

# Report of the Norwegian 2013 survey for minke whales within the *Small Management Area* EB – the Barents Sea

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## ABSTRACT

As part of a six-year program over the period 2008-2013 with the aim to get a new estimate of minke whale abundance in the Northeast Atlantic, the area around Jan Mayen, comprising the *Small Management Area* CM, was surveyed with one vessel during July-August 2010. The total survey area was divided into three blocks which were all covered twice. About 2,028 nautical miles of primary search effort was conducted within the survey blocks. In addition, about 569 nautical miles were searched with “large whale effort” using one platform. The most common species sighted were minke and fin whales. Humpbacks were observed mainly in an area northwest of Iceland. The sighting rates of killer whales and sperm whales have increased over the years Norwegian surveys have been conducted in the area.

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 in common with other surveys discussed in 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 and 2002-2007 is that the program has been quite successful (Skaug et al. 2004, Bøthun et al. 2009) in the mentioned respects. Norway therefore decided to continue with a new series of sighting surveys in the northeast Atlantic over the period 2008-2013 (Øien and Bøthun 2008) with the aim of presenting a new estimate of minke whale abundance in 2014. The survey conducted in the summer 2013 is the fifth one in this survey series.

## AREAS SURVEYED IN 2013

When the survey plans 2008-2013 were presented in 2008 (Øien and Bøthun 2008), we suggested to preferably cover one *Small Management Area* during one year's survey as the basic approach. In 2008 the survey cycle started by covering the Svalbard area (*Small Management Area* ES), in 2009 the North Sea area of the *Small Management Area* EN was covered, in 2010 the areas around Jan Mayen, the *Small Management Area* CM, and in 2013 the Barents Sea proper, the *Small Management Area* EB, was covered. This area was last covered in 2007 (the main part of it).

The stratum definitions we have been using up to and including the survey period 2002-2007, have changed over time due to increased experience. 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. In the ongoing survey cycle the block structure has been evaluated and redesigned to achieve a better total effort distribution over the covered area. The new implemented block structure for the Barents Sea, comprising of the three strata EB1-EB4, is shown in Figure 1.

## CRUISE SUMMARIES

The survey in 2013 was conducted sequentially by two vessels over the period 25 June to 18 August 2013. The research vessel *Håkon Mosby* covered the starta EB1 and EB2 over the period 25 June to 15 July and the trawler *Brennholm* over the period 15 July to 18 August, mainly covering the northern blocks EB3 and EB4 but also with some coverage of EB1 and EB2. Large parts of this survey took place in Russian waters. On board the vessels K.A. Fagerheim, George McCallum and N. Øien acted as team leaders.

The 2010 total survey area was divided into four ordinary survey blocks (Figure 1). The available survey effort was too sparse to allow for the usual construction of transects with a primary transect with intended full coverage. The construction of transects was therefore based on a continuous 18 hour run per day and setting the usual full watch when sighting conditions

were according to the survey protocol. In addition some effort, “large whale effort”, was run under conditions beyond those acceptable in the survey protocol for minke whales; only the upper platform was on watch during these parts of the survey.

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 3,613 nautical miles altogether in primary search mode in the designed survey blocks (Table 1) and about 990 nautical miles in single platform mode (‘F’) with Beaufort conditions above 4. This turns out to be about the effort we could anticipate for primary transects based on earlier experiences of weather and conditions and time available. Realised primary search effort as well as ‘large whale effort F, in the four blocks surveyed in 2013 is shown in Figure 1. Apparently, the effort seems to have been reasonably well distributed over the survey area.

The main impression from the survey was that there were relatively modest concentrations of cetaceans, and the feeding possibilities were also apparently modest. There were a few occasions with larger aggregations of minke whales, in the eastern parts. Belugas were seen in the southeastern Barents Sea, off the White Sea.

A summary of the number of groups of whales sighted during the 2013 survey when on primary search effort is shown in Table 1. Distributions of primary sightings of minke whales, and for all species are shown in Figures 2-3.

Distance and angle estimation training as well as experimental tests were conducted on 28 July and 4 August 2013.

## **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). The equipment was basically the same as was used in the NILS-95 survey, but some modifications have been made since then to the software to make relevant data recording of especially weather covariates easier. 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 2013, identification photos were collected from about 7 humpbacks.

## **FUTURE SURVEY ACTIVITY**

The coverage of the *Small Management Area* EB, the Barents Sea, completed the survey cycle 2008-2013. The future survey plans are uncertain due to economic constraints. However, a survey in the *Small Management Area* ES is scheduled for this summer, starting a new six-year survey cycle 2014-2019.

