

**DENMARK. PROGRESS REPORT ON CETACEAN RESEARCH, JANUARY 2005 TO DECEMBER 2005, WITH STATISTICAL DATA FOR THE CALENDAR YEAR 2005**

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## 1. Species and stocks studied

The following studies were conducted in the period: 2005

Common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Minke Whale	<i>Balaenoptera acutorostrata</i>	West & East Greenland	2, 6.1
Fin Whale	<i>Balaenoptera physalus</i>	Denmark, West & East Greenland	2, 3.1.3, 4.1, 6.1, 6.2.1
Humpback Whale	<i>Megaptera novaeangliae</i>	West & East Greenland, Brazil	2, 3.1.1, 3.1.3, 4.1, 6.2.3
Bowhead Whale	<i>Balaena mysticetus</i>	West Greenland, Canadian Arctic	3.1.3, 4.1
Sperm Whale	<i>Physeter macrocephalus</i>	Greenland, Norway	6.2.1, 9
Narwhal	<i>Monodon monoceros</i>	Canada and Greenland	7
White whale	<i>Delphinapterus leucas</i>	Greenland, various Arctic	7
White-beaked Dolphin	<i>Lagenorhynchus albirostris</i>	Denmark; Iceland	4.3, 7.2.1, 9
White-sided dolphin	<i>Lagenorhynchus acutus</i>	Denmark	4.3, 7.2.1
Common Dolphin	<i>Delphinus delphis</i>	Denmark	4.3, 7.2.1
Harbour Porpoise	<i>Phocoena phocoena</i>	Denmark, Greenland	2.1.1, 3.1.3, 4.1, 4.3, 7, 7.2.1, 9

## 2. Sightings data in 2005

### 2.1 Field work

#### 2.1.1 SYSTEMATIC

A ship-based line transect survey for large whales in East and West Greenland was conducted in September 2005 (GINR, see [sc/58/awmp6](#) for detail), and an aerial cue counting survey for large whales was conducted off West Greenland in September 2005 (GINR, see [sc/58/awmp7](#) for detail).

In 2005 Denmark supported the SCANS II (Small Cetaceans in the Europeans Atlantic and North Sea II) dedicated to estimate the abundance of small cetaceans in European Atlantic waters. Extensive ship and aerial surveys were conducted in July 2005, to which NERI, F&B and DHI participated to. Data on abundance for Danish and other EU waters will be available in 2006. Project information and preliminary results can be found at: <http://biology.st-andrews.ac.uk/scans2/>

NERI conducts regular ship surveys for harbour porpoises at Horns Reef as part of the monitoring program for Horns Reef Offshore Wind Farm. The final report will be ready in 2006 and annual reports are available at [http://www.hornsrev.dk/Engelsk/default\\_ie.htm](http://www.hornsrev.dk/Engelsk/default_ie.htm)

#### 2.1.2 OPPORTUNISTIC, PLATFORMS OF OPPORTUNITY

No information

### 2.2 Analyses/development of techniques

None

## 3. Marking data

### 3.1 Field work

#### 3.1.1 NATURAL MARKING DATA

Species	Feature	Area/stock	Calendar year/season/ no. photographed	Catalogued (Y/N)	Catalogue total	Contact person/institute
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Humpback whales	Flukes, dorsal fin	Disko Bay	9	Y	Not specified	GINR (sendt to NOAH, P. Stevik), DFFL
Humpback whales	Flukes, dorsal fin	Nuuk	1	Y	Not specified	GINR (sendt to NOAH, P. Stevik), DFFL

### 3.1.2. ARTIFICIAL MARKING DATA

None

### 3.1.3 TELEMETRY DATA

Species	Area/stock (month)	Tag type	No. successfully deployed	Maximum time transmitting	Contact person/institute
Bowhead whales	Disko Bay (04)	Satellite tag	6	Not specified	GINR
Bowhead whales	Disko Bay (04)	Satellite tag + fluorometers	5	Not specified	GINR
Bowhead whales	Disko Bay (04)	Satellite tags +TDR	3	Not specified	GINR
Bowhead whales	Cumberland Sound (07)	Satellite tag	9	Not specified	GINR / DFO (Can)
Fin whales	Disko Bay (08)	Satellite tag	3	Not specified	GINR
Humpback whales	Disko Bay (08)	Satellite tag	3	Not specified	GINR
Humpback whales	Brazil (05)	Satellite tag	16	Not specified	GINR / Biodinamica (Bra)
Harbour porpoise	Danish waters	Satellite + radio-tag*	1	6 months	Jonas Teilmann, NERI

