SC/59/RMP5

Report of the Norwegian 2006 survey for minke whales in the *Small Management Area EW* in the Northeast Atlantic

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ABSTRACT

As part of a 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 Norwegian Sea including the coastal areas off northern Norway, comprising the *Small Management Area* EW, was surveyed with two vessels during the summer 2006. There were four planned blocks with a planned basic coverage of about 2,150 nautical miles. In total about 2,300 nautical miles were searched with primary effort. The most common species sighted were minke whales (69 groups seen from the primary platform), sperm whales (55 groups), *Lagenorhynchus* dolphins (49 groups), killer whales (32 groups), harbour porpoises (26 groups) and fin whales (12 groups). Opportunistic collections were made of biopsy samples from 11 minke whales, one fin whale, one humpback whale and three sperm whales, and photo IDs were collected from two humpback whales and 14 minke whales.

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 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 2006 is the fifth one in this survey series.

AREAS SURVEYED IN 2006

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. In 2006 the original plan was to survey the eastern Barents Sea, the *EB SMA*. This area is for a large part within Russian Exclusive Economic zones, and requires a permit for conducting surveys. We were allowed into Russian EEZ but unfortunately not until the scheduled survey was finished. An alternative survey area was then decided as the *EW SMA*, since parts of it was unsurveyed within the 2002-2007 period, and parts of it had changed boundaries, the most notable that the southern boundary had been moved southwards to 62°N. Two of the blocks within the EW had to be modified (Fig. 1); FI by moving the eastern boundary to 28°E, and dividing NSC in two new strata north (NSC-I) and south of 62°N.

CRUISE SUMMARIES

The two vessels that participated in the 2006 survey were the whaler *F/V Ulvos (ULV)* and the sealer *F/V Havsel (HAV)*. The survey was conducted over the period 3 July to 6 August 2006. On board the vessels, G. Bøthun, P. Ensor (New Zealand), K.A. Fagerheim, L. Kleivane and N. Øien acted as team leaders.

The 2006 total survey area was divided into four survey blocks (Figure 1). *HAV* was allocated for

surveying the FI, LOC and NSC-I blocks, while *ULV* was allocated for the NOS and NSC-I blocks.

After being informed that we would not be allowed into Russian EEZ at the start of the survey, *HAV* headed towards the FI block off the Finnmark coast and conducted one transect there over the period 3 –9 July under mostly marginal weather conditions. The most common cetacean to see there were *Lagenorhynchus* dolphins, and a few large whales and a couple of minkes were recorded in an apparent lifeless area. *HAV* then covered the LOC block over the periods 10-22 and 28-30 July and in this block recorded a fair amount of minke whales but also sperm whales and harbour porpoises. During the period 23-27 July *HAV* covered a transect in NSC-I and recorded minke whales and harbour porpoises as the most common species there.

ULV headed for the NOS block and covered that block over the period 7-28 July with a break 17-18 July due to crew shift. Minke whales and sperm whales were the most commonly seen cetacean species within this block. One transect in the block NSC-I was covered over the period 29-30 July. The remaining few days of the survey with return to port was dedicated to biopsy and ID work on minke whales.

The two vessels were able to survey about 2,300 nautical miles, which was slightly more than we had seen as possible at the planning stage (about 2,200 nautical miles) based on earlier experience of weather and conditions. The four blocks all received a reasonable basic coverage at the end. Realised primary search effort in the four blocks surveyed in 2006 is shown in Table 1 and Figure 1.

A summary of the number of groups of whales sighted from the primary platforms during the 2006 survey when on primary search effort is given in Table 1. Distributions of primary sightings of minke whales, sperm whales, *Lagenorhynchus* spp., killer whales, harbour porpoises, fin whales and humpback whales are shown in Figure 2.

Distance and angle estimation training was conducted throughout the survey, and tests were conducted on *ULV* on 16 July.

