

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

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This report summarises information obtained from:

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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	Area/stock(s)	Items referred to
Common minke whale	<i>Balaenoptera acutorostrata</i>	NE Atlantic	2.1.1, 2.1.2, 4.3, 4.4, 8, 9
Humpback whale	<i>Megaptera novaeangliae</i>	NE Atlantic	2.1.1, 2.1.2, 3.1.1, 4.1, 4.4, 8, 9
Fin whale	<i>Balaenoptera physalus</i>	NE Atlantic	2.1.1, 2.1.2, 3.1.1, 4.4, 9
Sei whale	<i>Balaenoptera borealis</i>	NE Atlantic	2.1.1, 2.1.2
Blue whale	<i>Balaenoptera musculus</i>	NE Atlantic	2.1.1, 2.1.2
Harbour porpoise	<i>Phocoena phocoena</i>	NE Atlantic	2.1.1, 2.1.2, 2.2, 4.3, 8
Common dolphin	<i>Delphinus delphis</i>	NE Atlantic	2.1.1, 2.1.2, 4.3, 8
Striped dolphin	<i>Stenella coeruleoalba</i>	NE Atlantic	2.1.1, 2.1.2, 4.3, 8
Bottlenose dolphin	<i>Tursiops truncatus</i>	NE Atlantic	2.1.1, 2.1.2, 2.2, 3.1.1, 4.1, 4.3, 8, 9
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	NE Atlantic	2.1.1, 2.1.2, 4.3, 8, 9
White beaked dolphin	<i>L. albirostris</i>	NE Atlantic	2.1.1, 2.1.2, 8
Risso's dolphin	<i>Grampus griseus</i>	NE Atlantic	2.1.1, 2.1.2, 3.1.1, 4.3, 8
Long-finned pilot whale	<i>Globicephala melas</i>	NE Atlantic	2.1.1, 2.1.2, 3.1.1, 4.3, 8
Pygmy sperm whale	<i>Kogia breviceps</i>	NE Atlantic	4.3, 8
Killer whale	<i>Orcinus orca</i>	NE Atlantic	2.1.1, 2.1.2, 3.1.1
Sperm whale	<i>Physeter macrocephalus</i>	NE Atlantic	2.1.1, 2.1.2, 4.3
Northern Bottlenose Whale	<i>Hyperoodon ampullatus</i>	NE Atlantic	2.1.1, 2.1.2, 4.3
Sowerby's beaked whale	<i>Mesoplodon bidens</i>	NE Atlantic	2.1.1, 2.1.2, 4.3
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	NE Atlantic	2.1.1, 2.1.2
True's beaked whale	<i>Mesoplodon mirus</i>	NE Atlantic	2.1.1, 4.3, 8

2. SIGHTINGS DATA

2.1 Field work

2.1.1 Systematic

Target species	Date	Area	No. of sightings	Contact person/institute and references
All species, with focus on beaked whale species/habitats	18 August 2009 – 31 August 2009	North and west slopes of Porcupine Bank	89 sightings of 7 cetacean species. 135 hours of towed acoustic array recordings also collected.	D. Wall GMTI/IWDG Wall D. <i>et al.</i> (2009) Cetaceans on the Frontier Survey 2009. <i>Cruise report to the Marine Institute, Oranmore, Galway, Ireland.</i>
Bottlenose dolphins	June – September 2009	Connemara, Co Galway	12	A. Englund/E. Rogan /UCC Ingram, S. <i>et al.</i> , 2009. A site assessment of the waters of Connemara; a survey of bottlenose dolphins. <i>Report to NPWS</i>
Bottlenose dolphin	May 09 –May 10	Mullet Peninsula	9	M. Oudejans / DNT
Common dolphin	May 09 –May 10	Mullet Peninsula	8	M. Oudejans / DNT
Risso's dolphin	May 09 –May 10	Mullet Peninsula	1	M. Oudejans / DNT
Harbour porpoise	May 09 –May 10	Mullet Peninsula	35	M. Oudejans / DNT
Minke whale	May 09 –May 10	Mullet Peninsula	7	M. Oudejans / DNT
Killer whale	May 09 –May 10	Mullet Peninsula	1	M. Oudejans / DNT
Unidentified dolphin	May 09 –May 10	Mullet Peninsula	15	M. Oudejans / DNT
Sei whale	May 09 –May 10	Mullet Peninsula	3	M. Oudejans / DNT
All species	1 Jan 09 - 31 December 09 (land-based surveys)	Broadhaven Bay	62	P. Anderwald / UCC