## **ACKNOWLEDGEMENTS**

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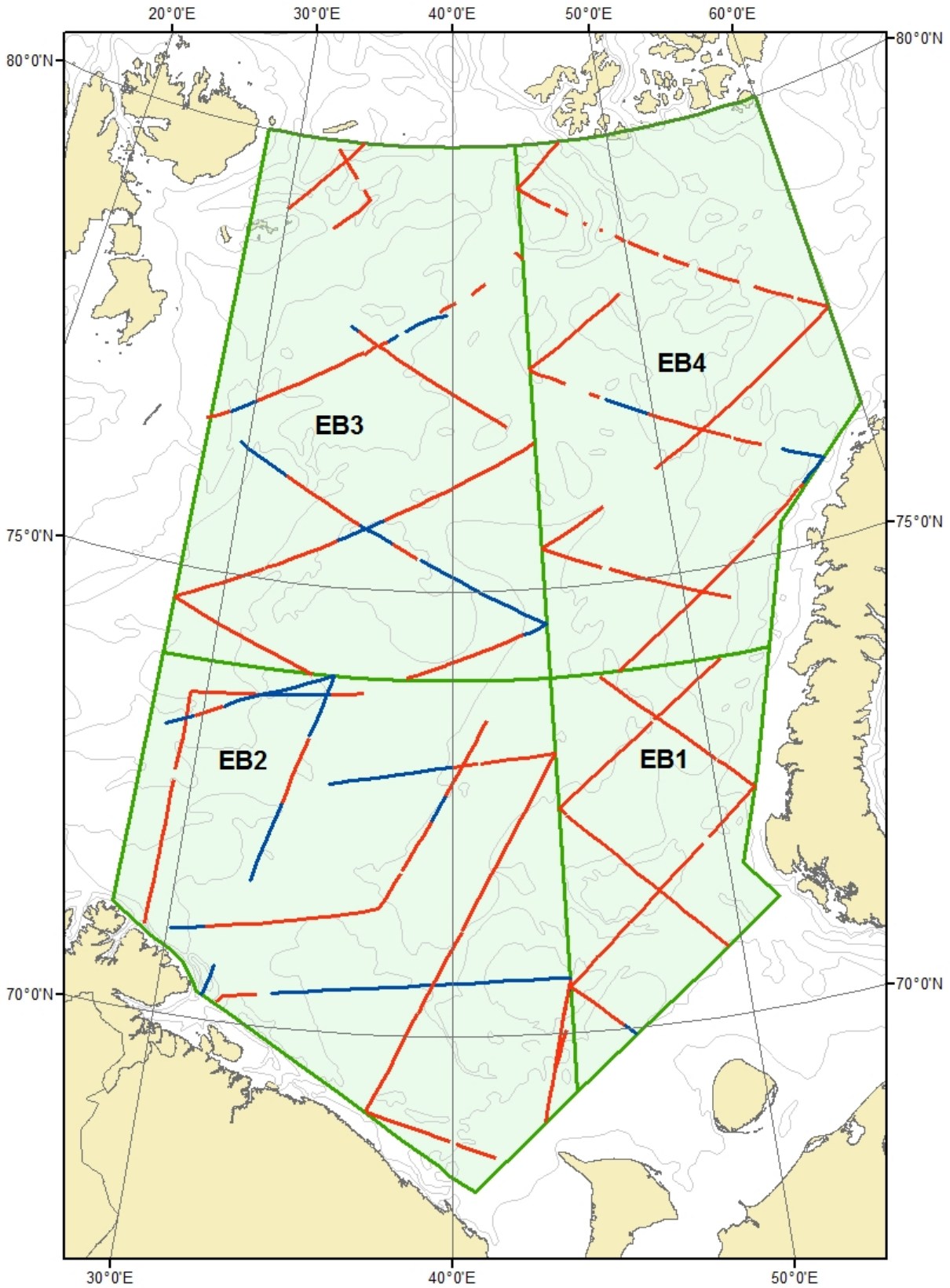
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**Table 1**

*Number of groups of whales seen from the upper and lower platforms during primary search, and realised primary search effort (nautical miles) by survey stratum, during the 2013 survey.*

