

AUSTRALIA. PROGRESS REPORT ON CETACEAN RESEARCH, JANUARY 1999 TO DECEMBER 1999, WITH STATISTICAL DATA FOR THE CALENDAR YEAR 1999

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Note abbreviations used for Australian States/Territories throughout the report: Australian Capital Territory (ACT), New South Wales (NSW), Northern Territory (NT), Queensland (QLD), South Australia (SA), Tasmania (TAS), Victoria (VIC), Western Australia (WA).

This report summarises information obtained from:

University of Sydney NSW - Australian Marine Mammal Research Centre; The Oceania Project QLD/NSW; Australian Whale Conservation Society QLD; James Cook University, QLD - Dept Tourism & Dept of Tropical Environmental Sciences and Geography (TESAG); Museum of Tropical Queensland; University of Queensland - Centre for Conservation Biology; Great Barrier Reef Marine Park Authority (GBRMPA) QLD; Queensland Museum; Dr Robert Patterson QLD; Pacific Whale Foundation QLD; Queensland Parks and Wildlife Service; Sea World QLD; Great Barrier Reef Marine Park Authority (GBRMPA) QLD; NSW National Parks and Wildlife Service (NSW NPWS), NSW Fisheries, Taronga Zoo NSW, The Australian Museum NSW, University of Sydney NSW, Macquarie University NSW, University of NSW, The Organisation for the Rescue and Research of Cetaceans in Australia (ORRCA) NSW; Cape Byron Whale Research Project NSW; Australian Dolphin Research Foundation SA; Eubalaena Pty Ltd SA; Dolphin Research Institute VIC; Dept Natural Resources and Environment VIC; University of Tasmania TAS; Australian Fisheries Management Authority ACT; Australian Antarctic Division TAS; RMIT University - Dept of Applied Biology and Biotechnology VIC; Dept Conservation and Land Management (CALM) WA; Centre for Whale Research WA; Western Australian Museum WA; Deakin University - Rusden VIC; Deakin University - Warrnambool VIC; Curtin University - Centre for Marine Science and Technology, WA; Southern Ocean Cetacean Environment Program - Marequus Pty Ltd; Parks and Wildlife Commission Northern Territory NT.

No information was supplied by Dept Environment and Heritage SA; Dept Primary Industries, Water and the Environment TAS

1. Species and stocks studied

Common name	Scientific name	Area/stock(s)	Items referred to
MYSTICETI			
Southern right whale	<i>Eubalaena australis</i>	Australia Southern coastline Southern coastline WA	2.12, 11.1 2.1.1, 2.1.2; 2.2; 3.1.1, 3.2, 9, 11.1, 11.2 2.1.1., 3.1.1
Humpback whale	<i>Megaptera novaeangliae</i>	QLD / Group V Byron Bay NSW / Group V WA Group IV Shark Bay WA Group IV Off Perth WA Group IV	2.1, 2.1.1, 2.2, 3.1.1, 3.2, 4.3, 5, 6.2, 8, 11.1, 11.2 2.1.1, 2.1.2, 3.1.1, 4.1, 8 2.1.1; 2.2; 3.1.1 2.1.1., 3.1.1 2.1.1, 2.2, 8
Minke whale	<i>Balaenoptera acutorostrata</i>	QLD Coast NSW Southern Ocean WA	2.1.1, 4.3, 8 6.2 4.4 8
Dwarf minke whale	<i>Balaenoptera acutorostrata sensu lato</i>	Northern Great Barrier Reef QLD	2.1.2, 3.1.1, 3.2, 9, 11.1, 11.2
Bryde's whale	<i>Balaenoptera edeni</i>	NSW	8
Blue whale	<i>Balaenoptera musculus</i>	Perth and C. Naturaliste WA Western Vic/SE South Aust	2.1.1., 3.1.1 2.1.1; 2.1.2; 3.1.1; 4.1; 4.3; 8; 9
unidentified whale		QLD Coast	2.1.1, 6.2, 8
ODONTOCETI			
Sperm whale	<i>Physeter macrocephalus</i>	QLD Coast Sth Hemisphere- Indian Ocean/ Southern Ocean/Tasman Sea WA	2.1.1, 8 4.4 8
Pygmy sperm whale	<i>Kogia breviceps</i>	NSW Southern Ocean	8 4.4
Dwarf sperm whale	<i>Kogia simus</i>	WA	8
Gray's beaked whale	<i>Mesoplodon grayi</i>	NSW WA	8 4.1, 8
Hector's beaked whale	<i>Mesoplodon hectori</i>	Southern Ocean WA	4.4 4.1
Rough-toothed dolphin	<i>Steno bredanensis</i>	QLD Coast	2.1.1, 4.3, 8
Indo-Pacific humpback dolphin	<i>Sousa chinensis</i>	QLD coastal	2.1.1, 3.1.1, 4.3, 7.1, 8, 10
Bottlenose dolphin	<i>Tursiops truncatus</i>	QLD Coast Jervis Bay & Port Stephens NSW Adelaide coastline SA Southern Port Phillip Bay VIC Port Phillip Bay VIC Southern Tasmania TAS WA	2.1.1, 4.3, 7.1, 8, 10, 11.1 2.1.1, 2.1.2, 3.1.1, 4.1, 4.3, 7.1, 8 2.1.1, 2.1.2, 3.1.1, 5, 9 2.1.1, 2.1.2., 3.1.1, 3.2, 8 2.1.1 4.4 4.1, 4.3, 5, 7.1, 8, 9
Indian Ocean bottle-nose dolphin	<i>Tursiops aduncus</i>	QLD Coastal	3.1.1, 11.1

Pantropical spotted dolphin	<i>Stenella attenuata</i>	QLD Coastal	4.3
Spinner dolphin	<i>Stenella longirostris</i>	QLD Coast	2.1.1, 4.3, 7.1, 8
Striped dolphin	<i>Stenella caeruleoalba</i>	QLD Coast WA	2.1.1, 4.3, 8 8
Common dolphin	<i>Delphinus delphis</i>	QLD Coast NSW Gulf St Vincent, SA Southern Tasmania	2.1.1, 4.3, 7.1, 8 2.1.1, 2.1.2, 7.1 2.1.2, 9 4.4
Southern right whale dolphin	<i>Lissodelphis peronii</i>	Southern Ocean	4.4
Risso's dolphin	<i>Grampus griseus</i>	QLD Coast NSW	2.1.1, 8 2.1.2, 8
Melon-headed whale	<i>Peponocephala electra</i>	QLD Coast	2.1.1, 4.3, 8
Pygmy killer whale	<i>Feresa attenuata</i>	NSW WA	2.1.2, 8 8
Killer whale	<i>Orcinus orca</i>	NSW Southern Ocean WA	2.1.2 4.4 2.1, 9
Long-finned pilot whale	<i>Globicephala melas</i>	NSW Southern Ocean	2.1.2 2.1.2, 3.1.1, 4.4
Irrawaddy dolphin	<i>Orcaella brevirostris</i>	QLD Coastal	2.1.1, 3.1.1, 4.3, 8, 9, 10, 11.1
unidentified dolphin sp.		QLD Coast	2.1.1, 7.1, 8
Spectacled porpoise	<i>Phocoena dioptrica</i>	Southern Ocean	4.4

2. Sightings data

2.1 Field work

2.1.1 SYSTEMATIC

Southern right whale

Eubalaena Pty Ltd: Head of Bight survey SA

Shore-based surveys were again conducted at the Head of the Bight, South Australia. On 33 days between July and October 1999, daily surveys of the number, position and reproductive status (cow with calf, unaccompanied adult) of right whales were made within the aggregation area. Maximum daily numbers ranged from 13 – 79 individuals and a minimum of 22 calves were born at the site in 1999. Southern right whale sightings data were analysed against data from previous years. Identification photographs for southern right whales at the Head of Bight SA were matched against the catalogue, further analyses are pending.

