

# Norway. Progress report on cetacean research, January 2008 to December 2008, with statistical data for the calendar year 2008

COMPILED BY SIDSEL GRØNVIK

Norwegian Institute for Nature Research, The Polar Environmental Centre, N-9296 Tromsø, Norway

This report summarises information obtained from:

Name of agency/institute	Abbreviation (use in rest of report)	Contact e-mail address
The Institute of Marine Research	IMR	tore.haug@imr.no; nils.oien@imr.no arne.bjoerge@imr.no
The University of Oslo, Natural History Museum	NHM	oystein.wiig@nhm.uio.no
The Norwegian Polar Institute	NP	lydersen@npolar.no
The Norwegian School of Veterinary Science	NVH	morten.tryland@veths.no; anuscha.polder@veths.no

## 1. SPECIES AND STOCKS STUDIED

IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Blue whale	<i>Balaenoptera musculus</i>	North Atlantic	2.1.1;3.1.1;3.2
Bowhead whale	<i>Balaena mysticetus</i>	North Atlantic	2.1.1;4.4
Fin whale	<i>Balaenoptera physalus</i>	Northeast Atlantic	2.1.1;2.1.2;3.1.1;3.2;4.1;4.4
Humpback whale	<i>Megaptera novaeangliae</i>	North Atlantic	2.1.1;2.1.2;2.2;3.1.1;3.2;4.1
Killer whale	<i>Orcinus orca</i>	Northeast Atlantic	2.1.2
Minke whale	<i>Balaenoptera acutorostrata</i>	Northeast Atlantic	2.1.1;2.1.2;2.2;3.1.1;3.1.3;3.2; 4.2; 4.4;5:6.2-9
White whale	<i>Delphinapterus leucas</i>	Svalbard	4.1;4.4
White-beaked dolphin	<i>Lagenorhynchus albirostris</i>	Northeast Atlantic	2.1.1;2.1.2

## 2. SIGHTINGS DATA

### 2.1 Field work

#### 2.1.1 Systematic

During the period 30 June to 3 August 2008, a sighting survey was conducted with two vessels (*Eros* and *Thorsteinson*) covering the Small Management Area ES, which includes the northern Norwegian Sea, the Greenland Sea and the Svalbard area west of 28°E and north of 73°N. This was the first year of the six-year program 2008-2013 to cover the northeast Atlantic to provide a new abundance estimate of minke whales every sixth year as part of the management scheme established for this species. A total of 2,780 nautical miles was surveyed on primary effort and 237 sightings of minke whales were made during this effort. Sightings of other cetacean species include fin whales (169 primary sightings), humpback whales (82 primary sightings), Lagenorhynchus dolphins (220 primary sightings), Northern bottlenose whales (12 primary sightings) and blue whales (4 primary sightings). (IMR)

In May 2008 mapping of whale distributions was conducted during an ecosystem survey in the Norwegian Sea onboard the research vessel *G O Sars* by having dedicated whale observers who collected information following line transect protocols. This was also done onboard *Eros* during an ecosystem survey in the Norwegian Sea in July-August. A similar arrangement with dedicated marine mammal observers following a line transect protocol was conducted also during the ecosystem surveys in the Barents Sea in August to September 2006 on the vessels *G O Sars*, *Johan Hjort* and *Jan Mayen*. (IMR)

A search for bowhead whales in the Greenland Sea along the ice edge between Svalbard and Greenland was conducted in connection with hooded seal fieldwork during March-April. No bowheads were observed, but vocalizations were detected twice via the hydrophone array that was towed after *RV Lance* along the ice edge. (NP, NHM)

### 2.1.2 *Opportunistic, platforms of opportunity*

IMR vessels and coastguard vessels have collected incidental observations of marine mammals. Recorded data include date, position, species and numbers. During 2008 a total of 1054 observation incidents have been reported. The most frequently observed species were minke whales (207 groups), *Lagenorhynchus* dolphins (183), fin whales (102), harbour porpoises (101), humpback whales (89), killer whales (57) and sperm whales (32 groups). (IMR)

## 2.2 Analyses/development of techniques

Databases containing incidental observations of marine mammals have been updated. Minke whale catch data for the 2008 season have been computerised and evaluated. (IMR)

Abundance estimates for fin, sperm and humpback whales based on recent surveys have been provided for publication. (IMR)

## 3. MARKING DATA

### 3.1 Field work

#### 3.1.1 *Natural marking data*

Several photo IDs have been collected from humpback (54), minke (10), fin (8) and blue (3) whales. (IMR)

#### 3.1.2. *Artificial marking data*

No new information.

#### 3.1.3 *Telemetry data*

During the period 1 to 21 September 2008 field work with emphasis on instrumentation of minke whales was conducted in Norwegian coastal waters from the North Sea to Varanger, Finnmark. One minke whale was radio tagged in the Varanger fjord in the southeastern Barents Sea and followed for a total of approximately 60 hours over a 7-day period. The track was discontinuous because it entered Russian EEZ at times where we were not able to follow the whale. (IMR)

## 3.2 Analyses/development of techniques

The work with cataloguing identification photos of humpback whales collected on incidental occasions and during our own surveys in Norwegian and adjacent waters are progressing. More recently, IMR has also collected identification photos from other species like minke whales, fin whales and blue whales. For the latter two species the usefulness in collecting such data is seen in connection with other established identification catalogues in the North Atlantic. (IMR)

In September 2008 one minke whale was radio tagged in the Varanger fjord, southeastern Barents Sea. This whale was followed over seven days but since it during that time entered Russian EEZ several times, about 60 hours of tracking time could be recorded. The mean blow rate of this whale was 38 blows/hour, which is in the lower range (33-72 blows/whale/hour) of what we have observed earlier between individuals. The mean blow rate for 20 minke whales collected so far, is 48.6 blows/whale/hour. (IMR)

## 4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

### 4.1 Biopsy samples (summary only)

During the sightings field work, biopsy samples have been collected from humpback (11) and fin (12) whales. (IMR)

Biopsies for a genetic study were collected from 14 white whales in the Kongsfjorden-Krossfjorden area in Svalbard in June. (NP)

#### 4.2 Samples from directed catches (commercial, aboriginal and scientific permits) or bycatches

During the traditional whaling season (April-October), body condition data and tissue materials for studies of DNA identity were collected from all minke whales taken by vessels participating in the Norwegian small type whaling. (IMR)

#### 4.3 Samples from stranded animals

No new information reported from 2008.

