SC/60/PFI 6

Report of the Norwegian 2007 survey for minke whales in the *Small Management Area EB* in the Northeast Atlantic

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ABSTRACT

As part of the six-year program over the period 2002-2007 with the aim to get a new estimate of minke whale abundance in the Northeast Atlantic, the eastern Barents Sea, comprising the *Small Management Area* EB, was surveyed with two vessels during the summer 2007. There were five blocks with a planned basic coverage of about 2,000 nautical miles. In total about 2,300 nautical miles were searched with primary effort. The most common species sighted were *Lagenorhynchus* dolphins (99 groups seen from the primary platform), minke whales (88 groups seen from the primary platform), harbour porpoises (37 groups), fin whales (15 groups) and humpback whales (11 groups). Opportunistic collections were made of biopsy samples from one minke whale, two fin whales and 52 humpback whales, and photo IDs were collected from 57 humpback whales, three fin whales and three minke whales.

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

BACKGROUND 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 period 1996-2001 is that the program has been quite successful (Skaug et al. 2004) in the mentioned respects. Norway therefore decided to conduct a new series of sighting surveys in the northeast Atlantic over the period 2002-2007 (Øien and Skaug 2001) with the aim of presenting a new estimate of minke whale abundance in 2008. The survey conducted in the summer 2007 is the sixth and last one in this survey series.

AREAS SURVEYED IN 2007

When the plans were presented in 2001 (Øien and Skaug 2001), we suggested covering small management areas in more than one year as a rule, by surveying blocks within such an area in different years. The reasoning behind was to get more information on distributional variations between areas. However, during the analyses made of earlier surveys conducted both synoptically and over a six-year cycle (Skaug et al. 2004) it became evident that the best approach would be to follow the strategy used during the years 1996-2001, that is, to cover *Small Management Areas (SMA)* preferably within one survey year.

The eastern Barents Sea, the *EB SMA*, is for a large part within Russian Exclusive Economic zones, which requires a permit for conducting surveys. The original survey plan involved surveying these areas during 2006; however, problems with getting access to Russian EEZ precluded a survey there in that year. In 2007 it was decided to go ahead with a survey of *EB*, and appropriate preparations were made.

CRUISE SUMMARIES

The two vessels that participated in the 2007 survey were the whaler *F/V Ulvos (ULV)* and the sealer *F/V Havsel (HAV).* The survey was conducted over the period 2 July to 5 August 2007. On board the vessels, G. Bøthun, P. Ensor (New Zealand), K.A. Fagerheim, L. Kleivane and N. Øien acted as team leaders.

The 2007 total survey area was divided into five survey blocks (Figure 1). The three blocks KO, BAE and GA were strata used in previous surveys while the blocks FI2 and BA2 arose from practical reasons after the changes made to the North Atlantic minke whale *Small Area* definitions during the Implementation Review in 2003 (IWC 2004), as an eastern boundary was introduced in the Barents Sea at 28°E that divided the blocks FI and BAW used in previous surveys.

Two vessels were chartered for the 2007 survey and applications for surveying in Russian EEZ were sent. In the meantime one of the chartered vessels withdrew from the task with the result that only one of the vessels, *ULV*, was given permission to survey within Russian EEZ.

Given these circumstances, *ULV* was allocated for surveying the blocks KO, GA and BAE within the Russian EEZ, while *HAV* was allocated to the blocks FI2, BA2 and BAE outside the Russian EEZ. The departure harbour for the vessels was Kirkenes, northern Norway.

HAV covered transects in the northern part of the block BAE on 5-8 July and 13-14 July. Around position 76º32'N 36º34'E several groups of humpbacks were encountered and biopsies and photo Ids were collected. Under very good sighting conditions, north of about 77ºN little was seen with the exception of a few groups of harp seals and one bowhead whale in position 78º12'N 39º01'E. After a crew shift in Kirkenes 20 July, the block FI2 was covered 21-22 July and transects within BAE 22 July- 3 August. During the period 25-31 July groups of humpback whales were photographed and biopsied in the area around 76º30'N 37ºE.