\* In addition this animal carried an acoustic data-logger for 4.5 hrs giving the first data on echolocation of a free ranging harbour porpoise.

### 3.2 Analyses/development of techniques

None

## 4. Tissue/biological samples collected

### 4.1 Biopsy samples

Species	Area/stock	2005 no. collected	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Bowhead whales	Disko Bay (04)	23	Y	?	Not specified	GINR
Bowhead whales	Disko Bay (08)	3	Y	?	Not specified	GINR
Fin whales	Disko Bay (08)	3	Y	?	Not specified	GINR
Humpback whale	Disko Bay (08)	3	Y	?	Not specified	GINR
Harbour porpoise	Danish waters	1	Y	0	Not specified	Jonas Teilmann, NERI

### 4.2 Samples from directed catches or bycatches

Species	Area/stock	Calendar year/ season total	Archived (Y/N)	Tissue type(s)	Contact person/institute
Fin whales	West Greenland	7	Y	skin	GINR
Minke whale	West Greenland	130	Y	skin	GINR
Minke whale	East Greenland	2	Y	skin	GINR
Humpback whale	Nuuk	1	Y	Muscle	GINR
Harbour porpoise	Danish waters	several	y	Not specified	DFNA / FMM

### 4.3 Samples from stranded animals

Species	Area/stock	Calendar year/ season total	Archived (Y/N)	Tissue type(s)	Contact person/institute
Harbour porpoise	Danish waters	several	Y	Not specified	FMM, S. Tougaard, <a href="mailto:st@fimus.dk">st@fimus.dk</a>
White beaked dolphins	Danish waters	several	Y	Not specified	FMM

White sided dolphins	Danish waters	several	Y	Not specified	FMM
Common dolphins	Danish waters	1	Y	Not specified	FMM

#### 4.4 Analyses/development of techniques

None

#### 5. Pollution studies

None

#### 6. Statistics for large cetaceans

##### 6.1 Direct catches (commercial, aboriginal and scientific permits) for the calendar year 2005

Species	Type of catch	Area/stock	Males	Females	Total landed	Struck and lost
Minke whale	Aboriginal	East Greenland	3	1	4	0
Minke whale	Aboriginal	West Greenland	34	134	173	3
Fin whale	Aboriginal	West Greenland	1	11	13	1 (found dead)

##### 6.2 Non-natural mortality for the calendar year 2005

Species	Area/stock	Males	Females	Total	Cause	Methodology
none						

##### 6.2.1 STRANDINGS OR DEAD WHALES ENCOUNTERED AT SEA

Whale species	Sex	Location	Cause of death	Det.	Source or contact institution, contact name and telephone and/or e-mail
A. Sperm whale	M	63°50'N, 51°50'W (approximate location)	U	V	Org.: Ministry of Fisheries, Hunting and Agriculture (DFFL) Address: Box 269, DK-3900 Nuuk Contact: F. Ugarte Tel.: +299 34 53 43, feug@gh.gl
B. Fin whale	U	Amaqut (Nuuk area, GI)	Struck and lost	V	DFFL
Fin whale	?	Denmark	U	V	FMM, S. Tougaard, <a href="mailto:st@fimus.dk">st@fimus.dk</a>

Comments: A. Seen floating at sea by fisheries and hunting inspector; B. Found dead by fisheries and hunting inspector, harpoon embedded (reported as struck and lost above).

