

Australia. Progress report on cetacean research, January 2010 to December 2010, with statistical data for the calendar year 2010

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Murdoch University Cetacean Research Unit	MUCRU	l.bejder@murdoch.edu.au
Museum Victoria	MV	robrien@museum.vic.gov.au
Norfolk Island Whale Survey	NIWS	adrianoosterman@hotmail.com

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Notes:

Data presented here are compiled from federal and state agencies, research organisations, and individual researchers who respond to a request for information. It is based upon submissions received, and as such, is not a complete record of research undertaken in Australia, and data that are reported are often based upon unpublished records.

Department of Environment and Resource Management (DERM) summarised this data from information supplied by the following organisations. DERM has taken all reasonable steps to ensure the information is accurate at the time of collation but accepts no responsibility for the information submitted by organisations other than DERM.

(*1) No research information was received from Guido Parra of Flinders University in time for the submission of this report. Guido has a permit for taking skin samples from up to 180 individuals of snubfin, indo-pacific humpback and bottlenose dolphins.

1. SPECIES AND STOCKS STUDIED

IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
<u>MYSTICETES</u>			
Antarctic minke whale	<i>Balaenoptera bonaerensis</i>	Vincennes Bay, East Antarctica	2.1.1; 2.2; 11
Blue whale	<i>Balaenoptera musculus</i>	Australia; SA; WA; Bass Strait	2.1.1; 2.1.2; 3.1.1; 4.3; 6.3.1; 8
Bryde's whale	<i>Balaenoptera edeni</i>	Pacific; WA; East Coast	2.1.1; 2.1.2; 3.1, 4.3, 8
Dwarf Minke whale	<i>Balaenoptera acutorostrata</i>	Australia; TAS; WA; QLD; SW Pacific; Southern Hemisphere	2.1.1; 2.1.2; 2.2; 3.1.1; 3.2; 4.1; 9; 11.1; 11.2
Fin whale	<i>Balaenoptera physalus</i>	WA; Area 5	2.1.1; 4.1
Humpback whale	<i>Megaptera novaeangliae</i>	Australia; QLD; WA; SW VIC; SA; NSW; Eastern Australia; Area 5; Area V; Group V Breeding Stock E (ii); Groups V Stock; Pacific (Area V); Group E(i); Group V	2.1.1; 2.1.2; 2.2; 3.1.1; 3.1.3; 3.2; 4.1; 4.3; 4.4; 5; 5.3; 6.3.1; 6.3.2; 7.3.1; 8; 9; 10; 11; 11.1; 11.2
Pygmy blue whale	<i>Balaenoptera musculus brevicauda</i>	SA, VIC, WA; Australian/Indian Ocean	2.1.1; 2.1.2; 3.1; 3.1.1; 4.1; 11.1
Pygmy right whale	<i>Caperea marginata</i>	TAS	4.3; 8
Southern right whale	<i>Eubalaena australis</i>	SA; WA; SE AUS; East Coast;	2.1.1; 2.1.2; 2.2; 3.1.1; 3.1.3; 4.3, 8, 10; 11.1; 11.2
Unid. Balaenopteridae	<i>Balaenoptera sp.</i>	SA	8
Unid. baleen whale	<i>Unidentified Mysticeti</i>	TAS, NT	2.1.2; 4.3; 8
<u>ODONTOCETES</u>			
Australian snubfin dolphin	<i>Orcaella heinsohni</i>	Australia; Central QLD-GBRMP; NT	2.1.1; 2.2; 3.1.1; 4.1; 4.3; 8; 9
Australian snubfin dolphin	<i>Orcaella heinsohni</i>	WA; NT	2.1.1; 3.1.1; 4.1; 8; 9

Beaked whale	<i>Mesoplodon sp.</i>	Pacific	4.3; 8
Bottlenose dolphin	<i>Tursiops sp.</i>	WA; QLD; SA; VIC; Bass Strait;	2.1.1; 2.1.2; 2.2; 3.1.1; 3.2; 4.1; 4.3; 7.3.1; 6.3.2; 8
Common dolphin	<i>Delphinus delphis</i>	Australia; SA; SE QLD; TAS; WA; SA; SW VIC; Southern Ocean; Bass Strait	2.1.1; 2.1.2; 2.2; 3.1.1; 4.1; 4.2; 4.3; 6.3.2; 7.3.2; 8; 9
Common bottlenose dolphin	<i>Tursiops truncatus</i>	NSW; TAS; WA; QLD	2.1.2; 3.1.2; 4.3; 4.4; 6.3; 7.3.2; 8
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	WA	8
Dolphin	<i>Delphinidae Gn. sp.</i>	SA	2.1.2; 8
Dusky dolphin	<i>Lagenorhynchus obscurus</i>	TAS	2.1.2
False killer whale	<i>Pseudorca crassidens</i>	WA; NT	2.1.1; 4.1; 8
Ginkgo-toothed beaked whale	<i>Mesoplodon ginkgodens</i>	East Coast Australia, NSW	4.3; 8
Gray's beaked whale	<i>Mesoplodon grayi</i>	VIC; WA; SW VC	4.3, 8
Indo-Pacific bottlenose dolphin	<i>Tursiops aduncus</i>	WA; NT; SA; NSW; SE QLD; Byron Bay & SE QLD; Australia; Central QLD-GBRMP	2.1.1; 2.1.2; 2.2; 3.1.1; 4.1; 4.2; 4.3; 7.2; 7.3.1; 7.3.2; 11.1, 8; 9
Indo-Pacific humpback dolphin	<i>Sousa chinensis</i>	WA; NT; QLD; NSW; SE QLD; Australia; Central QLD-GBRMP	2.1.1; 2.1.2; 2.2; 3.1.1; 4.1; 4.3; 6.3; 7.3; 8; 9
Killer whale	<i>Orcinus orca</i>	Australia; TAS; SW VIC; WA; Vincennes Bay, East Antarctica	2.1.1; 2.1.2; 2.2; 8; 11
Long-beaked common dolphin	<i>Delphinus capensis</i>	QLD	6.3.2; 8
Long-finned pilot whale	<i>Globicephala melas</i>	SA; Southern Ocean	2.1.2; 2.1.2; 2.2; 4.3; 6.3.1; 6.3.2; 8; 9
Melon-headed whale	<i>Peponocephala electra</i>	NSW, QLD, Australia	2.1.2; 4.3; 4.4; 6.3.2; 8
Pygmy sperm whale	<i>Kogia breviceps</i>	SA, QLD	4.3, 8
Risso's dolphin	<i>Grampus griseus</i>	SA; East Coast	8
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Australia, WA, Pacific	2.1.1; 2.1.2; 4.3; 6.3.2; 8;
Sperm whale	<i>Physeter macrocephalus</i>	Australia; NSW; TAS; SA; WA; Southern Ocean	2.1.1; 2.2; 3.1.1; 4.3; 8; 9;
Spinner dolphin	<i>Stenella longirostris</i>	QLD	8
Strap-toothed whale	<i>Mesoplodon layardii</i>	SA, QLD	4.3; 8
Striped dolphin	<i>Stenella coeruleoalba</i>	NSW; East Coast	4.3; 8
Unid. beaked whale		Macquarie Island	2.1.2
Unid. cetacean		TAS, SA	2.1.2, 8
Unid. dolphin		TAS, QLD	2.1.2; 8
Unid. pilot whale		Australia	2.1.2
Unid. whale		QLD	8

2. SIGHTINGS DATA

2.1 Field work

2.1.1 Systematic

Target species	Date	Area	No. of sightings	Contact person/institute and references
Antarctic minke whale	5-23/01/11	Vincennes Bay, East Antarctica	0	N. Kelly/AAD/CSIRO; <i>Paper is being prepared for the IWC-SC 63 meeting. Previous reference would be Kelly et al. (2010a and 2010b).</i>
Australian snubfin	Jan10 to Dec10	Darwin Harbour, Cobourg	181	C. Palmer/NRETAS
Australian snubfin dolphin	01-03-2010 to 30-10-2010	Gladstone to Shoalwater Bay, QLD, Australia	87	C.Daniele/ CQU
Blue whale	1/9/10-14/12/10	Geographe Bay	70 (Approx)	C. Burton/WWR - Dunsborough Coast and Landcare D-CALC Land surveys

Blue whale	15/10/10-23/12/10	Geographe Bay	14 (Approx)	C. Burton WWR L.Moller/Finders Small vessel biopsy surveys
Bottlenose dolphin		West Shark Bay/Bunbury WA		M.Kruetzen, L.Bejder
Bottlenose dolphin	15/01-18/12/10	Moreton Bay, QLD	45	I. Ansmann/UQ
Bottlenose dolphin	10/01/2010	Port Phillip	3	S. Mason/DRI
Bottlenose dolphin	13/01/2010	Port Phillip	1	S. Mason/DRI
Bottlenose dolphin	14/01/2010	Port Phillip	3	S. Mason/DRI
Bottlenose dolphin	17/02/2010	Port Phillip	3	S. Mason/DRI
Bottlenose dolphin	24/02/2010	Port Phillip	2	S. Mason/DRI
Bottlenose dolphin	27/06/2010	Gippsland Lakes	1	S. Mason/DRI
Bottlenose dolphin	28/06/2010	Gippsland Lakes	3	S. Mason/DRI
Bottlenose dolphin	29/06/2010	Gippsland Lakes	2	S. Mason/DRI
Bottlenose dolphin	30/06/2010	Gippsland Lakes	1	S. Mason/DRI
Bottlenose dolphin	17/02/2010	Port Phillip	3	S. Mason/DRI
Bottlenose dolphins, humpback dolphins, common dolphins	1/12/2010-15/2/2011	Byron Bay, Southern Moreton Bay, Gold Coast, Tweed Heads, QLD	>150	E. Hawkin/SCU
Brydes whale	02/07 – 10/09, 2010	NW Cape	2	Salgado/CMST
Common dolphin	2010	Southern Ocean west of TAS	2	K. Evans/IMAS
Common dolphin	8/01/2010	Port Phillip	1	S. Mason/DRI
Common dolphin	21/01/2010	Port Phillip	1	S. Mason/DRI
Common dolphin	1/06/2010	Port Phillip	2	S. Mason/DRI
Common dolphin	14/12/2010	Port Phillip	1	S. Mason/DRI
Dwarf minke whale	27/8/2010	Shark Bay	1	R. Connor/DOSBRF Small vessel photo ID surveys
False killer whale (*6)	04/01 – 29/07, 2009	Nickol Bay, Dampier	8	C. Jenner/CWR, <i>Jenner, K.C.S.. M. Jenner. 2010(a). unpubl. data.</i> Aerial Surveys
Fin whale (*6)	04/01 – 29/07, 2009	Nickol Bay, Dampier	4	C. Jenner/CWR, <i>Jenner, K.C.S.. M. Jenner. 2010(a). unpubl. data.</i> Aerial Surveys
Fin whale (*6)	22/07 & 05/08, 2010	Rottneest Island	1	C.Jenner, M.Jenner/CWR Photo Id

Humpback whale	06-10/10	Gold Coast Bay	26	J.O. Meynecke/GU
Humpback whale	21/09/10-28/10/10	Norfolk Island	39	A. Oosterman/NIWS; Oosterman, Whicker and Garbett (2011)
Humpback whale	20/8/2010	Shark Bay	7	R. Connor DOSBRF Small vessel photo ID surveys
Humpback whale	1/9/10-14/12/10	Geographe Bay	Approx 1200+400	C. Burton WWR Land , small vessel surveys
Humpback whale	06/08 to 21/09 2010	Port Douglas/Cairns and the Whitsunday Islands	Unknown at this stage	G.Kaufman/PCF
Humpback whale (*1)	24/05/10-31/07/10	Cape Solander, Botany Bay National Park	1824	G. Ross/NSW DPC
Humpback whale (*2)	AUG 6 - AUG 22, 2010	Port Douglas, QLD, Australia	35	G. Kaufman/PWF
Humpback whale (*2)	AUG 19, 2010	Cairns, QLD, Australia	2	G. Kaufman/PWF
Humpback whale (*2)	AUG 25 - SEP 2, 2010	Whitsunday Islands, QLD, Australia	59	G. Kaufman/PWF
Humpback whale (*2)	AUG 31 - SEP 29, 2010	Hervey Bay, QLD, Australia	741	G. Kaufman/PWF
Humpback whale (*2)	OCT 3 - OCT 23, 2010	Eden, NSW, Australia	269	G. Kaufman/PWF
Humpback whale (*4)	26-8-10 /15-10-10	Hervey Bay	788	T.Franklin/TOP; W.Franklin/TOP
Humpback whale (*5)	30/5-25/7/2010	Pt Lookout, east coast of Australia	2458 individual whales (from primary site)	M. Noad/ UQ
Humpback whale (*6)	22/09-23/10/2010	Peregian Beach, east coast of Australia	1155 (scan sampling platform)	M. Noad/ UQ
Humpback whale (*7)	17/6-9/9/2010	Southeast Queensland	169	M. Noad/ UQ
Humpback whale (*8)	2 May 2010 – 21 Oct 2010	Logan's Beach whale viewing platform	3	M.Watson/DSE
Humpback whale (*9)	02/07 – 10/09, 2010	NW Cape	2076	C. Jenner/CWR
Humpback whale (*9)	04/01 – 29/07, 2009	Nickol Bay, Dampier	198 8 4	C. Jenner/CWR, Jenner, K.C.S.. M. Jenner. 2010(a). unpubl. data. Aerial Surveys
Humpback whale (*9)	12/06/2010 28/08/2010 07/10 – 21/10, 2010 18/09 – 27/11, 201	Steep Point Rottneest Island Exmouth Gulf Rottneest Island	5 46 475 105	C. Jenner,W. Osborn , P.Osborn/CWR <i>V.Boladeras, A.Brewer, J.Braithwaite, P.Bouchet & S.Marley/CWR</i>
Humpback whale (*9)	23/08 – 13/09, 2009	Nichol Bay, Dampier	459	C. Jenner/CWR, <i>Jenner, K.C.S.. M. Jenner. 2010(a). unpubl. data.</i> Behavioural follows, Vessel surveys line transect
Indo-Pacific bottlenose	Jan10 to Dec10	Darwin Harbour Cobourg	122	C. Palmer/NRETAS
Indo-Pacific bottlenose	30/8/2010	Shark Bay	1900	R. Connor DOSBRF

