in recent years. The arguments for a multiyear sighting survey were that it would be more feasible to achieve common standards and better quality of data collection through more training of the observers and the scientists. Additional benefits were that the logistics would be simpler, and costs could be shared over more years. Our experience from the six-year survey periods 1996-2001, 2002-2007 and 2008-2013 is that the program has been quite successful (Skaug et al. 2004, Bøthun et al. 2009, Solvang et al. 2015) in the mentioned respects. Norway therefore decided to continue with a new series of sighting surveys in the northeast Atlantic over the period 2014-2019 (Øien 2013) with the aim of presenting a new estimate of minke whale abundance in 2020. The survey conducted in the summer 2017 is the fourth one in this latter survey series.

AREAS SURVEYED IN 2017

When the survey plans 2014-2019 were presented in 2013 (Øien 2013), we suggested to preferably cover one *Small Management Area* for one year's survey as the basic approach. In 2014 the survey cycle started by covering the Svalbard area (*Small Management Area* ES), in 2015 the Norwegian Sea, the *Small Management Area* EW was covered, in 2016 the areas around Jan Mayen, the *Small Management Area* CM, and in 2017 the Barents Sea proper, the *Small Management Area* EB, was covered. This area was last covered in 2013. In 2015, parts of the Jan Mayen area were also covered as an extension to the NASS-2015 survey.

The stratum definitions we had been using up to and including the survey period 2002-2007, have changed over time as information on distribution and densities of the target species minke whale has accumulated. Changes in the *Small Management Area* structure in 2003 (IWC 2004) also led to block modifications which were motivated of the wish to keep some consistency throughout a survey period and make comparisons with previous surveys easier. However, these adaptations have made it difficult to distribute survey effort in an efficient manner as many of the survey blocks have been small with impractical shapes. During the survey cycle 2008-2013 the block structure was evaluated and redesigned to achieve a better total effort distribution over the covered areas. For the Barents Sea *Small Management Area* EB, the strata EB1-EB4 were implemented (Figure 1). Based on personal communication with Russian scientists who reported on minke whale observations southeast of EB1, the Pechora Sea was added as the survey block EB5 (Figure 1).

A major part of the total survey area includes Russian EEZ. General access to Russian waters, with restrictions for certain areas (Figure 1), for the survey vessel *Acc Mosby* was given by official note from Moscow of 23 May 2017. During the survey, additional restrictions were enforced on access to areas.

CRUISE SUMMARY

The survey in 2017 was conducted by one vessel, the former IMR research vessel *Håkon Mosby* - presently with the name *Acc Mosby*, over the period 20 June to 14 August 2017. The survey period was divided into three parts; 20 June-10 July, 11-24 July and 25 July-14 August. On board the vessel Kjell-Arne Fagerheim, Silje Vindenes and Nils Øien acted as team leaders. Senior scientist Alexander Somov at the Marine Mammals Laboratory, VNIRO (Russian Federal Research Institute of Fisheries and Oceanography), Moscow, participated from the Russian side.

The original plan was to cover the survey blocks sequentially clockwise starting with block EB3 (Figure 1). However, the entrance procedures into Russian waters required specific entrance locations, implying that a sensible start would rather be in the southern areas. After having entered Russian waters, we were able to start surveying 24 June but already on the morning of 26 June we got bad survey weather, lasting until 30 June. At this time Russian authorities required us to move north of 72°N thus loosing the ability to cover the southern region. During the first survey period, EB1 was finalised in addition to some survey activity in EB2. The stratum EB4 was covered in the second survey period and EB3 and some additional survey transects in EB2 were covered during the third and last survey period, ending 14 August 2014. Experimental surveys on harbour porpoises were conducted in Varangerfjord on 8-9 July and 10 August, and in Porsangerfjord the 12 August 2017.

The established sightings procedures (Øien 1995), including tracking of minke whales, were followed as in previous surveys in which minke whales have been the primary target species.