##### 6.2.2 OBSERVED OR REPORTED SHIP STRIKES

Whale species	Sex	Date	Location	Vessel type	Speed	Fate	Source or contact
none							

Comments:

##### 6.2.3 FISHERY BYCATCH

Whale species	Sex	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
a. Humpback whale	U	Before May 18	Kangaamiut (GI), ca. 65°50'N, 53°15'W	U	Cod	FPN	A	DFFL
b. Humpback whale	U	June 18	Kangaamiut (GI), ca. 65°50'N, 53°15'W	K	Cod	FPN	Police report	DFFL
c. Humpback whale	U	July 25	Paamiut (GI), ca. 61°59'N, 49°40'W	K	Cod	FPN	Police report	DFFL
d. Humpback whale	F	August 05	Nuuk (GI), GPS 64°00.61'N, 51°53.785'W	K	Snow crab	FPO	Fishery and hunt inspector report	DFFL
e. Humpback whale	U	August	Maniitsoq, ca. 65°26'N, 52°55'W		Snow crab	FPO	Fishery and hunt inspector report	DFFL

Comments: a. Whale not seen, but gear damaged and humpback whales seen in the area earlier; b. young animal, mother near by; b & d. put down with grenade harpoon, meat distributed (not sold) in the community; c. Drowned, meat distributed free of charge among the community; d. About 12 m long, muscle samples given to the Greenland Institute of Natural Resources (GINR), ID picture given to GINR (Lars Wittinø) and to the New England Aquarium (Peter Stevik)

### 6.3 Earlier years' statistics

No correction

## 7. Statistics for small cetaceans

Concerning statistics on small cetaceans the Greenland Home Rule Government, the Directorate for Fisheries, Hunting and Agriculture, and the Government of the Faroes as a matter of principles request IWC to obtain scientific and technical information on small cetaceans from the North Atlantic Marine Mammal Commission (NAMMCO), University of Tromsø, N-9037 Tromsø, Norway ([Nammco-sec@nammco.no](mailto:Nammco-sec@nammco.no)).

### 7.1 Direct catches (commercial, aboriginal and scientific permits) for the calendar year 2005

Species	Type of catch	Area/stock	Males	Females	Total landed	Struck and lost
None known		DK				

### 7.2 Non-natural mortality for the calendar year 2005

#### 7.2.1 STRANDINGS OR DEAD SMALL CETACEANS ENCOUNTERED AT SEA

Species	Nr. /Sex	Location	Cause of death	Det.	Source or contact institution, contact name and telephone and/or e-mail
Harbour porpoises	143 /?	Denmark	U + entanglement	V + N in some cases	FMM, S. Tougaard, <a href="mailto:st@fimus.dk">st@fimus.dk</a>
White sided dolphins	2 / ?	Denmark	U	V + N in some cases	FMM, S. Tougaard, <a href="mailto:st@fimus.dk">st@fimus.dk</a>
White beaked dolphins	10 / ?	Denmark	U	V + N in some cases	FMM, S. Tougaard, <a href="mailto:st@fimus.dk">st@fimus.dk</a>
Common dolphin	1 / ?	Denmark	U	V + N in some cases	FMM, S. Tougaard, <a href="mailto:st@fimus.dk">st@fimus.dk</a>
Comments:					

#### 7.2.2 OBSERVED OR REPORTED SHIP STRIKES

Species	Sex	Date	Location	Vessel type	Speed	Fate	Source or contact
none							
Comments:							

#### 7.2.3 FISHERY BYCATCH

Species	Sex	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
Harbour porpoises	?	?	?	?	several	GN	?	DFNA

### 7.4 Earlier years' statistics

No correction

## 8. Strandings

The Danish stranding network is based on a contingency plan developed and managed by FNA ([HLS@sns.dk](mailto:HLS@sns.dk)) in cooperation with the Zoological Museum in Copenhagen, the Esbjerg Fisheries and Maritime Museum ([st@fimus.dk](mailto:st@fimus.dk)) and the participation of F&B ([marie@fjord-baelt.dk](mailto:marie@fjord-baelt.dk)).