During 2009, boat surveys were conducted to examine the distribution, site fidelity and abundance of bottlenose dolphins using the waters of northwest Connemara (UCC/NPWS). In total, 21 photo identification boat surveys were conducted. Bottlenose dolphin schools were encountered during eight surveys between 1st June and 18th September 2009. School sizes ranged from 2 to 25 animals with a median school size of 15 dolphins. A minimum of 86 uniquely marked dolphins were identified from photographs of their dorsal fins. Intervals between re-sightings extended the full duration of the study indicating at least seasonal site fidelity in the area. The dolphins using the waters of Connemara appear to belong to a wide ranging coastal community. Five dolphins were previously identified from surveys around Connemara in 2001 to 2003 and 10 catalogued dolphins were known from surveys at other coastal sites from Youghal to Donegal. Using a sightings matrix of marked animals from high quality photo-identification data a mark-recapture model was used to calculate an estimate of abundance. 171 ± 48 (se) dolphins were estimated to be using the survey area during June to September 2009. Despite the number of animals encountered, no neonates were observed during surveys.

2.1.2 Opportunistic, platforms of opportunity

Primary species	Area	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
All species	NE Atlantic	Line-transect & towed acoustic	Research scientists	Research vessels	GMTI/IWDG	D. Wall (GMTI/IWDG)
All species	NE Atlantic	Line-transect	Research scientists	Commercial Ro-Ro Ferries	IWDG	D. Wall (IWDG)
Bottlenose dolphin	Shannon Estuary	Photo-ID	Research scientists	whalewatching vessel	SDWF	S. Berrow (SDWF)
Bottlenose dolphins	Shannon estuary	*Photo-ID, behaviour,	Research scientists	whalewatching vessel	*UCC	R. Pinfield/E. Rogan (UCC)

		environmental data				
Fin whale	Celtic Sea	Photo-ID/ Biopsy sampling	Research scientists	whalewatching vessel	IWDG	P. Whooley (IWDG)
Humpback whale	Celtic Sea	Photo-ID/ Biopsy sampling	Research scientists	whalewatching vessel	IWDG	P. Whooley (IWDG)
Bottlenose dolphin	Mullet Peninsula	Photo-ID; sightings	crew / dedicated observer	marine-based tourism vessel	DNR	M. Oudejans (DNT)
Harbour porpoise	Mullet Peninsula	sightings	crew / dedicated observer	marine-based tourism vessel	DNR	M. Oudejans (DNT)
Common dolphin	Mullet Peninsula	sightings	crew	marine-based tourism vessel	DNR	M. Oudejans (DNT)
Risso's dolphin	Mullet Peninsula	sightings	crew	marine-based tourism vessel	DNR	M. Oudejans (DNT)
Killer whale	Mullet Peninsula	Photo-ID; sightings	crew / dedicated observer	fishing vessel	DNR	M. Oudejans (DNT)
Unidentified dolphin	Mullet Peninsula	sightings	crew / dedicated observer	marine-based tourism vessel	DNR	M. Oudejans (DNT)

2.2 Analyses/development of techniques

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Bottlenose dolphins	June – Sept 2009	Shannon estuary	Photo-identification	Quantification of encounters of bottlenose dolphins/trip/encounter/trip/day/week/month	E. Rogan/UCC Pinfield, R. 2009 MSc thesis
All marine mammals	Jan – Dec 2009	Broadhaven Bay	Land-based surveys	Rel. abundance, distribution	P. Anderwald / UCC
Bottlenose dolphin & harbour porpoise	Jan – Dec 2009	Broadhaven Bay	POD's	Rel. abundance	M. Coleman / UCC

3. MARKING DATA

3.1 Field work

3.1.1 Natural marking data

Provide this in the form of a table, e.g.

