

The Netherlands. Progress report on cetacean research, May 2009 to May 2010, with statistical data for the *calendar year 2009*

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National Museum of Natural History. Postbus 9517, 2300 RA Leiden, The Netherlands; www.naturalis.nl	Naturalis	naturalis@naturalis.nl

1. SPECIES AND STOCKS STUDIED

A tabular format is most appropriate. Please indicate where in the report the species is mentioned and use IWC recommended names (see IWC, 2006, Annex L). For subsequent items, common names are preferred. e.g.:

IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Harbour porpoise	<i>Phocoena phocoena</i>	North Sea	2.1.1, 2.1.2, 2.2, 4.3, 4.4, 5, 7.3.2, 8, 9
White-beaked Dolphin	<i>Lagenorhynchus albirostris</i>	North Sea	8
Killer Whale	<i>Orcinus orca</i>	North Sea, North Atlantic	8, 9
Sowerby's Beaked Whale	<i>Mesoplodon bidens</i>	North Sea	8
Sperm Whale	<i>Physeter macrocephalus</i>	North Atlantic	9
Long-finned Pilot Whale	<i>Globicephala melas</i>	North Atlantic	9
Humpback Whale	<i>Megaptera novaeangliae</i>	North Sea, Southern Ocean	2.1.2, 3.1.1

2. SIGHTINGS DATA

2.1 Field work

2.1.1 Systematic

Ship-based surveys for birds and small cetaceans (following the ESAS - European Seabirds at Sea protocol) were conducted mainly in and around offshore wind parks off the Dutch mainland. The data is collated in the ESAS database and is also held at IMARES.

In the Oosterschelde estuary a small scale boat survey was carried out to estimate the minimum number of harbour porpoises and calves throughout the year (a minimum of 37 individuals were counted during the September 2009 survey). More information is available via the Rugvin foundation.

Systematic aerial surveys using standard line transect distance sampling methodology were conducted in Dutch North Sea waters to obtain estimates of harbour porpoise abundance and obtain information on porpoise distribution. In 2009 surveys were conducted in February to April, August and November and the results can be found in Scheidat & Verdaat (2009). Analyses of habitat use and abundance estimates are ongoing and will be expected to be published in 2010. Surveys will continue in 2010 and analyses of the data is still ongoing. Also, towed hydrophone arrays were deployed during several small scale surveys in Dutch waters. Target species was the harbour porpoise. Currently a database for towed hydrophone data is established and will be stored at IMARES.

2.1.2 Opportunistic, platforms of opportunity

The NZG Marine Mammal Database is part of the Dutch Seabird Group (NZG) and was established by Kees Camphuysen. Its aim is to collect all sightings of marine mammals in and around The Netherlands. For 2009 the data entry is still ongoing. From 1 January to 9 March 225 sightings of harbour porpoises were registered (number of individuals was 733). Also, five sightings of a single humpback whale were made. The database can be accessed at: <http://home.planet.nl/~camphuys/Cetacea.html>.

The Rugvin Foundation is a volunteer-based organisation conducting cetacean surveys in the Southern North Sea and the Oosterschelde estuary. Monthly cetacean surveys are being conducted from the bridge of the Stena Line ferry between Hoek van Holland and Harwich.

2.2 Analyses/development of techniques

Within the mainframe of the project We@Sea conducted at IMARES, a 12 channel acoustic cetacean detector was developed for permanent underwater use on the bow of FRV "Tridens". Main ambition of this development is to have a system which supports the direction of visual observations and to increase the signal to noise ratio. In this perspective the system benefits of the relatively low noise condition underneath the ship's bow. Cetacean echolocation signals are received through a ship-based forward-facing semi-circular 12-channel hydrophone array. This system could be an alternative to towed acoustic equipments.