Western Australian Museum: Aerial surveys off the southern Australian coast WA/SA

Surveys involved flights close inshore between C Leeuwin, WA, and Ceduna, SA, where the majority of the 'Australian' population seems to approach the coast in winter/spring: cows about to give birth at an average of three years, others appearing less predictably. Two 'short' flights, on 29-31 July and 5-8 October, between C Leeuwin and Twilight Cove, WA, maintained a series of flights on the southern WA coast since 1976. A 'long' flight, on 31 August-6 September between C Leeuwin, WA and Ceduna, SA continued a series extended along the South Australian coast from 1993. On all flights, counts and identifying photographs were obtained, but with an emphasis on the latter on the 'short' flights and on the former on the 'long' flight. Usual concentrations, mainly but not exclusively, of cows accompanied by calves of the year, were encountered at Doubtful I Bay, in and east of Israelite Bay (WA), and at Head of the Bight (SA). There were again few sightings west of Albany, but concentrations of 'unaccompanied' animals (adults unaccompanied by calves, often interacting) were found at Yokinup Bay, and west of Twilight Cove (WA), as well as to the west of Head of the Bight (SA). Numbers recorded were fewer than in 1998 (itself a record year) but greater than in any other years, with a comparable total on the 'long' flight (C Leeuwin WA-Ceduna SA) of 262 animals, including 80 calves. Significant positive increase rates continue to be obtained for a number of combinations of time series, animal classes and subareas. For the area as a whole (extended in 1993 to obviate possible effects of coastwise movement) an increase rate was obtained, for 'all animals', of 7.82%, but it is not significant at the 5% level ($p=0.0844$). It excludes data for 1996 and 1997, where there may have been some undercounting. Including those two years gives a rate of 9.60% (95% CI 2.20-16.99, $p=0.0206$); both time series are still somewhat small (5-7 years).

Humpback whale

University of Sydney - Australian Marine Mammal Research Centre: Acoustics study QLD

Two weeks of song collection at Pt Lookout, North Stradbroke Island QLD, yielded approximately 60 hours of recordings. Methodology included the use of a hydrophone buoy anchored off-shore, radio-linked to a recording station on shore. This data collection was part of a long term study into the use of song by humpback whales and has not yet been fully analysed.

Oceania Research Project: Surveys in Hervey Bay QLD

Fieldwork conducted in the Hervey Bay Whale Management & Monitoring Area for a long term study of abundance, distribution and behaviour of the species in Hervey Bay. Effort involved 12 weeks of fieldwork, 72 working days during August 8th to October 15th 1999. Survey was conducted from a 15 metre vessel, 6 days each week 7am to 5pm Sunday to Thursday and 7am to 1pm Friday. There were 925 Humpback sightings and 4896 photographs were obtained, 26.7 hours of video and 2 hours of DAT whale song recordings. Systematic observation of pods including numbers, composition & behaviour. Photography of ventral flukes, lateral body colouration patterns and left and right dorsals were obtained as well as video of behaviour and samples of whale song. Documentation includes GPS positions, time, date, behaviour and observation notes. The project is being undertaken in collaboration with the Queensland Environment Protection Agency (See 11.2 for report details).

Analysis of photography has been completed for 1998 and analysis for 1994/95/96/97/99 is in progress. Analysis includes identification of resights within and between season and review of pod composition. Development of a web based fluke catalogue is in process. A data set for the period 1996/2001 is being prepared for mark/recapture estimates of abundance.

A summary of photography for the period 1994/1999:

Year	No. whales sighted	No. photographs obtained
1994	307	1293
1995	345	1015
1996	371	3456
1997	672	5148
1998	919	5220
1999	925	4896

Dr Robert Patterson: Stock recovery study QLD

Continued long-term study of the recovering stock of humpback whales in east Australia from Point Lookout, North Stradbroke Island. The survey period (1st June - 9th November) covered the northern and southern migrations. Unseasonal winter rain (250mm between 24th June - 14th July) at the peak of the northern migration caused some disruption. The rate of increase in this stock between 1984-1999, calculated on the average number of whales seen per 10 hours in the four weeks of the peak in the northern migration, was estimated at 11.3% (95% CI ± 0.8%). The northbound population in 1999 was estimated to be 3670 (95% CI ± 500) as compared with 1896 (95% CI ± 253) in 1992, this is an increase of >90% in seven years.

James Cook University - Dept of Tropical Environmental Sciences and Geography (TESAG): Assessment of whale-watch vessel operation and humpback whale responses: management implications QLD

This study is in the second of three years and is being undertaken in collaboration with QPWS. The project aims to test whether existing approach distance conditions for whale-watching vessels are an effective regulatory tool. A comparison of whale-watching operations targeting humpback whales in Queensland and New South Wales will be undertaken. A total of 107 humpbacks were recorded from 53 sightings in 1999.

Cape Byron Whale Research Project: Humpback distribution and photo-identification NSW

The project commenced in 1995 and involves positioning and tracking of humpback whales as they migrate past the NSW coast; vessel transects from Cape Byron to the continental shelf to determine humpback whale distribution; and photo-identification to identify individual animals using fluke and lateral body colouration and markings. The project is a collaborative effort between the NSW NPWS, Southern Cross University and Newcastle University. A total of 417 humpbacks were sighted in 1999.

Pacific Whale Foundation: photo-identification Whitsunday Islands and Hervey Bay QLD

Part of a long term study being undertaken in collaboration with QPWS. The surveys conducted in 1999 consisted of small boat effort to collect photographs of ventral fluke and lateral body colouration patterns of humpback whales. The location (determined by GPS), size and composition, date and time of observation, general activity and sea surface temperature of each group observed were documented. Research was conducted in the Whitsunday Islands during the period June 20 - August 3 and in Hervey Bay during August 11 - October 10.

Summary Tables of Sightings

Whitsunday Islands 20/6/99 to 3/8/99

Hervey Bay 11/8/99 to 10/10/99

	No of pods	No of whales	Hours with whales	Hours on water	Mean % time with whales		No of pods	No of whales	Hours with whales	Hours on water	Mean % time with whales
TOTAL	68	142	42.80	170.50	25.10	TOTAL	209	432	119.07	277.21	42.95

Pacific Whale Foundation: Habitat Use Patterns of Humpback whales near Eden NSW

The project commenced in 1996 and involves studying individual humpback whales using photographic identification; assessing degree of interchange between Eden and other areas of known northern aggregations along the east coast; and determining susceptibility of identified whales to human impacts.

New South Wales National Parks and Wildlife Service: Cape Solander Survey NSW
A land-based sightings survey of humpback whales on the northern migration.

Centre for Whale Research: Behavioural and photo-identification study of Group IV humpback whales WA
The 10th consecutive season studying the Southern Hemisphere Group IV population was based at Rottnest Island (S 32°) west of Perth, Western Australia. Both behavioural and photo-id data were collected of southward migrating whales. Abundance and effort data is summarised below.

Date	Adults	Subadults	Calves	Total	Hours	Linear nautical miles surveyed
September (23-30)	31	2	0	33	30.45	145.5
October (01-31)	154	8	6	168	126.63	594.4
November (01-19)	32	0	2	34	27.65	159.8
Totals	217	10	8	235	184.73	899.7

Western Australian Museum: Aerial survey Shark Bay WA

An aerial survey to cover the major part of the northern migration of the Southern Hemisphere Group IV population migrating past Shark Bay, WA was undertaken over a two-month period, 21 June-20 August 1999. The survey grid and flying regime were kept as close as possible to that in earlier surveys, from 1982. To provide data for absolute population numbers, two observers, taking angles and bearings to sightings, were employed in 1999, in contrast to the single pilot/observer assisted by an observer/recorder of earlier years. Unusually poor weather conditions in 1999 resulted in only 15 completed flights in place of the planned 30. The planned population size estimate has yet to be undertaken, but unvalidated results indicate a majority of animals moving north, particularly in the earlier part of the period. A major change to southbound animals was only evident towards the end of the survey. Although the 1999 results cannot be compared directly to those earlier, substantial numbers of animals were sighted, and it seems likely that the population increase observed over the period 1982-1994 has continued. From the distribution of sightings, and extension of flying legs seaward, very few animals migrating past the Bay would not have passed within the survey area. Flight legs designed to examine the distribution of animals within the Bay, which may be a staging post for migrating humpbacks, showed a rather less concentrated distribution within the northern part of the Bay than demonstrated earlier, and a somewhat lower proportion of animals there in 1999 (27.3% during the comparable period in mid-July) than in 1994 (39.7%).