The survey vessel was able to survey about 2,944 nautical miles altogether in primary search mode (Beaufort equal to or less than 4) in the designed survey blocks (Table 1). The realised effort is shown in Figure 2. With exception of survey block EB5 which we were not able to survey due to military restrictions introduced during the survey period, the effort seems to have been reasonably distributed over the survey blocks EB1-EB4.

The overall impression from the survey is that cetacean sightings are recorded at significant densities throughout the survey area (Figure 3). A summary of the number of groups of whales sighted during the 2017 survey when on primary search effort is shown in Table 1. Distribution maps for sightings of several cetacean species (minke, fin, humpback, harbour porpoise and white-beaked dolphin) are given in Figures 4-8. Sightings of harp seals are shown in Figure 9.

The Barents Sea *SMA* EB was last surveyed in 2013. Inspection of distributions and preliminary sighting rates indicate an increase in minke whales from 2013 to 2017 of about 30 %. The aggregations of minke whales seen west of Novaya Zemlya (EB1 and EB4) in 2013 were also present in 2017, however, there were additional aggregations at Storbanken (EB3, Northwest) and south of Sentralbanken (EB2, North) – Figure 4. For fin whales (Figure 5) and humpback whales (Figure 6) the sighting rates are very similar between 2013 and 2017. The humpback whales were mainly found in two aggregations (EB3 North and EB1) while the fin whales were more sparsely distributed. For harbour porpoises the distributions appeared like in previous surveys, but the sighting rate was much higher in 2017. Other noteworthy observations were of Greenland right whales in open waters around position 78°55'N, 55°51'E on 18 July 2017, and many open water sightings of harp seals in the two northern survey blocks EB3 and EB4 (Figures 1 and 9).

SURVEY DESIGN, SIGHTING PROCEDURES AND DATA COLLECTION

The survey procedures followed were the same as in NILS-95 (Øien 1995, Schweder et al. 1997, Skaug et al. 2004, Bøthun et al. 2009, Solvang et al. 2015). The logistics were basically the same as were used in the NILS-95 survey, but some modifications and improvements have been made over the years both to software and equipment used. Digital recording of speech is made directly to disk. This system has proved useful and easy for transcription and checking. Double platform effort is used exclusively during primary search following the defined protocol, and the observers are organised into teams of two persons. This has been consistent in all our surveys since 1997.

During the sighting survey in 2017, identification photos were collected from around 100 humpback whales, and photos were also taken of the Greenland right whales observed on the 18 July.

FUTURE SURVEY ACTIVITY

The coverage of the *Small Management Area* EB, the Barents Sea, completes the fourth year of the survey cycle 2014-2019. For the summer 2018 the plan is to survey the *Small Management Area* EN, the North Sea area.

ACKNOWLEDGEMENTS

We are very grateful to the crews and the whale observers onboard the vessel *'Acc Mosby'* for dedicated and pleasant cooperation in conducting the research. Access to Russian waters was given by note no. 5408/2ED of 23 May 2017 from Russian authorities. We are thankful to Alexander Somov, Marine Mammals Laboratory, VNIRO (Russian Federal Research Institute of Fisheries and Oceanography), Moscow, for all help onboard, including the communication with Russian authorities during the cruise. Also, many thanks to senior scientist Kirill A. Zharikov at Marine Mammals Laboratory, VNIRO, for input to the survey, guidance, and help underway. The hard work spent by K.A. Fagerheim and S. Hartvedt on validating and coding the survey data is much appreciated.

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Table 1

Number of groups of whales and harp seals seen from the upper and lower platforms during primary search, and realised primary search effort (nautical miles) by survey stratum, during the 2017 survey. There was no effort in block EB5 shown in the figures.