3. MARKING DATA

3.1 Field work

3.1.1 Natural marking data

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Humpback whale	Dorsal Fin / Fluke	Southern North Sea	1	N	-	K. Camphuysen, NIOZ

A humpback whale occurring in Dutch coastal waters in 2008 was photographed (photos available through K.Camphuysen, NIOZ).

3.1.2 Artificial marking data

Not applicable.

3.1.3 Telemetry data

Not applicable.

3.2 Analyses/development of techniques

Not applicable.

4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

4.1 Biopsy samples (summary only)

Not applicable.

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

Not applicable.

4.3 Samples from stranded animals

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Harbour porpoise	North Sea	Depending on conservation state: a variety of specific organs/tissues or tissues with pathologic changes; gastric contents; liver, fat and muscle; skin; teeth	92	Y	92	Andrea Groene, Department of Pathobiology, University of Utrecht

All pathological examinations were conducted at the Department of Pathobiology of the University of Utrecht. The cause of death for the 92 examined porpoises was unknown in 15%, cachexia in 20%, starvation in 9%, infectious disease in 14%, by-catch in 41% and other in 1%.

4.4 Analyses/development of techniques

In 2009, the North Sea Foundation started setting up a rapid alert system (RAS) for stranding events of porpoises. A plan of action was developed to increase information gathering on stranding events of dead harbour porpoises. In the event of a stranding event, Dutch police, researchers, pathologists, Ministry of Agriculture, Nature and Food Quality, and nature protection organisations, will work together to find the cause of the stranding event. In 2010 the RAS will be established and evaluated after each stranding event.

5. POLLUTION STUDIES

A small scale study investigating contaminants of stranded porpoises has started in 2009 at IMARES. Aim is to compare the contaminant level of porpoises stranded in the summer versus winter months. The study is ongoing and is expected to be finalized in 2010.

6. STATISTICS FOR LARGE CETACEANS

6.1 Corrections to earlier years' statistics for large whales

Not applicable.

6.2 Direct catches of large whales (commercial, aboriginal and scientific permits)

Not applicable.

6.3 Anthropogenic mortality of large whales for the calendar year 2009

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

None reported for Dutch waters.

6.3.2 Fishery bycatch of large whales

None reported for Dutch waters.

Whale species	Sex	No.	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
None reported	-	-	-	-	-	-	-	-	-

7. STATISTICS FOR SMALL CETACEANS

7.1 Corrections to earlier years' statistics for small cetaceans

Not applicable.

7.2 Direct catches of small cetaceans for the calendar year 2009

Species	Type of catch	Area/stock	Males	Females	Total landed	Struck and lost
Not applicable	-	-	-	-	-	-

7.3 Anthropogenic mortality of small cetaceans for the calendar year 2009

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

Species	Sex	No.	Date	Location	Vessel type	Speed	Fate	How observed	Contact person/ institute and refs
None reported for Dutch waters	-	-	-	-	-	-	-	-	-

7.3.2 Fishery bycatch of small cetaceans

The number of by-caught small cetaceans in Dutch waters is currently unknown. Cause of death of 41% of the 92 harbour porpoises examined post-mortem was considered by-catch (see section 4.3).

8. STRANDINGS

All strandings of cetaceans are collated on the website of Naturalis (www.walvisstrandingen.nl). In 2009 (1.1.09 to 31.12.09) 478 harbour porpoises, 3 white-beaked dolphins, 1 killer whale and 1 Sowerby's beaked whale were found on the beaches and registered.

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Harbour porpoises	478	92	Naturalis	naturalis@naturalis.nl
White-beaked dolphins	3	0	Naturalis	naturalis@naturalis.nl
Killer Whale	1	0	Naturalis	naturalis@naturalis.nl
Sowerby's beaked whale	1	0	Naturalis	naturalis@naturalis.nl

9. OTHER STUDIES AND ANALYSES

Kastelein et al. (2009) observed a Congenital Diaphragmatic Hernia (CDH) in a stranded juvenile male striped dolphin. The 2- to 3-y-old animal had survived with its stomachs and intestines in the thoracic cavity, which had caused a large size difference between its two lungs. The animal's combination of anomalies was either due to a genetic syndrome or caused by maternal exposure to toxic agents.