After having resolved communication problems with Russian authorities, *ULV* started surveying in the block KO 4 July where work was done until 12 July when a Russian military exercise occupied the central Barents Sea south of 74º40'N and thus hampered survey activity as we had to leave the zone. However, about 90% of the first transect in KO had been covered and therefore search activity was taken up again in the block GA 14 July and continued until 16 July when bad weather forecasts expedited a return to harbour for a crew shift. During the period 22-29 July search effort was spent in GA and BAE (transects within Russian EEZ). The survey concluded with running through parts of a second transect in KO during 30 July-4 August.

The two vessels were able to survey about 2,300 nautical miles, which was a bit more than we had seen as realistic at the planning stage (about 2,000 nautical miles) based on earlier experience of weather and operating conditions. The five blocks all received a reasonable basic coverage at the end, with the exception of the northeastern parts of block BAE. Realised primary search effort in the five blocks surveyed in 2007 is shown in Table 1 and Figure 1.

A summary of the number of groups of whales sighted from the upper primary platform during the 2007 survey when on primary search effort is given in Table 1. Distributions of primary sightings of minke whales, fin whales, humpback whales, harbour porpoises, *Lagenorhynchus* spp. and killer whales are shown in Figure 2. One bowhead whale was observed off effort in the northern part of the central Barents Sea.

Distance and angle estimation training was conducted throughout the survey, and tests were conducted on *HAV* on 17 July and on *ULV* 18 July.

Biopsies were collected from one minke whale, two fin whales and 52 humpback whales, altogether 55 individual whales. Fluke photos for individual identification were collected from 57 humpback whales and body photos taken of three minke whales and three fin whales.

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). The equipment was basically the same as was used in the NILS-95 survey, but some modifications have been made through the period 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 very useful and easy for transcription and checking. Double platform effort is used exclusively, and the observers are organised into teams of two persons. This has been consistent in all our surveys since 1997.

An integral part of the survey activity is collection of dive time data for minke whales by use of VHF tagging or eventual other appropriate methods. During a separate survey in 2007 (Øien et al. 2008) one new dive time series was collected.

On an opportunistic basis, biopsy sampling and photo identification are conducted during the sighting surveys.

FUTURE SURVEY ACTIVITY

The survey in the eastern Barents Sea in 2007 was the last one in the six-year period 2002-2007of survey activity, as planned (Øien & Skaug 2001). A new estimate of minke whale abundance based on these partial surveys 2002-2007 is presented to the present IWC/SC meeting in 2008 (Bøthun et al. 2008).

In 2008, we intend to start a new six-year cycle of surveys to provide future estimates of minke whale abundance in the area (Øien & Bøthun 2008).

ACKNOWLEDGEMENTS

The survey was partially funded by grant no. 111043/S40 from the Norwegian Research Council. We are very grateful to the vessels *'Ulvos'* and *'Havsel'*, the observers and the team leaders on both participating vessels for dedicated and pleasant cooperation in conducting the research, and special thanks to Paul Ensor for the photo ID efforts on the humpback whales. 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 seen from the upper platform during primary search, and realised primary search effort (nautical miles) by survey stratum, during the 2007 survey.

