

GERMANY
PROGRESS REPORT ON CETACEAN RESEARCH,
May 2011 to April 2012 with statistical data for the calendar year 2011

compiled by

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1. Species and Stocks Studied

Common name	Scientific name	Area/stock	Items referred to
Harbour porpoise	<i>Phocoena phocoena</i>	Baltic	2., 4.2, 4.3, 4.4, 5., 7.1, 8., 9.
Harbour porpoise	<i>Phocoena phocoena</i>	North Sea	2., 4.2, 4.3, 4.4, 5., 7., 8., 9.
Various species		worldwide	9.

2. Sightings data

2.1 Field work

Dedicated visual surveys to assess abundance and distribution of harbour porpoises

The first aerial survey covering the entire Dogger Bank area and adjacent slopes with a high spatial resolution was accomplished successfully in late summer 2011. The survey demonstrated that harbour porpoises strongly frequented the area during that time of the year. Other small cetaceans were only rarely encountered. Many porpoises were recorded in the western (English) and eastern (German/Danish) waters. Most sightings were recorded along the slopes and fewer animals were sighted on the bank itself. The abundance estimate for the entire area (66,768 km²) was 116,448 harbour porpoises (CV=0.31) corresponding to a density of 1.82 animals per km².

Acoustic surveys with the ITAW towed hydrophone were conducted in the area of the Dogger Bank during summer 2005, 2006 and 2008. During 14,602 km on effort 362 porpoise detections were recorded (on average 0.025 detections were recorded per km). Most harbour porpoises were detected in the eastern part and at the slopes of the Dogger Bank area. Within the framework of the Natura 2000 monitoring programme, aerial surveys to assess distribution and density of harbour porpoise were conducted in the German North Sea and western Baltic Sea between May 2010 and August 2011.

Within 15 months 32 flight days were successfully completed. In the German North Sea, in area C_Nord, density of harbour porpoises was estimated to be 2.12 animals per km² in June 2010. For July 2010 a substantially lower density was estimated (0.88 individuals per km²); the lowest summer density ever estimated since the beginning of the surveys in 2002. Due to very high sighting rates in June 2011 (449 sightings in 5h), porpoise density increased to 4.75 animals per km² which is significantly higher than in June 2010. Similar to 2010 density in July 2011 was significantly lower than in June. Density in the area C_Nord (and hence in the SCI *Sylt Outer Reef*) still belongs to the highest densities in the German North Sea and most mother-calf pairs are sighted within that area.

During the survey in area D (encompassing the SCI *Borkum Reef Ground*) in March 2011, 126 sightings with 141 harbour porpoises were recorded, mainly west of the island of Langeoog (East Frisia). Density was estimated at 1.06 animals per km². During the survey in May 2011, 332 sightings of 357 porpoises were recorded. Most animals were sighted north and west of the island of Borkum. In May 2011 density was estimated to be 1.59 animals per km². In comparison with earlier surveys conducted in area D since 2002, the density estimated for March and May 2011 were the highest for the area. This indicates an ongoing increase of porpoise density in the southern North Sea.

In the Baltic Sea, the four surveys were all accomplished during comparatively short time periods in spring, summer and autumn 2010 and in spring 2011. In May 2010 only 26 sightings with 29 harbour porpoises were recorded. Porpoises were only sighted in the west of the study area where density was estimated to be 0.38 animals per km² (Kiel Bay) In July 2010, 62 sightings with 75 porpoises were recorded; these predominantly in the north and west of the island of Fehmarn. A density of 0.37 individuals per km² was estimated for the entire study area. In September 2010, 38 sightings with 47 harbour porpoises were recorded. Many porpoises were sighted in the Kiel Bight, in the Flensburg Fjord, north of the islands of Als and Ærø and east of Fehmarn and in the Mecklenburg Bight. For the entire area the density was estimated to be 0.23 individuals per km². In June 2011, 33 sightings with 38 porpoises were recorded. Relatively few sightings were recorded in Kiel Bight and the density in the western Baltic Sea was estimated at 0.27 animals per km². Compared with surveys conducted since 2002, densities are decreasing in the Kiel Bight since May 2010. Porpoise density in the Fehmarn Belt area and Mecklenburg Bight varies strongly since 2002; density rarely exceeded 0.3 animals per km².

