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Report of the Norwegian 2009 survey for minke whales within the *Small Management Area* EN – the North 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, waters within the North Sea area which contribute to the *Small Management Area* EN, was surveyed with one vessel during the summer 2009. The total survey area was divided into three blocks which were approximately covered with the planned primary transect effort. Observations in the usual tracking mode were also made during an acoustic herring survey in the eastern coastal parts of the North Sea. About 1,540 nautical miles of primary search effort was conducted within the survey blocks. In addition, about 700 nautical miles were searched within the herring survey block. The most common species sighted was minke whales. Compared to the previous NILS survey conducted in the North Sea in 2004 the most striking feature is the nearly complete absence of harbour porpoise observations in 2009. Also sightings of *Lagenorhynchus* species were very few in 2009.

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 1996-2001and 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 2009 is the second one in this survey series.

AREAS SURVEYED IN 2009

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), and in 2009 the North Sea area of the *Small Management Area* EN was covered. This area was last covered in 2004 (Øien 2005).

The stratum definitions we have been using up to and including the survey period 2002-2007, have changed over time due to increased experience, and changes in the *Small Management Area* structure in 2003 (IWC 2004) also led to 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 present survey cycle the block structure is evaluated and designed to achieve a better total effort distribution over the covered area. The new implemented block structure for the North Sea, comprising of the three strata EN1-EN3, is shown in Figure 1.

CRUISE SUMMARIES

The original cruise plans involve an effort of 10 boat weeks each year. Due to economic constraints, only one vessel, the R/V *Johan Hjort*, was dedicated to the survey which was conducted as a whale survey for the periods 25 June to 12 July and from 22 July to 31 July 2009 and as an acoustic herring survey for the period 13 to 21 July. Thus the dedicated ship time for the whale survey was about four weeks while about one week was allocated for the herring survey. On board the vessel, G. Bøthun, K.A. Fagerheim and N. Øien acted as team leaders.

The 2009 total survey area was divided into three ordinary survey blocks (Figure 1). The blocks EN1 and EN2 were covered within the first period of dedicated survey effort, while the block EN3 was covered in the last period. The herring survey was conducted within a block which we have named *SIL* here (see figure 2). This block covered an area which extended from the western coast of Norway and offshore, mostly within the Norwegian EEZ.

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 1,541 nautical miles in the designed survey blocks (Table 1), which was about the effort we had anticipated for a primary transect at the planning stage based on earlier experience of weather and conditions and time available. Although we were able to survey all the three blocks with a near to planned coverage, it remains to see how the reduced effort may influence the precision of the estimates. During the herring survey it was also possible to conduct some primary effort, however, the resulting distribution of effort seem to be somewhat lumped which is not unexpected as the herring survey is not weather dependent in the same sense as the whale survey. Realised primary search effort in the three blocks surveyed in 2009 is shown in Figure 1 and in the herring block *SIL*, in Figure 2.

A summary of the number of groups of whales sighted during the 2009 survey when on primary search effort is shown in Table 1. Distributions of primary sightings of minke whales, *Lagenorhynchus* spp., harbour porpoises and killer whales are shown in Figures 1-3.

The North Sea area was last surveyed during the NILS surveys in 2004. The most striking observation when comparing the 2009 survey with the 2004 survey is the absence of harbour porpoises which in 2004 was the single most encountered species. Also, the number of observations of *Lagenorhynchus* spp. was much fewer in 2009.

Distance and angle estimation training was conducted on 5 July, and experimental tests were conducted on 12 July.

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 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 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.

In 2009 no new dive time data series were collected, nor were there any biopsy sampling or photo identification conducted during the sighting survey.

FUTURE SURVEY ACTIVITY

Within the on-going survey program for the six-year cycle 2008-2013, the Svalbard area was covered in 2008, the North Sea area in 2009 and the Jan Mayen area will be covered in the summer 2010. In 2011, the preliminary plan is to survey the *Small Management Area* EW – which includes the southern and eastern parts of the Norwegian Sea.

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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 2009 survey.