IMARES finalized a study on the possible impact of an operating wind farm off the North Sea coast of The Netherlands (close to Egmond at Sea). The outcome has provided reference data on occurrence and distribution of harbour porpoises in the wind farm area and two reference areas before and after construction. Both boat surveys and the deployment of stationary hydrophones (T-PODs) have been used. The results of the study indicate that harbour porpoises use the area of the wind farm after construction. The data will be published in 2010 when the final report of the study has been completed.

In an acoustic study by Au et al. (2009) the acoustic backscatter from Atlantic cod (*Gadus morhua*), gray mullet (*Chelon labrosus*), pollack, (*Pollachius pollachius*), and sea bass (*Dicentrarchus labrax*) was measured using simulated biosonar signals of the Atlantic bottlenose dolphin and harbor porpoise. The overall results suggest that there are sufficient acoustic cues available to discriminate between the four species of fish based on the echoes received, independent of aspect angle.

In a study by Kastelein et al. (2009) a psychoacoustic behavioral technique was used to determine the critical ratios (CRs) of two harbor porpoises for tonal signals with frequencies between 0.315 and 150 kHz, in random Gaussian white noise. Generally harbor porpoises can detect tonal signals in Gaussian white noise slightly better than most odontocetes tested so far. By combining the mean CRs found in the present study with the spectrum level of the background noise levels at sea, the basic audiogram, and the directivity index, the detection threshold levels of harbor porpoises for tonal signals in various sea states can be calculated.

A number of studies on underwater sound was conducted by TNO in 2009. This included investigations of anthropogenic (e.g. associated with piling activities of wind farms) and natural sound sources (de Jong et al. 2009; Dreschler et al. 2009).

The 3S group currently involving four main partners (FFI, TNO, SMRU and WHOI) conducted in May-June 2009 a research trial in Norwegian waters to investigate behavioral reactions of killer whales, pilot whales and sperm whales to Low Frequency Active Sonar (LFAS) and Mid Frequency Active Sonar (MFAS) signals, in order to establish safety limits for sonar operations (Kvadsheim et al. 2009).

Coastal & Marine Union (EUCC) started in 2009 a pilot study to investigate the workability and efficiency of a new pinger, the Dolphin Saver, aiming to mitigate bycatch of Harbour Porpoises (*Phocoena phocoena*) in the winter set net fishery on mainly cod, turbot and brill. The study is a close collaboration between the Dutch Fisheries Organisation (Vissersbond); Expert group on set net fishery (Kenniskring Staand want), 10 Dutch winter season set net fishermen and the Coastal & Marine Union. The study is supported by the Dutch Ministry of Agriculture, Nature and Food Quality and aims to be continued in 2010 and 2011. Project coordinator for EUCC is Marine Science & Communication.

10. LITERATURE CITED

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11. PUBLICATIONS

11.1 Published or 'In Press' papers only

Au, W.W.L., Branstetter, B.K., Benoit-Bird, K.J., and Kastelein, R.A. 2009. "Acoustic basis for fish prey discrimination by echolocating dolphins and porpoises," *J. Acoust. Soc. Am.* 126, 460-467.

Kastelein, R.A., Wensveen, P.J., Hoek, L., Au, W.W.L., Terhune, J.M., de Jong, C.A.F. 2009. "Critical ratios in harbor porpoises (*Phocoena phocoena*) for tonal signals between 0.315 and 150 kHz in random Gaussian white noise", *J. Acoust. Soc. Am.* 126, 1588-1597.

Kastelein, R.A., van Dooren, M.F., Tibboel, D. 2009. A case study of congenital diaphragmatic hernia in a juvenile striped dolphin (*Stenella coeruleoalba*). *Aquatic Mammals* 35(1), 32-35.

