

# United Kindom. Progress report on cetacean research, May 2009 to May 2010, with statistical data for 2009

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Eleven non-governmental organisations that work on cetaceans, seven government departments or agencies with responsibility for cetacean conservation and management, fifteen academic institutions and two individuals with research interests in cetaceans were contacted. Five NGOs, two government agencies, eight academic institutions and two individuals replied. Two of the academic institutions contacted include several researchers, and not all of these replied.

This report summarises information obtained from:

Name of agency/institute/individual	Abbreviation	Contact e-mail address
Aberdeen University Lighthouse Field Station	AULFS	Paul Thompson (lighthouse@abdn.ac.uk)
Centre for Research into Ecological and Environmental Modelling, University of St Andrews	CREEM	Danielle Harris (dh17@st-andrews.ac.uk) Len Thomas (len@mcs.st-and.ac.uk)
Cetacean Research and Rescue Unit	CRUU	Kevin Robinson (kev.robinson@cruu.org.uk), Marina Costa (marina.costa@cruu.org.uk)
Cornish Wildlife Trust	CWT	Tom Hardy (tom@cornwt.demon.co.uk) or Jan.Loveridge (jan.loveridge@cwtstrandings.org)
Hebridean Whale and Dolphin Trust	HWDT	Nienke van Geel (biodiversityofficer@hwdt.org)
Institute of Zoology	IoZ	Rob Deaville (rob.deaville@ioz.ac.uk)
Joint Nature Conservation Committee	JNCC	Eunice Pinn (Eunice.Pinn@jncc.gov.uk)
Marine Environmental Monitoring	MEM	Rod Penrose (rodpenrose@strandings.demon.co.uk)
National Museums Scotland	NMS	Jerry Herman (j.herman@nms.ac.uk) Andrew Kitchener (a.kitchener@nms.ac.uk)
Natural History Museum	NHM	Martin Stemp (m.stemp@nhm.ac.uk)
Nick Tregenza	Nick Tregenza	Nick Tregenza (nick@cheloniamuseum.demon.co.uk)
Russell Leaper	Russell Leaper	Russell leaper (russell@ivytdemon.demon.co.uk)
Scottish Agricultural College , Veterinary Services Division	SACVSD	Bob Reid (bob.reid@sac.co.uk)
Sea Mammal Research Unit, Scottish Oceans Institute, University of St Andrews	SMRU	Doug Gillespie (dg50@st-andrews.ac.uk) Phil Hammond (psh2@st-andrews.ac.uk) Simon Northridge (spn1@st-andrews.ac.uk) Vincent Janik ( <a href="mailto:vj@st-andrews.ac.uk">vj@st-andrews.ac.uk</a> )
Sea Watch Foundation	SWF	Peter G.H. Evans (peter.evans@bangor.ac.uk)
UK Cetacean Strandings Investigation Programme	CSIP	Rob Deaville (rob.deaville@ioz.ac.uk )
University of Newcastle Upon Tyne	UNOT	Per Berggren (per.berggren@newcastle.ac.uk)