		Survey block				
Species	***Platform***	**EN1**	**EN2**	**EN3**	**Total**	**SIL**
Minke whale	*Upper*	5	19	5	**29**	11
	Lower	4	17	6	**27**	13
White-sided dolphin	*Upper*	0	2	17	**19**	0
	Lower	0	0	10	**10**	0
White-beaked dolphin	*Upper*	0	1	0	**1**	1
	Lower	0	1	2	**3**	0
Lagenorhynchus sp.	*Upper*	0	1	2	**3**	1
	Lower	0	4	0	**4**	1
Harbour porpoise	*Upper*	5	0	1	**6**	2
	lower	1	1	2	**4**	1
Killer whale	*Upper*	0	0	1	**1**	1
	Lower	0	0	0	**0**	1
Total, groups	***Upper***	**10**	**23**	**26**	**59**	**16**
	Lower	**5**	**23**	**20**	**48**	**16**
Realised primary effort	***nmi***	**393**	**679**	**469**	**1,541**	**705**

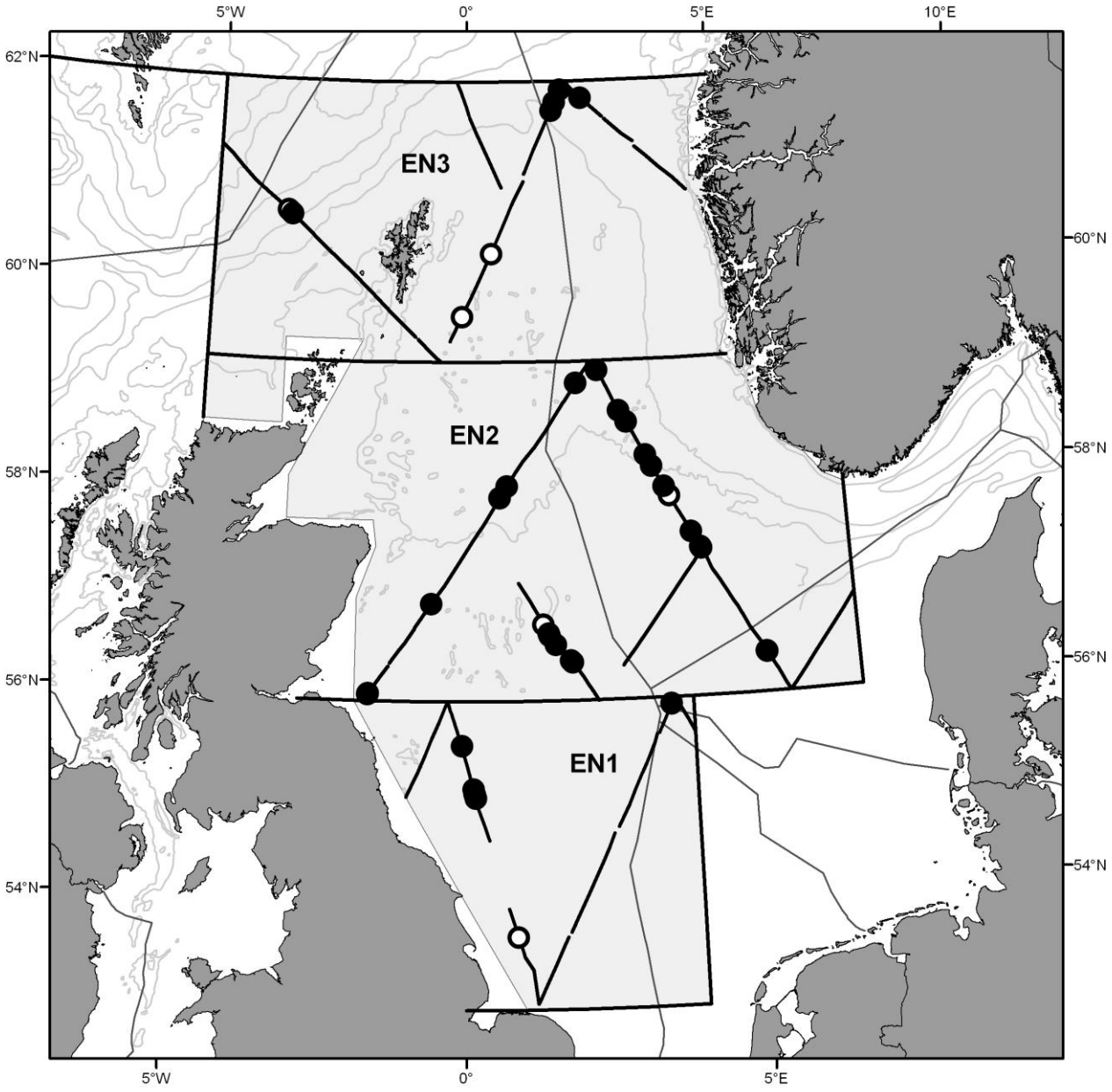

Figure 1. *The North Sea part of the EN Small Management Area with the block structure, EN1-EN3, adopted for the survey. Realised transects with primary search effort within these survey blocks have been added. Primary sightings of minke whales have been plotted as closed circles (from the upper platform) and open circles (from the lower platform).*