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Humpback whale	Fluke	N.E. Atlantic	1	Y	11	P. Whooley /IWDG
Fin whale	Dorsal fin	N.E. Atlantic	5	Y	62	P. Whooley / IWDG
Bottlenose dolphin	Dorsal fin	Shannon Estuary	47	Y	183	S. Berrow /SDWF
Bottlenose dolphin	Dorsal fin	Irish waters	19	Y	125	S. Berrow /IWDG
Bottlenose dolphin	Dorsal fin	Shannon estuary	131	Y	645	E. Rogan/UCC
Bottlenose dolphin	Dorsal fin	Connemara/Mayo	12	Y	97	A. Englund/UCC; Ingram <i>et al.</i> , 2009
Killer whale	Dorsal fin	N.E. Atlantic	6	Y	7	S. Berrow /IWDG
Risso's dolphin	Dorsal fin	Irish waters	17	Y	21	S. Berrow /IWDG
Long-finned pilot whale	Dorsal fin	N.E. Atlantic	6	Y	19	S. Berrow / IWDG
Bottlenose dolphin	Dorsal fin	Mullet Peninsula	123	Y	218	M. Oudejans / DNT

Killer whale	Dorsal fin	Mullet Peninsula	2	Y	2	M. Oudejans / DNT
Bottlenose dolphin	Dorsal fin	NE Ireland	119	Y	157	L. Walshe / UCC

3.1.2. Artificial marking data

NA

3.1.3 Telemetry data

NA

3.2 Analyses/development of techniques

NA

4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

4.1 Biopsy samples (summary only)

Species	Area/stock	Calendar year/ season - no. collected	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Humpback whale	NE Atlantic	2009/1	Y	1	4	S. Berrow / IWDG
Bottlenose dolphin	West coast Ireland	2009/16	Y	16	66	E. Rogan/UCC); S. Ingram /UP

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

No samples from bycatch were obtained this year.

4.3 Samples from stranded animals

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Sowerby's Beaked Whale	Irish Coast	Skin	2	Y	0	R. Carden /NMI
Risso's Dolphin	Irish Coast	Skin	1	Y	0	R. Carden /NMI
Bottlenose Dolphin	Irish Coast	Skin	6	Y	0	R. Carden /NMI
Minke Whale	Irish Coast	Skin	4	Y	0	R. Carden /NMI
Northern Bottlenose Whale	Irish Coast	Skin	4	Y	0	R. Carden /NMI
Sperm Whale	Irish Coast	Skin	1	Y	0	R. Carden /NMI
Common Dolphin	Irish Coast	Skin	4	Y	0	R. Carden /NMI
Pygmy Sperm Whale	Irish Coast	Skin, blubber etc	1	Y	0	E. Rogan /UCC; R.Carden /NMI
Harbour Porpoise	Irish Coast	Skin	6	Y	0	R. Carden /NMI
Long-finned Pilot Whale	Irish Coast	Skin	1	Y	0	R. Carden /NMI
Striped Dolphin	Irish Coast	Skin	6	Y	0	R. Carden /NMI
Atlantic White Sided Dolphin	Irish Coast	Skin	1	Y	0	R. Carden /NMI
True's Beaked Whale	Irish Coast	Skin	1	Y	0	R. Carden /NMI
UnID Dolphin Species	Irish Coast	Skin	4	Y	0	R. Carden /NMI
UnID Whale Species	Irish Coast	Skin	4	Y	0	R. Carden /NMI

*e.g. liver, skin, blubber etc.

4.4 Analyses/development of techniques

As part of a PhD project at GMIT, the genders and a 500bp fragment of the mitochondrial D-Loop were sequenced for 42 skin samples (fin, humpback, minke) at the Department of Genetics, Microbiology and Toxicology, University of Stockholm.

Stable isotope analyses of skin, blubber and baleen from fin and humpback whales was carried out at the MI and NOCS. Methodological studies into the effects of tissue treatments on stable isotope signatures and fractionation between tissues are being carried out. A mixed model approach will be used to assign potential prey species to baleen whales using biopsy samples and prey sampled during dedicated and fisheries surveys.