## 1. SPECIES AND STOCKS STUDIED

IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	Scottish west coast (Hebrides)	2.1.1; 2.1.2.
Beaked whales	<i>Ziphiidae</i>	Northeastern Atlantic; Bahamas	2.2; 3.2
Bottlenose dolphin	<i>Tursiops truncatus</i>	UK, Ireland Scottish west coast (Hebrides), Scottish East coast; Florida; Zoo Duisberg, Germany;	2.1.1; 2.1.2; 2.2; 3.1.1; 3.2; 4.3; 4.4; 8; 9
Bryde's whale	<i>Balaenoptera edeni</i>	South Africa	3.2
Costero dolphin	<i>Sotalia guianensis</i>	Colombia	3.2
Harbour porpoise	<i>Phocoena phocoena</i>	Scottish west coast (Hebrides)	2.1.1; 2.1.2; 2.2; 4.3;5; 7.3.2; 8; 9
Humpback whale	<i>Megaptera novaeanglea</i>	Scottish west coast (Hebrides); South Africa	2.1.1; 2.1.2; 3.1.1; 3.2
Irrawaddy River Dolphin	<i>Orcaella brevirostris</i>	Bangladesh	9
Indus River Dolphin	<i>Platanista gangetica minor</i>	Pakistan	2.2
Killer whale	<i>Orcinus orca</i>	Scottish west coast (Hebrides); Norway	2.1.1; 2.1.2; 2.2; 3.1.1; 3.2.
Long-finned pilot whales	<i>Globicephala melas</i>	Mediterranean	3.2
Minke whale	<i>Balaenoptera acutorostrata</i>	Scottish west coast (Hebrides); Hawaii, USA	2.1.1; 2.1.2; 2.2; 3.1.1; 3.1.3; 3.2; 4.3; 6.3.2; 8; 9
Pacific Whitesided dolphin	<i>Lagenorhynchus obliquidens</i>	Shedd Aquarium, USA; Canadian Pacific	3.2; 9
Risso's dolphin	<i>Grampus griseus</i>	Scottish west coast (Hebrides); Canary islands, Spain	2.1.1; 2.1.2; 3.1.1; 3.2; 8; 9.
Short-beaked common dolphin	<i>Delphinus delphis</i>	Scottish west coast (Hebrides), NE Atlantic	2.1.1; 2.1.2; 3.1.1; 3.1.3; 4.3; 5; 7.3.1; 7.3.2; 8
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Canary Islands	3.2
Striped dolphin	<i>Stenella coeruleoalba</i>	Scottish west coast (Hebrides), NE Atlantic	2.1.2.; 4.2; 8.
White-beaked dolphin	<i>Lagenorhynchus albirostris</i>	Scottish west coast (Hebrides)	2.1.1; 2.1.2; 3.1.1.
White whale	<i>Delphinapterus leucas</i>	Shedd Aquarium, USA	9

## 2. SIGHTINGS DATA

### 2.1 Field work

#### 2.1.1 Systematic

HWDT (Nienke van Geel) conducted surveys on the west coast of Scotland (Hebrides) from the end of March till mid October. Visual sightings of all cetaceans, pinnipeds, basking sharks and sunfish have been recorded.

Acoustic surveys were focused on harbour porpoise. SMRU (Cormac Booth) has been analysing these visual and acoustic line transect survey data collected 2003 - 2008, for the west of Scotland.

SWF continue to conduct boat-based photo-identification surveys of bottlenose dolphins around Cardigan Bay and Pen Llyn a'r Sarnau SAC's and Isle of Anglesey. The project will provide information on the distribution, population structure and abundance of dolphins, porpoises and seals in the region. Winter surveys take place in the Anglesey area but are yet to be established in the Cardigan Bay region. Acoustic monitoring is conducted in Cardigan Bay, using T-PODs and C-PODs (subject of a PhD based at Ocean Sciences Bangor)

Systematic offshore surveys are conducted in various other regions of UK (e.g. Grampian area, Hebrides, Shetland) by SWF. Systematic land based watches at New Quay within Cardigan Bay SAC were performed by dedicated SWF observers between 0700 and 2100 six days per week between May and October 2009. The watches recorded the presence of marine mammals, mainly bottlenose dolphin, harbour porpoise and Atlantic grey seal. These surveys particularly provided detailed information of bottlenose dolphin and harbour porpoise site use, reactions to vessels and a count of boat traffic in the harbour area. Since the watch site became very busy with the public, SWF provided information on marine mammals to the public and promoted SWF activities.

The CRRU (Kevin Robinson) conducted systematic surveys along the southern outer Moray Firth in northeast Scotland between May and October 2009. During 2009, studies concentrated primarily on coastal minke whales (*Balaenoptera acutorostrata*), bottlenose dolphins (*Tursiops truncatus*) common dolphins (*Delphinus delphis*) and harbour porpoises (*Phocoena phocoena*).