Species	**BA2**	**BAE**	**GA**	**KO**	**FI2**	**Total**
Minke whale	-	31	36	21	-	**88**
Fin whale	-	8	4	1	2	**15**
Humpback whale	-	11	-	-	-	**11**
Harbour porpoise	-	2	20	15	-	**37**
White-beaked dolphin	5	13	1	16	-	**35**
Dolphins, unsp.	8	30	10	12	4	**64**
Large whale	-	2	2	-	-	**4**
Total, groups	13	97	73	65	6	**254**
Realised primary effort (nmi.)	129	965	719	430	73	**2316**

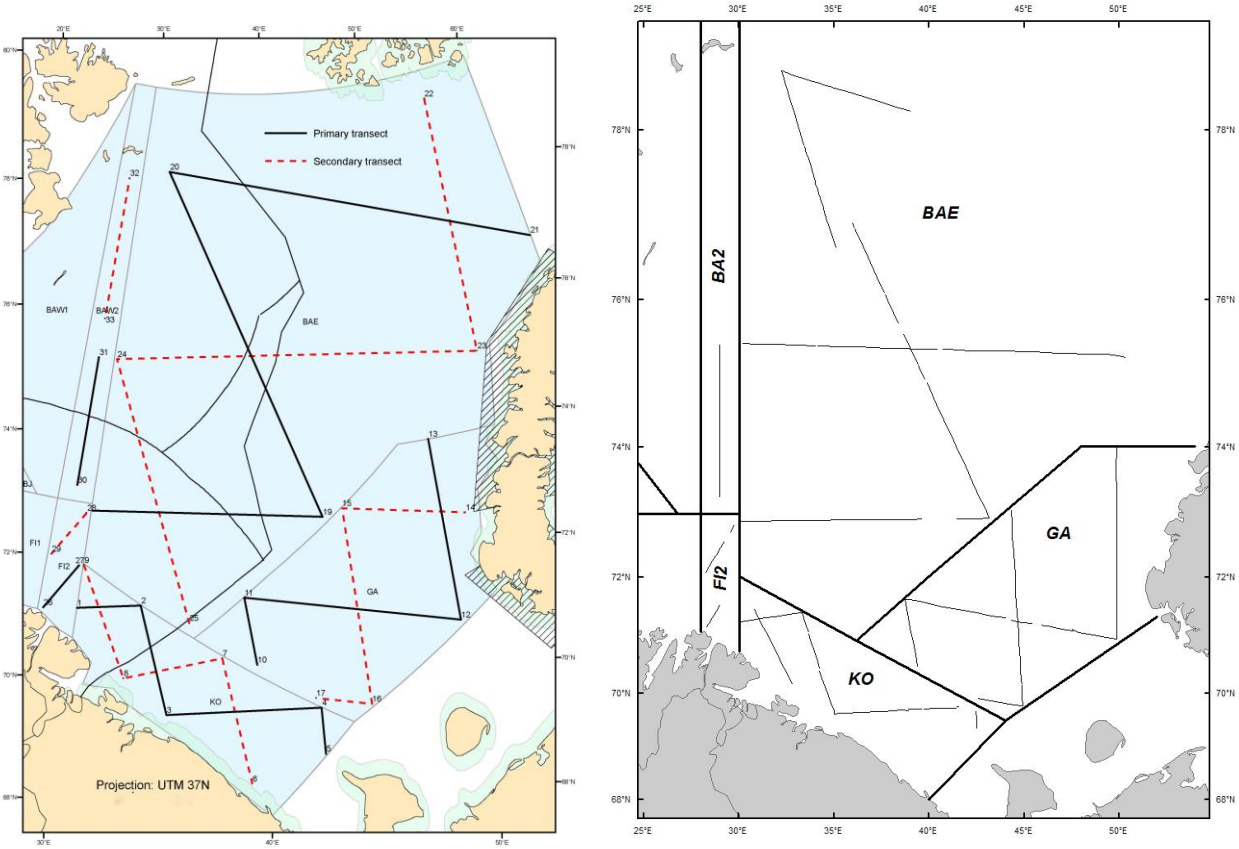
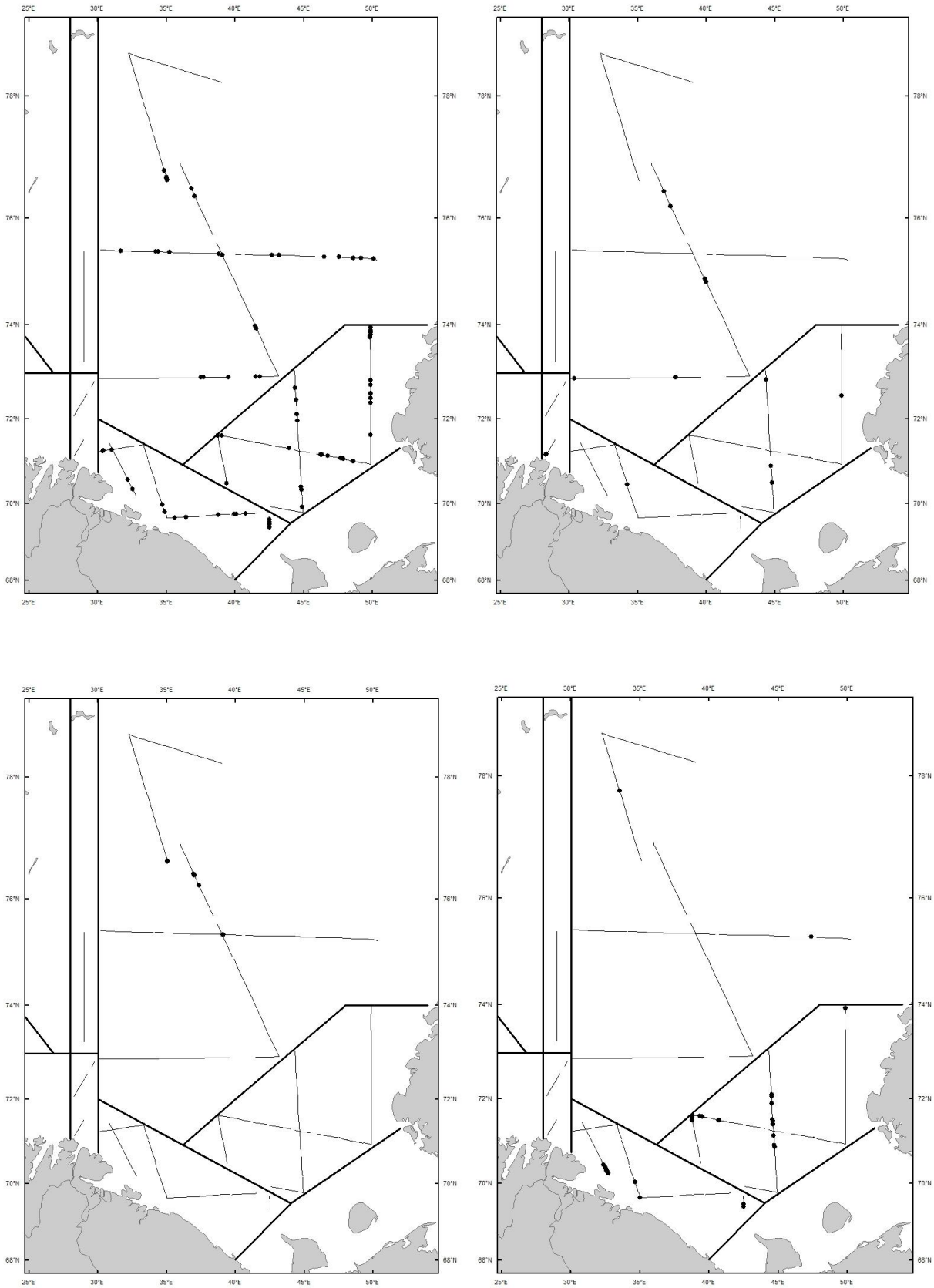