## 9. Other studies and analyses

### Investigations of methods to reduce by-catch

GDnatur, DIFRES and F&B, together with Kolmården Djurpark (SE) and the Institute of Marine Research (NO) completed the NIPER project - Nordic Interactive Pinger for Porpoise Entanglement Reduction - funded by the Nordic Council of Ministers (MiFi - Environment and Fisheries), the Kolmården Fundraising Foundation and the participating agencies. The objective of the NIPER project was to test the interactive pinger (IP, emission of deterrent sounds activated by porpoises sonar) in a set-up simulating a bottom set gillnet fishery. Accessory goals of the project were collecting data on the sonar source level of wild porpoises and on their acoustic activity in the wild, since knowing these is a prerequisite to optimizing the design of the interactive pinger and its porpoise detection (POD) function.

Set of field trials were conducted in August 2004, May and September 2005. The porpoise reaction to the array of IP was also compared to the porpoise reaction to an array of beacon-mode pinger. No difference in reaction was observed. The IP emitted 1-7% of the amounts of displacement sounds emitted by traditional, beacon mode pingers. The final report will be available by mid 2006. (Contact: [genevieve@gdnatur.dk](mailto:genevieve@gdnatur.dk)).

DIFRES also conducted research on methods for reducing by-catch of dolphins in pelagic trawls. (Contact: [fl@dfu.min.dk](mailto:fl@dfu.min.dk)).

#### *Acoustics*

Ongoing research on small cetaceans at the University of Southern Denmark (in cooperation with several other institutions) includes: echolocation and sound communication in white beaked dolphins in Icelandic waters, sound production in harbor porpoises, hearing and biosonar in harbor porpoises using non-invasive auditory brainstem electrophysiological recordings, and acoustic tagging of wild harbor porpoises in Danish waters (Contact: [lee@biology.sdu.dk](mailto:lee@biology.sdu.dk)).

AAU runs a study on the acoustics of sperm whales (*Physeter macrocephalus*) in the waters off Andenes, Norway, aims to investigate the biosonar system of these whales. The project now focuses on measurements with a 10 hydrophone, vertical, linear, 1km array, using fiber optics. (Contacts: [bertel.moehl@biology.au.dk](mailto:bertel.moehl@biology.au.dk) and [Magnus.Wahlberg@biology.au.dk](mailto:Magnus.Wahlberg@biology.au.dk)).

The F&B has resumed in September 2005 experiments investigating the hearing sensitivity of captive harbour porpoises for a project of the university of Ruhr-Bochüm (Germany) looking at the effect of man-made noise on harbour porpoise hearing, especially offshore windmill construction works, and aiming at providing guidelines for safe intensity level for sound emissions during underwater operations (Contact: [marie@fjord&bælt.dk](mailto:marie@fjord&bælt.dk)).

#### *Effect of wind farms on harbour porpoises.*

NERI has investigated the effects on harbour porpoises from wind farm constructions and operations at Nysted Offshore Wind farm and Horns Reef Offshore Wind Farm since 1999. The monitoring programs are based on stationary acoustic recordings (T-PODs) at both farms and in addition ship surveys at Horns Reef. The monitoring programs finish in 2006. The final report on the projects will be available by the end of 2006. Reports on the effect on harbour porpoises of the construction and operation phases are available at the following web pages:

[http://uk.nystedhavmoellepark.dk/frames.asp?Page\\_ID=81&Page\\_Ref=44&Templates\\_ID=1](http://uk.nystedhavmoellepark.dk/frames.asp?Page_ID=81&Page_Ref=44&Templates_ID=1)

[http://www.hornsrev.dk/Engelsk/default\\_ie.htm](http://www.hornsrev.dk/Engelsk/default_ie.htm)

(Contact: [jat@dmu.dk](mailto:jat@dmu.dk))

#### *Habitat exclusion and habituation of harbour porpoises to pingers*

In 2005 the reaction of harbour porpoises to two type of pingers (Airmar and SafeWave) was tested in a large scale and long duration experiment in Danish waters. Both habitat exclusion and gradual habituation was observed. Final results will be available in 2006. (Contact: [pbj@dmu.dk](mailto:pbj@dmu.dk))

## **10. Literature cited**

### **11. Publications**

#### *11.1 Published or 'In Press' papers only (2005, 2006 and in press)*

Beedholm, K. and Miller, L. A. 2005. Narrow band pulses as stimuli in an auditory brain stem recording study with a harbor porpoise. *J.Acoust.Soc.Am.* 117:2408.