11.2 Unpublished literature

Ainslie, M.A., de Jong, C.A.F., Dol, H.S., Blacquièrre, G., Marasini, C. 2009. Assessment of natural and anthropogenic sound sources and acoustic propagation in the North Sea, TNO report TNO-DV 2009 A085, February 2009. Available at TNO upon request.

de Jong, C.A.F., Blacquièrre, G., Ainslie, M.A. 2009. Measuring Underwater Sound: towards measurement standards and noise descriptors. TNO report TNO-DV 2009 C613, December 2009. Available at TNO upon request.

Kvadsheim, P., Lam, F.-P., Miller, P., Alves, A.C., Antunes, R., Bocconcelli, A. van Ijsselmuide, S. 2009. Kleivane, L., Olivierse, M. and Visser, F. 2009. Cetaceans and naval sonar – the 3S-2009 cruise report. Available at: <http://rapporter.ffi.no/rapporter/2009/01140.pdf>

Scheidat, M. & Verdaat, H. 2009. Distribution and density of harbour porpoises in Dutch North Sea waters. IMARES report C125/0911. pdf provided to IWC.

Appendix 1. FOA fishing descriptions and codes

FAO FISHING GEAR CATEGORIES:		FALLING GEAR	
SURROUNDING NETS		Cast nets	FCN
With purse lines	PS	Falling gear (not specified)	FG
One-boat operated purse seines	PS1	GILLNETS AND ENTANGLING GEAR	
Two-boat operated purse seines	PS2	Set gillnets (anchored)	GNS
Without purse lines (lampara)	LA	Driftnets	GND
SEINE NETS		Encircling gillnets	GNC
Beach seines	SB	Fixed gillnets (on stakes)	GNF
Boat seines	SV	Trammel nets	GTR
Danish seines	SDN	Combined gillnet-trammel nets	GTN
Scottish seines	SSC	Gillnets and entangling gillnets (not specified)	GEN
Pair seines	SPR	Gillnets (not specified)	GN
Seine nets (not specified)	SX	TRAPS	
TRAWLS		Stationary uncovered pounds nets	FPN
Bottom trawls	TBB	Pots	FPO
Beam trawl	OTB	Fyke nets	FYK
Otter trawls (side or stern)	PTB	Stow nets	FSN
Pair trawls	TBN	Barriers, fences, weirs, etc	FWR
Nephrops trawls	TBS	Aerial traps	FAR
Shrimp trawls (not specified)	TM	Traps (not specified)	FIX
Midwater trawls		HOOKS AND LINES	
Otter trawls (side or stern)	OTM	Handlines and pole-lines (hand operated)	LHP
Pair trawls	PTM	Handlines and pole-lines (mechanised)	LHM
Shrimp trawls	TMS	Set longlines	LLS
Midwater trawls (not specified)	TM	Drifting longlines	LLD
Otter twin trawls	OTT	Longlines (not specified)	LL
Otter trawls (not specified)	OT	Trolling lines	LTL
Pair trawls (not specified)	PT	Hooks and lines (not specified)	LX
Other trawls (not specified)	TX	GRAPPLING AND WOUNDING	
DREDGES		Harpoons	HAR
Boat dredges	DRB	HARVESTING MACHINES	
Hand dredges	DRH	Pumps	HMP
LIFT NETS		Mechanised dredges	HMD
Portable lift nets	LPN	Harvesting machines (not specified)	HMX
Boat-operated lift nets	LNB	MISCELLANEOUS GEAR	MIS
Shore operated stationary lift nets	LNS	RECREATIONAL FISHING GEAR	RG
Lift nets (not specified)	LN	GEAR NOT KNOWN OR NOT SPECIFIED	NK
		SHARK CONTROL NETS	NSC
		DERELICT FISHING GEAR	