		Survey block				
Species	***Platform***	**EB1**	**EB2**	**EB3**	**EB4**	**Total**
Minke whale	*Upper*	51	21	42	39	**153**
	Lower	50	14	44	43	**151**
Fin whale	*Upper*	3	1	8	3	**15**
	Lower	0	1	7	2	**10**
Humpback whale	*Upper*	8	0	26	0	**34**
	Lower	8	0	26	1	**35**
Greenland Right whale	*Upper*	0	0	0	5	**5**
	Lower	0	0	0	2	**2**
Harbour porpoise	*Upper*	14	21	16	9	**60**
	Lower	13	27	12	7	**59**
White-beaked dolphin	*Upper*	6	43	26	3	**78**
	Lower	16	45	23	3	**87**
Beluga	*Upper*	1	0	0	0	**1**
	Lower	0	0	0	0	**0**
Large whales	*Upper*	1	0	2	2	**5**
	Lower	1	2	3	4	**10**
Harp seals	*Upper*	6	2	58	136	**202**
	Lower	8	5	45	149	**207**
Total, groups	***Upper***	**90**	**88**	**178**	**197**	**553**
	Lower	**96**	**94**	**160**	**211**	**561**
Realised primary effort	***Nmi, T***	**526**	**721**	**1086**	**611**	**2,944**

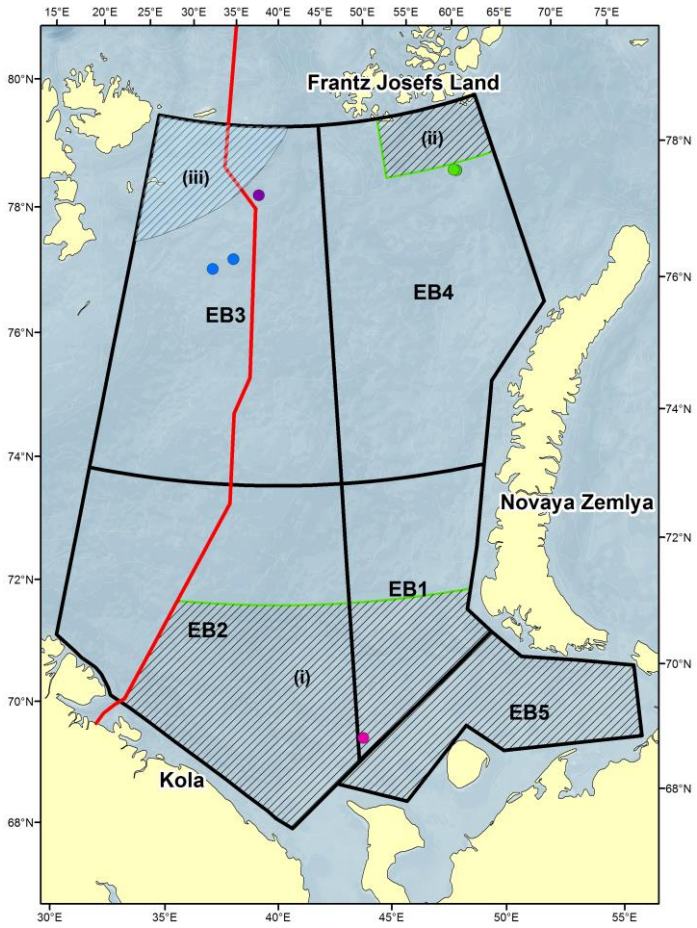

Figure 1. *The EB Small Management Area with the block structure, EB1-EB5, planned for the survey. The red line is the boundary between Norwegian and Russian EEZs. The shaded areas are (i) Russian EEZ south of 72ºN, which was closed for survey activity after 30 June; (ii) restricted area south of Frantz Josef's Land with no permission to enter; (iii) ice-covered areas in the north-western Barents Sea. The coloured dots represent sightings of beluga (pink, in EB1); bowheads (green, in EB4); aggregations of humpbacks (blue, in EB3); harp seal aggregations on ice floes (purple, in EB3).*