dolphin				Small vessel photo ID surveys
Indo-Pacific bottlenose dolphin	6/1/2010-22/12/2010	Bunbury	270	V. Buchanan, D. Chabanne/MUCRU Small vessel photo ID surveys
Indo-Pacific bottlenose dolphin	5/8/10-8/11/10	Hastings River, Port Macquarie	24	C.A. Fury/SCU
Indo-Pacific humpback dolphin	Jan10 to Dec10	Darwin Harbour Cobourg	207	C. Palmer/NRETAS
Indo-Pacific humpback dolphin	15/01-18/12/10	Moreton Bay, QLD	15	I. C. Ansmann/UQ
Indo-Pacific humpback dolphin	04/2010	Exmouth	40	L. Bejder, MUCRU Small vessel biopsy surveys
Indo-Pacific humpback dolphin	05/2010	Dampier	15	S. Allen, MUCRU Small vessel biopsy surveys
Indo-Pacific humpback dolphin	06/2010	Port Hedland	10	S. Allen, MUCRU Small vessel biopsy surveys
Indo-Pacific humpback dolphin	07/2010	Broome	5	S. Allen, MUCRU Small vessel biopsy surveys
Indo-Pacific humpback dolphin	01-03-2010 to 30-10-2010	Gladstone to Shoalwater Bay, QLD, Australia	91	C.Daniele/ CQU
Inshore bottlenose dolphin	01-03-2010 to 30-10-2010	Gladstone to Shoalwater Bay, QLD, Australia	101	C.Daniele/ CQU
Killer Whale	02/07 – 10/09, 2010	NW Cape	1	<i>Salgado, C., Jenner et al 2010. Draft unpubl. data.</i>
Long-finned pilot whale	2010	Southern Ocean west of TAS	1	K. Evans/IMAS
Minke whale	21/09/10-28/10/10	Norfolk Island	2	A. Oosterman (NIWS); <i>Oosterman, Whicker and Garbett (2011)</i>
Minke Whale	02/07 – 10/09, 2010	NW Cape	8	<i>Salgado, C., Jenner et al 2010. Draft unpubl. data.</i>
Minke whale	1/9/10-14/12/10	Geographe Bay	Approx 2	C. Burton WWR Land, small vessel surveys
P. Blue Whale (*6)	07/01 – 29/04, 2010	NW Shelf	4	C. Jenner/CWR, R. McCauley/CMST <i>Jenner, K.C.S., M. Jenner. and R.D McCauley. 2010 unpub. Data.</i> Aerial Surveys
Pilot Whale	02/07 – 10/09, 2010	NW Cape	60	Aerial Surveys
Pygmy blue whale	03-04/10 and 11-12/10	VIC, SA, WA	Refer to reports provided by collaborators	Collaboration with Blue Whale Study, Centre for Whale Research, Western Whale Research
Snubfin dolphin	07/2010	Broome	40	S. Allen, MUCRU
Southern right whale	1/9/10-14/12/10	Geographe Bay	Approx 28	C. Burton WWR; Land, small vessel surveys
Southern right whale	10-15/8/2010	Southern Australia, C Leeuwin, WA-Ceduna, SA	Max count: 519 (incl 134 cow/calf pairs)	J.Bannister/WAM; <i>ref Bannister, 2011;</i>

				Aerial Surveys
Southern right whale	9/8/2010	Shark Bay	2	R. Connor/DOSBRF; Small vessel photo ID surveys
Southern right whale (*3)	24-31/08/2010	Head of Bight, South Australia	97 (incl 42 calves)	C. Charlton/SAM
Southern Right whale (*8)	2 May 2010 – 21 Oct 2010	Logan's Beach whale viewing platform	301 (includes duplicate sightings of same individuals)	M. Watson/DSE
Sperm whale	2010	Southern Ocean west of TAS	2	K. Evans/IMAS
Sperm Whale	02/07 – 10/09, 2010	NW Cape	10	Aerial Surveys
Sperm Whale (*6)	07/01 – 29/04, 2010	NW Shelf	4	C. Jenner/CWR, R.McCauley/CMST <i>Jenner, K.C.S., M. Jenner. and R.D McCauley. 2010 unpub. Data.</i> Aerial Surveys

Notes:

(*1) *Cape Solander Whale Migration Study (CSWMS)* Between the 24th of May and the 31st of July 2010, trained volunteers recorded the species, pod size, time sighted, bearing, distance from shore and behaviour of all marine mammals observed passing Cape Solander in Botany Bay National Park, Sydney during daylight hours. A total of 65 days were surveyed during the 2010 northern migration season. Weather data was also recorded on an hourly basis.

The results are as follows:

Species (common name)	Number sighted
Humpback whale	1824

The data collected by community volunteers provides a baseline to the species and numbers of cetaceans that migrate past the coast, the approximate preferred distance offshore, and average pod size. It also provides information on the peak periods of migration and the percentage annual increase/decrease in the recovering population numbers. Though numbers appear to be lower than the previous year the mean corrected number of Humpbacks observed per day was the same for 2009 and 2010 (28.06 Humpbacks per day).

Results for the land station survey conducted during 2010

Survey Dates	24 th May to the 31 st July 2010
Total number of survey days	65
Total humpback whales observed	1824

(*2) *Pacific Whale Foundation (PWF)* Pacific Whale Foundation annually conducts vessel-based research along the East Coast of Australia to document the locations of humpback whales, primarily mothers with a calf. Observations were conducted from a 6.2 m XL Naiad (rigid hull inflatable) or from a whale watch vessel when indicated.

Data was collected opportunistically in the form of digital photographs, digital audio recordings, and real time observations recorded on pre-formatted data sheets.

(*3) *South Australian Museum (SAM)* 2010 marked the 20th consecutive year of population monitoring of southern right whales at the Head of Bight aggregation ground, within the Great Australian Bight Marine Park, South Australia (31 0 29' S, 131 0 08' E). Population census was completed over 8 days from August 24-31 in 2010 and was timed to coincide with peak right whale abundance at the site and allow for comparable midseason coverage across data series. The shore based systematic surveys were completed using designated cliff top vantage points between 30m and 50m high to count whales within a 15km stretch of coastline.

A daily census of the site was made to monitor calf production, whale numbers by population class, and spatial and temporal use patterns. Observers recorded the location and population class of whales on a site map daily.

Environmental conditions wind speed and direction, cloud cover, sea state and swell height were recorded to assess prevailing sight-ability conditions during each census.

(*4) The Oceania Research Project – Long-term humpback whale study, Hervey Bay 1992-2010.

The Oceania Project conducted the 21st year of fieldwork of a long-term survey of humpback whales in Hervey Bay. Boundaries of the survey area are Rooneys Point, Fairway Buoy, Coongul Creek and west coast of Fraser Island within the Whale Management & Monitoring Area of the Great Sandy Marine Park. The survey is being conducted under scientific permit WITK01192903.

The 2010 survey was undertaken from a 12-metre vessel for 42 days between August 6th and October 16th 2010 involving a total 336 hours of effort. Observations were made on 788 individual Humpbacks in 316 pods. A total of approximately 5000 Photo-id photographs were obtained, 6 hours of behavioural DV-CAM video. A total of 27 x 15 min systematic samples of humpback song and social sounds were recorded between 6th August and 16th October. No sloughed skin samples were obtained.

Systematic observational data of humpback pods included date, time, GPS positions, number of individuals, composition & behaviour. Photography of ventral flukes, lateral body colouration patterns and left and right dorsals were obtained as well as behavioural video and systematic samples of whale song and social sounds.

(*5) University of Queensland (UQ) - East Australian humpback whale survey, 2010: This eight-week survey follows on from a long series of land-based surveys conducted at Pt Lookout, near Brisbane, since the early 1980s, during the northward (winter) migration of the whales. Land-based observations included tracking groups with a theodolite to prevent double counting. The primary survey site was shifted this year, so three weeks of surveys were conducted concurrently at both the old and new sites to enable calibration of the new site. The survey demonstrates that the east Australian population continues to grow at a high annual rate. This work was funded by the Australian Marine Mammal Centre.

(*6) University of Queensland (UQ) - Behavioural Responses of Australian Humpback whales to Seismic Surveys, Year 1, 2010: This was the first year in a four year behavioural response study which is documenting how humpback whales react to seismic surveys as performed by the oil and gas industry. The project is collaboration between the Universities of Queensland and Sydney, and Curtin Univ. of Technology (Perth). As part of this, humpback whales were observed and tracked by theodolite from land during their southward (spring) migration. In addition to tracking all passing whales during the five-week study, some groups were focal-followed by additional theodolite stations. Some of these focal groups were also focally observed from a small boat, and some were also Dtagged. Focal groups were involved in trials involving a 19m vessel towing a 20 cubic inch airgun. The airgun was operating for half the trials, and not operating for the other trials. The airgun was towed along two different paths. An array of hydrophone buoys allowed the real-time recording and tracking of singing whales and a second array of deployed acoustic recorders (Curtin Univ.) were used for recording the seismic shots and other aspects of the ambient noise environment. Biopsies and photos were taken from/of some focal whales. The project is funded by the E&P Sound and Marine Life Joint Industry Program (JIP) and the Bureau of Ocean Energy Management, Regulation and Enforcement.

(*7) University of Queensland (UQ) - Gold Coast aerial surveys, 2010: Aerial surveys of humpback whales were undertaken between Kingscliff and Pt Lookout off SE Queensland to describe the distribution of humpback whales off the Gold Coast.

(*8) Department of Sustainability and Environment (DSE) Survey carried out by DSE and trained volunteers up to 4 hrs per day (2 hrs AM, 2 hrs PM) every day between June and October at Logan's Beach viewing platform, Warrnambool.

(*9) Centre for Whale Research (W.A.) Inc Aerial surveys were carried out at NW Cape for the seventh season. "Distance-style", line transect methodology was used to sample northbound humpback whales. In fifteen flights flown at five day intervals, a total of 2076 whales were sighted. The data will be used to calculate an absolute estimate of abundance for Breeding Population D humpback whales and to contribute to a long term spatial analysis of humpback whale migratory reaction to oil and gas infrastructure.

Estimates of the abundance of breeding group 'D' humpback whales (*Megaptera novaeangliae*) are key to managing what is thought to be one of the largest populations of the species. Five years (2000, 2001, 2006, 2007, and 2008) of aerial surveys carried out over an eight-year period at North West Cape (NWC, Western Australia) using line transect methodology allowed trends in whale numbers to be investigated, and provided a base for comparison with estimates made at another site, Shark Bay (SB, Western Australia). A total of 3,125 pods were sighted during 62 surveys of the 7,043km² study area west of NWC. Pod abundance for each flight was computed using a Horvitz-Thompson like estimator and converted to an absolute measure of population size after corrections for estimated mean cluster size, unsurveyed time, swimming speed and animal availability. Resulting estimates from the most credible assumptions and the migration model of best fit were 7,276 (CI = 4,993-10,167) for 2000, 10,548 (CI = 6,502-48,622) for 2001, 18,692 (CI = 12,980-24,477) for 2006, 20,044 (CI = 13,815-31,646) for 2007, and 26,100 (CI = 20,152-33,272) for 2008. Based on these data, the best trend model

was an exponential increase with an annual rate of 14.1%. While this value is above the species' maximum plausible growth rate of 11.8%, it is reasonably close to previous reports of between 10-12%. Perception bias was however not accounted for in these calculations. Based on a crude appraisal which yielded an estimated $p(0$ of 0.783 (from independent observer effort), the 2008 humpback population size could then be as large as 31,764. In conclusion, the work here provides evidence of an increasing breeding group 'D' humpback whale population, which is likely recovering at its maximum rate.

Aerial surveys were conducted across a 12 month period in the coastal region of the proposed Anketell Point Iron Ore Port facility in order to determine mega fauna distribution and abundance for development purposes. A total of 1069 humpback whales were sighted in 22 aerial surveys over the western Pilbara offshore region during mid August 2009 to late July 2010. The aerial surveys also reported regular sightings of dolphins, manta rays and turtles throughout the survey. A useful humpback whale baseline dataset has been established prior to establishment of the new port facility so that managers and key stakeholders can proceed with an understanding of where potentially important areas to humpback whales may be monitored.

A series of systematic aerial surveys were undertaken over a full calendar year in the coastal region inshore of the proposed Scarborough Gas Field in order to determine mega fauna distribution and abundance for development purposes. In particular humpback whale distribution and abundance was examined. A total of 2243 humpback whales were sighted in forty aerial surveys over the south western Pilbara offshore region between October, 2009, and December 2010. Humpback whales were sighted during twenty seven of the forty flights and peaked in numbers during early August. The majority of all pods of whales sighted (62%) were described as "Milling/Resting". Whales sighted in June/July were predominantly migrating northwards, while those sighted during October/November were southbound. Whales sighted during August to mid October were classified most often as Milling/Resting.

In general, humpback whales sighted off-shore (of the 50m depth contour) tended to be migrating while those sighted inshore tended to be resting. Cow/calf humpback whale pods were also sighted in higher numbers inshore of the 50m depth contour and 88% of these whales were described as Resting/Milling. Whales were observed in high densities either side of the Mary-Anne Passage and small numbers of whales were sighted inside the Passage.

Other cetacean species sighted included small numbers of false killer whales and a single blue whale. Dolphins were commonly sighted, as were dugongs, while whale sharks were less commonly sighted (n=7). Inshore legs of the aerial surveys reported regular sightings of manta rays and turtles throughout the survey.

