

Ireland. Progress report on cetacean research, May 2010 to May 2011, with statistical data for the *calendar year* 2010

COMPILED BY EMER ROGAN

School of Biology, Earth and Environmental Sciences, University College, Cork, Ireland.

This report summarises information obtained from:

Name of agency/institute	Abbreviation (use in rest of report)	Contact e-mail address
University College Cork	UCC	E.Rogan@ucc.ie
Galway-Mayo Institute of Technology	GMIT	simon.berrow@gmit.ie
Irish Whale and Dolphin Group	IWDG	simon.berrow@iwdg.ie
National Parks and Wildlife Service	NPWS	eamonn.kelly@environ.ie
Irish Sea Fisheries Board	BIM	cosgrove@bim.ie
Shannon Dolphin & Wildlife Foundation	SDWF	simon.berrow@shannondolphins.ie
Dúlra Research	DR	Machiel.oudejans@gmail.com
University of Plymouth	UP	Simon.Ingram@plymouth.ac.uk
Marine Institute	MI	Brendan.McHugh@marine.ie
National Biodiversity Data Centre	NBDC	eregan@biodiversityireland.ie

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
Humpback whale	<i>Megaptera novaeangliae</i>	NE Atlantic	2.1, 2.2, 3.1, 4.1, 4.3, 8
Common minke whale	<i>Balaenoptera acutorostrata</i>	NE Atlantic	2.1, 2.2, 4.3, 6.3, 8
Fin whale	<i>Balaenoptera physalus</i>	NE Atlantic	2.1, 2.2, 3.1, 4.1
Sei whale	<i>Balaenoptera borealis</i>	NE Atlantic	2.1
Blue whale	<i>Balaenoptera musculus</i>	NE Atlantic	2.1
Harbour porpoise	<i>Phocoena phocoena</i>	NE Atlantic	2.1, 4.3, 8
Common dolphin	<i>Delphinus delphis</i>	NE Atlantic	2.1, 2.2, 4.3, 8
Striped dolphin	<i>Stenella coeruleoalba</i>	NE Atlantic	2.1, 8
Bottlenose dolphin	<i>Tursiops truncatus</i>	NE Atlantic	2.1, 2.2, 3.1, 8
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	NE Atlantic	2.1, 8
White beaked dolphin	<i>L. albirostris</i>	NE Atlantic	2.1
Risso's dolphin	<i>Grampus griseus</i>	NE Atlantic	2.1, 3.1, 8
Long-finned pilot whale	<i>Globicephala melas</i>	NE Atlantic	2.1, 4.3, 8
Killer whale	<i>Orcinus orca</i>	NE Atlantic	2.1, 4.3, 8
Sperm whale	<i>Physeter macrocephalus</i>	NE Atlantic	2.1
Northern Bottlenose Whale	<i>Hyperoodon ampullatus</i>	NE Atlantic	2.1
Sowerby's beaked whale	<i>Mesoplodon bidens</i>	NE Atlantic	2.1
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	NE Atlantic	2.1

2. SIGHTINGS DATA

2.1 Field work

2.1.1 Systematic

Give brief details of **systematic** surveys, when and where held and references to cruise reports if applicable. A summary table of sightings may be included (e.g. see below).