Species	Survey block					
	Platform	EB1	EB2	EB3	EB4	Total
<i>Minke whale</i>	<i>Upper</i>	77	31	8	28	<b>144</b>
	<i>Lower</i>	73	26	7	36	<b>142</b>
<i>Fin whale</i>	<i>Upper</i>	7	7	2	6	<b>22</b>
	<i>Lower</i>	5	5	2	8	<b>20</b>
<i>Humpback whale</i>	<i>Upper</i>	3	7	16	9	<b>35</b>
	<i>Lower</i>	5	4	23	9	<b>41</b>
<i>Harbour porpoise</i>	<i>Upper</i>	11	7	0	0	<b>18</b>
	<i>Lower</i>	11	8	0	0	<b>19</b>
<i>White-beaked dolphin</i>	<i>Upper</i>	2	10	12	33	<b>57</b>
	<i>Lower</i>	3	18	14	45	<b>80</b>
<i>Lagenorhynchus sp.</i>	<i>Upper</i>	0	3	3	8	<b>14</b>
	<i>Lower</i>	0	3	3	9	<b>15</b>
<i>Beluga</i>	<i>Upper</i>	0	27	0	0	<b>27</b>
	<i>Lower</i>	0	19	0	0	<b>19</b>
<i>Sperm whale</i>	<i>Upper</i>	0	9	0	0	<b>9</b>
	<i>Lower</i>	0	5	0	0	<b>5</b>
<i>Large whales</i>	<i>Upper</i>	2	2	4	6	<b>14</b>
	<i>Lower</i>	1	0	5	2	<b>8</b>
<b>Total, groups</b>	<i>Upper</i>	<b>102</b>	<b>103</b>	<b>45</b>	<b>90</b>	<b>340</b>
	<i>Lower</i>	<b>98</b>	<b>88</b>	<b>54</b>	<b>109</b>	<b>349</b>
<b>Realised primary effort</b>	<i>Nmi, T</i>	<b>647</b>	<b>1141</b>	<b>904</b>	<b>921</b>	<b>3,613</b>



**Figure 1.** The EB Small Management Area with the block structure, EB1-EB4, adopted for the survey. Realised transects with primary search effort within these survey blocks have been added. The red lines represent search effort conducted within the limits of the acceptable weather conditions defined by the survey protocol, while the blue lines represent search effort in extended conditions and with single platform mode.