A series of aerial and acoustic surveys have been initiated near to the proposed Wheatstone Project (Project) trunkline in order to determine megafauna distribution and abundance in this area and to relate encountered species populations to the broader regional context. A total of 1221 humpback whales were sighted in 26 aerial surveys over the South West Pilbara offshore region during May 2009 to May 2010. Nearshore waters (5-50m depths) have lower densities of humpback whales than offshore waters (50-950m depths) perhaps due to annual water temperature profiles. Pygmy blue whales, sperm whales, killer whales, minke whales and pilot whales were also sighted during the aerial surveys. Acoustic surveys conducted over the May 2009 to December 2009 time period identified the presence of humpback whales, pygmy blue whales, Brydes' whales and dwarf minke whales in the study area. Pygmy blue whales and dwarf minke whales are present in deeper waters of the offshore study area from mid May onwards, although in the 2009 season these species were apparently in lesser numbers (based on call rates) than in previous seasons. Nearshore legs of the aerial surveys (depths less than 50m) reported regular sightings of dugongs, dolphins, manta rays and turtles throughout the period of the survey. No high-density concentrations of megafauna have been identified during the May to December time period near the Ashburton North Strategic Industrial Area (SIA), where an onshore LNG Plant, Product Loading Facility (PLF) and Material Offloading Facility (MOF) are proposed to be developed.

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
"dolphin" (Delphinidae Gn. sp.) (3) (*2)	SA	Opportunistic	Public	Various	SAM	C. Kemper/SAM
Blue whale	Australia N=1	Observer Whale Sighting Form	Observer	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA
Blue whale (9) (*2)	SA	Opportunistic	Public	Various	SAM	C. Kemper/SAM
Bottlenose	Gulf St	Sightings, behavioural	Honours student (K	Dolphin-watch, swim-	Flinders	L. Moller/Flinders

dolphin	Vincent	observations, Photo-ID*	Peters)	with-dolphin vessel	University	
Bottlenose dolphin	Port Macquarie	Photo-ID*; sightings, GPS	C.A. Fury	Whale watching vessel	C. A. Fury	C.A. Fury/ SCU
Bottlenose dolphin (*1)	N/A	Sightings	Staff / public / crew	Light plane, shore, whale watching vessel	N/A	R. Gales/DPIPWE
Bottlenose dolphin (5) (*2)	SA	Opportunistic	Public	Various	SAM	C. Kemper/SAM
Bryde's whale	Port Macquarie	Photo-ID*; sightings, GPS	C.A. Fury	Whale watching vessel	C. A. Fury	C.A. Fury/ SCU
Common dolphin (*1)	N/A	Sightings	Staff / public / crew	Light plane, shore, whale watching vessel	N/A	R. Gales/DPIPWE
Dusky dolphin (*1)	N/A	Sightings	Staff	vessel	N/A	R. Gales/DPIPWE
Dwarf minke whale (*3)	Northern GBR	Photo-id; behavioural observation; sightings	Primarily scientists + vessel crew	whale watching vessels	JCU	A. Birtles/JCU.
False killer whale	NT	Sightings	Crew	Coastal dolphin research vessel	NRETAS	C. Palmer/NRETAS
Humpback whale	Norfolk Island	Sightings	A.Oosterman and volunteers	Land stations & charter vessel		A. Oosterman/NIWS
Humpback whale	Australia N=24	Observer Whale Sighting Form	Observer	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA
Humpback whale	Gold Coast Bay	Photo-ID*; sightings	Crew/volunteers/students	whale watching vessel	Griffith University	J.O. Meynecke, S. Vindenes /GU
Humpback whale	Port Macquarie	Sightings, GPS	C.A. Fury	Whale watching vessel	C. A. Fury	C.A. Fury/ SCU
Humpback whale	Great Sandy Marine Park, Hervey Bay	Opportunistic collection of blow samples	Nicole Lima, Marlee Tucker, Tracey Rogers	Whale watching vessel	UNSW	T.Rogers/ UNSW
Humpback whale	VIC	14 recorded sightings (count, date, time, location, behaviour)	Mandy Watson, DSE staff, other reliable sources	Land based eg: Logans Beach viewing platform and other locations along Victorian coast	DSE, Warrnambool	M. Watson/DSE
Humpback whale (*1)	N/A	Sightings	Staff / public / crew	Light plane, shore, whale watching vessel	DPIPWE	R. Gales/DPIPWE
Humpback whale (*4)	NW Shelf	Visual sightings with effort	Crew	FPSO vessel	C. Jenner/CWR, CWR website oil and gas link	C. Jenner /CWR

Humpback whale (*4)	Rottneest Island	Photo Id	Crew & Whale watching passengers	Sea Eagle III & Ocean Spirit II/Rottneest Express Ferry	C. Jenner/CWR	C. Jenner /CWR
Humpback whale (4) (*2)	SA	Opportunistic	Public	Various	SAM	C. Kemper/SAM
Incidental sightings of various species	Entire GBRMPA, QLD	Incidental sighting data and photo ID	Crew and passengers	Tourist vessels	Eye on the Reef Database, GBRMPA	Chris Briggs, 07 47500777; Mark Read 07 47500725
Indo-Pacific bottlenose dolphin (1) (*2)	SA	Opportunistic	Public	Various	SAM	C. Kemper/SAM
Indo-Pacific hump-backed dolphin	Australia N=1	Observer Whale Sighting Form	Observer	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA
Killer whale	Australia N=25	Logbook comment	Skipper	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA
Killer whale	Australia N=22	Observer Whale Sighting Form	Observer	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA
Killer whale	VIC	1 recorded sightings (count, date, time, location, behaviour, photo-identification*)	Mandy Watson, DSE staff, other reliable sources	Land based – Logans Beach viewing platform, Warrnambool, VIC	DSE, Warrnambool	M. Watson, DSE
Killer whale (*1)	N/A	Sightings	Staff / public / crew	Light plane, shore, whale watching vessel	DPIPWE	R. Gales/DPIPWE
Minke whale	Australia N=6	Observer Whale Sighting Form	Observer	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA
Minke whale	Norfolk Island	Sightings; behaviour	A. Oosterman and volunteers; charter vessel operators	Land stations & charter vessel		A. Oosterman/NIWS
Minke whale (*1)	N/A	Sightings	Staff / public / crew	Light plane, shore, whale watching vessel	N/A	R. Gales/DPIPWE
Short-beaked common dolphin (2) (*2)	SA	Opportunistic	Public	Various	SAM	C. Kemper/SAM
Short-finned pilot whale	Australia N=23	Observer Whale Sighting Form	Observer	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA
Southern right whale	Australia N=6	Observer Whale Sighting Form	Observer	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA
Southern right whale	VIC	263 recorded sightings (count, date, time, location, behaviour, photo-identification if possible*) may include repeat sightings of same	Mandy Watson, DSE staff, other reliable sources	Aircraft, and land based eg: Logans Beach viewing platform, and other locations along Victorian coast	DSE, Warrnambool	M. Watson/DSE <i>* South-east Australian Southern Right Whale Photo-identification Catalogue</i>

		individuals				
Southern right whale (*1)	N/A	Sightings Photo ID	Staff / public / crew	Light plane, shore, whale watching vessel	DPIPWE	R. Gales/DPIPWE
Southern right whale (*2)	SA	Opportunistic	Public	Various	SAM	C. Kemper/SAM
Sperm Whale	Australia N=2	Observer Whale Sighting Form	Observer	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA
Unidentified baleen whale (*1)	2 N/A	Sightings	Staff / public / crew	Light plane, shore, whale watching vessel	N/A	R. Gales/DPIPWE
Unidentified cetacean (*1)	N/A	Sightings	Staff / public / crew	Light plane, shore, whale watching vessel	N/A	R. Gales/DPIPWE
Unidentified dolphin (*1)	N/A	Sightings	Staff / public / crew	Light plane, shore, whale watching vessel	N/A	R. Gales/DPIPWE
Unidentified pilot whale (*6)	Australia N=7	Logbook comment	Skipper	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA
Unidentified whale (*6)	Australia N=34	Logbook comment	Skipper	Commercial Fishing Vessel	AFMA database	S. McCarthy/AFMA

Notes:

(*1) Department of Primary Industries, Parks, Water and Environment Whale Hotline (DPIPWE-TAS).

DPIPWE manages a comprehensive sightings database facilitated by the Whale Hotline (0427 WHALES). The hotline provides a single point of call to report whale sightings and strandings within Tasmania. Due to the variety of sources, the sightings data presented encapsulates reports from agency staff undertaking dedicated cetacean work (e.g. attending strandings or sighting events), whale-watching and eco-tour operators, maritime professionals and the general public. Sightings are scored for their reliability based on key criteria such as experience of observer, features described and the availability of images relating to the sighting. Only reliable data are reported. Sighting events are an aggregate of sightings from multiple observers that relate to the same discrete individuals, considering the time between sightings, pod size, direction of travel and the presence of identifying features. If doubt occurs over species identification, species are allocated as unidentified and classified with the following, dependent on the information available (Unidentified Cetacean, Unidentified Mysticeti, Unidentified Delphinidae, Unidentified Ziphiidae, Unidentified Phocoenidae, and Unidentified Odontoceti). The numbers of whales sighted presented in this table may not represent the number of discrete individuals due to lack of photo-ID for all individuals, chances of multiple sightings of the same individuals over large spatial scales and return on migratory paths. Please see section 3.1.1 for references to the agencies photo ID program for southern right whales and humpback whales. Staff refers to agency staff, Public relates to sightings provided by members of the public from shore based vantage points, whilst crew refers to either fisherman or to one of a number eco-tour operators that call in sightings on a regular basis.

(*2) South Australia Museum (SAM) This section is based on the incomplete sightings records for 2010. All data have not yet been entered into SAM database. The numbers in brackets are the number of events in the database as at April 2011 (only reliably identified records are included).

(*3) James Cook University (JCU) Observations were recorded by researchers who were provided space on three tourist dive vessels (live-aboards: *Taka*, *Spoil Sport* & *Silent World*). Days on an individual vessel ranged from 12 to 30 (total of 53 researcher days at sea). Additional whales seen when researchers were not on board were reported on Whale Sighting Sheets (see below).

A total of 117 Whale Sighting Sheets (WSS) were received from six tourism vessels operating in the northern Great Barrier Reef. All day and live-aboard dive vessels running swim-with whale programs have submitted WSS (return of these has been a GBRMPA permit requirement since 2003 season). Analyses of those returns are still ongoing.

(*4) *Centre for Whale Research (WA) Inc. (CRW)* This is the 6th year of a programme involving BHP Billiton employees on their FPSO Stybarrow near NW Cape, Western Australia. The programme aims to stimulate interest in the environment for oil and gas workers and won an industry award in 2006.

MUCRU

Bunbury:

Survey effort: 170 sightings done on 69 surveys by Delphine Chabanne

115 sightings done on 75 surveys by Valissa Buchanan

Including 11 surveys without sighting (9 on Backbeach area and 2 on Buffalo area) by Delphine Chabanne and 12 surveys without sighting (4 on Buffalo area, 3 on Myalup area and 5 on Preston area) by Valissa Buchanan.

All other areas: NOT transect surveys, however dedicated, planned, boat-based surveys to locate, photograph and biopsy sample inshore delphinids

(*5) *Australian Fisheries Management Authority (AFMA)* The following represent opportunistic sightings made by AFMA fisheries observers and Commonwealth fishers. It documents both anecdotal evidence of catch/ bait depredation allegedly by whales that was reported as comments in fishery logbooks and sightings recorded in fishery observer whale sighting forms. For the logbook comments data, N= number of occurrences reported. The number of individuals involved in each occurrence reported is unknown. For the Observer Whale Sighting Form data the number reported reflects the number of individuals.

Some sightings may have been reported by both skipper and observer.

2.2 Analyses/development of techniques

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Antarctic minke whale	5-23/01/11	Vincennes Bay, East Antarctica	Continuous coverage of water surface with digital photographs; transects predetermined using sea ice information. Transects flown using CASA aircraft.	Distribution; sighting frequency	N. Kelly/AAD; <i>Kelly et al. (2010a and 2010b).</i>
Australian snubfin dolphin	01-03-2010 to 30-10-2010	Gladstone to Shoalwater Bay, QLD, Australia	Line transect survey	Distribution; sighting frequency, population size, survival rate, association, genetic, toxicology	C.Daniele/ CQU
Bottlenose dolphin	03/10-05/10	Gulf St Vincent, SA	Opportunistic	Behavioural responses to dolphin-watch and swim-with-dolphin activities	L. Moller/Flinders
Bottlenose dolphin	2/2011	Byron Bay	Data from land-based surveys from the Cape Byron Lighthouse carried out between 2009-2010	Usage patterns of dolphins, identification of critical habitat & important habitat zones, levels of dolphin-vessel encounters, human usage patterns	E. Hawkins, SCU
Bottlenose dolphin	On-going	Port Phillip	Opportunistic surveys	Sighting frequency, identification of individuals	S. Mason/DRI
Bottlenose dolphin	On-going	Gippsland Lakes	Opportunistic surveys	Sighting frequency, identification of individuals	S. Mason/DRI
Common dolphin	2010	Southern Ocean west of TAS	Line transect survey	Distribution; sighting frequency	K.Evans/IMAS
Common dolphin	On-going	Port Phillip	Opportunistic surveys	Sighting frequency, identification of individuals	S. Mason/DRI
Dwarf minke whale	2010	Northern GBR/Ribbon Reef area, QLD	Visual surveys of whales that aggregate around vessels/photo ID/length measurements	Whale behaviour; population demographics including size, sex ratio and descriptors of population size	A.Birtles/JCU; Team Leader for the Minke Whale Project, James Cook