Target species	Date	Area	No. of sightings	Contact person/institute and references
All species	30-31 Aug 2010	northwest	11	Simon Berrow (IWDG)
All species	25 Sept 2010	southwest	42	Simon Berrow (IWDG)
All species	12 Oct 2010	west	39	Simon Berrow (IWDG)
Bottlenose dolphins	July-October 2010	Shannon Estuary		Simon Berrow (SDWF)
Bottlenose dolphin	July to Oct 2010	Shannon Estuary, County Clare	5	A. Englund (UCC)
Bottlenose dolphin	July to Oct 2010	Broadhaven bay, County Mayo	2	A. Englund (UCC)
Bottlenose dolphin	July to Oct 2010	Cork harbour, County Cork	3	A. Englund (UCC)
Minke whale	1.1.-31.12.2010	Broadhaven Bay, NW Ireland	25	P. Anderwald / CMRC; Anderwald et al. (2011)
Harbour porpoise	1.1.-31.12.2010	Broadhaven Bay, NW Ireland	17	P. Anderwald / CMRC; Anderwald et al. (2011)
Common dolphin	1.1.-31.12.2010	Broadhaven Bay, NW Ireland	32	P. Anderwald / CMRC; Anderwald et al. (2011)
Bottlenose dolphin	1.1.-31.12.2010	Broadhaven Bay, NW Ireland	16	P. Anderwald / CMRC; Anderwald et al. (2011)
White-beaked dolphin	1.1.-31.12.2010	Broadhaven Bay, NW Ireland	2	P. Anderwald / CMRC; Anderwald et al. (2011)
Risso's dolphin	1.1.-31.12.2010	Broadhaven Bay, NW Ireland	1	P. Anderwald / CMRC; Anderwald et al. (2011)
Killer whale	1.1.-31.12.2010	Broadhaven Bay, NW Ireland	5	P. Anderwald / CMRC; Anderwald et al. (2011)
Harbour porpoise	2010	West of Ireland	41	M. Oudejans (DR)
Common dolphin	2010	West of Ireland	26	M. Oudejans (DR)
Unid dolphin	2010	West of Ireland	16	M. Oudejans (DR)
Bottlenose dolphin	2010	West of Ireland	10	M. Oudejans (DR)
White beaked dolphin	2010	West of Ireland	11	M. Oudejans (DR)
Pilot whale	2010	West of Ireland		M. Oudejans (DR)
Minke whale	2010	West of Ireland	8	M. Oudejans (DR)
Killer whale	2010	West of Ireland	1	M. Oudejans (DR)

Dedicated boat-based surveys of three sites were carried out between August and October 2010 (IWDG). A total of 92 sightings were made of a total of 528 individuals of at least five species (Ryan *et al.* 2010). Density and abundance estimates were derived for common dolphins in the west survey area (4.56 individuals km⁻²) equivalent to an abundance of 5254 ± 2311 (CV = 0.44) and in the southwest survey area (2.44 individuals km⁻²), equivalent to an abundance of 2812 ± 1254 (CV = 0.45).

A population assessment of the bottlenose dolphins in the Lower River Shannon cSAC was undertaken (SDWF) between July and October 2010 (Berrow *et al.*, 2010). During 12 transects a total of 64 dolphin groups were encountered with 547 individuals recorded. The proportion of dolphins with identifiable marks (Grade 1 only) ranged from 0.60 to 0.63. The estimated abundance of marked individuals was elevated depending on the

estimated proportion of marked individuals in the population to give a final estimate of 107 ± 12 , $CV = 0.12$ (95% CI 83 - 131). Previous abundance estimates for bottlenose dolphins in the Lower River Shannon cSAC ranged from 114 in 2008 to 140 in 2006. This suggests that, within the power of the survey technique, the population of bottlenose dolphins in the Lower River Shannon cSAC is relatively stable. Dedicated surveys were made in other areas around the coast of Ireland at different scales, mostly carried out in coastal areas and embayments (UCC, CMRC, DR), with some extending to the edge of the continental shelf (DR).

2.1.2 Opportunistic, platforms of opportunity

A number of organisations/individuals used a variety of POPS to collect sightings data in the waters around Ireland, summarised below. Some of these data are effort related. Sightings data are archived at the NBDC.

Primary species	Area	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
All species	West of Ireland	Sighting	Observers	Fishing vessels	UCC	E. Rogan (UCC)
Bottlenose dolphins	Shannon Estuary	Photo-id	Researchers	Dolphin-watching vessel	Shannon Dolphin and Wildlife Foundation	S. Berrow (SDWF)
Bottlenose dolphin	Shannon Estuary	Photo-ID, recordings	Researcher	Dolphin watching vessel	UCC	A. Englund (UCC)
Harbour porpoise	West of Ireland	sighting	Researchers	Ecotourism vessel	Dúlra research	M. Oudejans (DR)
Common dolphin	West of Ireland	sighting	Reearchers	Ecotourism vessel	Dúlra research	M. Oudejans (DR)
Unid dolphin	West of Ireland	sighting	Researcher	Ecotourism vessel	Dúlra research	M. Oudejans (DR)
Bottlenose dolphin	West of Ireland	sighting	Researcher	Ecotourism vessel	Dúlra research	M. Oudejans (DR)
Pilot whale	West of Ireland	sighting	Researcher	Ecotourism vessel	Dúlra research	M. Oudejans (DR)
Minke whale	West of Ireland	sighting	Researcher	Ecotourism vessel	Dúlra research	M. Oudejans (DR)
Killer whale	West of Ireland	sighting	Researcher	Ecotourism vessel	Dúlra research	M. Oudejans (DR)
All species	Irish EEZ	Sighting	Researchers	Research vessels	IWDG/GMIT & PreCAST surveys database	D. Wall (IWDG)
All species	Irish Sea	Sighting	Researchers	Ferries	IWDG ferry database	D. Wall (IWDG)