Two minke whales were instrumented with VHF tags during the survey (see SC/59/RMP6). One of them was followed for 39 hours, the other for 18 hours.

Biopsies were collected from 11 minke whales, one fin whale, one humpback whale and three sperm whales, altogether 16 individual whales. Fluke photos for individual identification were collected from two humpback whales and body photos taken of 14 minke 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. Analogue tape recorders, which were used in earlier surveys, have been substituted completely by digital recording 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.

FUTURE SURVEY ACTIVITY

The summer 2002 was the first year in the recent six-year period of survey activity (Øien & Skaug 2001). The plan is again to survey the eastern Barents Sea (*Small Area* EB) during the summer 2007, since the access conditions were impossible to meet in 2006. 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 the survey period in 2006 we were able to collect two new dive time series. The efforts to collect more data will be continued, preferably in connection with the survey activity. Efforts will also be continued to conduct satellite tagging of minke whales, especially early and late in the feeding season to get information on migration in and out of the summering areas. On an opportunistic basis, biopsy sampling and photo identification will also be continued during the sighting surveys. A new estimate of minke whale abundance based on the partial surveys 2002-2007 will be presented to the IWC/SC meeting in 2008.

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Table 1

Number of groups of whales seen from upper and lower platforms combined during primary search, and realised primary search effort (nautical miles) by survey stratum, during the 2006 survey.

Species	FI	LOC	NOS	NSC-I	Total
Minke whale	2	45	56	18	**121**
Fin whale	7	8	1	9	**25**
Humpback whale	1	0	4	0	**5**
Harbour porpoise	6	24	2	11	**43**
White-beaked dolphin	14	0	9	0	**23**
Dolphins, unsp.	55	1	5	7	**68**
Killer whale	0	6	39	2	**47**
Sperm whale	0	19	65	23	**107**
Large whale	8	7	2	2	**19**
Realised primary effort (nmi.)	260	590	980	446	**2276**

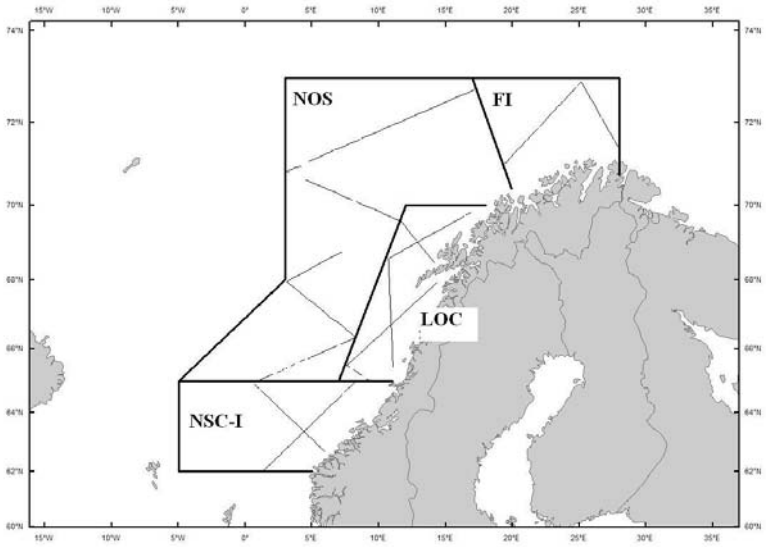

Figure 1. The blocks surveyed in summer 2006 with realised transects added. All blocks contribute to the *EW Small Area* (see IWC 2004 for *Small Area* definitions).