Target species	Date	Area	No. of sightings	Contact person/institute and references
Atlantic white-sided dolphin	30-3-2009 / 13-10-2009	Scottish west coast (Hebrides)	1	Nienke van Geel (HWDT)
Bottlenose dolphin	30-3-2009 / 13-10-2009	Scottish west coast (Hebrides)	4	Nienke van Geel (HWDT)
Bottlenose dolphin	1/1/09-31/12/09	Cardigan Bay and Anglesey	123	D. Feingold, P.G.H Evans, (SWF)
Harbour porpoise	30-3-2009 / 13-10-2009	Scottish west coast (Hebrides)	374	Nienke van Geel (HWDT)
Harbour porpoise	1/1/09-31/12/09	Cardigan Bay and Anglesey	91	D. Feingold, P.G.H Evans, (SWF)
Humpback whale	30-3-2009 / 13-10-2009	Scottish west coast (Hebrides)	1	Nienke van Geel (HWDT)
Indo-Pacific humpback dolphins		Trang Province, Thailand		K.P. Robinson (CRRU)
Killer whale	30-3-2009 / 13-10-2009	Scottish west coast (Hebrides)	2	Nienke van Geel (HWDT)
Minke whale	30-3-2009 / 13-10-2009	Scottish west coast (Hebrides)	64	Nienke van Geel (HWDT)
Risso's dolphin	30-3-2009 / 13-10-2009	Scottish west coast (Hebrides)	1	Nienke van Geel (HWDT)
Short-beaked common dolphin	30-3-2009 / 13-10-2009	Scottish west coast (Hebrides)	24	Nienke van Geel (HWDT)
White-beaked dolphin	30-3-2009 / 13-10-2009	Scottish west coast (Hebrides)	17	Nienke van Geel (HWDT)

### 2.1.2 Opportunistic, platforms of opportunity

In Cardigan Bay, SWF volunteers work in close conjunction with local dolphin spotting vessels. Volunteers serve as dedicated observers and are responsible for collecting effort, sightings, photo ID images when possible

and behaviour. In addition, volunteers engage in public talking on board raising public awareness to the marine habitat and the Cardigan Bay SAC.

AULFS (Ana Candido) continue to monitor dolphins and porpoises on the East coasts of Scotland using passive acoustic monitoring.

Primary species	Area	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
Bottlenose dolphin	Cardigan Bay SAC	Effort, sightings, Photo-ID*, behaviour	Dedicated observers (SWF research volunteers)	12 m vessel	SWF	D. Feingold, SWF
Harbour porpoise	Cardigan Bay SAC	Effort, sightings, behaviour	Dedicated observers (SWF research volunteers)	12 m vessel	SWF	D. Feingold, SWF
All species	UK wide	Effort, sightings, Photo-ID*, behaviour	Dedicated observers (volunteers)	Various (from 10 m vessels to large ferries)	SWF	ME Baines/ SWF

## 2.2 Analyses/development of techniques

CREEM (Charles Paxton and Len Thomas) have conducted an analysis integrating survey data from a variety of sources to investigate spatial and temporal changes in the abundance of cetacean species across the Irish Sea. This work was funded by the Joint Nature Conservation Committee.

CREEM (Danielle Harris) are developing methods of estimating whale abundance from sparse arrays of seabed-mounted hydrophones. The case studies being worked on involve blue whale (*Balaenoptera musculus*) vocalisations recorded near Diego Garcia in the northern Indian Ocean, and fin whale (*Balaenoptera physalus*) vocalisations recorded in the north-east Atlantic Ocean.

CREEM (Len Thomas) have been continuing a research project to develop methods for estimating cetacean density from fixed passive acoustics (DECAF: see <http://www.creem.st-and.ac.uk/decaf/>). The project is near completion, ending at the end of May 2010.

SMRU (Cormac Booth) analysed HWDT data on harbour porpoises. He investigated the temporal and spatial variation in harbour porpoise distribution on the West coast of Scotland and modelled visual and acoustic detections of harbour porpoise with respect to oceanographic and environmental variables. Habitat preferences and distribution of harbour porpoises have been investigated using predictive models (Generalised Estimating Equations).

Jeppe Dalgaard Balle (SMRU) is using passive acoustic monitoring to study beaked whales in the North Atlantic. Gill Braulik (SMRU) is analysing sightings and acoustic data collected in Pakistan on the ecology of Indus river dolphins.