Dept Conservation and Land Management: Aerial survey off Perth WA

Dr Nick Gales and D. Coughran conducted a preliminary aerial survey of Humpback whales in waters off the Perth metropolitan area during the commercial whale watching season (Oct.-Dec.). No report has been prepared yet.

Dept Conservation and Land Management: Photo-identification study of Group IV humpback whales WA

Photo ID of humpback whales off the Perth coast during commercial whale watch season by C. Burton (report pending) and staff from Dept. CALM. Data supplied to Dr J. Bannister (WA Museum).

Dwarf minke whale

James Cook University - Dept of Tourism, and Museum of Tropical Queensland: QLD

Field observations were carried out on *Undersea Explorer*, a 25 m tourist dive vessel, from June 20-July 23, 1999. Cruise tracks were influenced both by presence of whales and the availability of moorings at recognised dive sites on outer reefs between Port Douglas and Lizard Island. Committed search time totalled 283 hours, with 55% searching in open water over the continental shelf and 45% searching while moored at a reef. There were 41 primary encounters, 28 in open water; 13 on the reef. During extended encounters, surface and underwater visual observations and acoustic recording using a hydrophone array were routinely made.

In 1999, 24/28 open water and 10/13 reef encounters were initiated by voluntary approaches of the whales. As in previous seasons, open water encounters were longer (mean encounter length 2.1 hr) than reef encounters. In 16/28 cases the open water encounters were broken off by the vessel. During extended open water encounters, whales remained as the vessel drifted (with engine in neutral) for a mean distance of 8.9km. As in past seasons, mean group size in open water encounters was more than double that of reef encounters. Maximum group size in open water was at least 25 animals; analysis of video and underwater photographs continues and mean group size will likely increase.

Blue whale

Western Australian Museum: Aerial surveys off Rottnest Island WA

A series of twelve once-monthly survey flights for blue whales was planned from January 1999, in an area *ca* 20nm west of Rottnest I, Western Australia (the 'Rottnest Trench' area) where up to five blue whales per day were sighted on a joint Japan/International Whaling Commission sightings cruise in December 1995. Only eight flights could be completed in the 14 months Jan. 1999-Feb. 2000. No flights were possible in May-September, or Dec. 1999. Sixteen blue whales, including 4 'probable' blues, and 25 humpback whales were sighted during the period, but only one blue whale in Feb-May 1999; however, a total of 15 animals (including the 4 'probables') was recorded on two flights in February 2000. Following the poor result in early 1999, the flight path was altered from October to concentrate more closely on the area of the 1995 sightings. With the small number of sightings, no conclusions can yet be made on seasonal distribution or abundance, but continuation of the programme at least through winter 1999, weather and other variables permitting, may give more positive results.

Deakin University - Warrnambool: Blue whale study VIC/SA

Aerial surveys have been conducted weekly when possible, since mid-December 1999. Additionally, a yacht-based survey was conducted in February 2000, and fishermen have reported sightings as part of a voluntary sightings network. In total, there have been approximately 120 sightings of blue whales in the Blue Whale Study Area between mid-December and mid-May 2000, with feeding being noted in ~35% of sightings. Net sampling showed that the prey was the coastal krill *Nyctiphanes australis*. The research is summarised in Paper SC/52/OS9 to be presented to the IWC Scientific Committee in Adelaide.

Bottlenose dolphin

Macquarie University and NSW NPWS: Vessel Impacts on cetaceans NSW

Commenced in 1999, the project involves collecting baseline scientific data on cetaceans in and around Port Stephens; assessing the impacts of both commercial and recreational vessels on cetaceans in and around Port Stephens; and photo-identification to identify individual animals using fluke and lateral body colouration and markings. A total of 137 animals were recorded in 20 sightings in 1999.

Macquarie University - Marine Mammal Research Group: Social structure and dynamics of bottlenose dolphins, Jervis Bay and Port Stephens NSW

This project commenced in 1997. It involves investigating bottlenose dolphin group size, composition and stability in relation to behaviour, kinship and gender; assessing genetic relatedness within same-sex individuals and between sexes; investigating individual site fidelity and habitat use; and comparing the social behaviour of bottlenose dolphins between Jervis Bay and Port Stephens, and identifying possible ecological and social factors explaining for differences and similarities observed. A total of 490 dolphins were recorded in 14 sightings in 1999.

University of NSW: Kinship and alliance formation in male dolphins WA

Commenced in 1997, the 1999 field site was located in WA. The project involves taking small tissue samples from wild dolphins to investigate family relationships and genetic relatedness between different social groups and areas.

Australian Dolphin Research Foundation: Photo-identification and allied study SA

Approximately one hundred boat based surveys undertaken per year since 1989 in Adelaide area doing photo-identification of *T. truncatus*. Research also examines social relationships; habitat use; home ranges; and toxin loads.

Dolphin Research Institute: Population surveys and photo-identification, southern Port Phillip Bay VIC

Surveys were conducted from January to December 1999. The survey area was doubled during 1999. Dorsal fin photographs were collected for use in photo-identification of individuals, and observations continued for an investigation into the impacts of dolphin swim tours. Shore based observations, primarily of dolphin movements and behaviours were also collected. Fifty-one shore-based surveys, 32 surveys from the Institute's vessel and 70 surveys from tour operator platforms were conducted, resulting in approximately 700 field hours and 157 dolphin sightings for 1999. A sighting of an adult minke whale with a group of bottlenose dolphins was made in December in the southern part of Port Phillip Bay.

Deakin University - Rusden: Behaviour of bottlenose dolphins, Port Phillip Bay VIC

Sightings were made from 3 shore sites along the southern coast of Port Phillip Bay between Sorrento and Port Phillip Heads, observing bottlenose dolphins up to 500 metres offshore using binoculars (16x50 magnification). Details recorded included numbers of animals (and calves), direction of movement, and behaviour. Environmental information was also gathered, including prevailing wind direction and strength. Sightings were conducted between either 7am and 1pm or 1pm and 7pm. Unlike the earlier sightings, observations conducted in November and

December were timed with the tide, starting at the turn of tide (either Low or High tide) and lasting for half a tidal cycle, ending at the turn of tide (either High or Low tide). Data are currently being analysed. A summary of sightings is given below.

Research period	Research Days	Sightings	No. of dolphins ^{*1}	No. of Calves ^{*2}
Jan - end of April 1999	37	38	323	17
Nov - Dec 1999	18	13	31	1

*1 The largest number of dolphins seen in one sighting was 20. However, while anecdotal information suggests that a number of the animals sighted were the same animals seen a number of times, it cannot be determined whether animals seen were the same or different animals.

*2 The largest number of calves seen in one sighting was 4 (with anecdotal evidence of 6 calves in one large group sighted), but it cannot be determined if the calves sighted at other times were the same or different animals.

Killer whale

J. Tilbury: Killer whale survey WA

A shore-based survey of Killer whale distribution was conducted along the WA coastline. No report received yet.

Southern Ocean Cetacean Environment Program - Marequis Pty Ltd

Cetacean sightings were conducted on three voyages to the Southern Ocean in calendar year 1999: 1) January-March; 2) July-September; 3) November-December. Summary sightings data are given below.