Previous studies demonstrated the usefulness of static acoustic monitoring of harbour porpoise in the German EEZ of the Baltic Sea. The DMM (Deutsches Meeresmuseum) in Stralsund continued this work in 2011 with up to 12 recording positions in the German EEZ. This project is part of the Natura 2000 monitoring programme in cooperation with the ITAW in Büsum.

Furthermore, the DMM is involved in a study of the harbour porpoise population in the central Baltic using stationary acoustic methods. Harbour porpoise in the central Baltic have declined to the extent that common methods to estimate stock size such as line transect methods can no longer be used. Estimation of stock size has to rely on new methods currently being developed. In an EU – co-funded study ‘SAMBAH’ (Static Acoustic Monitoring of Baltic harbour porpoise) eight countries bordering the Baltic have deployed 300 passive acoustic

monitoring devices in 2011. They record the occurrence of harbour porpoise in various parts of the Baltic over a period of two years. The results from the study will be density estimates, information on the spatial and seasonal distribution of harbour porpoise and identification of important habitat in the Baltic proper.

In 2011, the German Oceanographic Museum took over the project ‘Sailors on the Lookout for Harbour Porpoise’ from the ‘Society for the Conservation of Marine Mammals’ (GSM). This project is well-respected and already known to a wide public especially along the coast of the Baltic Sea region. It includes registration of sightings of harbour porpoises and the findings of dead porpoises. Through the webpage of the museum and on their flyers on projects the museum provides information on porpoise sightings (<http://www.meeresmuseum.de/wissenschaft/sichtungen.html>) and dead animals (<http://www.meeresmuseum.de/wissenschaft/totfunde.html>). The flyers explain what people should do if they encounter a porpoise or find one dead. It is possible to contact the museum by post, email or telephone. The sighting data are posted on-line, and the Federal Agency for Nature Conservation (BfN) is regularly publishing the corresponding map showing all sighting data of the current year, see <http://www.bfn.de/habitatmare/en/downloads-schweinswalsichtungen-gsm.php>. A total of 770 incidental sightings were reported in 2011. There was a decline by 25% compared to 2010 which was most likely caused by the windy, cold and wet summer of 2011 and the resulting reduction in observer effort. A decline in sightings from west to east supported results obtained in previous years and from other studies.

A number of surveys have been conducted for environmental impact assessments preceding potential wind farm construction sites.

Dedicated visual surveys for cetaceans in the Southern Ocean

From November 28, 2010 to February 5, 2011 and November 28, 2011 to January 5, dedicated shipboard and aerial surveys for cetaceans have been conducted in the Southern Ocean from RV ‘Polarstern’. 16 886 km were surveyed during both cruises by helicopter. 160 sightings with 387 individual cetaceans were recorded. The shipboard surveys covered 2065 km while 59 sightings with 86 individuals were recorded. Data are being evaluated with respect to species’ distribution and density and relationships to sea ice and other environmental parameters.

2.2 Analyses/development of techniques

Offshore wind farms

A research project funded by the Federal Environmental Ministry (BMU) and coordinated by the Federal Agency for Shipping and Hydrography (BSH) has been continued in 2011 to investigate effects of construction and operation of the first German Offshore test-field for windfarms “Alpha Ventus” close to Borkum Reef, German EEZ. Sighting surveys using airplane and ship, as well as acoustic surveys with towed hydrophone and stationary acoustic monitoring using C-PODS are carried out.

Pile driving

A new technical design for an air bubble curtain system was developed and tested in 2010 by the ITAW in cooperation with FH Kiel GmbH. The study continued in 2011. This system should be used as a sound mitigation method during the pile driving installation of offshore wind turbines. The design was developed using test trials in a 5x4x2 m tank and showed that improvements in sound attenuation are possible and could be transferred to field trials.