					University, Tourism Program, QLD 4811, tel: (07) 4781 4736
Dwarf minke whale; other species on opportunistic basis	2003-present	Northern GBR (primarily offshore from Cairns, Port Douglas, Cooktown, Lizard Is.), QLD	GBR Minke Whale Sightings Network (Whale Sighting Sheets)	Species, location, date, time, type and duration of encounter, weather & sea conditions, behaviours observed	A.Birtles/JCU; Dr Mark Read Great Barrier Reef Marine Park Authority (Project Manager, GBRMPA Dwarf Minke Whale Tourism Monitoring Program)
Humpback whale	21/09/10-28/10/10	Norfolk Island	Land-based survey	Numbers observed, behaviour, weather statistics	A. Oosterman/NIWS; <i>Oosterman, Whicker and Garbett (2011)</i>
Humpback whale	28 June-11 July, 2010	North Stradbroke Island	Hydrophone recordings	Sound field on 4-hydrophone vertical array	Ann Allen
Humpback whale	9 – 21 August 2010	Great Sandy Marine Park, Hervey Bay	Whale watching vessel	Microbial load of whale blow to be measured	T.Rogers
Humpback whale	2007-2011	Moreton Bay/north Stradbroke Island	Enzyme and contaminant analyses on blubber biopsies	Persistent organic pollutants/CYPIA1/GST	S.Bengtson Nash
Humpback whale (*1)	AUG 6 - AUG 22, 2010	Port Douglas, QLD	Photo-Id; Sightings	Resight Rates, movements, reproductive rates	G. Kaufman/PWF
Humpback whale (*1)	AUG 19, 2010	Cairns, QLD	Photo-Id; Sightings	Resight Rates, movements, reproductive rates	G. Kaufman/PWF
Humpback whale (*1)	AUG 25 - SEP 2, 2010	Whitsunday Islands, QLD	Photo-Id; Sightings	Resight Rates, movements, reproductive rates	G. Kaufman/PWF
Humpback whale (*1)	AUG 31 - SEP 29, 2010	Hervey Bay, QLD	Photo-Id; Sightings	Resight Rates, movements, reproductive rates	G. Kaufman/PWF
Humpback whale (*1)	OCT 3 - OCT 23, 2010	Eden, NSW	Photo-Id; Sightings	Resight Rates, movements, reproductive rates	G. Kaufman/PWF
Humpback whale (*3)	23/08 – 13/09, 2009	Nickol Bay	Behavioural Follows to quantify humpback whale behaviour in response to shipping in Nickol Bay.	Behaviours patterns were collected in a systematic and quantified manner for Before/During/After exposure study	R.Jenner/CWR, <i>R. Jenner, K.C.S., M. Jenner. 2010 unpub. data.</i>
Humpback whale (*3)	30/5-25/7/2010	Pt Lookout, East Australia	Land-based visual observations; acoustic recordings	Rate of population growth	M. Noad/ UQ
Humpback whale (*3)	22/09-23/10/2010	Peregian Beach, east Australia	Land-based vis observations from 5 stations; acoustic recordings two arrays; biopsy; Dtags; Argos sat tags; experiments with airgun.	Behavioural responses to airgun (analyses on-going); propagation loss in study area.	M. Noad/ UQ
Humpback whale (*3)	Various	Lagoon of Great Barrier Reef, QLD	Predictive habitat modelling using opportunistic data with validation by sat tag	Presence of whales; sea surface temperature, water depth, distance to shore, distance to reef, seafloor slope & rugosity.	J. Smith/ MUCRU, Murdoch Univ, Perth
Indo-Pacific humpback dolphin	01-03-2010 to 30-10-2010	Gladstone to Shoalwater Bay, QLD, Australia	Line transect survey	Distribution; sighting frequency, population size, survival rate, association	C.Daniele/ CQU
Inshore bottlenose dolphin	01-03-2010 to 30-10-2010	Gladstone to Shoalwater Bay, QLD, Australia	Line transect survey	Distribution; sighting frequency, population size, survival rate, association, genetic,	C.Daniele/ CQU

				toxicology	
Long-finned pilot whale	2010	Southern Ocean west of TAS	Line transect survey	Distribution; sighting frequency	K. Evans/IMAS
Minke whale	21/09/10-28/10/10	Norfolk Island	Land-based survey; vessel survey	Numbers observed, behaviour, weather statistics	A. Oosterman/NIWS; <i>Oosterman, Whicker and Garbett (2011)</i>
Southern right whale	10-15 August 2010	Southern Australia, C Leeuwin, WA- Ceduna, SA	Aerial survey/5 days, 33.75 flying hours.	Max numbers present/distribution. Annual percentage increase rate 1993-2010: all animals 6.79 (95% CI 3.88, 9.78), cow/calf pairs 6.82 (2.92,10.86). Est. min. pop size for area surveyed (= 'western' population) 2892; total 'Australian' population ca 3500.	J Bannister (WAM); <i>ref Bannister, 2011</i>
Sperm whale	2010	Southern Ocean west of TAS	Line transect survey	Distribution; sighting frequency	K. Evans/IMAS

Notes

(*1) *Pacific Whale Foundation (PWF)* For the 2010 season, there was a total research effort of 441.3 hours on the water and 7122.72 km distance travelled. Sites were located along the east coast of Australia, and included areas in Queensland and New South Wales (see below a breakdown of each individual site). In 68 days of field effort there was a total of 314 pods of whales sighted (including affiliations and disaffiliations), and were comprised of 756 animals. Mean pod size was 2.4 whales. 135.84 hours were spent observing whales (31% of field effort), with approximately 11 (total) animals observed each day. Using photographic identification techniques, 307 unique whales were identified. To date, 274 of these animals have been reconciled with the catalogue, 46 were re-sights to the catalogue and 228 new animals were added to the catalogue.

Port Douglas/Cairns, QLD

In Port Douglas/Cairns, we travelled 1200.1 miles (1931.37 km) on the water during 14 days in the field (6-22 August 2010). The 37 sightings included 20 whale pods (14 adults, 19 sub-adults, and four calves). We spent 11.9% of our field effort (94.7hrs) with whales and observed an average of three animals each day. We observed an average of two pods per day, with a mean pod size of two whales. We photo-identified 17 whales (two adults, 12 sub-adults, and three calves). Calves were observed in three pods, all of which contained only one calf. High winds and seas restricted data collection and effort during 2010 season.

Whitsunday Islands, QLD

In the Whitsunday Islands, we travelled 546.3 miles (879.18 km) on the water during seven days in the field (25 August – 2 September 2010). The 59 sightings included 27 whale pods (39 adults, one sub-adult, and 19 calves). We spent 22.5% of our field effort (54.3 hrs) on whales and observed an average of eight animals each day, with an average of four pods per day and an average pod size of two whales. During the course of our surveys 18 whales were photo-identified (17 adults and one sub-adult). Calves were observed in 18 pods, 17 of which contained only one calf and one pod containing two calves.

Hervey Bay, QLD

A research effort of 224 hours were spent on the water in Hervey Bay over 10 days of field effort. A total of 741 sightings comprised of 302 pods (including affiliations and disaffiliations) of whales were observed comprised of 602 animals. Ninety hours were spent observing whales, with an average of 22 (total) animals observed each day. The average number of pods (groups) observed per day was 11. Using photographic identification techniques, 278 whales were individually identified;.

Eden, NSW

We spent 60.70 hours on the water for a total of nine days of effort. We encountered 63 whale pods (in total 269 sightings) comprised of 168 animals (91 adults, 75 sub-adults and 2 calves). We observed

whales for 22 hours (36% of field effort). Average pod size was 3 (SD ± 2) but number of pods observed ranged from three to eight on a given day. During the course of the study, we collected 3,256 digital images and photo-identified 79 individual whales (35 adult-5 females, 32 sub-adults, and 12 of unknown age class).

(*2) *Cetacean Ecology & Acoustics Lab., The University of Queensland (UQ)*

East Australian humpback whale survey, 2010: Data analyses show that the east coast population is continuing to grow. Over the peak 4 weeks of the northward migration, the average sighting rate was 84.7 whales per 10h. When added to previous survey data, this yields a long-term rate of increase of 10.8% per annum (95% CI 10.4-11.3%). Acoustic data were also collected as part of a long-term project for developing acoustic survey techniques for humpback whales, but these have not been analysed.

Behavioural Responses of Australian Humpback whales to Seismic Surveys, Year 1, 2010: Large data sets were acquired and data are being sorted, summarised and calibrated. Acoustic data will be used to develop a detailed propagation model for estimates of received level of the airgun shots across the study area. Behavioural data have not yet been analysed. New techniques include the use of a new version of *Cyclops* software (E. Kniest, Univ. Newcastle) which enabled data collected across five theodolite stations as well as boat and singer positional data to be combined in real time over two networks. This allowed the use of a single command centre to maintain an overview of all whales and boats.

Habitat modelling to identify breeding grounds of Australian east coast humpback whales: Wide-scale aerial survey data that included whale sightings incidentally were used to develop a predictive model of humpback whale habitat inside the Great Barrier Reef in an attempt to better define the breeding grounds of the east Australian population. The most predictive factors were found to be sea surface temperature and water depth. The model was validated using satellite tracks of whales in the region. It appears the core of the breeding area is likely to be between Bowen and Shoalwater Bay, between 20°S and 22°S. This study shows the value of predictive modelling using sparse data combined with satellite tag data for validation.

(*3) *Centre for Whale Research (WA) Inc (CWR)* Pile driving and dredging activities for a new harbour facility at Anketell Point in the Pilbara Region of Northwest Australia are planned for 2011. Whale pod density distribution plots and behaviour distribution plots from systematic vessel were collected for comparison with similar data to be collected in 2011 and 2012. Specifically, whale distribution and behaviour patterns in relation to pile driving activities are examined using passing mode line transects.

Behavioural follows of randomly selected individual pods were conducted that can, in future, add detail to pile driving/whale interactions during 0.5 hour periods at varying range categories to the pile driver. Range bins of one nautical mile radiating out from the pile driver have been used for grouping and comparing data.

(*4) *The Oceania Project* The Oceania Project's photography in Hervey Bay for 2010 has been recorded in the field notes log, and archived on CD. The Hervey Bay Fluke catalogue, reconciled within and between seasons, for the period 1992-2009 consists of 2288 flukes. The photo-id analysis and intra-, inter-season reconciliation for 1992-2009 has been completed. Statistical analysis of the 1992-2005 dataset has been completed for group characteristics and group behaviour. The 1992-2009 re-sight dataset will be completed and ready for CMR analysis by late-2011.

3. MARKING DATA

3.1 Field work

3.1.1 Natural marking data

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Australian snubfin dolphin	Dorsal	NT, Australia	40	Y	60	C. Palmer/NRETAS
Australian snubfin dolphin	Dorsal fin-genetic	Central QLD	79	y	79	C.Daniele/ CQU
Blue whale	Lateral	Geographe Bay, WA	12	Y	180	C. Burton/WWR <i>Land, small vessel surveys (include biopsy sightings)</i>
Bottlenose dolphin	Dorsal fin	Gulf St Vincent, SA	51	Y	51	L. Moller/ Flinders

Bottlenose dolphin	Dorsal fin	Byron Bay, NSW	550	Y	550	E. Hawkins/SCU
Bottlenose dolphin	Dorsal fin	Gold Coast/Tweed Heads region, QLD	200	Y	200	E. Hawkins/SCU
Bottlenose dolphin	Dorsal fin	Moreton Bay, QLD	132	Y	477	I.Ansmann/UQ
Bottlenose dolphin	Dorsal fin	Port Phillip	Analysis continuing	Y	110	S. Mason/DRI
Bottlenose dolphin	Dorsal fin	Gippsland Lakes	Analysis continuing	Y	30	K.Charlton-Robb – Monash/DRI
Bryde's whale	Dorsal fin	Pacific	2	Y	2	C.A. Fury/ SCU
Common dolphin	Dorsal fin	Gold Coast/Tweed Heads region, QLD	30	Y	30	E. Hawkins/SCU
Common dolphin	Dorsal fin	Port Phillip	Analysis continuing	Y	12	S. Mason/DRI
Dwarf minke whale	Lateral markings/unique features	Northern GBR/Ribbon Reef area, QLD	Unknown	Y	Unknown	A.Birtles/JCU; Team Leader for the Minke Whale Project, James Cook University, Tourism Program, QLD 4811, tel: (07) 4781 4736
Dwarf minke whale	L & R thorax region primarily; plus scar patterns and other unique features where present.	Northern GBR, QLD	For 2010: Approx. 100 different animals seen underwater and photographed. 5 whales identified so far from previous seasons. Analysis ongoing	Y	Photographs available of c.1000 whales since 1996. Full analysis completed for seasons 2006, 2007 and 2008 only - which has provided 384 complete ID's (images available for both sides of the whale) of different whales from these 3 years alone.	A. Birtles/JCU S. Sobtzick/JCU.
Humpback whale	Fluke	Group V	400	Y	400	J.O. Meynecke/GU
Humpback whale	Fluke	Port Douglas/Cairns and Whitsundays Island, Area V stock	Unknown	Y	Unknown	G. Kaufman/PWF
Humpback whale	Fluke	East Australia, Stock V	504	Y	5,285	G. Kaufman/PWF
Humpback whale	Ventral Flukes/ Left & right Dorsal fin/ Lateral Body marks	AreaV/Hervey Bay	788	Y	2288 (1992-2009)	T.Franklin/TOP; W.Franklin/TOP
Humpback whale	Fluke	East Australia (E(i))	19	Y	~100	M. Noad/ UQ
Humpback whale	Fluke and lateral body	Exmouth Gulf/Stock D	526	N	3352	C. Jenner, W. Osborn, P Osborn/CWR
Humpback whale	Fluke and lateral body	Rottnest Island/Stock D	459	N	3352	C.Jenner, V.Boladeras/ CWR
Humpback whale	Fluke	Geographe Bay, WA	30	N	2000	C. Burton/WWR <i>Land, small vessel surveys</i>