Species:	Voyage 1	Voyage 2	Voyage 3
Minke whale	128	4	112
Fin whale			1
Sperm whale	6	1	9
Humpback whale	74		19
Southern right whale	5		
Blue whale			3
Killer whale	61	5	131
Long-finned pilot whale		15	10
Ziphiid sp.		1	
Unidentified whale	31	1	6
Unidentified dolphin	7	4	
Unidentified small whale	1		
Unidentified large baleen whale	6		3
Unidentified large whale	12		
Unidentified cetacean			4
Unidentified small cetacean			4
Like killer whale	3		1
Like humpback	15		2
Like minke	16	10	2
Probable minke			1
Undetermined blue whale	3		
Total no. of animals	177	41	321
Total no. of sightings	54	13	126

2.1.2 OPPORTUNISTIC, PLATFORMS OF OPPORTUNITY

NPWS Atlas of NSW Wildlife: Opportunistic sightings reported during 1999

Common Name	Scientific Name	Number of sightings	Total no. of animals
Southern right whale	<i>Eubalaena australis</i>	4 +	9
Humpback whale	<i>Megaptera novaeangliae</i>	14 +	577+
Long-finned pilot whale	<i>Globicephala melas</i>	1	100
Killer whale	<i>Orcinus orca</i>	7	28
Pygmy killer whale	<i>Feresa attenuata</i>	1	1
Bryde's whale	<i>Balaenoptera acutorostrata</i>	?	3
Common dolphin	<i>Delphinus delphis</i>	5 +	133 +
Bottlenose dolphin	<i>Tursiops truncatus</i>	17	191
Risso's dolphin	<i>Grampus griseus</i>	1	1

James Cook University - Dept of Tropical Environmental Sciences and Geography (TESAG): Wildlife aerial surveys QLD

Incidental cetacean sighting data of bottlenose and Indo-Pacific humpback dolphins were collected during aerial strip transect surveys of dugongs in Queensland coastal waters. Irrawaddy dolphins were not sighted. Waters from Innisfail in the north to Moreton Bay in the south were surveyed in October-December 1999. Data are yet to be analysed.

Eubalaena Pty Ltd SA

Records were kept of opportunistic sightings (from a variety of sources) of right whales made in New South Wales, Victoria and Tasmania, and opportunistic observations of behaviour were made at the Head of the Bight SA.

Australian Dolphin Research Foundation: Dolphin surveys SA

Approximately two surveys per year undertaken in Gulf St Vincent recording distribution of *Tursiops truncatus* and *Delphinus delphis*. Unpublished paper with Dr Cath Kemper of SA Museum presented to Australian Mammal Society conference 1999.

Australian Whale Conservation Society: Dolphin feeding in Tin Can Bay QLD

Ad hoc monitoring of dolphin feeding activities at Tin Can Bay, south-east Queensland was undertaken. No formal report or analysis has been produced.

Dolphin Research Institute: Community sightings network VIC

The Institute continued building its community dolphin sighting network resulting in approximately 160 sightings of cetaceans being reported throughout the year within Port Phillip Bay and the adjacent Westernport Bay. In addition to bottlenose dolphins, other species of cetacean including common dolphins (*Delphinus delphis*) and southern right whales (*Eubalaena australis*) were recorded by network participants.

Australian Fisheries Management Authority ACT: Fisheries observers sightings from commercial fishing vessels 1999

Species	Date	Location	Number	Fishing vessel type	Interaction with fishing gear	Comments
Humpback whale	29/5/99	29° 59'S 88° 22'E	1	Trawler	No	
Killer whales	29/6/99	52° 14'S 74° 51'E	6	Trawler	No	1 bull, and 2 calves in the pod
Humpback whale	21/3/99	52° 55'S 74° 37'E	3 - 4	Trawler	No	No calves seen
Fin or Sei whale	11/12/99	38° 53'S 47° 26'E	3	Trawler	No	No calves seen
Killer whale	20/4/99	52° 55'S 74 34'E	1	Trawler	No	Female killer whale~5 to 6 m long playing 'cat and mouse' with a fur-seal around the vessel for approx 5 minutes

In 1998 AFMA observers covered:

- All cruises to the Macquarie Island Fishery and the Heard Island and McDonald Islands Fishery;
- Tuna longline activity undertaken in the Cocos Island Tuna Fishery;
- Trawl activity for blue grenadier off the west coast of Tasmania;
- High seas trawling undertaken by Australian vessels in the Indian Ocean; and
- Two trawl/dropline cruises to the Norfolk Island Fishery.

No interactions between cetaceans and the fishing vessels and/or fishing gears were observed on these cruises.

University of Tasmania: Killer whale sightings Southern Ocean

Opportunistic killer whale sightings by ANARE expeditioners at Macquarie Island recorded for the period January 1998 to December 1999 were 53, from a total of 397 recorded since 1989. These records are kept in the Southern Oceans Orca Database, coordinated by M. Morrice, University of Tasmania, and managed through the Australian Antarctic Data Centre. Other data on this database include killer whale sightings for other parts of the Southern Ocean and Australian waters. These are being provided by ANARE Expeditioners, other Australian researchers, Dr Christophe Guinet (for the Crozet Archipelago), Dr Marthan Bester (for Marion Island), and longline fishers off south and south eastern Tasmania.

Environment Australia ACT: Observers aboard Australian Customs Vessels

One voyage was undertaken using an ACV Bay class vessel as a platform of opportunity during 1999.

From 4-14 September 1999 two cetacean observers (M Fry, G Larmour) carried out observations of cetaceans between Fremantle WA and Sydney NSW. Sightings included 2 pods of sperm whales, 4 pods of humpbacks, 23 pods of common dolphin, 2 pods of bottlenose dolphin, 1 pilot whale sp., 2 unidentified dolphin and 2 unidentified whales.

Additional voyages have been made in 2000 that will be reported next year.

2.2 Analyses/development of techniques

University of Sydney - Australian Marine Mammal Research Centre: Humpback acoustic study QLD

Continued refinement of techniques for tracking humpback whales acoustically using a three element array (data collected in 1997).

Cape Byron Whale Research Project: Humpback distribution and photo-identification NSW
 Staff and students of Newcastle University have been working with the Cape Byron Whale Research Project to develop computer software, 'Cyclops', for real time tracking of whales using a computer interfaced with a theodolite. Once a pod is sighted the instrument is pointed to the pod, the horizontal and vertical angles are then directly sent to the computer. 'Cyclops' then calculates the position of the pod correcting for tides, earth curvature and refraction. The program determines which pod was observed and plots its position on a map shown on the computer screen, as well as the pods makeup, activity, speed, course, distance, direction and time of observation. The program also allows for factors such as weather conditions and visibility to be input. David Paton and Eric Kniest will be presenting a paper on this at the Humpback 2000 conference in Brisbane.

Centre for Whale Research (CWR): Behavioural and photo-identification study of Group IV humpback whales WA
 CWR has digitised and graded the 4050 images in its portion of the Western Australian Photo-Identification Catalogue. A new computer assisted matching programme based on the NMML/ College of the Atlantic system (Mizroch et al. 1990) has been developed using CD-ROM as the storage media. Black and white negative images are scanned and saved as both high resolution (2700 dpi FPX format) and low resolution (72 dpi JPEG format) computer files. Matching within the CWR catalogue and then between holdings at the Western Australian Museum will begin in 06/2000. Copies of the programme will be made available to other research groups, free of charge, upon application. A paper describing the temporal and geographic movements of Group IV humpback whales along the WA coast is being currently in production with a "preliminary" version available as of 05/2000. This work has been funded through grants to CWR from Environment Australia and Woodside Energy.

3. Marking data

3.1 Field work

3.1.1 NATURAL MARKING DATA

Species	Feature	Area/Stock	Calendar year/season/no. photographed	Catalogued (Y/N)	Catalogue total	Contact person / institute
Humpback whale	fluke	Hervey Bay QLD / Group V	1999/winter/925	N	in development	Oceania Project QLD
Humpback whale	left and right dorsal	Hervey Bay QLD / Group V	1999/winter/925	N	in development	Oceania Project QLD
Humpback whale	lateral body markings	Hervey Bay QLD / Group V	1999/winter/925	N	in development	Oceania Project QLD
Humpback whale	a) fluke b) lateral body patterns	Whitsunday Islands QLD / Group V	a) 81 b) 23	Y	1800 (Group V)	Pacific Whale Foundation QLD
Humpback whale	a) fluke b) lateral body patterns	Hervey Bay QLD / Group V	a) 218 b) 76	Y	1800 (Group V)	Pacific Whale Foundation QLD
Humpback whale		Eden NSW / Group V		Y	1800 (Group V)	Pacific Whale Foundation QLD
Humpback whale	Fluke	Byron Bay NSW / Group V		N		David Paton NSW
Humpback whale	Fluke	WA Group IV	100	N	1345	Centre for Whale Research WA
Humpback whale	Lateral body	WA Group IV	109	N	3024	Centre for Whale Research WA
Humpback whale	Sex Id	WA Group IV	5	N	21	Centre for Whale Research WA
Humpback whale	Fluke	Shark Bay WA Group IV	9	N	ca300	Western Australian Museum WA
Southern right whale	Callosity	Southern Australia	78	Y	455	S. Burnell/Eubalaena Pty. Ltd SA
Southern right whale	Head callosity	Southern Australia	134	N	ca600	Western Australian Museum WA
Blue whale	Lateral body	Off Cape Naturaliste WA	3-4	N	-	Western Australian Museum WA
Blue whale	Flanks	Western Victoria	99/2000; ~10	N	ca15	P Gill Deakin University VIC
Dwarf minke whale	body scar and colour patterns (still under development)	Northern Great Barrier Reef QLD	-	Y	-	James Cook University Dept Tourism / Museum of Tropical Queensland QLD