Beedholm, K. and Miller, L. A. 2005. Stimulus-response characteristics of a harbor porpoise during active echolocation and passive hearing studied with auditory brain stem recordings (ABR). *J.Acoust.Soc.Am.* 117:2441.

Beedholm, K., Miller, L. A., and Blanchet, A.-M. 2006. Auditory brainstem response (ABR) in a harbor porpoise show lack of automatic gain control for simulated echoes. *J.Acoust.Soc.Am.* 119, EL41-EL46.

Cañadas, A., Donovan, G., Desportes, G. and Borchers, D. in press. The estimation of the detection function and  $g(0)$  for short-beaked common dolphin (*Delphinus delphis*), using double-platform data collected during the NASS-95 Faroese survey. *NAMMCO Sci. Publ* 7.

Carstensen, J., Henriksen, O.D. and Teilmann, J. (in press). Impacts on harbour porpoises from offshore wind farm construction: acoustic monitoring of echolocation activity using porpoise detectors (T-PODs). *Marine Ecology Progress Series*.

Edrén, S. and Teilmann, J. 2005. Humpback Whale. In: Nuttall, M. (Ed.), *Encyclopedia of the Arctic*: 898-899.

Eriksen, N. *et al.* (2005). Cultural change in the songs of humpback whales (*Megaptera novaeangliae*) from Tonga. *Behaviour* 142:305-328.

Paxton, C.G.M., Burt, M.L., Hedley, S.L., Víkingsson, G.A., Gunnlaugsson, T. and Desportes, G. (in press). Using environmental covariates to estimate the density of humpback whales with application to the 1995 and 2001 NASS aerial and shipboard surveys. *NAMMCO Sci. Publ.* 7.

- Pike, D.G., Gunnlaugsson, T., Víkingsson, G.A., Desportes, G. and Bloch, D. (in press). Estimates of the abundance of minke whales (*Balaenoptera acutorostrata*) from Faroese and Icelandic NASS shipboard surveys. *NAMMCO Sci. Publ.* 7.
- Pike, D.G., Gunnlaugsson, T., Øien, N., Desportes, G., Víkingsson, G.A., Paxton, C.G.M and Bloch, D. (in press). Distribution, abundance and trends in abundance of fin and humpback whales in the North Atlantic. CM 2005/R12, proceedings of the Annual ICES conference. Aberdeen, Scotland, September 2005.
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- Simon, M., Wahlberg, M., Ugarte, F. and Miller, L. A. (2005) Acoustic characteristics of underwater tail slaps used by Norwegian and Icelandic killer whales (*Orcinus orca*) to debilitate herring (*Clupea harengus*). *Journal of Experimental Biology* 208:2459-66
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- Strand, J., Larsen, M.M. and C. Lockyer. 2005. Accumulation of organotin compounds and mercury in harbour porpoises (*Phocoena phocoena*) from the Danish waters and West Greenland. *Science of the Total Environment* 350 (2005):59-71.
- Teilmann, J., Tougaard, J., Kirketerp, T., Anderson, K., Labberté, S. & Miller, L. (2006). Reactions of captive harbour porpoises (*Phocoena phocoena*) to pinger-like sounds. *Marine Mammal Science* 22(2):240-260.
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### 11.2 Unpublished literature

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- Justines, O and Øen, E.O. 2006 Shooting trials on heads of dead pilot whales, guidelines to test the efficiency of rifle ammunition used for hunting and euthanasia of small whales. NAMMCO/15/7 ANNEX 1. Selfoss, Iceland, March 2006. Available at [nammco-sec@nammco.no](mailto:nammco-sec@nammco.no).
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- Tougaard, J., Carstensen, J., Teilmann, J. & Bech, N.I. 2005: Effects of the Nysted Offshore Wind Farm on harbour porpoises. - Annual status report for the T-POD monitoring program. Report request. Commissioned by ENERGI E2 A/S. National Environmental Research Institute. 51 pp.
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