Humpback whale	Lateral	Geographe Bay, WA	50	N	2500	C. Burton/WWR <i>Land, small vessel surveys</i>
Indo-Pacific bottlenose	dorsal	NT, Australia	30	Y	171	C. Palmer/NRETAS
Indo-Pacific bottlenose	Dorsal fin	Coral Bay	10	Y	10	S. Allen/MUCRU
Indo-Pacific Bottlenose Dolphin	Dorsal Fin	Adelaide area, SA	U	U	U	M. Bossley/WDCS
Indo-Pacific bottlenose dolphin	Dorsal fin	Bunbury	503	Y	503	V. Buchanan, D. Chabanne, MUCRU
Indo-Pacific bottlenose dolphin	Fluke	Pacific	14	Y	14	C.A. Fury/ SCU
Indo-Pacific humpback dolphin	Dorsal fin	Gold Coast/Tweed Heads region	6	Y	6	E. Hawkins, SCU
Indo-Pacific humpback dolphin	Dorsal fin-genetic	Central QLD	150	Y	150	C.Daniele/ CQU
Indo-Pacific humpback dolphin	dorsal	NT, Australia	45	Y	175	C. Palmer/NRETAS
Indo-Pacific humpback dolphin	Dorsal fin	Exmouth, Dampier, Port Hedland	60	Y	60	L. Bejder/MUCRU
Indo-Pacific humpback dolphin	Dorsal fin	Coral Bay	3	Y	3	S.Allen/MUCRU
Inshore bottlenose dolphin	Dorsal fin	Central QLD	NA	Y	N/A	C.Daniele/ CQU
Minke whale	Lateral	Geographe Bay, WA	2	N		C. Burton/WWR <i>Land, small vessel surveys</i>
Pygmy blue whale	lateral pigment	Southern Australia (off SA)	6	Y	200	M.Morrice/BWS
Pygmy blue whale	lateral pigment pattern	Southern Australia (off VIC)	21	Y	200	M.Morrice/BWS
Pygmy blue whale	Dorsal fin	Perth Canyon	23	Y	320	C. Jenner/CWR
Snubfin dolphin	Dorsal fin	Roebuck Bay	15	Y	15	S. Allen/MUCRU
Southern right whale	Callosity aerial and boat based	SE Aus	16	Y	104	R. Gales/DPIPWE
Southern right Whale	Callosities	Southern Australia	52	Y	~1060	Burnell,Charlton/SAM
Southern right Whale	Head callosity	SE Australia	25 individuals	Y	163	M. Watson/DSE
Southern right whale	Head callosity pattern	Southern Australia, C Leeuwin,WA-Ceduna, SA	From 2010 survey, ca 5100 images	N	6208 images 1976-2009. 1406	J. Bannister/WAM

3.1.2. Artificial marking data

Department of Primary Industries, Parks, Water and Environment (DPIPWE-TAS) DPIPWE attach approved floy “spaghetti” tags on individuals released at stranding events. Please contact R. Gales, DPIPWE for further information. All individuals were bottlenosed dolphins released alive from a stranding at the Pieman River 12/04/2010.

120 Floy Tags were deployed by DPIPWE-TAS on Bottlenose Dolphins.

J.O. Meynecke, Griffith University. One attempted deployment of National Geographics Crittercam for training purposes. However, no deployment in 2010.

3.1.3 Telemetry data

Species	Tag type	No. successfully deployed	Maximum time transmitting	Contact person/institute; refs
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Humpback whale	Satellite	37	106 days	N. Gales/AAD
Humpback whale	Satellite	7	4 months	M. Noad/ UQ
Humpback whale	Dtag	11	4 hours	M. Noad/ UQ
Humpback whale	Argos	23	108 days	N. Gales, M. Double/AAD, Jenner/Jenner/CWR
Pygmy blue whale	Argos	3	7 months	N. Gales, M. Double/AAD, Jenner,Jenner/CWR
Southern right whale	Satellite	1	52 days	N. Gales/AAD
Southern right whale (*1)	Satellite	1		R. Gales/DPIPWE S. Childerhouse/AAD

Notes:

(*1) Department of Primary Industries, Parks, Water and Environment (DPIPWE-TAS) In collaboration with researchers from AMMC, DPIPWE attached a satellite transmitter on a single Southern Right Whale (*Eubalaena australis*) on the 25th October 2010.

3.2 Analyses/development of techniques

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Bottlenose dolphin	2008-2010	Moreton Bay, QLD	Photo-ID	Social structure / association patterns	I. Ansmann/UQ

(*1) James Cook University (JCU) Analyses of the 2010 photo-identification data are still ongoing. Based on initial results, there were at least 5 between season re-sightings.

(*2) Pacific Whale Foundation (PWF) Fluke identification photographs are first matched within-season and the best photograph of each individual is selected and then matched to the overall catalogue. The photographs and accompanying data enable us to produce sighting histories of known individuals. These sightings records are then used to generate Capture-Mark-Recapture profiles for individuals across years and field sites.

Reproductive parameters (i.e. calving rates and intervals) were calculated based upon mark-recapture data (obtained via photo-ID) from eastern Australia from 1984 – 2007 and are currently being updated to include 2008 to 2010. Analyses of rates of interchange across several sites within eastern Australia are currently underway.

(*3) The Oceania Project (TOP) Trish and Wally Franklin as PhD Candidates at Southern Cross University have analysed photo-id data for fourteen-year period 1992-2009. The respective focus of their PhD work is the ‘Social and ecological significance of Hervey Bay to the Area V humpback whales’ and ‘Population dynamics and migratory interchange of humpback whales in Hervey Bay’. Professor Peter Harrison, Director, Southern Cross University Whale Research Centre, Emeritus Professor Peter Baverstock, and Dr Phil Clapham, Adjunct Professor, Southern Cross University Whale Research Centre are supervising their PhD work. Publications include:

Collaborations using data from the Hervey Bay Fluke catalogue are underway between Members of the Southern Cross University Whale Centre Group (Dave Paton & Dan Burns), Members of the South Pacific Whale Research Consortium and the AMMC AWE Antarctica photo-id project. Papers in review, in press or accepted include:

1 - Franklin, T., W. Franklin, L. Brooks, P. Harrison, P. Baverstock and P. Clapham. (2010). Seasonal changes in pod characteristics of eastern Australian humpback whales (*Megaptera novaeangliae*), Hervey Bay 1992-2005. *Marine Mammal Science*. DOI: 10.1111/j.1748-7692.2010.00430.x.

2 - Franklin, T., W. Franklin, L. Brooks, P. Harrison, P. Baverstock and P. Clapham. (In review). Seasonal changes in social 1 behavior of eastern Australian humpback whales (*Megaptera novaeangliae*) in Hervey Bay, Queensland, 1992-2005. Submitted to *Marine Mammal Science* March 29th 2011.

3 - Franklin, W., T. Franklin, N. Gibbs, S. Childerhouse, C. Garrigue, R. Constantine, L. Brooks, D. Burns, D. Paton, M. M. Poole, N. Hauser, M. Donoghue, K. Russell, D. K. Mattila, J. Robbins, M. Anderson, C. Olavarria, J. Jackson, M. Noad, P. Harrison, P. Baverstock, R. Leaper, S. C. Baker and P. Clapham. (In press). Photo-identification confirms that humpback whales (*Megaptera novaeangliae*) from eastern Australia migrate past New Zealand but indicates low levels of interchange with breeding grounds of Oceania. *J. CETACEAN RES. MANAGE.*

4 - Franklin, W., T. Franklin, L. Brooks, N. Gibbs, S. Childerhouse, F. Smith, D. Burns, D. Paton, C. Garrigue, R. Constantine, M. M. Poole, N. Hauser, M. Donoghue, K. Russell, D. K. Mattila, J. Robbins, A. Ooseterman, R. Leaper, P. Harrison, S. C. Baker and P. Clapham. (In press). Antarctic waters (Area V) near the Balleny Islands are a summer feeding area for some Eastern Australian (E (i) breeding group) Humpback whales (*Megaptera novaeangliae*). J. CETACEAN RES. MANAGE.

5 - Garrigue, C., T. Franklin, K. Russell, D. Burns, M. Poole, D. Paton, N. Hauser, M. Oremus, R. Constantine, S. Childerhouse, D. Mattila, N. gibbs, W. Franklin, J. robbins, P. Clapham and C. S. Baker. (In press). First assessment of interchange of humpback whales between Oceania and the east coast of Australia. J. CETACEAN RES. MANAGE, CASH Special Edition.

6 - Paton, D. A., L. Brooks, D. Burns, T. Franklin, W. Franklin, P. Harrison and P. Baverstock. (In press). First abundance estimate of east coast Australian humpback whales (*Megaptera novaeangliae*) utilising mark-recapture analysis and multi-point sampling. J. Cetacean Res. Manage, CASH Special Edition.

7 - Wally Franklin, Trish Franklin, Curt Jenner, Micheline Jenner, Leandra Goncalves, Russell Leaper, Lyndon Brooks and Phil Clapham (2008). Photo-identification comparison of humpback whale (*Megaptera novaeangliae*) flukes from Antarctic Area IV with Western and Eastern Australian fluke catalogues. (IWC Scientific Committee SC/60/SH1).

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
Australian snubfin dolphin	NT	2010/ 2	Y	0	8	Celine Frere Qld Uni
Australian snubfin dolphin	Central QLD GBRMP	11	Y	To analyse	11	C.Daniele/ CQU
Blue whale	Geographie Bay	7	Y			L. Moller/Flinders
Bottlenose dolphin	WA, SA	16	Y	0	16	L. Moller, K. Bilgmann/Flinders
Bottlenose dolphin	Moreton Bay, QLD	34	Y	34	123	I. C. Ansmann/UQ
Common dolphin	WA, SA	71	Y	71	71	L. Moller, K. Bilgmann/Flinders
Common dolphin	Albany	16	Y	N/A	N/A	S. Allen/MUCRU
Common dolphin	Dillon Bay, South Coast	5	Y	N/A	N/A	S. Allen/MUCRU
Dwarf minke whale	Northern GBR	1	Y	0	c.50	A. Birtles; JCU.
False killer whale	NT	23/11/2009/ 3	Y	3	3	C. Palmer/NRETAS
Fin whale	Area V	1	Y	1	1	N.Gales/AAD
Humpback whale	Area V	64	Y	64	825	N.Gales/AAD
Humpback whale	Group E(i)	33	Y	0		M. Noad/UQ
Humpback whale	Group E1	2007-2009 (90)	Y	90	10	S.Bengtson Nash/GU
Humpback whale (*1)	AreaV Hervey Bay	0	Y	846	1464	W. Franklin/TOP
Indo-Pacific bottlenose	NT	2010 / 2	Y	0	12	C. Palmer/NRETAS
Indo-Pacific bottlenose dolphin	Esperance	13	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific bottlenose dolphin	Albany	17	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific bottlenose dolphin	Augusta	15	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific bottlenose dolphin	Bunbury	23	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific bottlenose dolphin	Coral Bay	11	Y	N/A	N/A	S. Allen/MUCRU

Indo-Pacific bottlenose dolphin	Exmouth	32	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific bottlenose dolphin	Onslow	6	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific bottlenose dolphin	Dampier	29	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific bottlenose dolphin	Port Hedland	27	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific bottlenose dolphin	Broome	22	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific humpback	NT	2010 / 1	N	0	4	C. Frere/QU
Indo-Pacific humpback dolphin	Central QLD	16	Y	To analyse	16	C.Daniele/ CQU
Indo-Pacific humpback dolphin	Moreton Bay, QLD	8	Y			G. J. Parra/Flinders
Indo-Pacific humpback dolphin	Coral Bay	3	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific humpback dolphin	Exmouth	24	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific humpback dolphin	Dampier	20	Y	N/A	N/A	S. Allen/MUCRU
Indo-Pacific humpback dolphin	Port Hedland	1	Y	N/A	N/A	S. Allen/MUCRU
Pygmy blue whale	WA, VIC, SA	32	Y	32	32	L Moller/ Flinders, C Attard/Macquarie University
Pygmy blue Whale	Rottneest Island	2010	Y	16	16	C. Jenner/CWR, L.Moller/Flinders
Snubfin dolphin	Broome	15	Y	N/A	N/A	S.Allen/MUCRU

Notes:

(*1) These samples were used by Megan Anderson for her PhD thesis, which was submitted in 2010.

(*2) **South Australia (SA)** Biopsy samples have been obtained by Moller et al. but no report was received.

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

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Humpback whale	Group V	Skin	2	Y	2	J.O. Meynecke/GU and Woods Whole Oceanographic Institute
Humpback whale	Group V, Eastern Australia	Whale blow	25	Y	25	T Rogers/UNSW
Indo-Pacific bottlenose dolphin(*1)	SA	Genetic tissues, (blood, liver, kidney, muscle, skin) reproductive's, stomach and intestines, toxic contaminants (liver, kidney, muscle, blubber)	2	Y	0	C. Kemper/SAM
Short-beaked common dolphin (*1)	SA	Genetic tissues, (blood, liver, kidney, muscle, skin) reproductive's, stomach and intestines, toxic contaminants (liver, kidney, muscle, blubber)	4	Y	0	C. Kemper/SAM

Notes:

(*1) *South Australian Museum (SAM)*

The following list includes:

- Entanglement Probable – for example, animals with net marks/injuries and/or that have had flippers or fluke's removed, and full stomachs and sometimes food in the oesophagus, suggesting a sudden death.
- Entanglement – known entanglements in aquaculture nets, wild fishery nets and other types of net
- Other Unintentional - Accidental injury by humans for example, boat strike
- Intentional – e.g. shooting, stabbing

*Complete sets of tissue samples were not collected from all animals because in some cases the state of decomposition made this inappropriate.