Indo-Pacific humpback dolphin	dorsal surface	Qld coastal	not yet known	In part	40	James Cook University – TESAG QLD
Indian Ocean bottlenose dolphin	dorsal surface	Moreton Bay Marine Park QLD	lots	Y	>500	James Cook University – TESAG QLD
Bottlenose dolphin	Dorsal fin	a) Jervis Bay b) Pt Stephens NSW	a) 119 b) 137	Y	256	Macquarie Uni. Marine Mammal Research Group NSW
Bottlenose dolphin	Dorsal fin	Adelaide SA	not yet known	Y	273	Aust. Dolphin Research Foundation SA
Bottlenose dolphin	Dorsal fin	Port Phillip Bay VIC	2000	Y	~60	Dolphin Research Institute VIC
Killer whale*	Left & right dorsal, lateral markings	Macquarie Island, Southern Ocean	3	Y	13	University of Tasmania/M.Morrice
Irrawaddy dolphin	dorsal surface	Qld coastal	not yet known	In part	~ 35	James Cook University – TESAG QLD

*Further killer whale photographic images are being collected and added to the *Southern Ocean Orca Database* from the Australian Antarctic Division Photo Library, ANARE Expeditioners, longline fishers off Tasmania, other Australian researchers, Dr Christophe Guinet (for the Crozet Archipelago) and Dr Marthan Bester (for Marion Island). It is planned to compare photo-ID images, along with sighting and behavioural data from the different areas of the Southern Ocean to help delineate stocks. Photos are also being collected of seals with killer whale or shark bites.

Southern Ocean Cetacean Environment Program photo-identification shots of various species taken in the Southern Ocean have been supplied to catalogue holders for incorporation and comparison.

3.1.2. ARTIFICIAL MARKING DATA

Species	Area/stock	Calendar year/season No. collected	Archived (Y/N)	Tissue Types	Contact person/institute
Common dolphin	Gold Coast QLD	12/99 (1)	Y freeze branded as Q5	Skin	J Haines / QPWS or Sea World QLD

3.1.3 TELEMETRY DATA

Nothing to submit.

3.2 Analyses/development of techniques

James Cook University - Dept of Tourism, and Museum of Tropical Queensland: Dwarf minke whales QLD
Underwater digital video and photographs document individually recognisable dwarf minke whales. Individuals are recognised primarily through scar patterns, particularly of oval scars, over the body as well as colour patterns, especially on the head, shoulder and flippers. Still images from the video and underwater photographs are being used to build up a portable computer based catalogue. The best set of characters to select individual whales in the catalogue for comparison with newly sighted individual whales is still being developed.

In 1999, about 200 dwarf minke whales were recorded, with about half providing good identification data. There were re-sightings of 13 individuals, separated by up to 16 days and 40km. Re-sighting data is providing initial information on habitat use. Documentation of association patterns of recognisable dwarf minke whales, relative sizes, gender (where possible), natural scars (eg oval scars, large shark bites), external parasites (*Pennella*, *Xenobalanus*), and presence of cow-calf pairs is continuing.

Pacific Whale Foundation: photo-identification Whitsunday Islands and Hervey Bay QLD

Whales recorded in the Whitsunday Islands and Hervey Bay were compared against each other, and compared with whales observed in other areas along the east Australian coastline. The comparisons found 5 occasions in which whales were sighted in more than one study site during the 1999 research season. Three individuals (3% of the Whitsunday Islands fluke identified whales) were observed in both the Whitsunday Islands and the Hervey Bay Marine Park.

1999 resightings between the Whitsunday Islands and Hervey Bay

Animal #	Sex	Age class	Sightings in Whitsundays	Sightings in Hervey Bay	# of days between sightings
1	Unknown	Sub-adult	13/7/1999; 15/7/ 1999	20/8/1999	37
2	Unknown	Sub-adult	17/7/1999	19/8/1999	34
3	Unknown	Adult	19/7/1999	13/8/1999	26

Average Resight Interval = 32.3 Days

All the whales identified in the Whitsunday Islands and Hervey Bay were also compared to whales photographed off

Eden, New South Wales by Pacific Whale Foundation between October 26 and November 15, 1999. This further comparison found a mother/calf pair that was documented in the Hervey Bay Marine Park and off the Eden coastline.

1999 resightings between Hervey Bay and Eden

Animal #	Sex	Age class	Sightings in Hervey Bay	Sightings in Eden	# of days between sightings
1(E0502)	Female	Mother/Adult	19/7/1999; 22/7/1999	2/11/1999	42
2	Unknown	Calf	19/7/1999; 22/7/1999	2/11/1999	42

Dolphin Research Institute VIC

The Institute is developing a digital shape analysis system for the identification of dolphins in conjunction with Melbourne University Geomatics Department.

4. Tissue/biological samples collected

4.1 Biopsy samples

Species	Area/stock	Calendar year/ season/ no. collected	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Blue whale	Southern hemisphere Western VIC	1999/2000	N	0	3	P Gill, Deakin University VIC
Bottlenose dolphin	Jervis Bay/Pt Stephens NSW	22 (Jervis Bay), 52 (Pt Stephens)	Y	74	74	Macquarie University Marine Mammal Research Group NSW
Hector's beaked whale	Southern hemisphere WA	1999, 1	Y	1	1	Dept Conservation and Land Management WA
Gray's beaked whale	Southern hemisphere WA	1999, 2	Y	2	2	Dept Conservation and Land Management WA
Bottlenose dolphin	Shark Bay, WA	1999, 38	Y	38	252	M. Kruetzen and Dr Bill Sherwin, University of NSW.

Other Samples – e.g. slough skin / skin scrape

Species	Area/stock	Calendar year/ season no. collected	Type	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Southern right whale	Sydney/ East Aust. NSW	1999/August/ 3	slough skin	Y	2	1	NSW NPWS / University of NSW
Humpback whale	Byron Bay / Group V NSW	1999/-/56	slough skin	N	current	56	Genetics Lab., Southern Cross University NSW

4.2 Samples from directed catches or bycatches

Samples from bycatch

Species	Area /stock	Calendar year/ season total	Archived (Y/N)	Tissue type(s)*	Contact person/institute
Common dolphin	Sydney NSW	9	Y	various	Australian Museum, Taronga Zoo
Bottlenose dolphin	Sydney NSW	1	Y	various	Australian Museum, Taronga Zoo
Common dolphin	NSW	1	Y	various	Department of Veterinary Anatomy, University of Sydney
Bottlenose dolphin	NSW	1	Y	blubber, liver, muscle	Department of Veterinary Anatomy, University of Sydney

4.3 Samples from stranded animals

Species	Area/stock	Calendar year/ season total	Archived (Y/N)	Tissue type(s)*	Contact person/institute
Queensland					
Indo-Pacific humpback dolphin		1998/99	N	Blubber, liver	D. Haynes / GBRMPA
Bottlenose dolphin		1998/99	N	Blubber, liver	D. Haynes / GBRMPA
Pantropical spotted dolphin		1998/99	N	Blubber, liver	D. Haynes / GBRMPA
Humpback whale		1998/99	N	Blubber, liver, muscle	D. Haynes / GBRMPA