TTS in harbour porpoises

In 2011 an auditory study on harbour porpoises was continued to validate the TTS level for impulsive noise. This project is conducted by the ITAW in cooperation with NERI (Denmark) and Fjord&Baelt (Denmark) and aims at testing the acoustic tolerance in another captive harbour porpoise as well as for free-ranging animals.

By-catch research

The number of strandings on the Baltic Sea coast of Schleswig-Holstein has increased during the last years. Therefore a pilot project was started to investigate critical areas of by-catch in the German Baltic Sea, to assess the health status and life history of by-catches and to develop and test techniques to reduce by-catch of harbour porpoises.

Research on stress

The large number of anthropogenic activities in the seas creates increased stress levels on cetaceans. A research project has been initiated to investigate stress levels and their effects on harbour porpoises. Stress levels will be measured along exposure to different sound levels.

Marine mammal database for risk assessment

An international, 3 years project within the European Defence Agency (EDA) to establish a common marine mammal database for risk assessment was started. The data base will contain sighting records, probabilities of occurrence, habitat use and species' characteristics.

Management of harbour porpoises

In 2011 the development of management plans for harbour porpoises in German waters has been taken up and is to be completed by 2014. Plans for species conservation in German waters as well as location specific management plans for designated SACs are being developed.

Monitoring of harbor porpoises in the Wadden Sea (Schleswig-Holstein & Lower Saxony)

In 2011 the acoustic monitoring of the German Wadden Sea area started with four CPOD-stations in coastal

regions with one position in Lower Saxony (Minsener Oog) and three positions in Schleswig-Holstein (Meldorf Bay, Westerland and Lister Tief). The work will continue over the next years and is coordinated and funded by the National Park administrations in Schleswig-Holstein and Lower Saxony. ITAW carries out the field work.

Telemetry

Funding by the Federal Agency for Nature Conservation provides for the development and testing of new telemetry devices. The work is carried out by NERI in Denmark in close cooperation with the ITAW.

Field testing of noise logger for the evaluation of anthropogenic noise impacts

In 2011 first tests of noise loggers have been conducted by DW-Shipconsult & ITAW to monitor anthropogenic noise impacts. Devices will be deployed in 2012 in the Baltic Sea and 2013 in the North Sea (Sylt Outer Reef).

Comparison Of Static Acoustic Monitoring Methods

The COSAMM project is an investigation of the comparability of the various static passive acoustic monitoring methods used for detection of harbour porpoises and other tooth whales. All available click detectors for harbour porpoises are compared in this project. This is done in order to make representative and comparable statements on the abundance of harbour porpoise, despite the deployment of different devices.

3. Marking data

3.1 Field Work

3. 1.1 + 2 NATURAL AND ARTIFICIAL MARKING DATA

No marking using artificial marks was conducted. As a result, no photographs of whales of one of the IWC management area/stocks are currently held which can be utilized in photo ID studies.

3. 1. 3 TELEMETRY DATA

4. Tissue/biological samples collected

4.1 Biopsy samples

No biopsy samples were collected

4.2 Samples from by-catches

Species	Area/stock	2011: total no. of individuals	Archived	Tissue Types(s)	Contact
Harbour porpoise	Baltic Sea Schleswig-Holstein	5	0	all organs, central nervous system, skeletal system	U. Siebert
Harbour porpoise	North Sea Schleswig-Holstein	0	0		U. Siebert

Harbour porpoise	Baltic Sea Meckl.- Prepom.	1	1	All organs, central nervous system, skeletal system	H. Benke
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4.3 Samples from stranded animals

Species	Area/stock	2011: total no. of individuals	Archived	Tissue Type(s)	Contact
Harbour porpoise	North Sea Schleswig- Holstein	113	0		U. Siebert
Harbour porpoise	North Sea Lower Saxony	55		Lung, liver, different tissues	S. Ramdohr
Harbour porpoise	Baltic Sea Schleswig- Holstein	68	0		U. Siebert
Harbour porpoise	Baltic Sea Meckl.- Pre Pomerania	34	17	Skeleton, various tissues	H. Benke
White-sided dolphin	North Sea Schleswig- Holstein	1	1	Different tissues for histopathology, toxicology, genetics	U. Siebert
Common dolphin	Baltic Sea Schleswig- Holstein	1	1	Different tissues for toxicology, genetics	U. Siebert