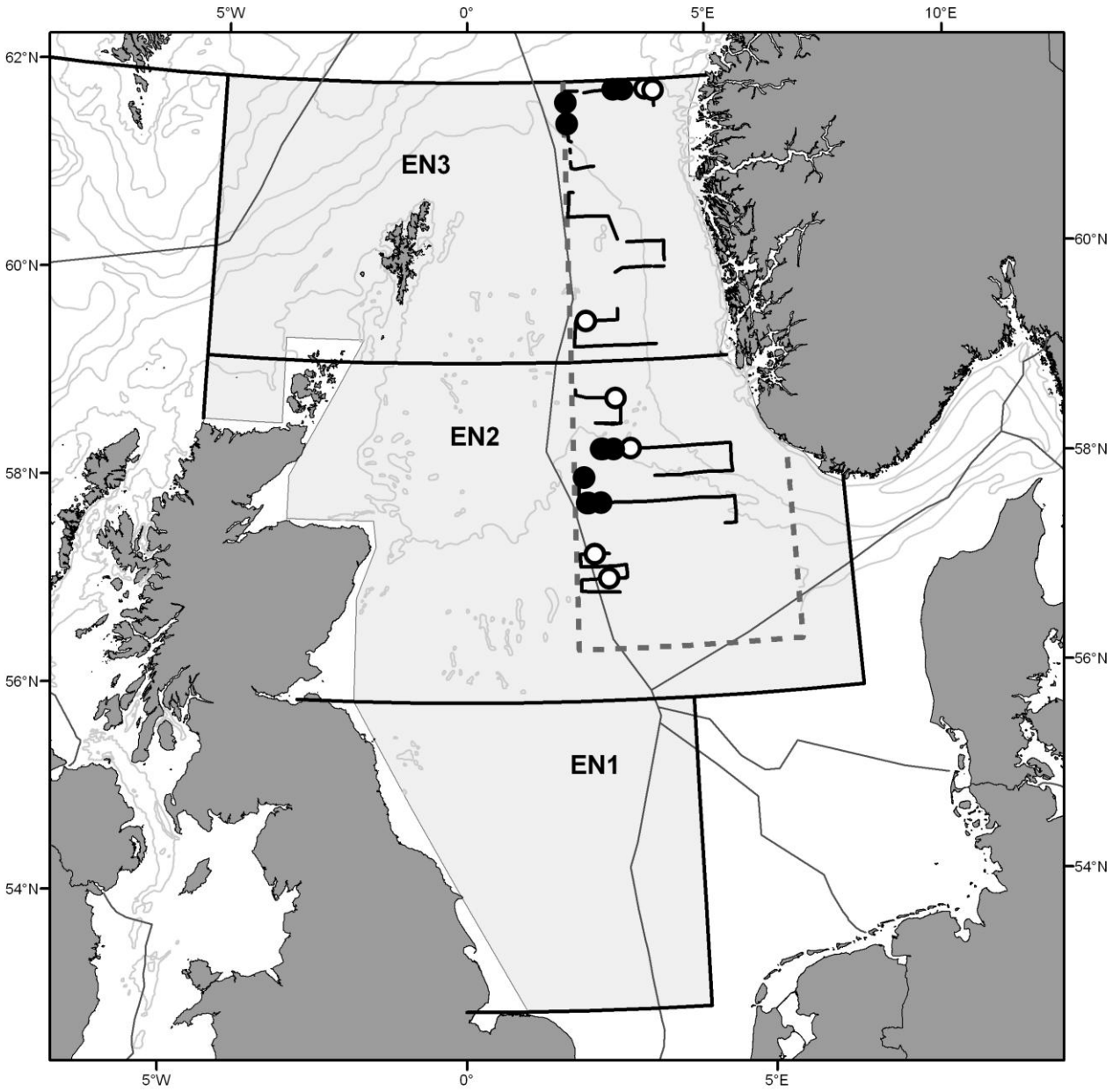

Figure 2. *The herring survey block SIL within the dashed line; realised transects with primary search effort within this block have been added. Primary sightings of minke whales have been plotted as closed circles (from the upper platform) and open circles (from the lower platform).*