Humpback whale	Fraser Island	21/07/99	W1058	*Necropsy	J Haines / QPWS
	Fraser Island	26/07/99	W1067	*Necropsy	
	Fraser Island	17/08/99	W1078	*Necropsy	
	Mackay	03/09/99	W1077	*Necropsy	
	Sunshine Coast	26/09/99	W1092	Reproductive system & skin	
Melon-headed whale	Great Keppel Is.	18/04/99	W1024	*Necropsy	J Haines / QPWS
	Bribie Island	11/06/99	W1040	*Necropsy	
Indo-Pacific humpback dolphin	Port Douglas	16/01/99	W992	*Necropsy	J Haines / QPWS
	Gold Coast	03/09/99	W1111	*Necropsy	
	Townsville	07/10/99	W1106	*Necropsy	
Minke whale	Fraser Island	23/9/99	W1099	Skin	J Haines / QPWS
Common dolphin	Facing Island	23/08/99	W1076	*Necropsy	J Haines / QPWS
	Gold Coast	01/12/99	W1133	*Necropsy	J Haines / QPWS or Sea World
Spinner dolphin	Sunshine Coast	08/07/99	W1057	*Necropsy	J Haines / QPWS
Rough-toothed dolphin	Hervey Bay	16/09/99	W1089	Skeletal material	J Haines / QPWS
Bottlenose dolphin	Nudgee Creek	01/04/99	Q5	Skin	J Haines / QPWS or Sea World
	Moreton Island	12/06/99	W1039	Skin	J Haines / QPWS
	Fraser Island	02/07/99	W1055	*Necropsy & skin	J Haines / QPWS
	Sunshine Coast	21/04/99	W1029	*Necropsy	J Haines / QPWS
	Sunshine Coast	02/08/99	W1064	*Necropsy	J Haines / QPWS
	Sunshine Coast	07/09/99	W1081	*Necropsy	J Haines / QPWS
	Gold Coast	17/06/99	W1043	*Necropsy & heavy metals	J Haines / QPWS or Sea World
	Gold Coast	30/07/99	W1065	*Necropsy	J Haines / QPWS
Gold Coast	23/09/99	W1091	Skin	J Haines / QPWS	
Striped dolphin	Cairns	07/12/99	W1132	*Necropsy & toxicology	J Haines / QPWS
New South Wales					
Gray's beaked whale	Budgewoi Beach	1999, 1	Not known	various	ORRCA NSW
	Readhead Beach	1999, 1	Not known	various	
Pygmy sperm whale	Empire Vale Beach	1999, 1	Y	various	Australian Museum, NSW NPWS/Sea World (QLD)
Gray's beaked whale	Tura Beach	1999, 1	Not known	Not known	
Humpback whale	Stockton Beach	1999, 1	Y	various	Taronga Zoo, Australian Museum, NSW NPWS
Unidentified <i>Balaenoptera</i> sp.	Seven Mile Beach	1999, 1	Y	skin, baleen, tongue, muscle	Australian Museum; NSW NPWS
Pygmy killer whale		1999, 1	Not known	Not known	
Humpback whale	Port Macquarie	1999, 1	Not known	Not known	
Risso's dolphin	Bombo Beach	1999, 1	Not known	various	ORRCA, NSW
Bottlenose dolphin	Pt Stephens	1999, 1	Y	blubber, liver, muscle	Department of Veterinary Anatomy, University of Sydney
Western Australia					
Bottlenose dolphin	WA coastal	1999, 4.	N	blubber samples	Dept Conservation and Land Management WA

*Necropsy is performed whenever it is considered possible to establish the cause of death. Samples are taken for pathological and histological tests from major organs such as liver, kidney, skin, blubber and intestine.

4.4 Analyses/development of techniques

University of Tasmania: Analysis of samples from stranded animals TAS

A number of analyses have been conducted of samples collected from the mass strandings of *Physeter macrocephalus* in Tasmania in 1998. Diet samples have been analysed and dietary items identified have been verified against reference collections held by the Museum of Victoria. The results are currently being analysed but preliminary results were presented at the 13th Biennial Conference on the Biology of Marine Mammals, Hawaii, 1999. Blubber samples have been analysed for fat content (as an indicator of nutritive condition) and organochlorine pollutants (DDT, DDE, DDD and PCBs). Analysis of the nutritive condition data is complete and is being written up. The results of the pollutant analysis are being analysed. Analysis of skin samples is being carried out by the Southwest Fisheries Science Centre (USA). Further analysis of microsatellite loci has been conducted to investigate relationships between the stranded animals.

Teeth from the same mass strandings have been prepared and ages determined from these. A cross reading study of a subsample of these teeth is being conducted in collaboration with scientists experienced in the age determination of *P. macrocephalus*. On completion of this study the results of the age determination of *P. macrocephalus* will be analysed. These results will provide a more comprehensive analysis of the other aspects of *P. macrocephalus* biology and ecology under study. A modification of preparation techniques for age determination of *P.*

macrocephalus developed by the University of Tasmania and the South West Fisheries Science Centre (USA) is being written up.

Ages have been determined from teeth collected from a *Globicephala melas* mass stranding (1998), two *Delphinus delphis* mass strandings (1998), a *Tursiops truncatus* mass stranding (1997) and single strandings of *T. truncatus* (1998), *D. delphis* (1995) *Lissodelphis peronii* (1995), *Phocoena dioptrica* (1997), *Mesoplodon hectori* (1997) and *Kogia simus* (1992).

Samples have been provided to a number of institutions for various research projects:

1. Blood samples from *T. truncatus*, *P. dioptrica* and *Orcinus orca* for an international morbillivirus study conducted by the Peruvian Centre for Cetacean Research (CEPEC), and the Department of Vaccinology-Immunology, University of Liège, Belgium. The results of this have been submitted to Veterinary Microbiology.
2. Skin samples from the University's archive collection of single strandings of *G. melas* to the Molecular Ecology Laboratories, Cambridge University, England for a PhD study into the population structure of *G. melas*.
3. Blubber samples from *P. dioptrica* to the Duke University Marine Laboratories, North Carolina for a PhD study into the structure and function of blubber in Phocoenids.
4. Skin samples from the University's archive collection of single strandings of *D. delphis* have been sent to the Southwest Fisheries Science Centre, USA for a study into the worldwide population structure of this species.
5. Skin samples from *Mesoplodon grayi*, *G. melas* and *Balaenoptera acutorostrata* have been sent to the South West Fisheries Science Centre, USA to be included in their reference/forensic database as type specimens.
6. Results from a genetic study into the genus *Kogia*, to which the University of Tasmania provided samples was presented at and published in the abstracts from the 13th Biennial Conference on the Biology of Marine Mammals, Wailea, Hawaii, November 28-December 3, 1999 (see Section 11 for publication details).

Dept of Conservation and Land Management: DNA tissue analysis WA

DNA tissue samples were collected from one Hector's and 2 Gray's beaked whales during the year. Analysis confirmed the identification of all three animals. The record for Hector's Beaked whale in waters off WA is the first ever recorded from WA. A publication on this event is being prepared.

5. Pollution studies

The Oceania Research Project QLD

Weekly triplicate water samples to monitor Chlorophyll A were obtained from 6 structured geographical areas within Hervey Bay during the period August 8th to October 15th 1999. The project is a long term water quality monitoring program being conducted in conjunction with the Environment Division of the Queensland Environment Protection Agency. Sampling for the program commenced in 1993 and outcomes of the first five years - 1993/1997 - is provided in: Queensland Department of Environment & Heritage, Environmental Technical Report No 23 (see 11.2).

Great Barrier Reef Marine Park Authority QLD

As per section 4, ongoing monitoring of pollutant concentrations in Great Barrier Reef Marine Park megafauna is undertaken using samples from stranded animals.

Australian Dolphin Research Foundation SA

Tissue analysis by the SA Museum of four dead *Tursiops truncatus* with documented home ranges in the Adelaide area have shown elevated levels of PCB, mercury and lead. Routine testing for these pollutants had not revealed a local problem but subsequent testing (prompted by the dolphin data) has revealed sources of these chemicals in storm water outlets. A paper documenting this is in preparation.