4.4 Analyses carried out

In 2011 an auditory study on harbour porpoises was continued to validate the TTS level for impulsive noise. This project is conducted by ITAW in cooperation with NERI (Denmark) and Fjord&Baelt (Denmark) and aims at testing the acoustic tolerance in captive harbour porpoise as well as in free-ranging animals.

As part of the national monitoring funded by the State Ministry of Agriculture, Environment, and Rural Affairs of Schleswig-Holstein cetaceans stranded or by-caught were routinely investigated for their basic biological data and, at a minimum, information on length, sex, weight collected.

The ribosomal DNA of different lung nematodes of harbour porpoise was analyzed and sequences from different regions were compared.

5. Pollution studies

Studies on pollutant level in small cetaceans were not conducted in 2011.

6. Statistics for large cetaceans

6.1 Corrections to earlier years

No corrections to earlier years have been made

6.2 Direct catches

Germany was not engaged in any whaling activity neither commercial nor aboriginal or under scientific permits

6.3.1 Anthropogenic mortality of large whales for the calendar year 2011

No anthropogenic mortality of large cetaceans was observed in 2011

6.3.2 Observed or reported ship strikes of large whales

No ship strikes of large whales were being reported in 2011

6.3.3 Fishery by-catch of large whales

No large whales has been taken as by-catch in fisheries

7. Statistics for small cetaceans in 2011

7.1 Corrections to earlier years

No corrections to earlier years have been made

7.2 Direct catches of small cetaceans for the calendar year 2011

No small cetaceans were taken in a directed fishery in Germany.

7.3 Fishery by-catch of small cetaceans in 2011

Species	Area/stock	Incidental Mortality			Live capture
		Reported	Estim. total	Source	
Harbour porpoise	North Sea Schleswig- Holstein	0	unknown		none

Harbour porpoise	Baltic Sea Schleswig- Holstein	4	unknown		none
Harbour porpoise	Baltic Sea Mecklenburg- Prepomerania	1	unknown	Fish pods	none

8. Strandings in 2011

Species	Total	North Sea Lower Saxony	North Sea Schl.-Holstein	Baltic Schl.- Holstein	Baltic Meck.-Pre- Pomerania
Harbour porpoise	270	55	113	68	34
White-sided dolphin	1		1		
Sperm whale	1		1		

9. Other studies and analyses

Modelling of population size and spatial distribution of Antarctic minke whales in relation to pack-ice, based on sighting survey data

Data collected by means of aerial and ship-based sighting surveys using the distance sampling method from RV 'Polarstern' is being evaluated in order to assess minke whale abundance in pack ice regions. Within the project, these data shall be linked to environmental data, especially sea ice data, in order to assess the influence of sea ice on the distribution of the minke whales. The project is still ongoing

Marine mammal database for risk assessment

An international, 3 years project within the European Defence Agency (EDA) to establish a common marine mammal database for risk assessment is ongoing. For Germany the project is funded by the ministry of defence. The data base contains sighting records, probabilities of occurrence, habitat use and species' characteristics, with focus on European waters. The existing German marine mammal data base was further developed, including new identification tables for different sea areas.

An acoustic and visual survey of marine mammals was conducted in the Azores Front area, with focus on the occurrence of beaked whales. A new towed array for passive acoustic monitoring (PAM) of marine mammals was tested and evaluated.

A study about the classification of marine mammal signatures was continued, funded by the ministry of defence. The study is ongoing within an European Defence Agency (EDA) project for the improvement of detection and classification methods for marine mammals.

To reduce the risk for marine mammals during explosions (disposal of old ammunition in the Baltic Sea), the effect of an air bubble curtain for the attenuation of shock waves was further examined, using different configurations.