JNCC is funding SMRU (Phil Hammond) to make a comparison of the different techniques for mapping cetacean habitats. This project will use harbour porpoise sightings and effort data sets as a test case for a comparison of different habitat mapping methods, namely Ecological Niche Factor Analysis (ENFA), Generalised Linear Models (GLMs), Generalised Additive Models (GAMs) and Generalised Estimation Equations (GEEs). The project will investigate how each method performs under a range of effort scenarios. As a minimum, these will include data sets with a lot of effort data versus and some with sparse effort; evenly spread effort versus uneven effort will also be compared, as well as high and low sightings rates.

JNCC is funding the development of distribution and abundance indices and trends for cetaceans using the Atlantic Research Coalition (ARC) dataset (with Tom Brereton, Colin Macleod and Kelly MacLeod). This project will develop distribution and abundance indices and trends for cetacean species using ARC data, assess how representative ARC data is of the wider sea area by species, and assess the ability of the ARC data to detect trends in particular species over a fixed time frame.

JNCC is also funding a desk based project to assess the costs associated with implementing a dedicated cetacean surveillance scheme (with Peter Evans). This project will assess the cost implications for instigating a dedicated cetacean surveillance scheme for UK waters. It will include the design of a survey protocol with suggested track-lines and sampling frequencies for coverage of all UK waters, involving vessels and/or planes. The design of a

possible C-POD arrangement for monitoring long-term usage at coastal sites and proposed costs for dedicated photo-ID of the major coastal bottlenose dolphin populations will be included.

AULFS (Andy Foote) analysed photo-ID and sightings data of killer whales collected by HWDT in order to investigate site fidelity. Further information on this project is available at <http://www.northatlantickillerwhales.com/>.

AULFS (Paul Thompson, Kate Brookes) are assessing seismic surveys impacts on cetaceans in the Moray Firth.

SWF researchers have analysed sighting data from 2001-2009 regarding distribution and reproductive success. These were presented in the latest ECS conference in Stralsund. See also CCW reports, and publications listed below.

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Bottlenose dolphin	2001-2009	Cardigan Bay SAC	Line transect survey, Ad Libitum Surveys, Platform of opportunity	Distribution in relation to environmental factors	D. Feingold et al. ECS 2010 poster.
Bottlenose dolphin	2001-2009	Cardigan Bay	Line transect survey, Ad Libitum Surveys, Platform of opportunity	Reproductive success of bottlenose dolphins in welsh waters	G. Pesante and P.G.H Evans, ECS 2010 presentation

### 3. MARKING DATA

#### 3.1 Field work

HWDT and SWF continue their work using photo-identification and mark recapture analyses of several cetacean species around the UK.

CRRU continues to conduct photo-ID of bottlenose dolphins and minke whales in the southern Moray Firth, Scotland. New catalogues constructed for common dolphins and Risso's dolphins in 2009.

CRRU continues to collaborate on a joint database of photo-ID of minke whales in Scotland and Iceland to cross reference sightings data.

CRRU currently conducting photo-ID studies of Irrawaddy dolphins (*Orcaella brevirostris*) in Trang Province, SW Thailand.

AULFS (Barbara Cheney) continue to conduct photo-ID surveys of bottlenose dolphins in north east Scotland.

##### 3.1.1 Natural marking data

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Bottlenose dolphin	Dorsal fin	Scottish west coast (Hebrides)	28	Y	36	Laura Mandleberg (HWDT)
Humpback whale	Tail fluke/dorsal fin	North east Atlantic	1	N	?	Laura Mandleberg (HWDT)
Killer whale	Dorsal fin	Scottish west coast (Hebrides)	9	Y	9	Laura Mandleberg (HWDT)
Minke whale	All parts	Scottish west coast (Hebrides)	9	Y	125	Laura Mandleberg (HWDT)
Risso's dolphin	Dorsal fin	Scottish west coast (Hebrides)	0	Y	6	Laura Mandleberg (HWDT)
White-beaked dolphin	Dorsal fin	Scottish west coast (Hebrides)	0	N	0	Laura Mandleberg (HWDT)
Bottlenose dolphin	Dorsal fin	Cardigan Bay and Anglesey	226 (marked)	Y	469 (marked + unmarked)	D. Feingold, SWF