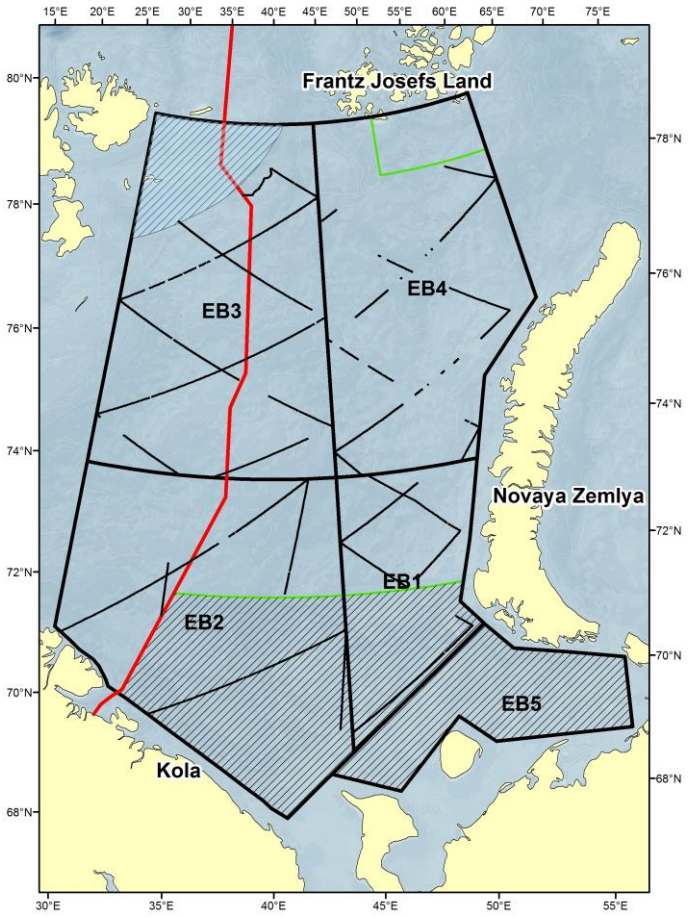

Figure 2. *Realised transects in the EB survey blocks with primary search effort within the limits of the acceptable weather conditions defined by the survey protocol. No survey activity was possible in EB5.*

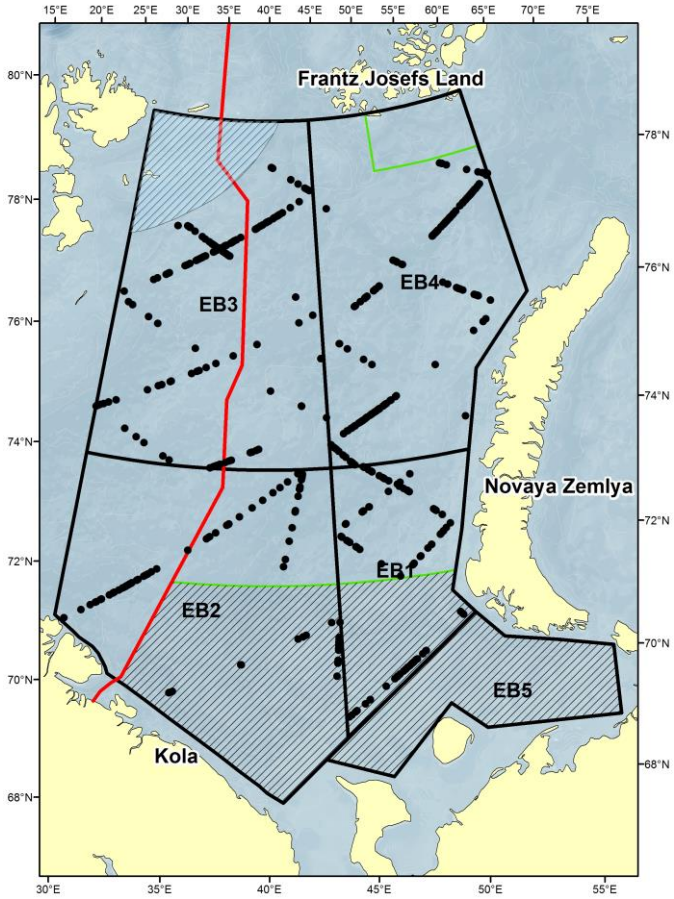

Figure 3. *Primary sightings from platform 1 (the upper platform) of all cetacean species listed in Table 1.*