2.2 Analyses/development of techniques

Give brief details of any analyses of data carried out, with references where appropriate. A summary table of sightings and associated effort may be included (see below).

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Fin, Humpback and Minke Whale		Celtic Sea (Biopsies) and Irish coast (Strandings)	Biopsy sampling	Effects of lipid extraction on $\delta^{13}C$ and $\delta^{15}N$ in skin and blubber	C. Ryan(GMIT), B. McHugh (Marine Institute)
Bottlenose dolphin	July to Oct 2010	West Ireland	Photo id and acoustic surveys	Distribution, individual id, whistle rate and characteristics	A. Englund (UCC)
Minke whale	Jan-Dec 2010	Broadhaven Bay, NW Ireland	Land-based watches; line-transects	Temporal occurrence; habitat use	P. Anderwald / CMRC; Anderwald et al. (2011)
Common dolphin	Jan-Dec 2010	Broadhaven Bay, NW Ireland	Land-based watches; line-transects	Temporal occurrence; habitat use	P. Anderwald / CMRC; Anderwald et al. (2011)

Bottlenose dolphin	Jan-Dec 2010	Broadhaven Bay, NW Ireland	Land-based watches; line-transects	Temporal occurrence; habitat use	P. Anderwald / CMRC; Anderwald et al. (2011)
Bottlenose dolphin	Nov 2010	West Ireland	Photo-id	Ind movement patterns	M. Oudejans / Dúltra research.; Oudejans et al., 2010 NPWS report

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
Fin Whale	Dorsal Fin	NE Atlantic	10	Y	63	P. Whooley & C.Ryan (IWDG & GMIT)
Humpback Whale	Fluke and Dorsal Fin	NE Atlantic	3	Y	14	P. Whooley (IWDG)
Bottlenose dolphin	Dorsal fin	Shannon Estuary	273	Y	243	Simon Berrow (SDWF)
Bottlenose dolphin	Dorsal fin	Shannon Estuary	71	Y	385	A.Englund (UCC)
Bottlenose dolphin	Dorsal fin	West coast	Under analysis	Y	298 – under analysis	A.Englund (UCC)
Bottlenose dolphin	Dorsal fin	W Ireland	120	Y	180	P. Anderwald / CMRC; Anderwald et al. (2011)
Risso's dolphin	Dorsal fin	NE Atlantic	7	Y	7	P. Anderwald / CMRC
Bottlenose dolphin	Dorsal fin	NE Atlantic	83	Y	251	M. Oudejans / Dúltra research

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)

Biopsy samples

Species	Area/stock	Calendar year no. collected	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Humpback whale	NE Atlantic	2	Y	-	2	C.Ryan (GMIT)
Fin whale	NE Atlantic	8	Y	-	8	C.Ryan (GMIT)

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
Minke Whale	N. Atlantic	Skin, Blubber, Muscle, Baleen	6	Y	4	C. Ryan (GMIT)
Humpback Whale	N. Atlantic	Skin, Blubber, Muscle, Baleen	1	Y	0	C. Ryan (GMIT)
Pilot Whale	N. Atlantic	Skin, Blubber, Teeth	33	Y	0	I.O'Connor (GMIT)
Killer Whale	N. Atlantic	Skin, Blubber, Muscle, Teeth, Liver, Kidney	2*	Y	0	C. Ryan (GMIT)
Risso's dolphin	NE Atlantic	Skin, blubber	1	Y	0	P. Anderwald (CMRC)
Common dolphin	NE Atlantic	Skin, blubber	1	Y	0	P. Anderwald (CMRC)
Common dolphin	NE Atlantic	All	2	Y	0	E. Rogan (UCC)
Harbour porpoise	NE Atlantic	All	1	Y	0	E. Rogan (UCC)

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

*Mother and Foetus

4.4 Analyses/development of techniques

Lipid normalization models for fin, minke and humpback whales are being developed. The effects of biopsy technique on percentage lipid in blubber samples due to lipid loss is being carried out (GMIT & MI)

5. POLLUTION STUDIES

No pollution studies are currently ongoing.

