

# THE NETHERLANDS, PROGRESS REPORT ON CETACEAN RESEARCH, May 2006 TO MAY 2007, WITH STATISTICAL DATA FOR THE CALENDAR YEAR 2006

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This report summarises information obtained from the Institute for Marine Resources and Ecosystem Studies (IMARES), the Royal Netherlands Institute for Sea Research (NIOZ), and the Sea Mammal Research Company (SEAMARCO).

## 1. Species and stocks studied

Common name	IWC recommended scientific	Area/stock(s)	Items referred to
<i>Balaenoptera acutorostrata</i>	Minke whale	North Sea	2.1.1, 2.1.2
<i>Balaenoptera physalis</i>	Fin whale	Dutch coast	8
<i>Balaena glacialis australis</i>	Southern right whale	South Africa	2.1.2
<i>Megaptera novaeangliae</i>	Humpback whale	South Africa	2.1.2
<i>Orcinus orca</i>	Killer whale	Northern Norway	2.1.1
<i>Tursiops truncatus</i>	Bottlenose dolphin	Dutch coast,	2.1.1
<i>Delphinus delphis</i>	Common dolphin	Dutch coast	2.1.1, 8
<i>Globicephala melas</i>	Long-finned pilot whale	Dutch coast	8
<i>Lagenorhynchus acutus</i>	White-sided dolphin	Celtic Sea, Dutch coast	4.3, 7.3.3, 8
<i>Lagenorhynchus albirostris</i>	White-beaked dolphin	North Sea	2.1.2, 8
<i>Phocoena phocoena</i>	Harbour porpoise	North Sea, Northern Norway	2.1.1, 2.1.2, 4.3, 7.3.3, 8, 9
<i>Stenella coeruleoalba</i>	Striped dolphin	Dutch coast	2.1.2, 8
<i>Souza plumbea</i>	Indian humpback dolphin	South Africa	2.1.2
<i>Cephalorhynchus heavisidii</i>	Heaviside's dolphin	South Africa	2.1.2
<i>Tursiops aduncus</i>	Indo-Pacific bottlenose dolphin	South Africa	2.1.2

## 2. Sightings data

### 2.1 Field work

#### 2.1.1 SYSTEMATIC

The coastal seawatching programme was continued in 2006, producing 487 sightings of 3-4 species of cetaceans (1677 individuals) in Dutch nearshore waters: Bottlenose Dolphins *Tursiops truncatus* (2 sightings, 6 animals), Common or Striped Dolphin *Delphinus/Stenella* (2, 3), White-beaked Dolphin *Lagenorhynchus albirostris* (3, 12), Harbour Porpoise *Phocoena phocoena* (480, 1656). Systematic ship-based surveys in The Netherlands were largely confined to waters off the mainland coast and one survey between the Wadden Sea Islands and the Oystergrounds/Outer Silver Pit in summer. Three species of whales and dolphins were recorded, 414 sightings in all, including Minke Whale *Balaenoptera acutorostrata* (14 sightings, 16 individuals), White-beaked Dolphin *Lagenorhynchus albirostris* (3, 11), and Harbour Porpoise *Phocoena phocoena* (397, 692).

In November, systematic sightings surveys were conducted in Vestfjorden en Ofotfjorden, northern Norway, in conjunction with @ASK FRANS-PETER LAM ABOUT SURVEY NAME@@ tagging operations on free-living Killer Whales. The surveys produced 113 sightings of cetaceans (excluding acoustic recordings; totalling 461 individuals), including Killer Whales *Orcinus orca* (90 sightings, 428 individuals) and Harbour Porpoises *Phocoena phocoena* (23, 38).

#### 2.1.2 OPPORTUNISTIC, PLATFORMS OF OPPORTUNITY

Opportunistic sightings were collected routinely and logged into the Marine Mammals database. In all, over 2006 642 sightings were logged for Dutch waters (1753 individuals), including some unidentified small whales (4 sightings, 7 individuals, Minke Whales *Balaenoptera acutorostrata* (4, 4), Bottlenose Dolphins *Tursiops truncatus* (1, 2), White-beaked Dolphins *Lagenorhynchus albirostris* (14, 86) and Harbour Porpoises *Phocoena phocoena* (612, 1644).

The combined results of systematic sightings data and opportunistic material confirm the ongoing increase in Harbour Porpoises utilising Dutch coastal waters. The number of sightings of Harbour Porpoises in 2006 and the number of individuals logged is the highest figure ever.