Figure 1. The blocks surveyed in summer 2007 with planned (*left*) and realised (*right*) transects added. In the left part of the figure are also shown (black irregular lines) the boundaries for Norwegian and Russian EEZs anf the Fishery Zone around Svalbard. All blocks east of 28°E contribute to the *EB Small Area* (see IWC 2004 for *Small Area* definitions).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30°E
35°E
40°E
45°E
50°E
78°N
76°N
74°N
72°N
70°N
68°N

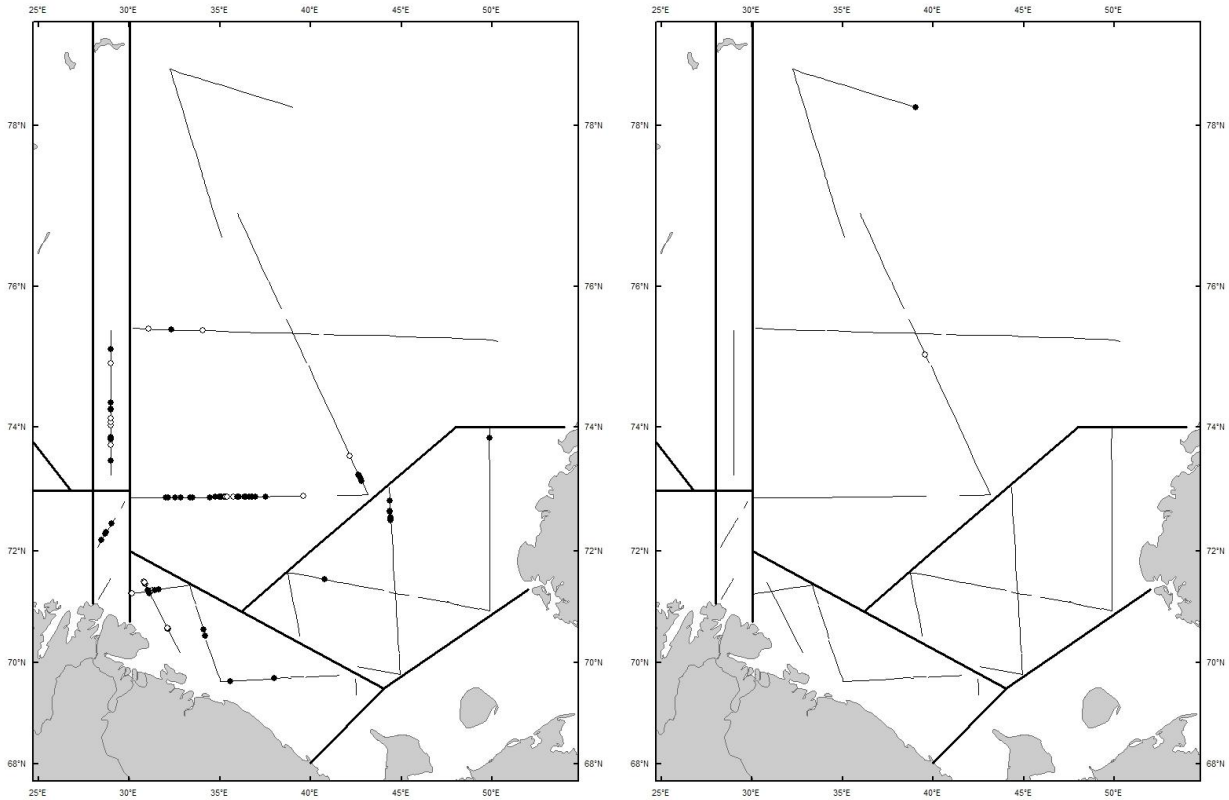

Figure 2. Primary sightings of minke whales (*previous page upper left*); fin whales (*previous page upper right*); humpback whales (*previous page lower left*); harbour porpoises (*previous page lower right*); *Lagenorhynchus* sp. (black dots) and *L. albirostris* (open circles) (*this page left*); killer whale (open circle) and a bowhead whale (black dot) seen off effort (*this page right*). Lines within the block boundaries are realised primary search effort during the 2007 sightings survey.