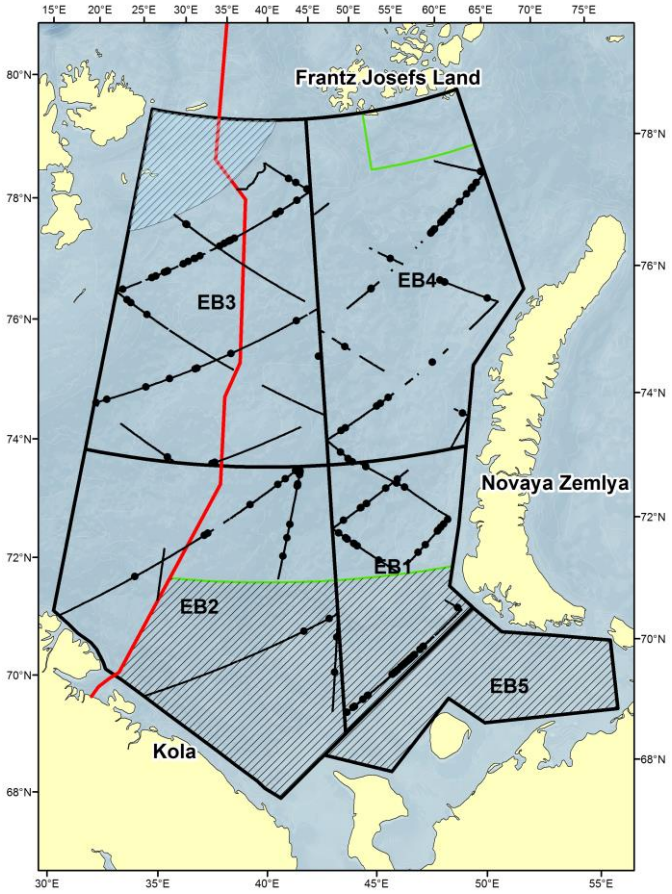

Figure 4. *Primary sightings of minke whales from platform 1.*

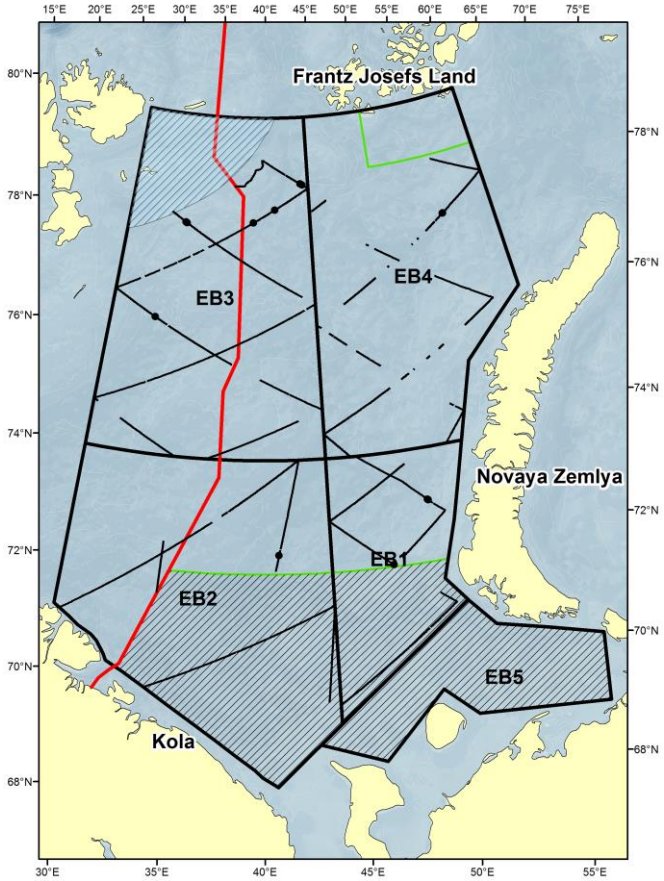

Figure 5. *Primary sightings of fin whales from platform 1.*