Bottlenose dolphin killer whale, Risso's dolphin, minke whale, humpback whale	Dorsal fin, flank markings, tail fukes	Throughout UK	c. 60 new ones during 2009 (excluding BND above)	Y	c. 600 (BND), 80 (KW), 55 (RD), 85 (MW), 10 (HW)	PGH Evans, SWF
Bottlenose dolphin	Dorsal fin	NE Scotland		Y	247	CRRU
Minke whale	Dorsal fin	NE Scotland		Y	45	CRRU
Risso's dolphin	Dorsal fin	NE Scotland		Y	26	CRRU
Common dolphin	Dorsal fin	NE Scotland		Y	56	CRRU
Humpback whale	Tail fluke /dorsal fin	NE Scotland		Y	3	CRRU
Irrawaddy dolphin	Dorsal fin	Thailand		Y		Kevin Robinson, CRRU/WFFT
Bottlenose dolphins	Dorsal finds	NE Scotland				Barbara Cheney AULFS

### 3.1.2. Artificial marking data

None Reported for 2009

### 3.1.3 Telemetry data

CRRU (Kevin Robinson) continued its work with TDR suction tags in NE Scotland. However, no successful deployments were achieved in 2009.

## 3.2 Analyses/development of techniques

HWDT (Nienke van Geel) are using natural marking data to estimate population size and movement patterns, focusing especially on bottlenose dolphin, killer whale, minke whale and Risso's dolphin in the Hebrides.

Several projects are underway at the SMRU using photo-id data to explore aspects of ecology, population structure and conservation. Simon Northridge and Laura Mandleberg (HWDT) are using the HWDT photo-id catalogue to explore possible fishery interactions with minke whales. Sanna Kuningas is using photo identification data and mark recapture methods to estimate population size, survival rates and calving rates of killer whales in Norway. Erin Ashe is investigating the population biology of Pacific white-sided dolphins off the Pacific coast of Canada using mark-recapture analysis of photo-id data and other methods. Rebecca Jewell is investigating the ecology and conservation of long-finned pilot whales in the Alborán Sea (Mediterranean Sea) using spatial analysis of line transect data and mark-recapture analysis of photo-id data. Diane Claridge is investigating spatial processes in the population ecology of beaked whales in the Bahamas using mark-recapture analysis of photo-id data. Antonella Servidio is investigating the social structure, distribution and habitat use of short-finned pilot whales in the Canary Islands using mark-recapture analysis of photo-id data. Salomé Dussán-Duque is investigating the ecology of costero dolphins (*Sotalia guianensis*) in Columbia using analysis of survey data and mark-recapture analysis of photo-id data. Aaron Banks is investigating the population biology of humpback whales off southeastern Africa using mark-recapture analysis of photo-id data and analysis of genetic material from biopsy samples. Gwen Penry has been investigating the biology of South African Bryde's whales using mark-recapture analysis of photo-id data and analysis of genetic material from biopsy samples. Phil Hammond and Nicola Quick are investigating the population biology of bottlenose dolphins off southeastern Scotland using analyses of photo-id data.

For bottlenose dolphins in Cardigan Bay, the following biological parameters have been determined from Photo-ID (2001-09) by SWF: birth rates 7.68% (based on closed model population estimate) 9.37%, (based on open model population estimate); corresponding values for 2009 were 7.3% and 7.8% respectively. Modal Inter-birth Interval 3 years (mean 3.2, range 2-5); calving season: 60% in July & Aug, 94% May-Sep. Juvenile mortality 20% 1<sup>st</sup> yr 25% 2<sup>nd</sup> yr, 10% 3<sup>rd</sup> yr.