4.3 Samples from stranded animals

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Australian snubfin dolphin	GBRMP	Skin, blubber	1	Y	0	C.Daniele/ CQU
Australian snubfin dolphin	QLD	Skin	1	Y		Col Limpus/DERM
Baleen whale (decomposed)	Gulf of Carpentaria, NT	Skin	1	N	0	R. Chatto/NRETAS
Blue whale (washed up 05/04/10)	Bass Strait	Skin, blubber,	2	Y	1 skin sample analysis underway	D.Donnelly – DRI / Samples sent to and stored at Melbourne Museum C.Attard/MQ (skin sample analysis)
Bottlenose dolphin	TAS	Skin	41	Y	40	R. Gales/DPIPWE
Bottlenose dolphin	TAS	Blubber	27	Y	27	R. Gales/DPIPWE
Bottlenose dolphin	TAS	Kidney	25	Y	25	R. Gales/DPIPWE
Bottlenose dolphin	TAS	Liver	25	Y	25	R. Gales/DPIPWE
Bottlenose dolphin	TAS	Teeth	9	Y		R. Gales/DPIPWE
Bottlenose dolphin	Cronulla, NSW	Full tissue set	1	Y	1	J. Hall/ARWH
Bottlenose dolphin – calf (washed up 20/7/10)	Gippsland Lakes	Carcass currently in freezer at DSE, East Gippsland	unknown	N	will be analysed once collected	K.Charlton-Robb DRI/MU
Bottlenose dolphin (10/10/10)	Port Phillip Bay	Skin	1	Y	1 skin	K.Charlton-Robb/MU
Bottlenose dolphin (calf – 23/04/10)	Bass Strait	Head (brain) skin, blubber, liver, kidney, melon	1 2	N	1 skin sample stored ready for analysis	K.Charlton-Robb/MU
Bottlenose dolphin (Mum and calf – 03/03/10)	Bass Strait	Head (brain), blubber, liver	1 2	N	sample stored ready for analysis	Kelly O'Sullivan – Phillip Island Nature Park Alissa Monk – Monash University
Bryde's whale	Northern NSW Coast	Blood	1	N		SW
Common dolphin	TAS	Whole carcass	2	Y		R. Gales/DPIPWE
Common dolphin	TAS	Skin	1	Y		R. Gales/DPIPWE
Common dolphin	TAS	Tooth	2	Y		R. Gales/DPIPWE
Common dolphin	TAS	Blubber	1	Y		R. Gales/DPIPWE
Common dolphin	South-east Qld coast	Multiple	1	N		SW
Common dolphin (08/07/10)	Bass Strait	Head (brain), blubber	1 2	N	sample stored ready for analysis	Marcus Salton-Phillip Island Nature Park Alissa Monk – Monash University

Common dolphin (3/11/10)	Bass Strait	Head (brain) skin, blubber, liver, kidney, melon	1 2	N	sample stored ready for analysis	K.Charlton-Robb/MU
False killer whale	Illaroo-South Sandon Beach, NSW	Skin, teeth, blubber	1			
Ginkgo-toothed beaked whale	Kingscliff; 180m south of Cudgen Creek breakwall, NSW	Blood	1			
Ginkgo-toothed beaked whale	NSW	Muscle tissue	1	Y		S. Ingleby/AM
Gray's beaked whale	VIC, Portland, Nuns Beach	Muscle, Blubber, Skeleton	1	Y	0	R.O'Brien/MV
Humpback whale	Woolgoolga, NSW	Eye, skin, blubber, ocular fluid	1	Y	1	J. Hall/ARWH
Humpback whale	SA	Genetic tissues, (blood, liver, kidney, muscle, skin) reproductive's, stomach and intestines, toxic contaminants (liver, kidney, muscle, blubber)	1	Y	0	C. Kemper/SAM
Humpback whale	Woolgoolga, NSW	Eye, skin, blubber, ocular fluid	1	Y	1	J. Hall/ARWH
Humpback whale	South Golden Beach, NSW	Skin	1			
Humpback whale	Woolgoolga Back Beach, NSW	Eye and Blubber	1			
Humpback whale	E1	Skin, blubber	(2010) 3	Y	0	Susan Bengtson nash
Humpback whale	QLD	Skin	1	Y		Col Limpus/DERM
Indo-Pacific bottlenose dolphin	Mandurah, WA	Skin, blubber, teeth, skull, brain, lung, heart, stomach, intestine, liver, kidney, adrenal glands, muscle, gonads, bone, lymph nodes, parasites	1	Y	Histological examination	Dr Nahiid Stephens/Dr Carly Holyoake, Murdoch University, WA
Indo-Pacific bottlenose dolphin	Bunbury, WA	Skin, blubber, teeth, skull, brain, lung, heart, stomach, intestine, liver, kidney, adrenal glands, muscle, gonads, bone, lymph nodes, parasites	3	Y	Histological examination	Dr Nahiid Stephens/Dr Carly Holyoake, Murdoch University, WA

Indo-Pacific bottlenose dolphin	Shark Bay, WA	Skin, blubber, teeth, skull, brain, lung, heart, stomach, intestine, liver, kidney, adrenal glands, muscle, gonads, bone, lymph nodes, parasites	1	Y	Histological examination	Dr Nahiid Stephens/Dr Carly Holyoake, Murdoch University, WA
Indo-Pacific bottlenose dolphin (*1)	SA	Genetic tissues, (blood, liver, kidney, muscle, skin) reproductive's, stomach and intestines, toxic contaminants (liver, kidney, muscle, blubber)	1	Y	0	C. Kemper/SAM
Long-finned pilot whale	SA	Genetic tissues, (blood, liver, kidney, muscle, skin) reproductive's, toxic contaminants (liver, kidney, muscle, blubber)	1	Y	0	C. Kemper/SAM
Melon headed whale	Woolgoolga NSW	Full tissue set	1	Y	1	J. Hall/ARWH
Mesoplodon ginkgodens	NSW	Skull and muscle tissue	1	Y		S. Ingleby/AM
Mesoplodon sp. Beaked whale	Pacific	Skin, Blubber	1	Y	0	C.A. Fury/ SCU
Off-shore bottlenose dolphin	South-east Qld Coast	Multiple	1	N		SW
Off-shore bottlenose dolphin	South east Qld Coast	Multiple	1	N		SW
Pygmy right whale	TAS	Whole carcass	1	Y		R. Gales/DPIPWE
Pygmy right whale	TAS	Skin	1	Y		R. Gales DPIPWE
Pygmy sperm whale	SA	Genetic tissues, (blood, liver, kidney, muscle, skin) reproductive's, stomach and intestines, toxic contaminants (liver, kidney, muscle, blubber)	1	Y	0	C. Kemper/SAM
Short-beaked common dolphin (*1)	SA	Genetic tissues, (blood, liver, kidney, muscle, skin) reproductive's, stomach and intestines, toxic contaminants (liver, kidney, muscle, blubber)	6	Y	0	C. Kemper/SAM
Short-finned pilot whale	Pacific	Skin, teeth, blubber	1	Y	0	C.A. Fury/ SCU

Southern right whale	SA	Genetic tissue (skin), toxic contaminant (blubber)	1	Y	0	C. Kemper/SAM
Sperm whale	TAS	Skin	1	Y		R. Gales/DPIPWE
Sperm whale	TAS	Blubber	1	Y		R. Gales/DPIPWE
Sperm whale	WA	S/B	1	Y	0	L. Moller/Flinders
Straptooth whale	SA	Genetic tissues, (blood, liver, kidney, muscle, skin) reproductive's, stomach and intestines, toxic contaminants (liver, kidney, muscle, blubber)	2	Y	0	C. Kemper/SAM
Strap-toothed whale	QLD	Skin	1	Y		Col Limpus/DERM
Striped dolphin	NSW	Skull and muscle tissue	1	Y		S. Ingleby/AM
Whale – unidentified sp	QLD	Skin	1	Y		Col Limpus/DERM

Notes:

(*1) *South Australian Museum (SAM)* The following list includes other circumstances of death:

- Unknown - no information, too decomposed, incomplete specimen
- Diseased – e.g. significant parasites, heart disease, infection
- Live stranding - put back to sea and died, euthanased, died after stranding
- Other natural – e.g. choked on shark, starved, neonatal death, predator (killer whale, shark)

Complete sets of tissue samples were not collected from all animals because in some cases the state of decomposition made this inappropriate.

4.4 Analyses/development of techniques

(*1) **Australian Registry of Wildlife Health (ARWH)** Morphometric measurements were taken for all animals listed. Tissues collected were examined histologically and results are available from the Australian Registry of Wildlife Health: Melon Headed Whale (ARWH 7411.1), Bottlenose Dolphins (ARWH 7577.1 and ARWH 8010.1) and Humpback Whale (ARWH 7814.1)

(*2) **Susan Bengsten nash/Griffith University:** Analysed for Persistent organic pollutants (POPs) and detoxification enzymes Waugh, C.A., et al., Cytochrome P450 isoenzyme protein verified in the skin of southern hemisphere humpback whales (*Megaptera novaeangliae*); Implications for biochemical biomarker assessment. Marine Pollution Bulletin, Available online 28th January, 2011.

(*3) **The Oceania Project (TOP)** DNA analysis of Sloughed Skin Samples being undertaken by Megan Anderson and Wally Franklin, at the Centre for Animal Conservation Genetics, Southern Cross University, under the Supervision of Professor Peter Baverstock. Analysis of total holdings will be completed and up to date by end of 2011. The following references are relevant:

Anderson, M., D. Steel, W. Franklin, T. Franklin, D. Paton, D. Burns, P. Harrison, P. Baverstock, C. Garrigue, P. Baverstock, C. Olavarria, M. Poole, N. Hauser, R. Constantine, D. Theile, P. Clapham, M. Donoghue and S. Baker. 2010. Microsatellite genotype matches of eastern Australian humpback whales to Area V feeding and breeding grounds. For consideration by the Scientific Committee of the International Whaling Commission, Agadir, Morocco, 30th May - 11th June 2010. SC/62/SH7. [Available from the office of this Journal]:11pp

Elphinstone MS, Hinten GN, Anderson MJ, Nock CJ (2003) An inexpensive and high-throughput procedure to extract and purify total genomic DNA for population studies. Molecular Ecology Notes TECHNICAL NOTE 3:317

Anderson, M.J., Hinten, G., Paton, D., Baverstock, P.R., 2001. A model for the integration of microsatellite genotyping with photographic identification of humpback whales. *Memoirs of the Queensland Museum* 47(2): 451-457.

(*4) **Flinders University of South Australia:** DNA was extracted from all samples. Genetic sexing was completed for blue whales and common dolphins. Sequencing of the mtDNA control region and microsatellite genotyping are currently underway for blue whale and common dolphin samples.

5. POLLUTION STUDIES

South Australian Museum (SAM): The South Australian Museum continues to archive tissues for toxic contaminant studies and now has samples for hundreds on cetaceans. No further analysis of samples was undertaken in 2010. An application has been made to the IWC small cetacean committee to study the effects of heavy metal pollution in upper Spencer Gulf. Since the Museum's collection is by far the largest and most comprehensive in Australia, there is a need to discuss how it is going to be maintained in the long term.

Susan Bengsten nash/Griffith University: Analyses have been conducted on all biopsies and results are in preparation for publication.

The Oceania Project (TOP) – Long-term Water Quality Monitoring Program, Hervey Bay Marine Park 1993-2008: During the 2006 humpback season The Oceania Project undertook the 14th year of Chlorophyll A sampling for a long-term habitat and water quality monitoring program, in the Whale Management and Monitoring Area of the Hervey Bay Marine Park. The program is being conducted in conjunction with Andrew Moss, Environment Division, Queensland Environment Protection Agency. Weekly triplicate Chlorophyll A samples were obtained from 6 structured geographical areas within the Hervey Bay Marine Park between August 5th and October 15th 2006. Outcomes of the first five years of monitoring (1993/1997) and the eleven years of monitoring (1993-2003) are published in:

"Queensland Department of Environment & Heritage, Environmental Technical Report No 23: Hervey Bay Report - Chlorophyll-a Sampling by The Oceania Project, Andrew Moss and Julie Kocovski, ISSN 1037-4671 RE271, July 1998".

"Long-term monitoring of chlorophyll-a in Hervey Bay, Queensland (1993-2003) by The Oceania Project"; See: <http://www.epa.qld.gov.au/publications?id=1771>

6. STATISTICS FOR LARGE CETACEANS

6.1 Corrections to earlier years' statistics for large whales

Centre for Whale Research (WA) Inc. A long term monitoring programme to determine the risk of displacing resting humpback whales in Exmouth Gulf was begun in 2000 (Jenner and Jenner, 2005). A population modelling component using genetic and photo-id data was added in 2007. An ACAAMS grant was secured in 2008 to use Distance modelling to estimate population size for Breeding Population D whales. Resulting estimates from the migration model of best fit with the most credible assumptions were 7,276 (CI = 4,993-10,167) for 2000, 12,280 (CI = 6,830-49,434) for 2001, 18,692 (CI = 12,980-24,477) for 2006, 20,044 (CI = 13,815-31,646) for 2007, and 26,100 (CI = 20,152-33,272) for 2008. Based on these data, the trend model with the greatest r^2 was exponential with an annual increase rate of 13%. While this value is above the species' maximum plausible growth rate of 11.8%, it is reasonably close to previous reports of between 10-12%. The coefficient of variation, however, was too large for a reliable trend estimate. Perception bias was only assessed in the 2008 survey and was not accounted for in the estimated 13% of annual population increase. Based on a crude appraisal which yielded an estimated $p(0)$ of 0.783 (from independent observer effort), the 2008 humpback population size could then be as large as 31,764. The work presented provides evidence of an increasing breeding group 'D' humpback whale population; however more data are necessary to confirm whether the population is indeed increasing at its maximum rate.

6.2 Direct catches of large whales (commercial, aboriginal and scientific permits) for the calendar year 2010 or the season 2009/10

Nil

6.3 Anthropogenic mortality of large whales for the calendar year 2010 or the season 2009/10

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
Blue whale sp. (*2)	M	1	05/04/2010	Flinders (washed up)	U	U		Washed up	D. Donnelly/ DRI ddonnelly6@yahoo.com.au research@dolphinresearch.org.au
Humpback whale	U	1	22/09/10	Sandon Point, off Bulli. Illawarra, NSW.	U	U	D*	Beachwashed	G. Ross/NSW DPC
Humpback whale	U	1	17/7/10	Off coast of Broome 17°53S; 122°01E	FV	10.5knots	X	Crew	D. Coughran/DEC
Humpback whale (*1)	M	1	22/11/2010	1.4 km WSW Port Wakefield (township), SA 34° 11' 24" S 138° 8' 11" E	U	U	D	SAM post mortem (possible ship strike*)	C. Kemper./SAM
Humpback whale (calf) (*3)	U	1	23/11/10 0/27/11/10	Jacks Smith Beach, Darriman, Gippsland (wash up)	U	U		Washed up	DSE- environmental.research@ se.vic.gov.au

Notes

(*1) Carcass showed severe blunt trauma.

(*2) Possible large impact to head region.