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) for the calendar year 2010

Not applicable

6.3 Anthropogenic mortality of large whales for the calendar year 2010

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

There were no reported ship strikes in the calendar year 2010

6.3.2 Fishery bycatch of large whales

A number of observer programmes were in operation this year, including a dedicated observer programme to observe small cetacean bycatch in pelagic trawls. No large whales were observed entangled during these trips, however, one minke whale was reported entangled in a lobster pot lines.

Whale species	Sex	No.	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
Minke whale	F	1	30/05/2010	53.01 N, -9.41 W	D	Lobster	Lobster Pots	V	C. Ryan (GMIT)
Comments: Entangled in gear, cut off and sank.									

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

7.2 Direct catches of small cetaceans for the calendar year 2010

Not applicable

7.3 Anthropogenic mortality of small cetaceans for the calendar year 2010

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

No ship strikes on small cetaceans were reported during this period

7.3.2 Fishery bycatch of small cetaceans

Onboard observer programmes were in operation this year (MI/BIM), including a dedicated cetacean programme to examine bycatch in pelagic trawls in compliance with the EU 812 Directive (McCarthy *et al.*, 2011). Towards the end of the calendar year 2010, dedicated observers monitored pelagic trawls targeting albacore tuna and herring. No bycatch was observed in these trips.

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 mortality observed or reported.													

8. STRANDINGS

The IWDG Stranding Scheme operates throughout the year around the entire coastline of Ireland (Northern Ireland and the Republic of Ireland). Records are received from IWDG members, National Parks and Wildlife Conservation Rangers and members of the public, usually by e-mail or phone. In 2010, 89.13% 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 92 stranding records were reported during 2010. Ten species were identified with the most frequent being harbour porpoises (25%) and common dolphins (23.9%). Twenty strandings were of live animals representing 21.74% of total stranding incidents. This figure compares with 2008 and 2009 when live strandings accounted for 13.33% and 16.91%, respectively. A small number of individuals were recovered for post-mortem examination (IWDG, UCC).

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address
Harbour porpoise	23	3	Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Common dolphin	22	6	Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Striped dolphin	11	4	Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Minke whale	8	1	Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Bottlenose dolphin	3		Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Risso's dolphin	3		Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Pilot whale	2		Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Atlantic white-sided dolphin	1		Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Humpback whale	1		Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie

Killer whale	1		Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Unidentified dolphin	16		Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Unidentified whale	1		Mick O'Connell (IWDG)	mick.oconnell@iwdg.ie
Minke whale	2	0	Pia Anderwald (CMRC)	p.anderwald@ucc.ie
Risso's dolphin	1	0	Pia Anderwald (CMRC)	p.anderwald@ucc.ie
Common dolphin	4	0	Pia Anderwald (CMRC)	p.anderwald@ucc.ie
Common dolphin		2	Emer Rogan (UCC)	E.Rogan@ucc.ie

9. OTHER STUDIES AND ANALYSES

A spatially explicit model of cetacean and fisheries overlap is currently being developed (UCC). This model will be used to examine various factors which may contribute to cetacean bycatch. A number of testable hypotheses will be considered including: "random hypothesis" were cetaceans and fisheries overlap in a mechanical sense; "prey hypothesis" were cetaceans and fisheries share the same prey and are therefore attracted to the same area; and "attraction hypothesis" were cetaceans are attracted to fishing activity. "Hot spot" areas, with high potential for bycatch, will be identified and will be used to inform Ecological Risk Assessments for the Effects of Fishing for the waters around Ireland. Studies on diet of small cetaceans/fisheries interactions are on-going (UCC).

A PhD examining the population structure and habitat use of bottlenose dolphins in Irish coastal waters has just commenced (UCC/UP) and an MSc thesis looking at the impact of gas pipeline construction on cetacean habitat use using PAMs has been completed (Coleman, 2011).

DeepPAM project is studying the use of passive acoustic monitoring technologies for monitoring sub sea canyon habitat use by beaked whales off the west coast of Ireland (IWDG/GMIT). This is a 6 month pilot study and is complimented by deployment of Deepwater C-POD on the M6 weather buoy in abyssal habitat to the west of the Porcupine Bank.