Further opportunistic sightings surveys were conducted in South Africa in October 2006, and in Tysfjord/Ofotfjorden Norway in December 2006. Logged sightings in South Africa include Southern Right

Whale *Balaena glacialis australis* (148 sightings, 338 individuals), Humpback Whale *Megaptera novaeangliae* (1, 1), Indian Humpback Dolphin *Souza plumbea* (2, 10), Indo-Pacific Bottlenose Dolphin *Tursiops aduncus* (1, 9), and Heaviside's Dolphin *Cephalorhynchus heavisidii* (1, 2). Norwegian sightings include Killer Whale *Orcinus orca* (5 sightings, 72 individuals) and Harbour Porpoise *Phocoena phocoena* (3, 3).

#### 4. Tissue/biological samples collected

##### 4.1 Biopsy samples

##### 4.3 Samples from stranded animals

Species	Area/stock	Calendar year/ season total	Archived (Y/N)	Tissue type(s)*	Contact person/institute
Harbour porpoise	NL North Sea coast	hundreds	Y	Skin, ovaries, blubber, liver, lung, inner-ears, teeth, gonads, stomachs	IMARES
Atlantic white-sided dolphin	Celtic Sea	1	Y	Stomach, teeth, skin, blubber	IMARES
Common dolphin	Celtic Sea	1	Y		

#### 5. Pollution studies

In order to assess consequences at the population level of exposure of marine mammals to contaminants, a study has been carried out using bottlenose dolphins as a sentinel species. It has been shown that the annual accumulation rate of polychlorinated biphenyls (PCBs) in Sarasota bottlenose dolphins might be depressing the population growth rate (a joint study carried out under the IWC POLLUTION2000+ programme, involving e.g. Mote Marine Laboratory Sarasota, SMRU, Univ. Barcelona, WHOI, IMARES).

#### 7. Statistics for small cetaceans

##### 7.1 For the calendar year 2006

##### 7.3.3 FISHERY BYCATCH

Species	Sex	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
Harbour porpoise*	F+M	2006	Dutch North Sea coast	D		GN	Found dead and autopsied	IMARES
Atlantic white-sided dolphin	M	2006	49.°40N; 11°05W	D	Scad; Mackerel	Pelagic trawl	Observer	IMARES
Common dolphin	M	2006	53°13N; 11°21W	D	Scad; Mackerel	Pelagic trawl	Reported by crew	IMARES
Comments:* estimated number minimally 250								

#### 8. Strandings

Details of cetaceans stranded in The Netherlands were entered into a relational database and made available to the national archives at Naturalis in Leiden (C.J. Camphuysen). The database held records of 4362 stranded cetaceans since the first documented event in 1255, of which 544 were found in 2006. Strandings in 2006 included Fin Whale *Balaenoptera physalus physalus* (1), Long-finned Pilot Whale *Globicephala melas melas* (1), Striped Dolphin *Stenella coeruleoalba* (1), Common Dolphin *Delphinus delphis* (1), White-beaked Dolphin *Lagenorhynchus albirostris* (3), White-sided Dolphin *Lagenorhynchus acutus* (1), unidentified small cetaceans (2), and Harbour Porpoise *Phocoena phocoena* (534). The number of stranded harbour porpoises is unprecedented and follows a period of exponential increase in strandings (and sightings) since the mid 1990s. The increase is of great concern and seems to reflect a distributional shift from more northerly areas within the North Sea towards the shallow waters of the Low Countries, possibly as a result of reductions in food availability in the north (Camphuysen 2004, MacLeod et al. 2007). The high percentage of probably bycatch in stranded animals (see below) is a further reason for concern. (NIOZ, Naturalis, IMARES).

#### 9. Other studies and analyses

In September 2006, 64 earlier in that year on the Dutch North Sea coast stranded harbour porpoises, have been investigated. This was a joint study by the Institute for Marine Resources and Ecosystem Studies and the Royal NIOZ. Of the carcasses suitable for investigation, the percentage bycatch-victims are estimated at 64-70%. The majority of the studied animals were subadult, but the estimated percentage bycatch did not differ between young and old(er) animals.

Porpoises strand on the coast the entire year round, but there are two distinct periods when higher numbers were found. The first wave of strandings was observed in March and April. These animals were healthy, freshly dead, often with full stomachs. Of these spring strandings, around 84% are estimated to have died because of drowning in fishing gear (nets). A second wave was discernable in the summer. These animals were usually unhealthy, with very little blubber reserves and empty stomachs. Drowning as a cause of death of these summer strandings was estimated to amount to only 25%. Animals unsuitable for investigation (progressed state of decomposition) were not equally distributed over the year: few in the spring period when the estimated percentage bycatch was very high, and much more rotten animals in summer period with a lower estimated bycatch percentage. When the found bycatch percentages amongst the fresh carcasses were applied to all the collected stranded porpoises including the unsuitable ones, the percentage bycatch victims during the collection period, decreased to 53-57%. The outcome of this investigation reveals that the percentage bycatch amongst all collected animals is at least 53% (excluding animals which were suspected to be bycaught, but no conclusive evidence) and a maximum bycatch percentage (including the suspected possible bycatch victims). (IMARES, NIOZ).