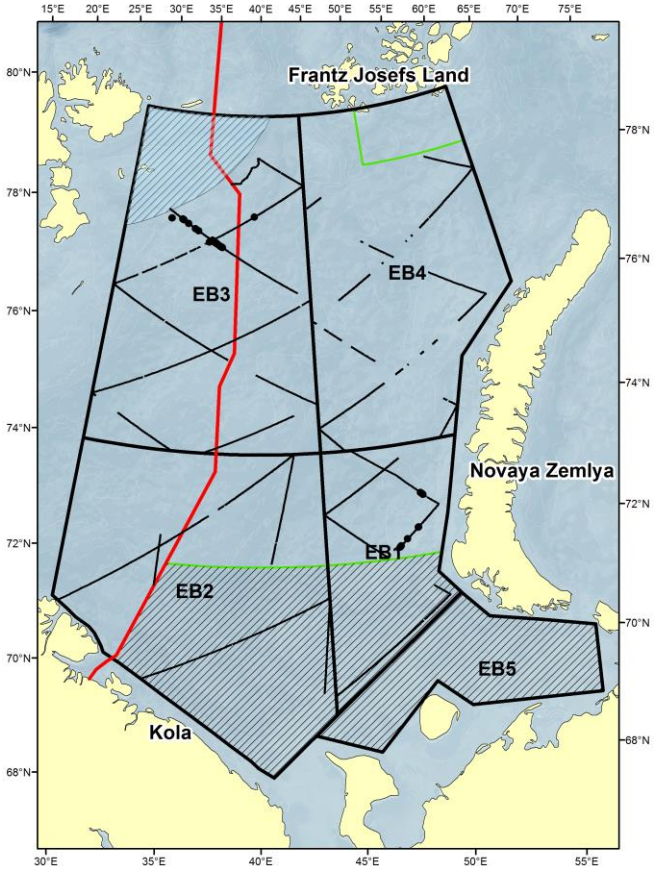

Figure 6. *Primary sightings of humpback whales from platform 1.*

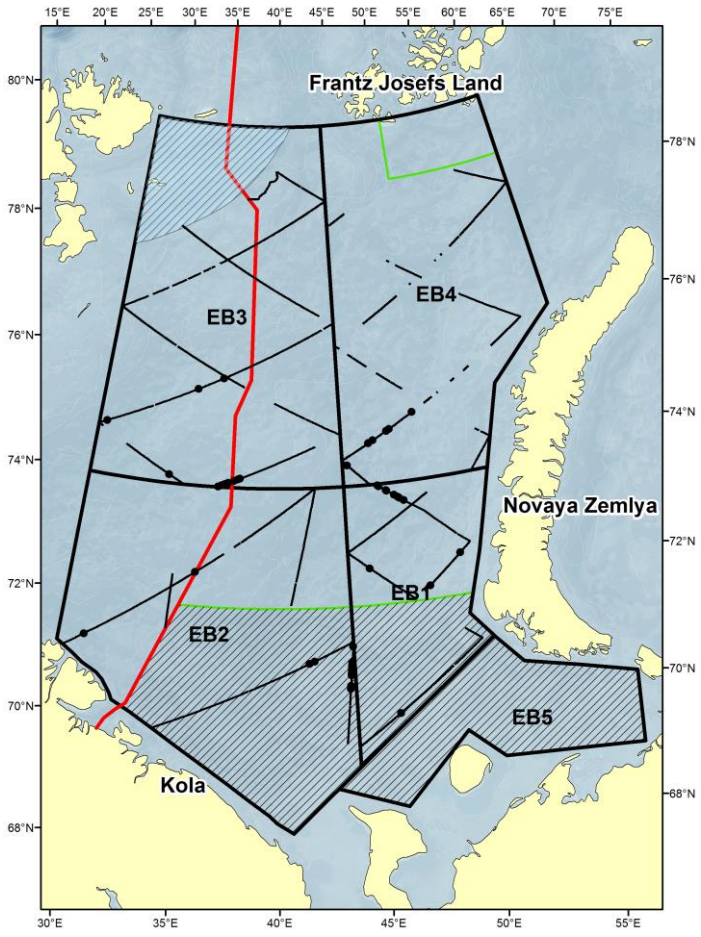

Figure 7. *Primary sightings of harbour porpoises from platform 1.*