#### 4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

##### 4.1 Biopsy samples.

None Reported for 2009

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

None reported for 2009

##### 4.3 Samples from stranded animals

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Harbour porpoise	UK	Various	55	Y	N/A	Rob Deaville (IoZ)/Bob Reid (SACVSD)/Rod Penrose (MEM)
		Skull	44	Y	0	Jerry Herman (NMS)
Short beaked common dolphin	UK	Various	15	Y	N/A	Rob Deaville (IoZ)/Bob Reid (SACVSD)
		Skull	3	Y	0	Jerry Herman (NMS)
Striped dolphin	UK	Various	7	Y	N/A	Rob Deaville (IoZ)/Bob Reid (SACVSD)
		Skull	1	Y	0	Jerry Herman (NMS)
	Hebrides	Skin, teeth	1	Y	N/A	Laura Mandelberg (HWDT) / Bob Reid (SACVSD)
White-beaked dolphin	UK	Various	6	Y	N/A	Rob Deaville (IoZ)/Bob Reid (SACVSD)
		Skull	3	Y	0	Jerry Herman (NMS)
Northern bottlenose whale	UK	Various	5	Y	N/A	Rob Deaville (IoZ)/Bob Reid (SACVSD)
Atlantic white-sided dolphin	UK	Various	2	Y	N/A	Bob Reid (SACVSD)
		Skull	5	Y	0	Jerry Herman (NMS)
Bottlenose dolphin	UK	Various	3	Y	N/A	Rob Deaville (IoZ)/ Rod Penrose (MEM)
		Skull	2	Y	0	Jerry Herman (NMS)
Minke whale	UK	Various	2	Y	N/A	Bob Reid (SACVSD)
		Hebrides (floating)	2	Y	N/A	Nienke van Geel (HWDT) / Bob Reid (SACVSD)
	Hebrides (stranded)	Skin	1	Y	N/A	Nienke van Geel (HWDT) / Bob Reid (SACVSD)
Long-finned pilot whale	UK	Various	1	Y	N/A	Rob Deaville (IoZ)
Risso's dolphin	UK	Various	1	Y	N/A	Rob Deaville (IoZ)
Humpback whale	UK	Various	1	Y	N/A	Rob Deaville (IoZ)
Sowerby's beaked whale	UK	Various	1	Y	N/A	Rod Penrose (MEM)
		Skull	2	Y	0	Jerry Herman (NMS)

##### 4.4 Analyses/development of techniques

None reported for 2009

#### 5. POLLUTION STUDIES

During 2009, the Centre for Environment, Fisheries & Aquaculture Science (CEFAS) Lowestoft Laboratory, Essex completed the analyses of long-term temporal trends in blubber concentrations of chlorobiphenyls (PCBs) (n=440; 1991-2005) and brominated diphenyl ethers (PBDEs) (n=415; 1992-2008) in UK-stranded harbour porpoises (Law *et al* 2010; Law *et al* accepted for publication). A non-parametric statistical method was used and potential confounding factors (area, season, by-caught or stranded, age class, sex, blubber thickness and lipid

content) were investigated and found not to confound any of the trends identified. For PCBs, a standard suite of 25 CB congeners was determined throughout the study period and show a decline that is much slower than for organochlorine pesticides (e.g. DDTs). It also shows regional differences across the UK (e.g. lowest levels in Scotland). The reason for the slow decline in PCBs is likely due to both continuing diffuse inputs from e.g. PCB-containing materials in storage and in landfills where these were disposed of prior to the more stringent requirements for such sites being enacted, and to the substantial reservoir of PCBs already in the marine environment. Further efforts to limit or eliminate PCB discharges to the marine environment are still needed. Statistically robust case-control studies show strong evidence for PCB-induced infectious disease mortality in UK-stranded harbour porpoises (at mean blubber PCB concentrations around 20-25mg/kg lipid weight) (Jepson *et al* 2005; Hall *et al* 2006). Even greater concerns exist in other species where the mean blubber PCB concentration in UK-stranded bottlenose dolphins is 100mg/kg lipid weight (n=15) (Jepson *et al* 2008) and 225mg/kg (n=5) in killer whales for the same period 1992-2005 (Law *et al.* 2006; CEFAS, unpublished data).

For BDEs, nine congeners were: BDE28, BDE47, BDE66, BDE85, BDE99, BDE100, BDE138, BDE153 and BDE154. The maximum  $\Sigma$ BDE concentration observed was 15.7 mgkg<sup>-1</sup> lipid wt in an animal which died in 1993. The median concentrations peaked around 1998, and have reduced by between 55% and 76% to 2008 (Law *et al* accepted for publication). The BDE congeners found in UK marine mammals arise primarily from the penta-mix PBDE product, which was banned in the EU in 2004.