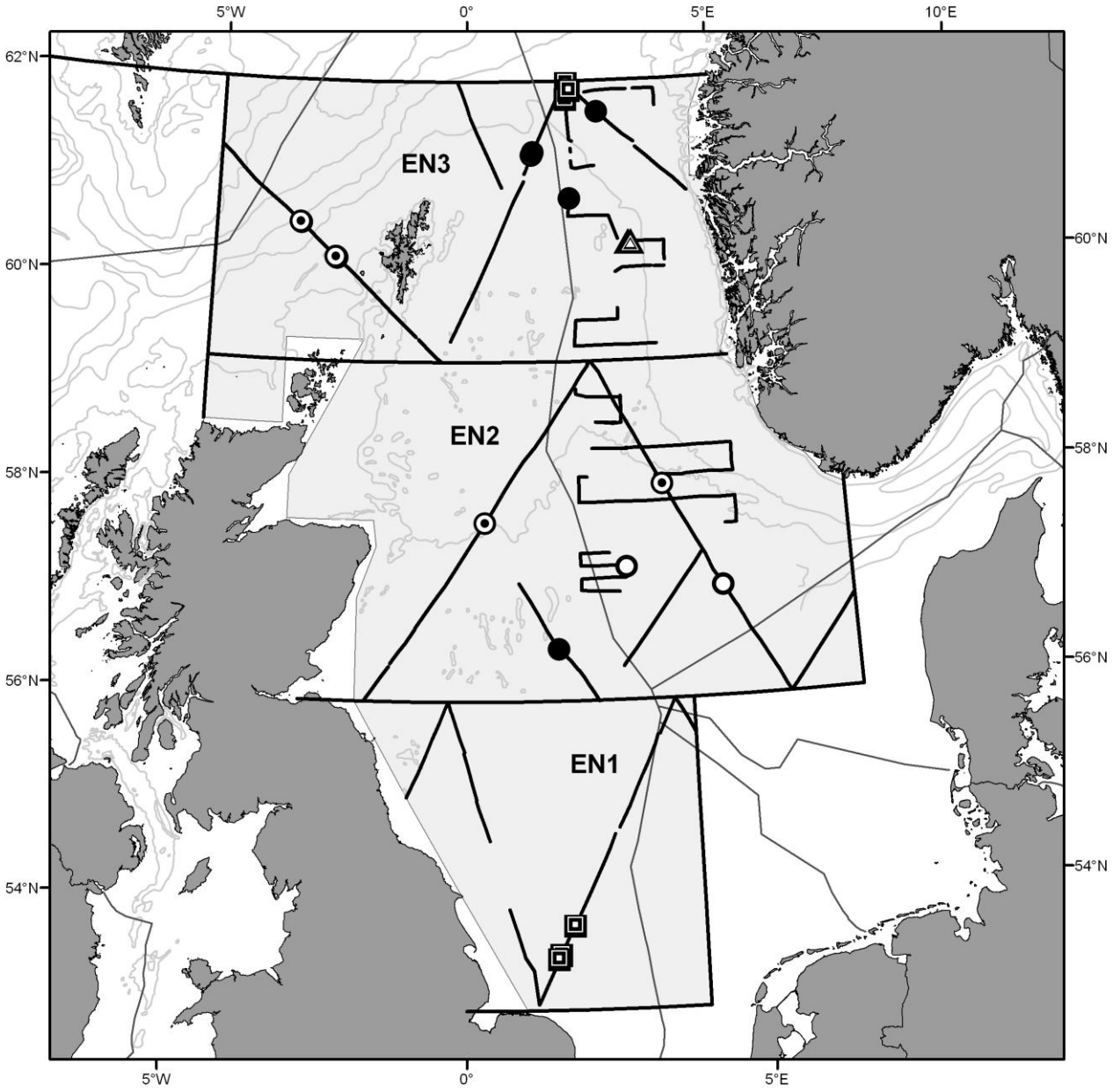

Figure 3. *Primary sightings of species other than minke whales: Circles are Lagenorhynchus spp. sightings (open circles - L. albirostris; dotted circles – L. acutus; black circles - L. spp., undetermined). Squares are harbour porpoise sightings and triangles are sightings of killer whales.*