Research to reduce by-catch of cetaceans in pelagic trawling was conducted within an international EU-co funded programme NECESSITY (Contract No SSP8-CT-2003-501605). A 'cetacean tunnel barrier' was rigged in the front part of a 4300 meshes circumference pelagic trawl and tested in the Bay of Biscay on board the German fisheries research vessel FRV "Walther Herwig III" in September/ October 2006.. The performance of the barrier was underwater observed day and night exploiting a newly developed flash-card based autonomous video recorder system. The ship's SIMRAD SP70 hull sonar was used in passive mode to detect cetacean vocalisations and the direction relative the ship's course. A total of 19 instrumented hauls were carried out, during all of which video and sonar recordings were collected. On night hauls the trawl was fished with an opened codend to avoid fish catches and hauling of the gear at night. A panel of 250 mm square meshes in the codend collected larger animals, which passed the barrier. On the first night haul three male common dolphins (*Delphinus Delphis*) were caught with the observation equipment not fully functioning. No observations were obtained on the behaviour of cetaceans against the barrier. Relatively large numbers of sunfish (*Mola mola*) were bycaught with the highest numbers in the southern part of the research area (51 in 12 hours, 11 in 2:15 hours). (IMARES)

Many cetacean pingers produce masking type of signals which could collide echo-locating cetaceans. In the same mainframe a basin study (started in 2005) on the effects of incidence signals on the efficiency echo-location sonar of a bottlenose dolphin was continued in the Bruges dolphinarium. A reference white noise signal was used to achieve the threshold amplitude of the acoustic interference. Incidence signals were applied with this amplitude but with the frequency density as the main test parameter. The research is expected to end in April 2007. (Seamarco, Imares)

The acoustic underwater emitted sound of pile-driving produced during the construction of the OWEZ wind farm facility west of Egmond aan Zee was measured on 6 of the 36 hammering cases. The research will be completed in March 2007. (IMARES)

A study within the European Union co-funded "Necessity" project has been conducted, assessing the Dutch pelagic fishery west of Ireland by means of analysis of data collected in the nineties. Evidence is provided for possible causes of bycatch of Atlantic white-sided dolphins (*Lagenorhynchus acutus*) in the Dutch pelagic fishery, west of Ireland, in the 1990ies. The hypothesis is put forward that dolphins are feeding on discards in the wake of the trawlers at night and thus become victim of bycatch during hauling or shooting of the gear. Therefore a possible mitigation measure would be to stop discarding, by temporally storing discards in a "buffer-tank", during the fishing operations and to release the discards between fishing operations only. In this study, an extensive description is given of the way the catch is handled on board and how discards are released and become available for scavenging dolphins. Stomach contents of by-caught specimens are compared with discards and catch composition. Mackerel dominates the fresh remains of the stomach contents. The length distribution of the mackerel in stomach contents is similar to the mackerel in the discards. Indicating that dolphins are feeding on discarded mackerel, rather than foraging on the mackerel when these are caught in the net. Information gained by observers on board the trawlers and from other diet studies confirms this hypothesis. This conclusion suggests that controlling the discards flow may be an effective mitigation measure. This could be tested for example by implementing a discards "buffer-tank" on a trawler.

World-wide many cetaceans drown incidentally in fishing nets. To reduce the unwanted bycatch in gillnets, pingers (acoustic alarms) have been developed that are attached to the nets. In the European Union, pingers will be made compulsory in some areas in 2005 and in others in 2007. However, pingers may affect non-target marine fauna such as fish. Therefore a study has been carried out in The Netherlands, to quantify the effects of

seven presently commercially-available pingers on the behaviour of five North Sea fish species in a large tank. The species tested were: sea bass (*Dicentrarchus labrax*), pout (*Trisopterus luscus*), thicklip mullet (*Chelon labrosus*), herring (*Clupea harengus*), and cod (*Gadus morhua*).

The fish were housed as single-species schools of 9–13 individuals in a tank. The behaviour of fish in quiet periods was compared with their behaviour during periods with active pingers. The results varied both between pingers and between fish species.

Of the seven pingers tested, four elicited responses in at least one fish species, and three elicited no responses. Whether similar responses would be elicited in these fish species in the wild, and if so, whether such responses would influence the catch rate of fisheries, cannot be derived from the results of this study. However, the results indicate the need for field studies with pingers and fish. Based on the small number of fish species tested, the present study suggests that the higher the frequency of a pinger, the less likely it is to affect the behaviour of marine fish.