5. POLLUTION STUDIES

There are no on-going pollution studies.

6. STATISTICS FOR LARGE CETACEANS

6.1 Corrections to earlier years' statistics for large whales

6.2 Direct catches of large whales (commercial, aboriginal and scientific permits) for the calendar year 2009

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)

No ship strikes of large whales were reported

6.3.2 Fishery bycatch of large whales

No whales were reported entangled during this period (BIM/MI)

Whale species	Sex	No.	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
Comments: No whales were reported entangled during this period									

7. STATISTICS FOR SMALL CETACEANS

It was first agreed to include this information in a Commission resolution in 1976 (IWC, 1977, p.31)). Furthermore, in 2005 (IWC, 2006, Annex J) it was agreed that these data should be brought into line with those reported for large cetaceans. **Therefore, this Section should be completed using the same guidelines as given in Section 6 above, Statistics for large cetaceans. If no mortality has been reported then please state this in the table (do not leave blank).**

7.1 Corrections to earlier years' statistics for small cetaceans

This would be a place to include any corrections to statistics presented in earlier years. It may also be appropriate to include references to studies that utilise time series of data here.

7.2 Direct catches of small cetaceans for the calendar year 2009

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)

No ship strikes of small cetaceans were reported during this year (BIM/MI).

7.3.2 Fishery bycatch of small cetaceans

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
Comments: No small cetaceans were recorded this year.													

8. STRANDINGS

The IWDG Stranding Scheme operates throughout the year around the entire coastline of Ireland (north and south). Records are received from IWDG members, National Parks and Wildlife Conservation Rangers and members of the public, usually by e-mail or phone. In 2009, 87.5% of records submitted were accompanied by a photograph. All records are validated by the IWDG and published in the Irish Naturalists' Journal (O'Connell and Berrow in press).

A total of 136 stranding records were reported during 2009. Sixteen species were identified with the most frequent being harbour porpoises (19.9%) and common dolphins (15.4%). Twenty three strandings were of live animals representing 16.91% of total stranding incidents. This figure compares with 2007 and 2008 when live strandings accounted for 19.58% and 13.33%, respectively.

No post-mortem sampling programme is currently in place.

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Harbour porpoise	27	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Common dolphin	21	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Pilot whale	13	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Bottlenose dolphin	13	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Striped dolphin	10	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Sperm whale	5	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Minke whale	4	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Cuvier's beaked whale	3	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Fin whale	3	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Risso's dolphin	3	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Sowerby's beaked whale	3	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
White-beaked dolphin	2	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Pygmy sperm whale	2	1	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Atlantic white-sided dolphin	2	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Northern bottlenose whale	2	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
True's beaked whale	1	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Unident. dolphin	17	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Unident. whale	2	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie
Unident. cetacean	3	0	M. O'Connell (IWDG)	mick.oconnell@iwdg.ie

9. OTHER STUDIES AND ANALYSES

A PhD study funded by the Irish Research Council for Science, Engineering and Technology commenced, examining mysticete ecology in Irish waters (C. Ryan, GMIT). The study aims to use both molecular genetics (mtDNA D-Loop and microsatellites) and stable isotope analyses to investigate stock structure of fin, humpback and minke whales occurring in Irish waters. A genetic tagging approach to identify which breeding and feeding groups "Irish" humpback whales belong to is part of the project. Stable isotope analyses of skin and blubber biopsies and baleen plates from recently stranded/museum collections are ongoing at the MI and NOCS.

Acoustic recordings using a single element hydrophone and a solid state recorder were made during photo-identification surveys for bottlenose dolphins, resulting in 6 hours of recordings collected on the west coast of Ireland. Whistle contours will be compared to the whistle repertoires between different communities of bottlenose dolphins in Irish waters as part of a PhD (A. Englund, UCC).