## 6. STATISTICS FOR LARGE CETACEANS 2009

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

None reported.

### 6.2 Direct catches of large whales for the calendar year 2009

Not applicable to UK

### 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)

Whale species	Sex	No.	Date	Location	Vessel type	Speed	Fate	How observed	Contact person/institute and refs
Minke whale	M	1	20/05/09	Sanham Insir Beach, Rhum, Highland, Scotland	U	U	D	Stranded & diagnosed at necropsy	Bob Reid (SACVSD)

#### 6.3.2 Fishery bycatch of large whales

Whale species	Sex	No.	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
Comments: None reported 2009.									

## 7. STATISTICS FOR SMALL CETACEANS 2009

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

None reported

### 7.2 Direct catches of small cetaceans for the calendar year 2009

Not applicable to UK

### 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
Common dolphin	M	1	20/08/09	Solva, Pembrokeshire, Wales	U	U	D	Stranded and diagnosed	Rob Deaville (IoZ)

#### 7.3.2 Fishery bycatch of small cetaceans 2009

Species	Ratio of male to female (if known)	No.	No. extrapolated to fleet total (point estimate)	Range, CI or CV	Date of bycatch	Location (description or lat/long)	FAO statistical area (if known)	FAO area	Fate	Targeted species	Gear	How observed?	Source or contact
Common dolphin	1:2	9	U	U	U	Stranded- various England and Wales	27	IV, VII, VIII	D	U	U	M (stranded and diagnosed)	Rob Deaville (IoZ)
Harbour porpoise	1:2	6	U	U	U	Stranded- various England, Wales and Scotland	27	IV, VI, VIII	D	U	U	M (stranded and diagnosed)	Rob Deaville (IoZ)/ Bob Reid (SACVSD)
Bottlenose dolphin	M	1	U	U	U	Stranded- Wales	27	VIIa	D	U	U	M (stranded and diagnosed)	Rob Deaville (IoZ)
Harbour porpoise	U	10	616*	CV 0.16	2009	Celtic Sea	27	VII defgh	D	Demersal fish	GEN	M	Simon Northridge (SMRU)
Common dolphin	U	3	-	-	2009	Celtic Sea	27	VIIe	R	Demersal fish	PTB	M	Simon Northridge (SMRU)
Common dolphin	U	4	4	+/- 0	2009	Celtic Sea	27	VIIe	D	Bass	PTM	M	Simon Northridge (SMRU)
Common dolphin	U	3	264*	CV 0.24	2009	Celtic Sea	27	VII efgh	D	Demersal fish	GEN	M	Simon Northridge (SMRU)

\* Estimates based on bycatch rates observed over four years for these species and fisheries.

## 8. STRANDINGS

The UK Cetacean Strandings Investigation Programme (CSIP) is a consortium of organisations consisting of IoZ, SACVSD, NHM and MEM and is contracted by Defra and the Devolved Administrations to record information on all UK stranded cetaceans and to conduct standardised necropsies on 100 cetacean strandings per annum, to allow the investigation of diseases and causes of death. Data collected by the CSIP is now held on a web accessed database and extracts from this will be periodically exported to the National Biodiversity Network Gateway (<http://data.nbn.org.uk/>), to facilitate wider access to information on UK strandings. IoZ and SACVSD also maintain extensive tissue archives derived from UK stranded animals which have been necropsied. Further information on the CSIP can be found at [www.ukstrandings.org](http://www.ukstrandings.org).

In addition to the strandings co-ordination funded by Defra, the National Assembly for Wales is funding the Welsh Strandings Co-ordinator, Rod Penrose (MEM) in conjunction with the Countryside Council for Wales (CCW). The Scottish Strandings Co-ordinator role is funded directly by the Scottish Government which also provides funding for a number of additional necropsies in Scotland. The Cornwall Wildlife Trust Marine

Strandings Network trains and encourages members of the public to report their sightings and strandings for the Cornish coast and maintains its own strandings database, with all information feeding into the national UK CSIP database.