Measures under Ireland's action plan for cetaceans, the *Conservation Plan for Cetaceans in Irish Waters* (Dec. 2009), have been progressing in the June 2010-May 2011 period (NPWS). The plan 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. It consists of five main programmes of measures presented in a delivery grid against which progress can be clearly measured. A number of actions have commenced or been completed in the June 2010-May 2011 period including several species/site monitoring, research and management actions (e.g., SAC monitoring, regional cetacean monitoring, maintenance of a national stranding scheme, establishment of an Irish marine mammal database, case-specific risk assessments via the statutory consultation process). Details of a National Cetacean Protection Strategy have also been elaborated. Its three-pillared approach underpinned by the Conservation Plan focuses on (i) designating and monitoring SACs, (ii) ensuring general regulatory and administrative functions are sufficiently rigorous, and (iii) pursuing an integrated strategy for general surveillance of cetaceans.

The Conservation Plan and its accompanying Delivery Schedule and National Cetacean Protection Strategy are available on the website of the National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government (www.npws.ie/marine).

10. LITERATURE CITED

Include all references cited in the text here. Please follow the official IWC style guide for references (<http://www.iwcoffice.org/publications/styleguide.htm>).

Anderwald, P., Coleman, M., O'Donovan, M., Pinfield, R., Walshe, L., Haberlin, D., Jessopp, M. and Cronin, M. (2011). *Marine mammal monitoring in Broadhaven Bay 2010*. Progress Report to RSK Environment Limited Group. Coastal and Marine Research Centre, University College Cork, Ireland. 60pp.

Coleman, M. (2011). Distribution of harbour porpoise (*Phocoena phocoena*) and dolphins in Broadhaven Bay: natural and anthropogenic factors influencing habitat use. MSc thesis, University College Cork.

McCarthy, A. Pinfield, R., Enright, J. and Rogan, E. (2011) Pilot observer programme in Irish pelagic trawl and gillnet fisheries: Implementing Council Regulation (EC) No 812/2004. University College Cork. Report to An Bord Iascaigh Mhara 24pp

O'Connell, M. and Berrow, S. (2010) Records from the Irish Whale and Dolphin Group. *Irish Naturalists' Journal* 31(1), 50-55.

Ryan, C., Berrow, S., Pierini, A., O'Brien, J., O'Connor, I. and McGrath, D. (2010) Inshore Boat-based Surveys for Cetaceans. Report to the National Parks and Wildlife Service. Irish Whale and Dolphin Group. pp.33.

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

Please list all published or 'in press' papers. **It will be appreciated if you can send a pdf or reprint to the Secretariat for the library.**

Anderwald, P., Evans, P.G.H., Gygax, L. and Hoelzel, A.R. (*in press*). The role of feeding strategies in seabird-minke whale associations. Marine Ecology Progress Series

Berrow, S., Ryan, C. and O'Brien, J. (*in press*) Goose barnacle *Conchoderma auritum* (L.) attached to tooth of stranded Sowerby's beaked whale *Mesoplodon bidens* Sowerby. Irish Naturalists' Journal.

Foley, A., McGrath, D., Berrow, S. and Gerritsen, H. (2010) Social structure within the bottlenose dolphin (*Tursiops truncatus*) population in the Shannon Estuary. Aquatic Mammals 36(4), 372-381.

Footo, A.D., Vilstrup, J.T., De Stephanis, R., Verborgh, P., Abel Nielsen, S.C., Deaville, R., Kleivane, L., Martín, V., Miller, P.J.O., Øien, N., Pérez-Gil, M., Rasmussen, M., Reid, R.J., Robertson, K.M., Rogan, E., Similä, T., Tejedor, M.L., Vester, H., Víkingsson, G.A., Willerslev, E., Gilbert, M.T.P., Piartney, S.B. (2011). Genetic differentiation among North Atlantic killer whale populations. Molecular Ecology, 20 (3), pp. 629-641.

Fontaine, M.C., Tolley, K.A., Michaux, J.R., Birkun Jr., A., Ferreira, M., Jauniaux, T., Llavona, N., Öztürk, B., Öztürk, A.A., Ridoux, V., Rogan, E., Sequeira, M., Bouquegneau, J.-M., Baird, S.J.E. (2010). Genetic and historic evidence for climate-driven population fragmentation in a top cetacean predator: The harbour porpoises in European water. Proceedings of the Royal Society B: Biological Sciences, 277 (1695), pp. 2829-2837.