Dept of Conservation and Land Management WA

Blubber samples were collected from 4 stranded bottlenose dolphins for analysis of heavy metal content. The analysis is yet to be completed and no report has been received yet.

6. Statistics for large cetaceans

6.1 Direct catches (commercial, aboriginal and scientific permits) for the calendar year 1999

Not applicable for Australia.

6.2 Other non-natural mortality for the calendar year 1999

Species	Area/stock	Males	Females	Total	Cause	Methodology
Unidentified whale	QLD Coast			1	Collision with HMAS Sydney 27/08/99 fate unknown	
Minke whale	NSW		1	1	Drowning - shark net	Post mortem
Minke whale	NSW			1	Drowning - possible net wounds, disposed at sea	Observation

6.3 Earlier years' statistics

No information to submit.

7. Statistics for small cetaceans

7.1 For the calendar year 1999

Species	Area/stock	Directed catch		Incidental mortality			Live-capture
		Reported	Est. total	Reported	Est. total	Source*	Reported
	Queensland						
Unidentified dolphin	Sunshine Coast			27/05/99	1	Boat-strike	
Common dolphin	Gold Coast			01/12/99	1	Shark netting	
Indo-Pacific humpback dolphin	Sunshine Coast			26/05/99	1	Shark netting	
	Gold Coast			03/09/99	1		
Spinner dolphin	Sunshine Coast			08/07/99	1	Shark netting	
Bottlenose dolphin	Sunshine Coast			09/04/99	1	Shark netting	
	Gold Coast			21/04/99	1	Shark netting	
	Gold Coast			30/07/99	1	Shark netting	
	Gold Coast			23/09/99	1	Shark netting	
	New South Wales						
Common dolphin	Sydney			-	9 (7 adults, 2 foetuses)	Shark netting	
Bottlenose dolphin	Sydney			-	1	Shark netting	
Unidentified dolphin	Sydney			-	1	Shark netting	
Unidentified dolphins	Nth Newcastle			-	>1	Anchored	

Australian Fisheries Management Authority: reporting of cetacean incidental mortalities/interactions

There is the capacity for fishers to report cetacean interactions/mortalities in seven AFMA logbooks. Fisheries covered are Pelagic Tuna longlining, Tuna Minor Line, Australian Purse seine and pole and line, Farmed SBT, Coral Sea Log, Sub-Antarctic Fisheries, Southern Shark and South-east non-trawl. Ten mortalities and four releases were reported in the Southern Shark and South-east non-trawl (AFMA Logbook GN01) as shown below. No other mortalities or interactions were reported.

Species	Area/Location		Date	Source*	Incidental capture	
	(decimal degrees)				Reported	Released alive
Unidentified dolphin	33.25	134.25	8/1/99	Demersal gillnet		1
Unidentified dolphin	37.25	138.73	13/1/99	Demersal gillnet		1
Unidentified dolphin	36.37	138.58	24/1/99	Demersal gillnet	1	
Unidentified dolphin	36.75	138.48	17/3/99	Demersal gillnet		1
Unidentified dolphin	36.68	138.75	1/4/99	Demersal gillnet	1	
Unidentified dolphin	36.78	138.68	3/6/99	Demersal gillnet	1	
Unidentified dolphin	36.72	138.38	7/12/99	Demersal gillnet	1	
Unidentified dolphin	35.73	138.63	20/10/99	Demersal gillnet	1	
Unidentified dolphin	35.90	138.07	20/6/99	Demersal gillnet	1	1
Unidentified dolphins	37.10	139.42	21/6/99	Demersal gillnet	4	

Captive bottlenose dolphins WA

Four captive bottlenose dolphins have been maintained at the Underwater World facility in Perth for several years. Three adult animals had previously been rehabilitated and released back into the wild following the closure of an earlier commercial aquarium. These three adults did not adjust to life at sea and were taken back into care. The fourth animal was a 24-month old captive-bred sub-adult animal. In October 1999 the sub-adult animal died due to an infection of *Toxoplasmosis* sp. In November 1999 a second calf was born, but died of natural causes two days after its birth. During a four day period December 27-31 the remaining three adult animals died under suspicious circumstances. Investigations into the circumstances surrounding these deaths are still in progress. As a result of

these events there are no longer any captive cetaceans in WA facilities. Current policy stipulates that no further wild cetaceans will be collected to facilitate commercial displays of any type.

7.2 Earlier years' statistics

No information to submit.

8. Strandings

Queensland

Common name	No./Sex/ Size	Area/Stock	Date	Live/Dead stranding	Outcome/Comment	Tissue samples taken?
Minke whale	1/?, 5.91m	Moreton Bay	17/6/99	Live	Released	Yes
Minke whale	1/?, 3.70m	Fraser Island	23/9/99	Live	Released	Yes
Common dolphin	1M, 2.21m	Gladstone	23/8/99	Dead	Buried	Yes
Common dolphin	1M, 1.97m	Gold Coast	1/12/99	Dead	Shark net	Yes
Grampus Griseus	1M, 2.90m	Moreton Island	1/10/99	Dead	Buried	
Humpback whale	1F, 4.68m	Fraser Island	21/7/99	Dead	Buried	Yes
Humpback whale	1F, 3.67m	Fraser Island	26/7/99	Dead		Yes
Humpback whale	1?	Fraser Island	17/8/99	Dead		Yes
Humpback whale	1F, 4.00m	Mackay	3/9/99	Dead		Yes
Humpback whale	1F, 15.00m	Port Clinton	21/9/99	Live	Birth of calf after rescue	
Humpback whale	1F, 13.50m	Sunshine Coast	26/9/99	Dead	Buried	Yes
Humpback whale	1?, 5.88m	Moreton Island	27/10/99	Dead	Buried	Yes
Irrawaddy dolphin	1F, 2.24m	Yeppoon	16/9/99	Dead	Buried	
Melon-headed whale	1M, 2.66m	Great Keppel Island	18/4/99	Dead	Buried	Yes
Melon-headed whale	1F, 2.70m	Bribie Island	11/6/99	Dead		Yes
Indo-Pacific humpback dolphin	1M	Port Douglas	16/1/99	Dead	Buried	Yes
Indo-Pacific humpback dolphin	1?	Rainbow Beach	26/5/99	Dead	Shark net	
Indo-Pacific humpback dolphin	1M, 1.50m	Gold Coast	3/9/99	Dead	Shark net	Yes
Indo-Pacific humpback dolphin	1?, 2.10m	Townsville	7/10/99	Dead	Buried	Yes
Striped dolphin	1M, 1.84m	Cairns	7/12/99	Dead	Euthanased	Yes
Spinner dolphin	1F, 2.16m	Sunshine Coast	8/7/99	Dead	Shark net	Yes
Rough-toothed dolphin	1	Hervey Bay	16/9/99	Dead		Yes
Bottlenose dolphin	1F, 2.12m	Moreton Bay	31/3/99	Live		
Bottlenose dolphin	1?, 1.09m	Noosa	9/4/99	Dead	Shark net	
Bottlenose dolphin	1F, 1.66m	Gold coast	21/4/99	Dead	Shark net	Yes
Bottlenose dolphin	1F, 1.93m	Moreton Island	7/5/99	Dead		
Bottlenose dolphin	1F	Moreton Island	12/6/99	Dead		Yes
Bottlenose dolphin	1M, 1.60m	Sunshine Coast	14/6/99	Dead		
Bottlenose dolphin	1F	Gold coast	17/6/99	Dead		Yes
Bottlenose dolphin	1F	Fraser island	2/7/99	Dead		Yes
Bottlenose dolphin	1M, 2.22m	Gold coast	30/7/99	Dead	Shark net	Yes
Bottlenose dolphin	1M, 1.22m	Sunshine coast	2/8/99	Dead		Yes
Bottlenose dolphin	1M, 2.54m	Sunshine coast	7/9/99	Dead		Yes
Bottlenose dolphin	1M, 2.05m	Gold coast	23/9/99	Dead		Yes
Bottlenose dolphin	1?	Moreton Island	29/9/99	Dead	Buried	
Bottlenose dolphin	1M, 0.88m	Bribie Island	6/10/99	Dead	To Queensland Museum	
Bottlenose dolphin	1M, 2.55m	Teewah Beach	23/10/99	Dead	Buried	
Unidentified dolphin	1?, 1.85m	Rainbow Beach	27/5/99	Dead	Boat strike	
Unidentified dolphin	1?	Cooktown	18/10/99	Dead	Dead many days	
Unidentified dolphin	1M, 2.82m	Teewah Beach	7/12/99	Dead	Buried	
Unidentified whale	1?	Off Keppel Islands	27/8/99		Hit by naval vessel	

- The fate of whale struck by HMAS *Sydney* on 27 August 1999 is unknown. It may not have died.