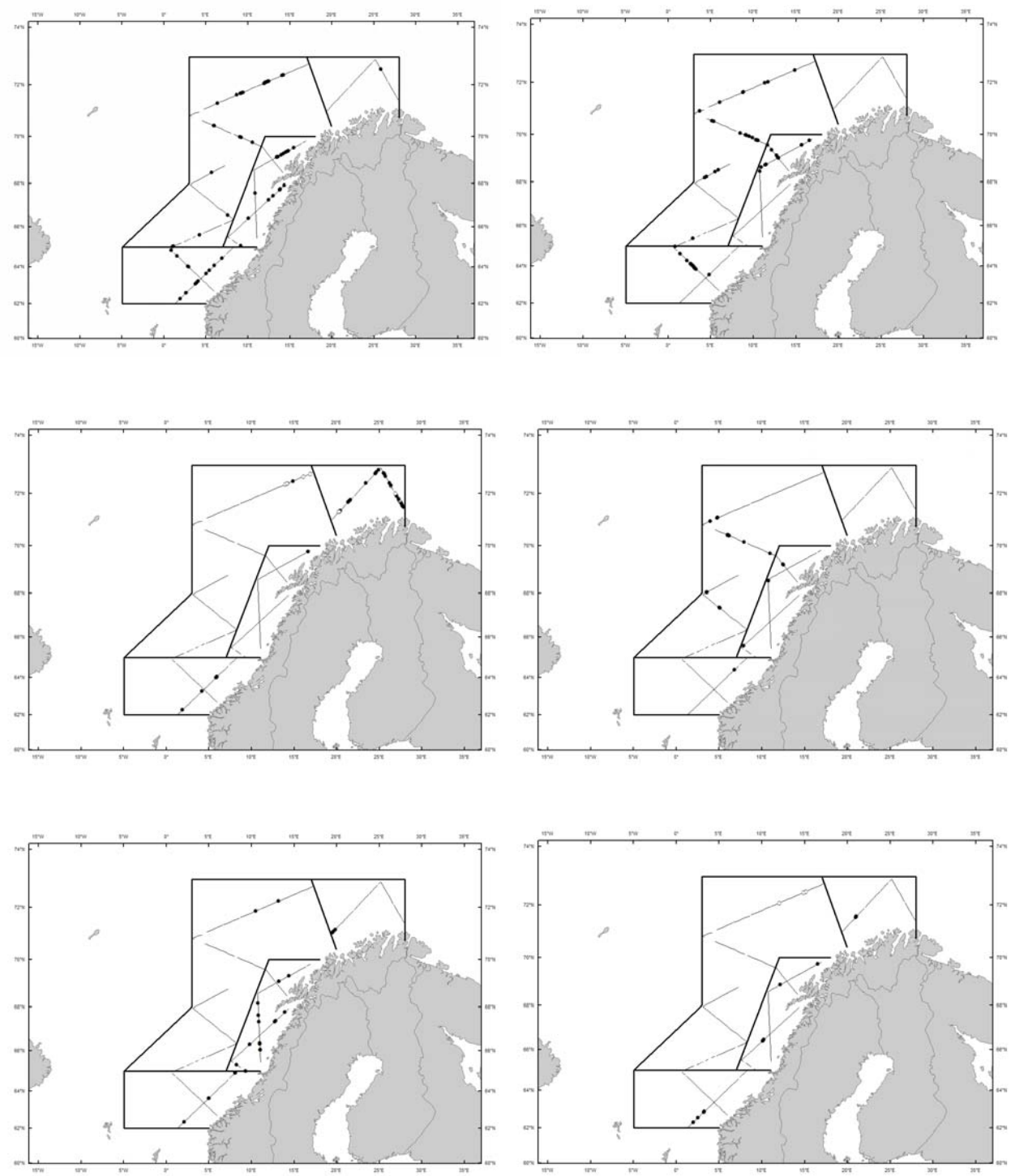

Figure 2. Primary sightings of minke whales (*upper left*); sperm whales (*upper right*); *Lagenorhynchus* sp. (black dots) and *L. albirostris* (open circles) (*mid panel left*); killer whales (*mid panel right*); harbour porpoises (*lower left*) and fin whales (black dots) and humpback whales (open circles) (*lower right*). Lines within the block boundaries are realised primary search effort during the 2006 sightings survey.