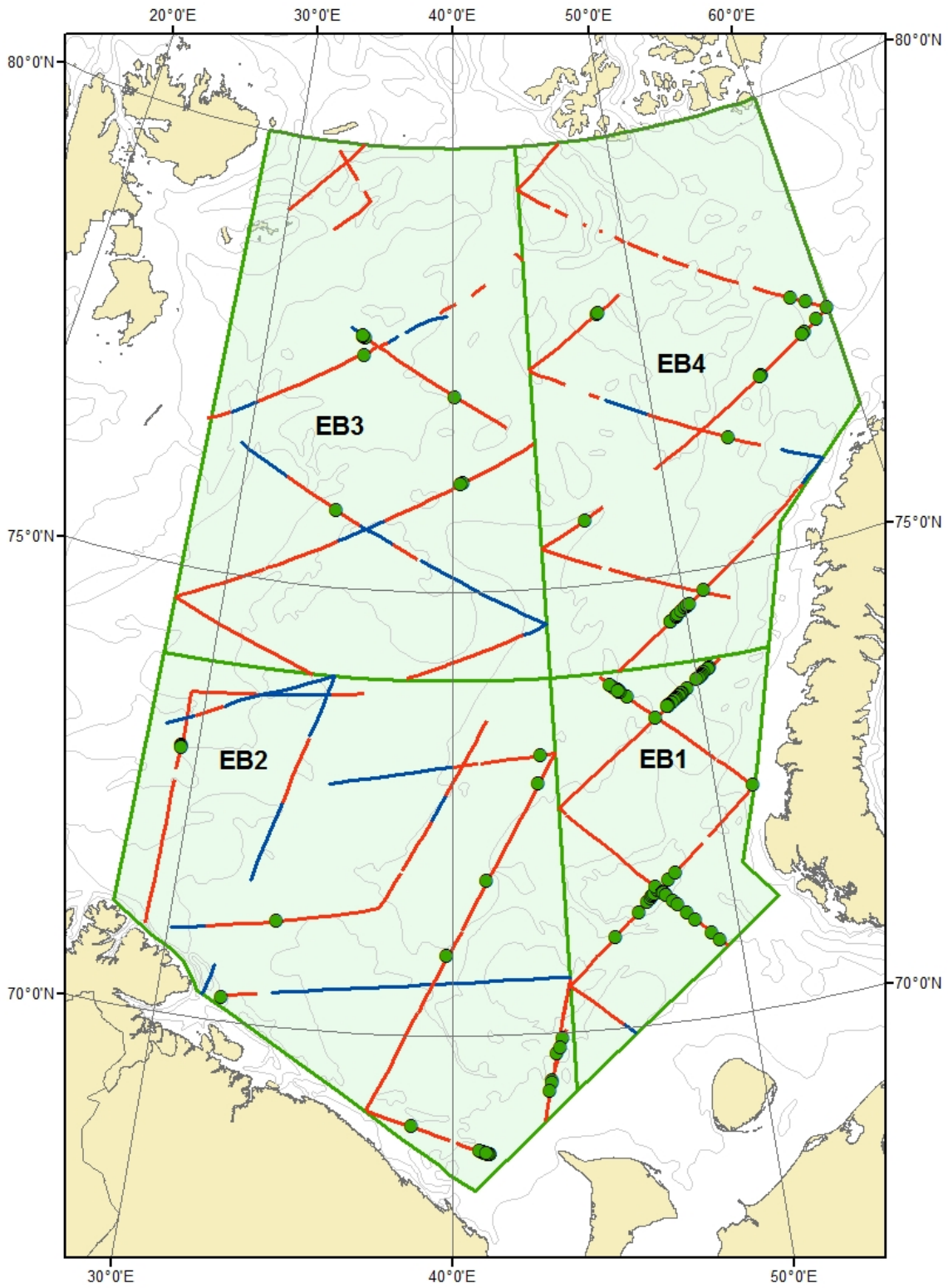
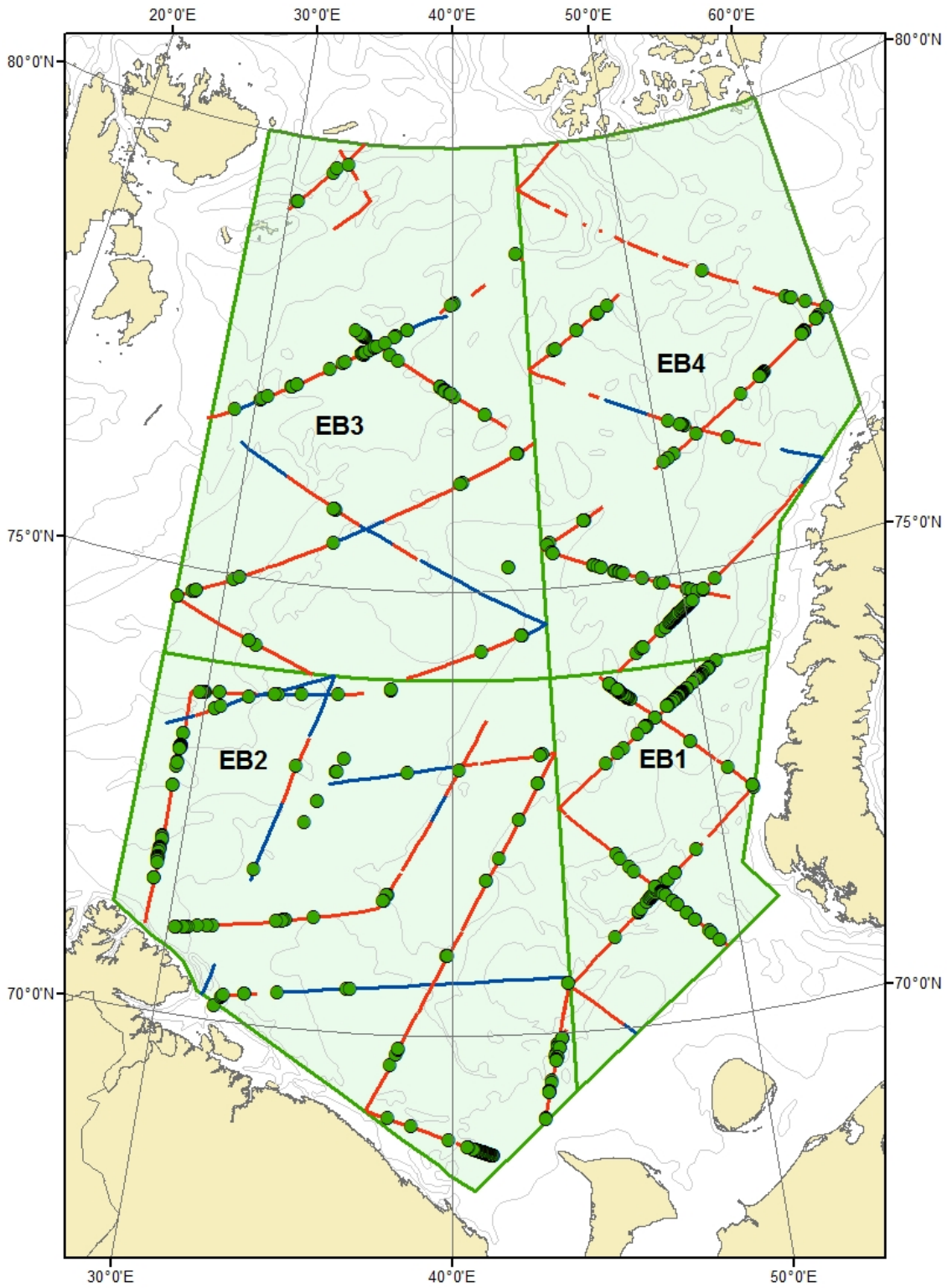


Figure 2. Primary sightings of minke whales.



**Figure 3.** Primary sightings of all species listed in Table 1.