(*3) Large cuts in whale consistent with ship's propeller

6.3.2 Fishery bycatch of large whales

Whale species	Sex	No.	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
Humpback whale	U	1	5/8/10	Bremer Bay 34°24S; 119°25E	U	<i>Crayfish</i>	Fishing 300mm orange float	A	D. Coughran/DEC
Humpback whale	U	1	19/8/10	Exmouth, North West Cape 24°48S; 114°06E	U	<i>Unknown</i>	Fishing Norwegian float	A	D. Coughran/DEC
Humpback whale	U	1	28/8/10	Barrow Island Port 20°52S; 115°20E	R	NA	Data logger	A	D. Coughran/DEC
Humpback whale	U	1	14/9/10	Warnbro Sound, Rockingham Perth 32°21S; 115°36E	R	<i>Octopus</i>	Fishing rope with 10 floats	A	D. Coughran/DEC
Melon-headed whale (*1)	U	1	8/03/2010	-25.83S 154E	D	Tuna	LLD	V	Sally McCarthy, AFMA
Short-finned pilot whale (*1)	U	1	13/02/10	-18.77S 152.75E	R	Tuna	LLD	F	Sally McCarthy, AFMA
Short-finned pilot whale (*1)	U	1	5/04/10	-20.3S 153.93E	R	Tuna	LLD	V	Sally McCarthy, AFMA

Short-finned pilot whale (*1)	U	1	6/04/10	-25.45S 154.06E	R	Tuna	LLD	F,V	Sally McCarthy, AFMA
Short-finned pilot whale (*1)	U	1	19/07/10	-30.60S 154.31E	R	Tuna	LLD	F	Sally McCarthy, AFMA
Unidentified whale (*1)	U	1	1/07/10	-21.55S 154.33E	D	Tuna	LLD	V	Sally McCarthy, AFMA
<u>Notes:</u>									
(*1) Dates in Australian format. Latitude and longitude in decimal degrees.									

7. STATISTICS FOR SMALL CETACEANS

7.1 Corrections to earlier years' statistics for small cetaceans

Nil

7.2 Direct catches of small cetaceans for the calendar year 2010 or the season 2009/10

Species	Type of catch	Area/stock	Males	Females	Total landed	Struck and lost
Indo-Pacific bottlenose dolphin (*1)	Illegal killing (12 shot gun pellets)	SA	1	0	1	0
<u>Notes</u>						
(*1) Includes intentional injury by humans, for example shooting, stabbing						

7.3 Anthropogenic mortality of small cetaceans for the calendar year 2010 or the season 2009/10

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
Bottlenose dolphin (*3)	F	1	23/1/10	Bunbury Surf Club 33°19 S; 115°00 E	O	U	D	Post mortem	D. Coughran/DEC N. Stephens/MUCRU
Indo-Pacific bottlenose dolphin (*1)	M	1	13/12/10	0.6 km NNW St Kilda (jetty), SA 34° 44' 18" S 138° 31' 55" E	U	U	D	SAM post mortem (fatal propeller wound)	C. Kemper/SAM
Indo-Pacific-humpback (*2)	U	1		Darwin, NT	U	U	D	Washed up on beach	C. Palmer/NRETAS
<u>Notes</u>									
(*1) Accidental injury by humans for example boat strikes including probable incidents									
(*2) Fluke, dorsal and pectoral fins cut-off; had been dead for a number of days /week									
(*3) Small watercraft unknown									

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
Bottlenose dolphin	1:0	1			2009	Cronulla, NSW			Frozen/Thaw Necr		NSC	Routine contracted net checks	NSW DECCW
Bottlenose dolphin (*2)	1:0	1			2009	Cronulla, NSW			Necropsy		NSC	Routine contracted net checks	NSW DPC
Common dolphin	1:0	1			7/5/10	King George Sound, Albany			D	Tuna	Purse seine	Post mortem	D. Coughran/DEC
Common dolphin – unidentified sp	F	1			07/06/10	-28.1511; 153.51			D	Shark Control Program	Net	V	QDPI&F
Common dolphin – unidentified sp	F	1			12/06/10	-28.0951; 153.4686			D	Shark Control Program	Net	V	QDPI&F
Common dolphin – unidentified sp	F	1			14/06/10	-28.0017; 153.4387			D	Shark Control Program	Net	V	QDPI&F
Common dolphin – unidentified sp	M	1			14/06/10	-28.1583; 153.5381			D	Shark Control Program	Net	V	QDPI&F
Common dolphin – unidentified sp	F	1			15/07/10	-28.1273; 153.4937			D	Shark Control Program	Net	V	QDPI&F
Common dolphin – unidentified sp	2x?	2			08/08/10	-25.8987; 153.0977			D	Shark Control Program	Net	V	QDPI&F
Common dolphin – unidentified sp	?	1			10/09/10	-25.8987; 153.0977			D	Shark Control Program	Net	V	QDPI&F
Common dolphin – unidentified sp	M	1			15/09/10	-28.087; 153.4573			D	Shark Control Program	Net	V	QDPI&F
Common dolphin (*3)	U	1	N/A	N/A	23/09/10	-35.97S 138.58E	U	U	D	shark	GNS	F,V	S. McCarthy/AF MA
Common dolphin (*3)	U	1	N/A	N/A	25/09/10	-36.07S 138.55E	U	U	D	shark	GNS	V	S. McCarthy/AF MA
Common dolphin (*3)	U	1	N/A	N/A	10/10/10	-35.78S 138.85E	U	U	D	shark	GNS	V	S. McCarthy/AF MA
Common dolphin (*3)	U	1	N/A	N/A	14/10/10	-35.85S 138.87E	U	U	D	shark	GNS	V	S. McCarthy/AF MA
Common dolphin (*3)	U	1	N/A	N/A	6/11/10	-36°20'S 137°46'E	U	U	D	shark	GNS	F,V	S. McCarthy/AF MA

Common dolphin (*3)	U	1	N/A	N/A	5/12/10	-36.55S 138.63E	U	U	D	shark	GNS	V	S. McCarthy/AF MA
Common dolphin (*3)	U	1	N/A	N/A	9/12/10	-36.12S 138.9E	U	U	D	shark	GNS	V	S. McCarthy/AF MA
Common dolphin (*3)	U	1	N/A	N/A	23/09/10	-35.97S 138.58E	U	U	D	shark	GNS	F,V	S. McCarthy/AF MA
Indo-Pacific bottlenose dolphin (*1)	U	1	N/A	N/A	5-6/5/10	Whyalla marina 35° 02' 27" S 137° 35' 33"E	N/A	N/A	R	Unknown	NK*	Known Entanglement, DA.	C. Kemper, SAM
Indo-Pacific hump-backed dolphin	?	1			05/11/10	-16.7846; 145.7052			D	Shark Control Program	Net	V	QDPI&F
Long-beaked common dolphin	F	1			08/03/10	-28.1458; 153.4903			D	Shark Control Program	Net	V	QDPI&F
Long-beaked common dolphin	F	1			09/03/10	-28.1586; 153.5332			D	Shark Control Program	Net	V	QDPI&F
Long-beaked common dolphin	F	1			23/05/10	-28.0951; 153.4686			D	Shark Control Program	Net	V	QDPI&F
Long-beaked common dolphin	M	1			24/05/10	-26.3815; 153.0892			D	Shark Control Program	Net	V	QDPI&F
Long-beaked common dolphin	F	1			02/06/10	-27.9734; 153.436			D	Shark Control Program	Net	V	QDPI&F
Long-beaked common dolphin	F	1			15/07/10	-28.087; 153.4573			D	Shark Control Program	Net	V	QDPI&F
Offshore bottlenose dolphin	F	1			14/12/10	-28.1583; 153.53806			D	Shark Control Program	Net	V	QDPI&F
Offshore bottlenose dolphin	M	1			14/12/10	-27.97343; 153.436			D	Shark Control Program	Net	V	QDPI&F
Short-beaked common dolphin	1:0	1	N/A	N/A	April 2010	Arno Bay 33° 55' S 136° 34' E	N/A	N/A	K	Kingfish	NK	Known Entanglement, F, SAM post mortem	C. Kemper/SAM
Short-beaked common dolphin	1:0	1	N/A	N/A	4/4/10	E of Thistle Island 35° 02' 02" S 136° 23' 03"E	N/A	N/A	K	SA Sardine Fishery	PS1/ PS2	Known Entanglement, F, SAM post	C. Kemper/SAM

Short-beaked Common Dolphin	0:1	1	N/A	N/A	14/5/10	24 km N, Emu Bay 35° 20' S 137° 35' E	N/A	N/A	K	SA Sardine Fishery	PS1/PS2	Known Entanglement, F, SAM post mortem	C. Kemper/SAM
Short-beaked Common Dolphin	1:0	1	N/A	N/A	27/6/10	25 km W, Corny Point 34° 56' S 136° 45' E	N/A	N/A	K	SA Sardine Fishery	PS1/PS2	Known Entanglement, F, SAM post mortem	C. Kemper/SAM
Short-beaked Common Dolphin	U	1	N/A	N/A	22/12/10	Port Neill 34° 09' S 136° 24' E	N/A	N/A	K	SA Sardine Fishery	PS1/PS2	Known Entanglement, post-mortem	C. Kemper/SAM
Short-beaked common dolphin	F	1			30/01/10	-28.0652; 153.4511			D	Shark Control Program	Net	V	QDPI&F
Short-beaked common dolphin	F	1			05/04/10	-26.66806; 153.1139			D	Shark Control Program	Net	V	QDPI&F
Short-beaked common dolphin	F	1			30/05/10	-28.08306; 153.4596			D	Shark Control Program	Net	V	QDPI&F

Notes:

(*1) Reported as fishing line

(*2) None reported in self regulated log book system for commercial fisheries in the Northern Territory

(*3) Dates in Australian format. Latitude and longitude in decimal degrees.

8. STRANDINGS

Queensland

The Department of Environment and Resource Management's (DERM) marine wildlife stranding and mortality database ("StrandNet") summarises all records of sick, injured or dead marine wildlife reported to DERM.

Most records of individual strandings are supplied by DERM and Great Barrier Reef Marine Park Authority (GBRMPA) staff, including those reported via the state-wide stranding hotline 1300 130 372. Other records are received directly via members of the public and organisations such as Sea World, Australian Wildlife Hospital, Underwater World and Cairns Turtle Hospital.

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Bottlenose dolphin – unidentified sp	3	1	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Bryde's whale	1	1	D.Blyde/SW	David.Blyde@wvtp.com.au
Common dolphin	1	1	D.Blyde/SW	David.Blyde@wvtp.com.au
Common dolphin – unidentified sp	9	0	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Dolphin – unidentified sp	9	0	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Humpback whale	9	1	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Indo-pacific bottlenose dolphin	4	2	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Indo-Pacific humpback dolphin	1	1	C.Daniele	Dcagna10@scu.edu.au
Indo-pacific hump-backed dolphin	3	0	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au

Long-beaked common dolphin	6	0	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Long-snouted spinner dolphin	2	0	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Melon-headed whale	2	0	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Offshore bottlenose dolphin	6	2	C.Limpus/DERM; T.Biddle/DERM D.Blyde/SW (2 necropsies)	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au David.Blyde@wvtp.com.au
Pygmy sperm whale	2	0	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Short-beaked common dolphin	4	1	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Snubfin dolphin	2	1	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Strap-toothed whale	1	1	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au
Whale – unidentified sp	3	0	C.Limpus/DERM; T.Biddle/DERM	col.limpus@derm.qld.gov.au taryn.biddle@derm.qld.gov.au

Victoria

DRI / MONASH UNI - Strandings along the Victorian coastline were attended by members of the Dolphin Research Institute (DRI), Monash University and members representing the Victorian Strandings Network, Zoos Victoria and the Melbourne Museum. Specimens (skulls) collected will be incorporated into the Melbourne Museum IWC report.

DSE - Reports usually come in via opportunistic reports from local land manager, council or member of the public, either directly to DSE or to the Dolphin Research Institute who then reports it to DSE. A Whale and Dolphin Emergency Hotline (1300 136 017) was established in October 2009, through which reports will now be handled.

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Blue whale sp.	1	0	D.Donnelly -DRI	ddonnelly6@yahoo.com.au research@dolphinresearch.org.au
Bottlenose dolphin	1	0	T.Wilson , L.Clausen/DSE East Gippsland	lucy.clausen@dse.vic.gov.au
Bottlenose dolphin	2	0	S.Mason/DRI, K.O'Sullivan/Phillip Island Nature Park	research@dolphinresearch.org.au
Bottlenose dolphin	2	1	K.Charlton-Robb /MU <i>Post mortem conducted by Dr Padraig Duignan and Kate Charlton-Robb</i>	kate.charlton@monash.edu
Common dolphin	1	0	S.Mason/DRI, Marcus Salton – Phillip Island Nature Park	research@dolphinresearch.org.au
Common dolphin	1	1	K.Charlton-Robb/MU <i>Post mortem conducted by Kate Charlton-Robb</i>	kate.charlton@monash.edu
Common dolphin	1	1	M.Watson/DSE	mandy.watson@dse.vic.gov.au
Gray's beaked whale	1	0	M.Watson/DSE	mandy.watson@dse.vic.gov.au

Western Australia

Murdoch University and DEC worked together to respond to reported strandings. In most instances strandings were of dead bottlenose dolphins 10 of 11 strandings. One stranding of 2 live individual bottlenose dolphins (mother & calf) were stranded and successfully returned to the water in the Preston River 22 October 2009 by MUCRU staff. In all cases practicable samples were collected including full morphometric measurements and genetic samples. For 3 of the 10 bottlenose dolphin strandings post mortems were conducted by veterinarians at Murdoch University. There were more strandings of bottlenose dolphins than observed in previous 2 years (2007, 2008) by Murdoch University Cetacean Research Unit in the Bunbury area.

MUCRU assisted with strandings of other species where required, Risso's dolphin *Grampus griseus* 15 March 2009 and the mass stranding of long finned pilot whales *Globicephala melas* at Hamelin Bay 23 March 2009. MUCRU collected tissue samples on behalf of DEC at the mass pilot whale stranding. A single stranding of a dead striped dolphin *Stenella coeruleoalba* was handled by the local Bunbury Shire Council 14 June 2009. DEC has a more comprehensive list of strandings for multiple species of the area. This is held by head office in Perth and data custodian and contact person is Doug Coughran.