A genetic structure analysis (with no prior information of sampling areas) using 62 biopsy samples from free ranging bottlenose dolphins and 23 samples from stranded dolphins revealed fine-scale population structure among three genetically distinct populations. Moderate nuclear (15 microsatellites) and low mitochondrial (544bp of the control region) gene diversity in dolphins using the Shannon Estuary and in dolphins using the Connemara-Mayo region were recorded, while dolphins that stranded along the coast showed markedly higher levels of gene diversity at both classes of markers. Specifically these stranded dolphins formed a third genetically distinct cluster, which may be part of a larger pelagic population, as also suggested by the high levels

of gene diversity (UCC/NUIG/UP). Stable isotopes of sulphur (δS), nitrogen (δN) and carbon (δC) extracted from the skin biopsy samples were also used to investigate their usefulness in differentiating aggregations of bottlenose dolphins. The two coastal populations were differentiated based on the δN but not on δC or δS (UCC/MI/UP).

As part of an ongoing PhD study on foraging ecology of small cetaceans, diet analysis of bottlenose dolphin and white-sided dolphin stranded on the west coast of Ireland has been carried out (G. Hernandez-Milian, UCC). The 10 bottlenose dolphins examined showed a wide prey spectrum with gadoid species, mainly *Pollachius* species and blue whiting (*Micromesistius poutassou*) & whiting (*Merlangius merlangus*) recorded. Diet analysis of 14 white-sided dolphins suggests that this species feeds mainly on blue whiting, silvery pout (*Gadiculus argenteus*) and *Trisopterus* species.

Photo-ID was used to assess the level of exposure individual bottlenose dolphins are subjected to from whalewatching tours in the Shannon Estuary SAC. In total 131 well-marked individuals were identified and 90 of these were re-captured during the study period. The re-capture rate was high, with several individuals being re-sighted on the same trip more than once, on different trips during the same day and on consecutive days. 80% of individual re-sightings ($n = 30$) on the same trip occurred within 40 minutes and encounters of two animals up to three times in a single trip within 90 minutes occurred. At least two individuals experienced over 3 hours contact with the tour boat over three consecutive days. In addition to use of photo-id to assess level of exposure to tour boats, it was also used to examine individual movements of the most frequently re-captured (≥ 10) individuals ($n = 7$). Results indicate these individuals were moving between two key areas within the estuary and that their movements were being influenced by tidal state (ebb or flood) (Pinfield, R. unpublished MSc thesis).

Ireland finalised an action plan for cetaceans in December 2009 (NPWS). The Conservation Plan for Cetaceans in Irish Waters underwent extensive statutory and public consultation phases and it provides comprehensive information concerning the ecology of all cetacean species occurring in Ireland. It identifies the primary pressures and the administrative and scientific gaps that pose a threat to the protection of cetaceans in Ireland, and identifies clear measures required to ensure such threats are addressed. The Plan, and its accompany schedule for actions, will shortly be available on the website of the National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government (www.npws.ie).

10. LITERATURE CITED

Ingram, S., Kavanagh, A., Englund, A. & Rogan, E. 2009. Report for the National Parks and Wildlife Service of Ireland. University College Cork, November 2009. 34pp.

Pinfield, R. 2009. Ecotourism and habitat use of bottlenose dolphins, *Tursiops truncatus*, in the Shannon estuary. Thesis submitted for the Degree of Master of Science in Marine Biology. University College Cork.

11. PUBLICATIONS

Please follow the official IWC style guide for references (<http://www.iwcoffice.org/publications/styleguide.htm>).

11.1 Published or 'In Press' papers only

Berrow, S.D. (2009) Winter distribution of Bottle-nosed Dolphins *Tursiops truncatus* (Montagu) in the inner Shannon Estuary. *Irish Naturalists' Journal*. 30(1), 35-39.

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- O'Brien, J.M., Berrow, S.D., Ryan, C, McGrath, D., O'Connor, I., Pesante, P., Burrows, G., Massett, N., Klötzer, V. And Whooley, P. (2009) A note on long-distance matches of bottlenose dolphins (*Tursiops truncatus*) around the Irish coast using photo-identification. *Journal of Cetacean Research and Management* 11(1), 71-76.
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11.2 Unpublished literature

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