Species	Area/stock	Type of investigation	Contact address ^{*)}
Various species	world wide	Creation of a management-orientated data base for the European participants	S. Ludwig M. Knoll I. Nissen, D. Lorenzen,
Various species	Antarctic	Distribution, abundance and habitat use	H. Herr, L. Lehnert, K.-H. Kock, U. Siebert
Antarctic minke whales	Antarctic	Investigation of minke whale-sea ice relationship	H.Herr, L.Lehnert, K.-H. Kock, U.Siebert
Cuvier's beaked whale, various species	Mediterranean, North Atlantic	Passive acoustic detection	S. Ludwig M. Knoll R. Kreimeyer
Various species	worldwide	Classification of marine mammal signatures	S. Ludwig M. Knoll I. Nissen, R. Kreimeyer
Harbour Porpoise	German EEZ SACs	Development of management plans for SACs under the EU Habitat Directive	H. Herr, Seb. Müller, U. Siebert
Harbour Porpoise	German EEZ	Development of species conservation/management plans under the EU Habitat Directive	H. Herr, Seb. Müller, U. Siebert
Harbour porpoise	Baltic Sea	Potential impacts of explosions, risk mitigation due to bubble curtains	E. Schmidtke S. Ludwig
Various species	World wide with emphasis on North Sea, Baltic, North Atlantic, Mediterranean	Creation and extension of a management orientated data base	S. Ludwig M. Knoll J. Nissen D. Lorenzen

Various species	worldwide	Classification of marine mammal signatures	S. Ludwig M. Knoll J. Nissen R. Kreimeyer
Harbour porpoise	Baltic Sea	Stock structure, genetics	R. Tiedemann
Harbour porpoise	Belts, Baltic Sea	Stock discrimination	H. Benke
Harbour porpoise	Belt Sea, Baltic Sea	Reproduction, age structure, health status	H. Benke, U. Siebert, I. Hasselmeier
Cetaceans	Baltic and North Seas	Stranding network	I. Hasselmeier, C. Schmidt, M. Hillmann, M. Rademaker, U. Siebert, H. Benke
Harbour porpoise	Baltic and North Seas	Research on by-catches	I. Hasselmeier, K.-H. Kock, O. Meyer-Klaeden, U. Siebert, H. Benke
Harbour porpoise, other small cetaceans	North Sea/Baltic	Distribution and abundance, aerial surveys	H. Herr, A. Gilles, V. Peschko, S. Adler, U. Siebert
Harbour porpoise, other small cetaceans	North Sea/Baltic	Anthropogenic impacts	H. Herr, U. Siebert, M. Dähne, A. Gilles, H. Seibel
Harbour porpoise	North Sea/Baltic	Habitat use, distribution and abundance, nutrition	A. Gilles, U. Siebert
Harbour porpoise	North Sea/Baltic	Impact of sounds	A. Ruser, J. Sundermeyer, M. Dähne, U. Siebert
Harbour porpoise	North Sea/Baltic	Research on stress	S. Müller, H. Seibel, U. Siebert
Harbour porpoise	North Sea, test field Alpha Ventus	Testing the standard routine for EIAs	A. Gilles, U. Siebert, K. Krügel, S. Müller, V. Peschko, A. Ruser
Harbour porpoise	North Sea, Baltic Sea	Development of bubble curtain	M. Dähne, M. Jacobsen, J.H. Weyhardt, A. Ruser, U. Siebert
Harbour Porpoise	Lower Saxony	Abundance, distribution, aerial surveys	Nationalpark Niedersächsisches