#### 4.4 Analyses/development of techniques

Biopsies collected from humpback whales in the Barents Sea have been through a DNA laboratory analyse and results are in the process of being worked up. (IMR)

Biopsy samples of bowhead whales from western Greenland are analyzed in cooperation with Mads Peter Heide Jørgensen, Greenland Institute of Natural Resources and Lianne Postma, Fisheries and Oceans. (NHM)

DNA suitable for PCR amplifications has been extracted from historic whale samples from South Georgia. Amplification and sequencing of two stretches of the mitochondrial cytb gene offers an easy and rapid approach to identifying samples suitable for further genetic analyses and to determine the species status of whale remains with reasonable confidence. At least for humpback, fin, and sei whales, South Georgia provides suitable material for studying historic population structures. A manuscript is under publication in Marine Mammal Science. The project is done in cooperation with Tony Martin, BAS. (NHM).

Tissues sampled for stock identity studies of minke whales have been archived and analysed using DNA techniques. (IMR)

Serum samples from 12 white whales and 2 narwhales, sampled 1992 – 2008 in the Svalbard archipelago, were assayed for antibodies against the zoonotic parasite *Toxoplasma gondii* using a direct agglutination test. Individuals harbouring antibodies, indicative of ongoing infection or previous contact with the parasite, were identified. The results are currently being published. (NVH)

### 5. POLLUTION STUDIES

Historical Norwegian pooled samples of minke whale blubber (1993 and 1999) were analysed for brominated flame retardants as part of a Nordic project "New" POPs in marine mammals in Nordic Arctic areas during three decades", which is funded by the Nordic Council of Ministers. The chemical analyses were performed at the MTM Research Center, Örebro, Sweden. Results so far showed that the levels of sum polybrominated diphenyl ethers ( $\Sigma$ PBDEs) in Norwegian minke whales were considerably lower than corresponding levels in pilot whales from Faroe Islands. The  $\Sigma$ PBDE levels in minke whale from 1993 and 1999 were in the same range, and BDE 47 was the major congener. Results will be distributed at the UN POP COP 4 meeting in Geneva in May 2009. New samples will be collected in 2009 for continuation of the time trend study. (NVH)

### 6. STATISTICS FOR LARGE CETACEANS

#### 6.1 Corrections to earlier years' statistics for large whales

No corrections made.

#### 6.2 Direct catches of large whales (commercial, aboriginal and scientific permits) for the calendar year 2008

Species	Type of catch	Management Areas					Total catch
		EB	EN	ES	EW	CM	
Minke whale	Small-type whaling	22	94	230	160	30	536

### 6.3 Anthropogenic mortality of large whales for the calendar year 2008

#### 6.3.1 Observed or reported ship strikes of large whales (including non-fatal events)

No observations or reports from 2008.

#### 6.3.2 Fishery bycatch of large whales

No observations or reports from 2008.

## 7. STATISTICS FOR SMALL CETACEANS

### 7.1 Corrections to earlier years' statistics for small cetaceans

No corrections made.

### 7.2 Direct catches of small cetaceans for the calendar year 2008

No direct catches

### 7.3 Anthropogenic mortality of small cetaceans for the calendar year 2008

#### 7.3.1 Observed or reported ship strikes of small cetaceans (including non fatal events)

No observations or reports from 2008

#### 7.3.2 Fishery bycatch of small cetaceans

Observed bycatches in 2008 will be reported to IWC SC/61. Extrapolated estimates of total bycatch in fisheries (estimated as mean annual bycatch in 2006-2008) are scheduled to be submitted to IWC SC/62. (IMR)

## 8. STRANDINGS

Information on strandings has been collected by IMR.

## 9. OTHER STUDIES AND ANALYSES

Modelling multi-species interactions in the Barents Sea ecosystem has been done with special emphasis on minke whales and their interactions with cod, herring and capelin. The Barents Sea ecosystem has experienced major fluctuations in species abundance the past five decades. Likely causes are natural variability, climate change, overfishing and predator-prey interactions. In the modelling exercises, an age-length structured multi-species model (Gadget, Globally applicable Area-Disaggregated General Ecosystem Toolbox) was used to analyse the historic population dynamics of major fish and marine mammal species in the Barents Sea. The model was used to examine possible effects of a number of plausible biological and fisheries scenarios. The results suggest that changes in cod mortality from fishing or cod cannibalism levels have the largest effect on the ecosystem, while changes to the capelin fishery have had only minor effects. Alternate whale migration scenarios had only a moderate impact on the modelled ecosystem. Indirect effects are seen to be important, with cod fishing pressure, cod cannibalism and whale predation on cod having an indirect impact on capelin, emphasising the importance of multi-species modelling in understanding and managing ecosystems. Models such as the one used in these studies provide one step towards an ecosystem-based approach to fisheries management. (IMR)

## 10. LITERATURE CITED

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