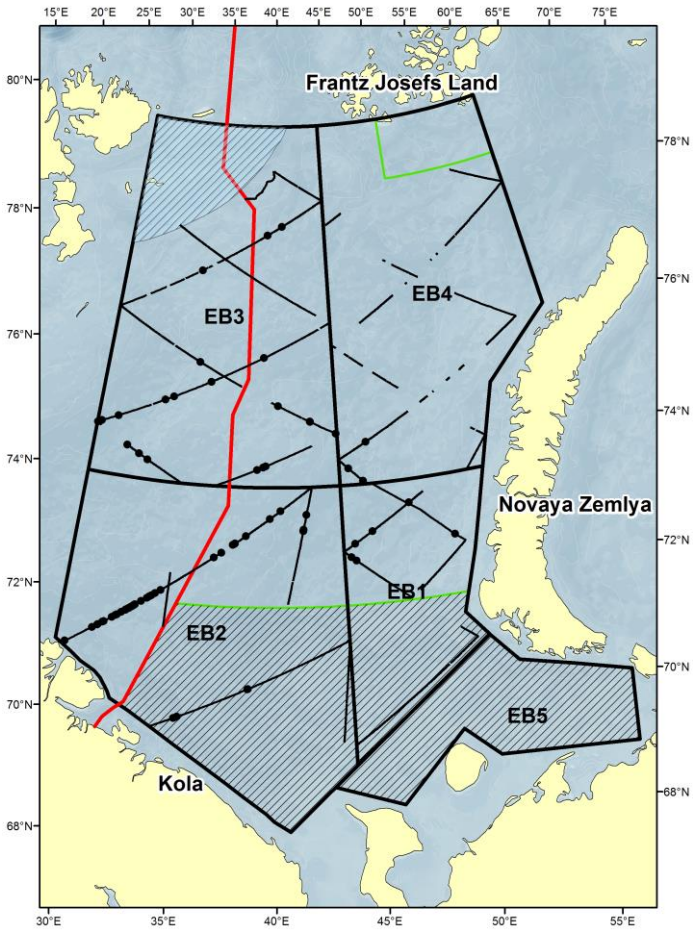

Figure 8. *Primary sightings of white-beaked dolphins from platform 1.*

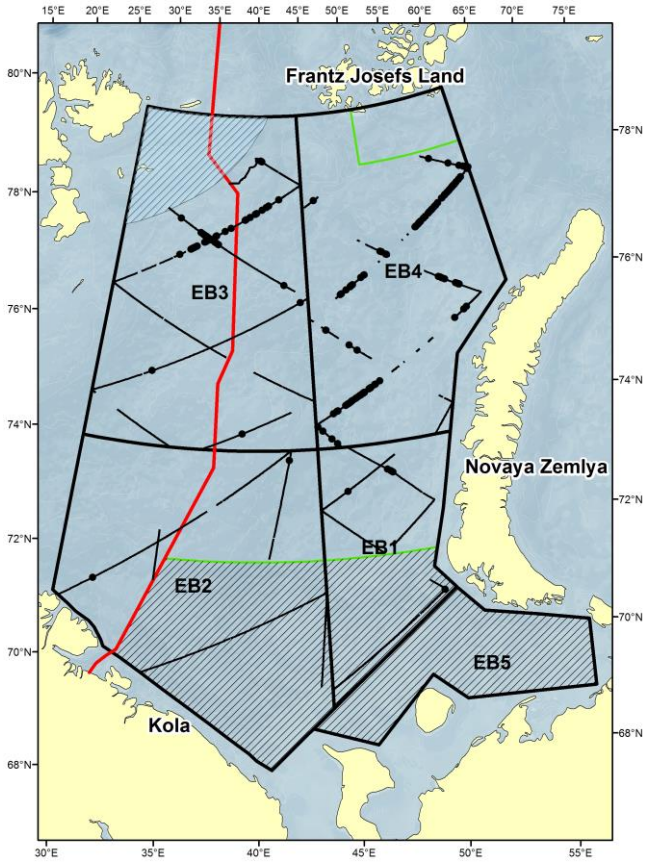

Figure 9. *Primary sightings of harp seals from platform 1.*