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Bottlenose dolphin	13	5	D. Coughran/DEC (strandings) N.Stephens/MUCRU (PMs)	douglas.coughran@dec.wa.gov.au n.stephens@murdoch.edu.au
Common dolphin	3	2	D. Coughran/DEC	douglas.coughran@dec.wa.gov.au
Cuvier's beaked whale	1		D. Coughran/DEC	douglas.coughran@dec.wa.gov.au
False killer whale	1		D. Coughran/DEC	douglas.coughran@dec.wa.gov.au
Gray's beaked whale	4		D. Coughran/DEC	douglas.coughran@dec.wa.gov.au
Humpback whale	16		D. Coughran/DEC	douglas.coughran@dec.wa.gov.au
Killer whale	1		D. Coughran/DEC	douglas.coughran@dec.wa.gov.au
Sperm whale	2		D. Coughran/DEC	douglas.coughran@dec.wa.gov.au

New South Wales

Stranding data is systematically collected across the entire NSW coast by NSW DPC staff. Reporting is through the NSW Marine Events database.

Most cetacean necropsies in NSW are undertaken at Taronga Zoo or on-site at whale burial locations. Where necropsies have been conducted at burial or locations other than Taronga the ARWH received only fixed tissue along with a written necropsy report from the submitter. Melon Headed and Humpback Whales described above were examined on site by veterinarians from the Pet Porpoise Pool, Coffs Harbour with assistance from staff from NSW DPC. Samples were then sent by courier to ARWH for processing. Reports and samples are gathered opportunistically and in communication with the NSW DPC. Any information regarding these cases can be obtained by contacting the Australian Registry of Wildlife Health (arwh@zoo.nsw.gov.au).

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Bottlenose dolphin (*2)	2	2	J. Hall/ ARWH	jhall@zoo.nsw.gov.au
Bottlenosed dolphin	7	2	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Bryde's whale	2	0	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Common dolphin	3	0	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
False killer whale	1	0	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Ginkgo-toothed beaked whale	1	1	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Ginkgo-toothed beaked whale (*1)	1	1	S. Ingleby/AM	sandy.ingleby@austmus.gov.au
Humpback whale	7	0	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Humpback whale (*2)	1	1	J. Hall/ ARWH	jhall@zoo.nsw.gov.au
Melon headed whale (*2)	1	1	J. Hall/ ARWH	jhall@zoo.nsw.gov.au
Melon-headed whale	2	1	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Risso's dolphin	2	1	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Short-finned Pilot whale	2	0	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Southern right whale	1	0	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Sperm whale	3	1	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Sperm whale (*1)	1	0	S. Ingleby/AM	sandy.ingleby@austmus.gov.au

Striped dolphin	1	0	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au
Striped dolphin (*1)	1	1	S. Ingleby/AM	sandy.ingleby@austmus.gov.au
Unknown species	2	0	G. Ross/DECCW	ross.geoff@environment.nsw.gov.au

Notes:

(*1) The Sperm Whale was reported to the AM by DECC central coast, the Stenella by Debbie Andrews DECC Hurstville and the Ginko toothed Beaked Whale by DECC Tweed area as part of a regular reporting network.

(*2) Animals are submitted from various organisations for post mortem examination. Post mortem examinations are occasionally carried on site by submitting organisation and the ARWH received only fixed tissue along with a written necropsy report from the submitter. Melon Headed and Humpback Whales described above were examined on site by veterinarians from the Pet Porpoise Pool, Coffs Harbour with assistance from staff from NSW DECCW. Samples were then sent by courier to ARWH for processing. Reports and samples are gathered opportunistically and in communication with the NSW DECCW. Any information to these cases can be obtained by contacting the Australian Registry of Wildlife Health (arwh@zoo.nsw.gov.au).

Northern Territory

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Australian snubfin dolphin	1	0 decomposed	R.Chatto/NRETAS	ray.chatto@nt.gov.au
Baleen whale unidentified	1	0 decomposed	R.Chatto/NRETAS	ray.chatto@nt.gov.au
Indo-Pacific humpback dolphin	2	0 decomposed	R.Chatto/NRETAS	ray.chatto@nt.gov.au

South Australia

A network for DEH SA, PIRSA and community members report to SAM, even when carcasses are not collected. The contact person for this data is C. Kemper, SAM.

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
<i>Balaenoptera</i> sp.	2	0	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Bottlenose dolphin	3	0	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Dolphin	8	0	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Humpback whale	2	1	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Indo-Pacific bottlenose dolphin	6	3	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Long-finned pilot whale	1	1	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Pygmy sperm whale	1	1	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Risso's dolphin	1	0 (skull only)	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Short-beaked common dolphin	13	10	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Southern right whale	1	0	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Sperm whale	3	0	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Straptooth whale	2	2	C. Kemper/SAM	catherine.kemper@samuseum.gov.au
Unknown species	2	0	C. Kemper/SAM	catherine.kemper@samuseum.gov.au

Tasmania

In Tasmania DPIPWE have a 24hr / 7days week marine mammal hotline number (0427WHALES) for the public to report strandings and sightings of cetaceans. Strandings are joint managed by the Tasmanian PWS (incident control and operational) and DPIPWE (specialist advice, animal management, rescue and research). The agencies are responsible for strandings throughout Tasmanian, covering 4,882 kms of coastline. For more information please contact Rosemary Gales, DPIPWE.

Species	No. Strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
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	(total animals)			
Bottlenose dolphin	6 (39)	25	R. Gales/DPIPWE	rosemary.gales@dpiipwe.tas.gov.au
Common dolphin	4 (7)	0	R. Gales/DPIPWE	rosemary.gales@dpiipwe.tas.gov.au
Pygmy right whale	2 (2)	0	R. Gales/DPIPWE	rosemary.gales@dpiipwe.tas.gov.au
Sperm whale	1 (1)	0	R. Gales/DPIPWE	rosemary.gales@dpiipwe.tas.gov.au
Unidentified dolphin Spp	2 (2)	0	R. Gales/DPIPWE	rosemary.gales@dpiipwe.tas.gov.au

9. OTHER STUDIES AND ANALYSES

Summary of cetacean permits current in 2010 (Mark Read / GBRMPA) A search of GBRMPA databases and files indicates that:

The maximum allowable number of 9 permits remains current (first issued in 2003) for tourist programs that include the swim-with-dwarf minke whale activity in the Ribbon Reef Sector and Offshore Port Douglas Sector of the Marine Park.

In 2010:

- The total number of dedicated tourism whale watching activities (which also includes dolphin watching but which rarely occurs) allowed to operate in the Great Barrier Reef Marine Park in 2010 was 44
- Five permits were current for the conduct of a research program involving whales or dolphins:
 - Genetic distinction and relative distribution of three spinner dolphins (*Stenella longirostris* spp.) morphotypes in Australian waters
 - Concentration of anthropogenic contaminants in Australian humpback and snubfin dolphins using samples collected in Central Queensland.
 - The study of dwarf minke whales (*Balaenoptera acutorostrata* subspecies) in the northern Great Barrier Reef and opportunistic observation of other cetacean species.
 - Conservation genetics of Queensland's inshore dolphins: snubfin, Indopacific humpback and bottlenose dolphins.
 - Photographic identification of Humpback whales (*Megaptera novaengliae*) in Queensland

Taxonomy of *Tursiops* spp. in Australia (Kemper, SA Museum, Michael Krutzen, Maria Jedensjo and associates)

An Australian Marine Mammal Centre grant application was received to study the taxonomy of bottlenose dolphins from around Australia. Maria Jedensjo is supervised by Michael Krutzen (University of Zurich) and Catherine Kemper. The project combines morphological and genetic characters, and will compare with type specimens for both *T. truncatus* and *T. aduncus*. Maria is at present collecting genetic samples and measuring skeletons at museums around Australia. She hopes to present to the Biennial Marine Mammal Conference in Tampa, Florida in December 2011.

Cause/circumstance of death of SA cetaceans (Kemper, Tomo SAM, Adelaide Mount Lofty NRM)

The Dolphin Trauma Group continues to study dead dolphins from Gulf St Vincent Bioregion and has been awarded funding as part of a Caring for Your Country grant to study marine debris in Gulf St Vincent. The project is nearing completion and will submit a final report in May 2011. Ikuko Tomo has summarised pathology information for all of the specimens collected in Gulf St Vincent and will present a paper to Wildlife Disease Association-Australian Section in September in SA.

Assessment of mortality of dolphins in North Spencer Gulf (Kemper, Tomo and Bossley)

An application has been submitted to IWC to study the impact of heavy metal pollution, disease and entanglement on dolphins in upper Spencer Gulf, South Australia. This will entail reviewing all the information available on the pathology of the carcasses already collected as well as collecting any new mortalities. The project aims to study heavy metal concentrations and linking these to bone and kidney disease. It will also attempt to determine if reproductive abnormalities are linked to heavy metal pollution.

Lung nematode epidemic in common dolphins (Tomo, Kemper SAM)

A publication is planned that will describe the pathological effects of lung nematodes on common and bottlenose dolphins in SA.

Investigating dolphin mortality in the South Australian Sardine Fishery (Hamer, Tomo, Kemper and Gibbs, SARDI)

No further progress has been made on this project except that more carcasses have been collected and studied.

National Centre for Aging Marine Mammals An international student (Mauro Talamonti, Istituto di Biologia e Genetica Università Politecnica delle Marche, Italy) spent 6 months at the Museum studying age and female sexual maturity in *T. aduncus* from South Australia. The total *T. aduncus* that have been aged now stands at about 130. Another Italian student will spend 6 months aging *T. aduncus* and *D. delphis* from North Spencer Gulf.

Reproductive maturity and abnormalities in male and female *T. aduncus* (Kemper, Tomo, Trentin, Talamonti)

Studies on sexual maturity in *T. aduncus* have revealed some unusual cases of reproductive regression and abnormalities. A method has been devised to detect regression in male dolphins even when the testes are autolysed. There is preliminary data to link disease (and possibly heavy metal pollution) and reproductive regression in males and this will be investigated further.

A publication is near submission on male reproductive maturity.

Oceanographic influences on the distribution of *Caperea marginata* (Kemper, Middleton and Van Ruth) A manuscript has been submitted on this project.

Oceanographic influences on cetacean strandings in South Australia (Segawa, Kemper, Seuront, Flinders University)

A publication is being prepared on this study.

South Australian cetacean sightings database (SAM) The South Australian Museum is the primary repository for cetacean sighting records in South Australia. The partnership with the South Australian Whale Centre at Victor Harbour is streamlining sightings reporting, including an on-line reporting system. This still requires SAM to verify and calculate localities for all records, a time-consuming process for which it receives no funding.

James Cook University (JCU) - 3 x PhD studies completed:

1. Dwarf minke whale population biology

A PhD study by Ms. S. Soltzick (submitted 2010; supervised by Dr Alastair Birtles & Prof Helene Marsh, JCU) investigated dwarf minke whale population structure, site fidelity and social structure in the northern GBR using photo-identification and underwater videogrammetry.

2. Dwarf minke whale behaviour

A PhD study by Dr. A. Mangott (2010; supervised by Dr Alastair Birtles, Prof Helene Marsh, JCU and A/Prof Peter Valentine Associate) investigated behaviours of dwarf minke whale associated with human interactions in the northern GBR.

3. Whalewatching: sustainable management of swim-with-dwarf minke whales tourism

A PhD study by Mr. M. Curnock (submitted 2010; supervised by Dr Alastair Birtles & A/Prof Peter Valentine) investigated mechanisms for assessing the sustainability of the swim-with-dwarf minke whales tourism industry in the northern GBR.

Department of Environment and Conservation (DEC-WA) Licensed commercial whale watching in Western Australia (for southern right and humpback whales) for the 2010 season involved 124 licensed vessels. Data collected from whale watching operators regarding the number of passengers and whales seen during the 2010 season are still being analysed. Commercial dolphin watching licences were also issued during 2010 with a total of 101 for the year.

Murdoch University Cetacean Research Unit (MUCRU) The project is designed to test the following hypothesis:

Unmanned Aerial Vehicles (UAVs) can replace manned aircraft to conduct aerial surveys for marine mammals.

The major objective is to determine whether UAV systems can improve aerial survey methods by: (1) eliminating human risk, (2) increasing accuracy of detection, location and identification of species, (3) providing a permanent record of the survey, (4) reducing cost, and (5) enabling surveys in remote regions where manned surveys are the most logistically challenging. To achieve this objective, we are:

1. Trialling a suite of imaging systems to determine the most effective and efficient system for detecting and identifying marine mammals, with a focus on dugongs and humpback whales.

2. Based on the most effective imaging systems, developing methodology for surveying dugong and humpback whales to determine distribution and abundance using a UAV, including real-time or post flight animal detection methods.
3. Directly comparing the results from traditional manned and UAV surveys of dugongs and humpback whales to test the efficacy of UAV surveys.

The first trial flights have been conducted in Shark Bay, where the target species was dugongs and the imaging system payload was a digital SLR camera. The results showed that dugongs (and many other marine fauna) could be successfully identified in the images. The data from these flights are currently being analysed to determine the effects of altitude and environmental conditions on detect ability of the dugongs within the images. The next trial will target humpback whales.

University of New South Wales (UNSW): carries on genetic studies on samples collected by Bejder (Bunbury WA) and Krutzen (Shark Bay WA) – publications shown below from Sherwin’s past PhD student C Frere (East Shark Bay WA). There are two current students, A Kopps (West Shark Bay WA) and C Daniel (Bunbury WA).

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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	
Shore operated stationary lift nets	LNS		MIS
Lift nets (not specified)	LN	RECREATIONAL FISHING GEAR	
			RG
		GEAR NOT KNOWN OR NOT SPECIFIED	
			NK
		SHARK CONTROL NETS	
			NSC
		DERELICT FISHING GEAR	