			Wattenmeer, ITAW Büsum (A. Gilles, V. Peschko, U. Siebert)
Harbour porpoise	Baltic (Pommeranian Bay)	Acoustic surveys, porpoise detectors (PODs)	A. Gallus, K.T. Clausen, J. Koblitz
Harbour porpoise	Baltic	Standardisation and methodology of static acoustic monitoring	J. Koblitz
Harbour porpoise	Baltic	Creation of a management – orientated data base	A. Ruser H. Giewat S. Adler M. Rademaker U. Siebert
Harbour porpoise	North Sea	Acoustic surveys, porpoise detectors (PODs)	U. Siebert, K. Lucke, J. Sundermeyer M. Dähne A. Ruser S. Adler
Harbour porpoise	Baltic, North Sea	Telemetry	U. Siebert, I. Hasselmeier
Harbour porpoise	North Sea/Baltic	Pathology, Immunology, Virology, Ear pathology	H. Seibel, U. Siebert, E. Wehrmeister
Harbour porpoise	North Sea/Baltic	Life History	I. Hasselmeier K. Lehnert U. Siebert
Harbour porpoise	North Sea/Baltic	Pollutants, Immunology, Endocrinology	E. Wehrmeister, U. Siebert, K. Lehnert, H. Seibel
Harbour porpoise	North Sea/Baltic	Parasitology	K. Lehnert
Harbour Porpoise	Baltic Sea	Possible impact of explosions and risk mitigation by means of bubble curtains	S. Ludwig
Harbour porpoise	North Sea/Baltic	Incidental sightings, data bases	U. Siebert M. Rademaker S. Müller J. Koblitz
Harbour porpoise	North Sea/Baltic	Primary cell culture, Pollutants,	V. Hellwig
Harbour porpoise	North Sea, Baltic	Feeding ecology	A. Gilles, U. Siebert
Common dolphin	North Atlantic	Skin morphology and	V. Pavlov, U. Rist, U.

		modelling	Siebert
Harbour porpoise	North Sea, Denmark	Distribution and abundance	W. Piper
Harbour porpoise	Europe	Assessment of impact of offshore wind farm noise	W. Piper
Bottlenose dolphin, short-finned pilot whale, Atlantic spotted dolphin, rough-toothed dolphin and other species	La Gomera (Canary Islands)	Abundance, distribution, behaviour, Photo-ID, land-based observations	F. Ritter, M.E.E.R. e .V.
Toothed whales: Delphinus, Phocoena, Physeter, Pontoporia, Stenella, Tursiops	worldwide	Morphology, development, evolution	S. Huggenberger

*) contact addresses see section 12

History of Whaling

Studies on the history of whaling were continued under the auspices of the 'Deutsches Schiffahrtsmuseum' and associated researchers and groups and dealt primarily with historic whaling in northern Europe.

10. Literature cited

None

11. Publications

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Kern A., Siebert U., Cozzi B., Hof P.R. and Oelschläger H.H.A. 2011. Stereology of the neocortex in odontocetes: qualitative, quantitative, and functional implications. *Brain, Behaviour and Evolution* DOI: 10.1159/000323674

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Lucke, K.; Lepper, P. A.; Blanchet, M.-A.; Siebert, U. 2011. The use of an air bubble curtain to reduce the received sound levels for harbor porpoises (*Phocoena phocoena*). *Journal of the Acoustical Society of America* 130, 5 (2011) 3406–3412, ISSN 0001-4966

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Siebert, U.; Pozniak, B.; Anderson Hansen, K.; Nordstrom, G.; Teilmann, J.; van Elk, N.; Vossen, A.; Dietz, R. 2011. Investigations of thyroid and stress hormones in free-ranging and captive harbor porpoises (*Phocoena phocoena*): a pilot study. *Aquatic Mammals* 37, 4 (2011) 443-453, ISSN 0167-5427

Sundermeyer, J.K., Lucke, K., Dähne, M. Gallus, A. Krüger, K. and Siebert, U. 2011. Effects of underwater explosions on presence and habitat use of harbour porpoises in the German Baltic Sea. In: *The Effects of Noise on Aquatic Life*, Popper, A.N. and Hawkins, A. (eds), 289-292

Sveegaard, S.; Teilmann, J.; Tougaard, J.; Dietz, R.; Mouritzen, K.; Desportes, G.; Siebert, U. 2011: High density areas for harbour porpoises (*Phocoena phocoena*) identified by satellite tracking. *Marine Mammal Science* 27: 1 (2011) 230–246, ISSN 0824-0469

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