HWDT also has a sightings/strandings network which encourages members of the public to report their sightings and strandings for the west coast of Scotland (Hebrides). Local strandings are attended by HWDT if possible. Data are passed to the Strandings Coordinator for Scotland, Bob Reid at the Scottish Agricultural College (SAC) in Inverness. Additionally, strandings and floating animals are also observed during the monitoring surveys. Samples from stranded and floating animals are sent to Bob Reid (SACVSD).

CWT continues their evaluation of evidence for bycatch among stranded small cetaceans (project "BEEP").

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Harbour porpoise	248	50	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Short-beaked common dolphin	54	15	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
White beaked dolphin	21	6	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Striped dolphin	13	7	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Bottlenose dolphin	9	2	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Minke whale	8	2	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Atlantic white-sided dolphin	8	2	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Northern bottlenose whale	8	5	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Risso's dolphin	7	1	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Long-finned pilot whale	4	1	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Sowerby's beaked whale	3	0	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Sperm whale	3	0	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Cuvier's beaked whale	2	0	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Fin whale	1	0	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Humpback whale	1	1	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list
Cetacean (indeterminate species)	42	0	Rob Deaville (IoZ)/Bob Reid (SACVSD) /Martin Stemp (NHM)/ Rod Penrose (MEM)	IoZ/SACVSD/ NHM/MEM- see contact list

## 9. OTHER STUDIES AND ANALYSES

Development and maintenance of the 'PAMGUARD' software has continued at SMRU (Doug Gillespie). PAMGUARD consists of open source software for acoustic detection and localisation of cetacean sounds. It has applications in mitigation of marine engineering work and in acoustic surveys for cetaceans. Ongoing work includes development of new statistical classification techniques to identify clicks and whistles to species. The project is JIP (Joint Industry Program) funded. The UK's Natural Environment Research Council is also funding a PhD student to look at models for analysis of acoustic data in line transect surveys.

Studies on the acoustic behaviour of bottlenose dolphins, Irawaddy dolphins, Risso's dolphins and minke whales have been conducted by the SMRU. Vincent Janik and co-workers used focal follows, passive acoustic localization, and playback experiments to investigate individual recognition, whistle matching and the natural acoustic behaviour of the animals. They also studied visual communication signals and social behaviour in white whales and Pacific white-sided dolphins at the Shedd aquarium in Chicago

SMRU (Simon Northridge, Jonathan Gordon, Cormac Booth) have been examining the effects of acoustic seal scaring devices (ADDs) used at fish farms on the echolocation clicks of harbour porpoises using click detectors. A draft report has been submitted to the funders of this work (Scottish Aquaculture Research Forum) and a final version will be available later in 2010.

SMRU (Simon Northridge & Al Kingston) have been trialling acoustic deterrent devices in gill and tangle net fisheries in the western English Channel. Preliminary results have been submitted to the European Commission (SMRU 2009).

SMRU (Alice Mackay and Simon Northridge) have been investigating harbour porpoise distribution around gillnets with different net and headline characteristics using C-Pods.

SMRU (Alice Mackay and Simon Northridge) are examining the effects of a tidal turbine in Strangford Lough narrows on the presence and distribution of harbour porpoises

CWT are studying the application of pingers to inshore set net fisheries to reduce harbour porpoise and bottlenose dolphin bycatch, using passive acoustic monitoring.

Nick Tregenza is making Non-DISTANCE cetacean density estimates using 'time present' as a metric, through deployment of a calibration array of 36 C-POD loggers Feb - May 2010.

CRRU (Kevin Robinson) initiated a new research project in Thailand in 2010 in collaboration with the Phuket Marine Biological Centre (PMBC) and the University of Chulalongkorn, Bangkok.

CRRU (Kevin Robinson) working with AULFS, HWDT and the Marine Biodiversity Research Group, Ireland on inter-coastal movements by bottlenose dolphins between the Moray Firth, west coast of Scotland and Ireland.

CRRU observed the first ever intraspecific attack on a bottlenose dolphin calf by an adult male in the Moray Firth in August 2009.

CRRU (Michael Tetley) publishes his PHD study on the habitat preference and site fidelity of minke whales (co-supervised by Drs Kevin Robinson (CRRU) and Gay Mitchelson-Jacob from the University of Bangor).

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