(SEAMARCO, IMARES)

A study has been carried out on the influence of ultrasonic signals on the behaviour of harbour porpoises in a floating pen. Data analyses are underway.

(SEAMARCO)

The first phase of a study on the possible impact of a wind farm off the North Sea coast of The Netherlands (close to Bergen at Sea) has been finished. The outcome has provided reference data on abundance, occurrence and distribution

Of harbour porpoises in the wind farm area and two reference sites. Both boat surveys and the deployment of hydrophones (T-PODs) have been used to acquire the necessary baseline data. The construction of the wind farm has been finalised at the end of 2006. During the construction works, noise levels have been recorded and are being processed. Early 2007, the second phase of this study will start and continue for at least two years to investigate again abundance, occurrence and distribution of harbour porpoises.

(IMARES)

A study has been carried out by the Institute for Marine Resources and Ecosystem Studies in The Netherlands on request of the The Dutch government, with the aim to identify candidate Special Areas of Conservation (SACs) in the Dutch sector of the North Sea. This should become the basis to propose SACs to the European Commission in accordance with Article 4 of the Habitat Directive. This study has been finalized and presented to the responsible authorities. It is not to be expected that these potential SACs will be specifically proposed for the harbour porpoise, but may have a positive radiating effect for this species.

(IMARES)

A historic over view has been produced on the past and present occurrence of harbour porpoises in Dutch coastal waters. This overview spans the 20<sup>th</sup> century till present, and is based on effort corrected sightings from sea-watching sites, and *ad hoc* observations.

Along the mainland North Sea coast in The Netherlands (i.e. south of Den Helder) several fixed effort sites exist, providing very frequent sightings and a clear-cut seasonal pattern. Harbour porpoises initially were winter visitors in Dutch coastal waters, but are becoming year-round visitors. Adult females with small offspring have been observed with increasing regularity in recent years. Documented strandings show a similar trend: increasing numbers wash ashore, and more frequent strandings of young individuals. It is postulated that the same trends and seasonal patterns occur at the west-Frisian islands, which is corroborated by opportunistic sightings only.

The increase in harbour porpoises in the Dutch waters since the mid-1990s until now, is linked to a distributional shift of harbour porpoises in the North Sea rather than population fluctuations. The re-distribution may be triggered by local reductions or regional changes in principal prey available.

(NIOZ)

## 11. Publications

### 11.1 Published literature

Au, W.W.L., Kastelein, R.A., Benoit-Bird, K.J., Cranford, T.W. & McKenna, M.F. 2006. Acoustic radiation from the head of echolocating harbour porpoises (*Phocoena phocoena*). *J. Experim. Biol.* 209: 2726-2733.

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Camphuysen Kees & Gerard Peet 2006. Whales and dolphins of the North Sea. Fontaine Publishers. 's-Graveland, The Netherlands. 159pp.

Camphuysen C.J., B. Scott & S. Wanless 2006. Distribution and foraging interactions of seabirds and marine mammals in the North Sea: multi-species foraging assemblages and habitat-specific feeding strategies. In

Boyd I.J., Wanless S. and Camphuysen C.J. (eds): Top predators in Marine Ecosystems: monitoring change in upper trophic levels. Cambridge Univ. Press, Cambridge. pp. 82-97.

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Hall, A.H., McConnell, B.J., Rowles, T.K., Aguilar, A., Borrell, A., Schwacke, L., Reijnders, P. J. H. & Wells, R. S. 2006. An individual based model framework to assess the population consequences of polychlorinated biphenyl exposure in bottlenose dolphins. Environ. Health Perspect. 114 (suppl.1): 60-64.

Kastelein, R.A., Jennings, N., Verboom, W.C, de Haan, D. & Schooneman, N.M. 2006. Differences in the response of a striped dolphin (*Stenella coeruleoalba*) and a harbour porpoise (*Phocoena phocoena*) to an acoustic alarm. Mar. Environm. Res. 61: 63-378.

Meij, S.E.T. van der & C.J. Camphuysen 2006. Distribution and diversity of whales and dolphins (Cetacea) in the Southern North Sea: 1970-2005. Lutra 49(1): 3-28.

#### *11.2 Unpublished literature*

Camphuysen, Kees 2006. A marked increase in harbour porpoises in the Southern North Sea 1990-2005. In: Shetland Sea Mammal Report 2004, Shetland Sea Mammal Group, Shetland, 20-24.

Leopold, M.F. & C.J. Camphuysen 2006. Bruinvisstrandingen in Nederland in 2006: Achtergronden, leeftijdsverdeling, sexratio, voedselkeuze en mogelijke oorzaken. IMARES Rapport C083/06, NIOZ Report 2006-5, Wageningen IMARES, Texel en Koninklijk Nederlands Instituut voor Onderzoek der Zee, Texel.