Mirimin, L., Banguera-Hinestroza, E., Dillane, E., Hoelzel, A.R., Cross, T.F., Rogan, E. (2011). Insights into genetic diversity, parentage, and group composition of Atlantic white-sided dolphins (*Lagenorhynchus acutus*) off the west of Ireland based on nuclear and mitochondrial genetic markers. Journal of Heredity, 102 (1), pp. 79-87.

Mirimin, L., Miller, R., Dillane, E., Berrow, S.D., Ingram, S., Cross, T.F. and Rogan, E. (2011) Fine-scale population genetic structuring of bottlenose dolphins using Irish coastal waters. Animal Conservation. 15, 1469-1795.

Murphy, S., G. J. Pierce, G.J., Law, R. J., Bersuder, P., Jepson, P. D., Learmonth, J. A., Addink, M. Dabin, W. Santos, B. M., Deaville, R., Zegers, B. N., Mets, A., Rogan, E., Ridoux, V., Reid, R. J., Smeenk, C., Jauniaux T., López, A., Alonso Farré, J. M., González, A. F., Guerra, A., García-Hartmann, M., Lockyer, C. and Boon, J. P. (2010). Assessing the Effect of Persistent Organic Pollutants on Reproductive Activity in Common Dolphins and Harbour Porpoises J. Northw. Atl. Fish. Sci., Vol. 42: 153-173

O'Connell, M. and Berrow, S. (2010) Records from the Irish Whale and Dolphin Group. Irish Naturalists' Journal 31(1), 50-55.

Whooley, P., Berrow, S. and Barnes, C. (2011) Photo-identification of fin whales (*Balaenoptera physalus* L.) off the south coast of Ireland. Marine Biodiversity Records. Volume 4e8, 1-7.

Ryan, S and Berrow, S. (*in press*) An Extension to the Known Home Range of Shannon Estuary Bottlenose Dolphins (*Tursiops truncatus* (Montagu 1821)). Irish Naturalists' Journal.

11.2 Unpublished literature

Please include information as to where the documents may be obtained **and if possible, pdf versions or reprints for the library.**

Anderwald, P., Coleman, M., O'Donovan, M., Pinfield, R., Walshe, L., Haberlin, D., Jessopp, M. and Cronin, M. 2011. *Marine mammal monitoring in Broadhaven Bay 2010*. Progress Report to RSK Environment Limited Group. Coastal and Marine Research Centre, University College Cork, Ireland. 60pp.

Berrow, S., Whooley, P., O'Connell, M. and Wall, D. (2010) Irish Cetacean Review (2000-2009). Irish Whale and Dolphin Group, 60pp. ISBN 0-9540552-4-1.

- Berrow, S., O'Brien, J., Groth, L., Foley, A. and Voigt, V. (2010) Bottlenose Dolphin SAC Survey 2010. Report to the National Parks and Wildlife Service. Shannon Dolphin and Wildlife Foundation. pp.24.
- Coleman, M. (2011). Distribution of harbour porpoise (*Phocoena phocoena*) and dolphins in Broadhaven Bay: natural and anthropogenic factors influencing habitat use. MSc thesis, University College Cork.
- Leahy, J. 2010. A behavioural insight into the social structure of bottlenose dolphins (*Tursiops truncatus*) in the Shannon estuary, Ireland. MSc thesis, University College, Cork.
- McCarthy, A. Pinfield, R., Enright, J. and Rogan, E. (2011) Pilot observer programme in Irish pelagic trawl and gillnet fisheries: Implementing Council Regulation (EC) No 812/2004. University College Cork. Report to An Bord Iascaigh Mhara 24pp.
- Ryan, C., Berrow, S., Pierini, A., O'Brien, J., O'Connor, I. and McGrath, D. (2010) Inshore Boat-based Surveys for Cetaceans. Report to the National Parks and Wildlife Service. Irish Whale and Dolphin Group. pp.33.
- Gkafas, G. 2010 Molecular Ecology and fitness of striped (*Stenella coeruleoalba*) and common (*Delphinus delphis*) dolphins. PhD thesis submitted to the University of Durham. 178pp.

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	