New South Wales

Common name	No./Sex/Size	AREA/stock	Date	Live/Dead stranding	Outcome/Comment	Tissue samples taken?
Gray's beaked whale	1	Budgewoi Beach	14/01/99	alive	Died. Post mortem conducted	yes
Gray's beaked whale	1	Readhead Beach	15/01/99	dead	Post mortem.	yes
Unidentified dolphin	1	Clarence River	04/02/99	dead		Not known
Pygmy sperm whale	1	Empire Vale Beach	26/02/99	alive	Euthanased. Post mortem.	yes
Pygmy/Dwarf sperm whale ?	1	Grassy Head	02/04/99	alive	Died in transit.	no
Pygmy/Dwarf sperm whale ?	1	Hat Head	16/04? /99	dead		no
Pygmy/Dwarf sperm whale ?	1	Dunbogan	23/04/99	alive	Died, buried on site	no
Pygmy/Dwarf sperm whale ?	1	North Haven	26/04/99	dead		no
Gray's beaked whale	1	Tura Beach?	05/04/99	dead		yes
Humpback whale	1	Stockton Beach	15/07/99	dead	Post mortem	yes
Pygmy sperm whale	1	Lighthouse Beach	31/07/99	Not known		Not known
Bryde's whale	1	Toowoomb Bay	06/09/99	Not known		Not known
Minke or Bryde's whale	1	Seven Mile Beach	13/09/99	dead		yes
Bottlenose dolphin	1	Location unknown	07/10/99	dead		Not known
Pygmy killer whale	1	Location unknown	04/11/99	dead	Post mortem	yes
Humpback whale	1	Port Macquarie?	23/11/99	dead		yes
Risso's dolphin	1	Bombo Beach	26/12/99	dead	Post mortem	yes

Northern Territory

Species	No./Sex/Size	Area/Stock	Date	Live/Dead stranding	Outcome/Comment	Samples/Measurements taken?
Short-finned pilot whale	3 adult, 2 juvenile	Melville Is 11°11'S, 130°22'E	18/3/99	4 dead on 19/3/99	Remaining juvenile euthanased	Measurements and photos
<i>Balaenoptera</i> sp.	1	South of Gove 12°24'S, 136°55'E	c 19/3/99	Dead	Decomposed carcass washed ashore	Photos only
Irrawaddy dolphin	1, ~1.5 m	Is. of Woodah 13°22'S, 136°08'E	27/5/99	Dead	Decomposing carcass washed ashore	Photos only
Irrawaddy dolphin	1F, adult 1.93m	Fog Bay 12°46'S, 130°22'E	1/10/99	Dead	Washed ashore	Measurements and photos
Irrawaddy dolphin	1F adult, 2.15m	Black Point 11°10'S, 132°09'E	20/10/99	Live	Euthanased	Measurements and photos

Victoria: Museum of Victoria (MoV)

Species	No./Sex/Size	Area/Stock	Date	Live/Dead stranding	Outcome/Comment	Samples/Measurements taken?
Sperm whale	1	Moonlight Head AMG 7520 952064	24/9/99		Badly decomposed	Photos only
Pygmy sperm whale	1F 2.2m	Barwon Heads	13/10/99		Post mortem at Melbourne Zoo	MoV C31373
Long-finned pilot whale	1F adult	Petticoat Creek AMG 7620 370104	16/4/99			Photos only
Bottlenose dolphin	1M adult 2.78m	Point Addis	3/10/99		Extensive injury anal area	Measurements and photos

Western Australia

Species	No./Sex/Size	Area/Stock	Date	Live/Dead stranding	Outcome/Comment	Samples/Measurements taken?
Bottlenose dolphin	1M 2.68m	Florida Beach, Mandurah 32°38'S, 115°37'E	9/4/99	Found dead.		Measured.
Bottlenose dolphin	1M 1.3m	Halls Head, Mandurah 32°32'S, 115°42'E	15/4/99	Found dead.		Measured, tissue sample taken.
Bottlenose dolphin	1M 2.54m	Forrest Beach 33°35'S, 115°26'E	3/5/99	Found dead.		Measured.
Bottlenose dolphin	1M 1.9m	Warnbro Beach 32°19'S, 115°44'E	23/6/99	Found dead.		Tissue sample taken.
Bottlenose dolphin		Yeagorup Beach 34°33'S, 115°49'E	21/7/99	Found dead.	Advanced decomposition	-

Bottlenose dolphin	1F	Yeagorup Beach 34°33'S, 115°49'E	21/7/99	Found dead.	Advanced decomposition	-
Bottlenose dolphin	1M 1.7m	Swanbourne Beach 31°58'S, 115°46'E	3/8/99	Found dead.	Advanced decomposition	Measured.
Bottlenose dolphin	1M 1.55m	South Beach 32°04'S, 115°45'E	9/9/99	Found dead.		Measured.
Bottlenose dolphin	1M 1.4m	Floreat Beach 31°58'S, 115°45'E	15/9/99	Found dead.		Measured, tissue sample taken.
Minke whale	3.4m	Dunsborough 33°36'S, 115°06'E	24/9/99	Live	Released alive	Measured.
Striped Dolphin	1F 1.74m	Palm Beach, Rockingham 32°23'S, 115°43'E	25/9/99	Found dead.		Measured.
Bottlenose dolphin	1F 1.86m	Whale Bone, Shark Bay 26°08'S, 113°39'E	26/9/99	Found dead.	Advanced decomposition	Measured.
Humpback whale	1M 5.9m	Cowrie Cove, Burrup Peninsula 20°34'S, 116°48'E	26/9/99	Live stranded	Died on beach.	Measured.
Humpback whale	1F 12m	King George Sound 35°03'S, 117°58'E	1/10/99	Found dead.		Measured.
Bottlenose dolphin	1F 2.34m	Buchanan Bay, Garden Island 32°12'S, 115°41'E	14/10/99	Found dead, emaciated.		Measured, tissue sample taken.
Bottlenose dolphin	1F 1.64m	Entrance, Serpentine- Murray Rivers 32°35'S, 115°46'E	15/10/99	Found dead.	Advanced decomposition	Measured.
Pygmy sperm Whale	1M 2m	Buller River mouth. 28°38'S, 114°36'E	26/10/99	Found dead.		Measured.
Striped dolphin	1M 1.96m	Drummonds Cove 28°40'S, 114°37'E	26/10/99	Live stranded	Died shortly after	Measured.
Sperm whale	1F 9.2m	Peaceful Bay, Walpole 32°02'S, 116°56'E	27/10/99	Found dead.	Advanced decomposition	Measured.
Humpback whale	1M 15m	Two Rocks 31°30'S, 115°35'E	28/10/99	Found dead.		Measured.
Bottlenose dolphin	1F 1.12m	Matilda Bay, Swan River 31°59'S, 115°49'E	3/11/99	Found dead.	Advanced decomposition	Measured.
Dwarf sperm Whale	1F 2.2m	Bellander Beach, Walpole 34°59'S, 116°44'E	12/11/99	Found dead.	Advanced decomposition	Measured.
Bottlenose dolphin	2.4m	Falcon Beach 32°34'S, 115°39'E	27/11/99	Found dead.	Advanced decomposition	Measured.
Striped dolphin	1M 2m	Karratha 20°44'S, 116°51'E	22/12/99	Found dead.	Advanced decomposition	Measured.
Bottlenose dolphin	1F 1.87m	Bunbury 33°20'S, 115°37'E	23/12/99	Found dead.	Advanced decomposition	Measured.

Dolphin Research Institute VIC

Records are maintained of small cetacean strandings in Port Phillip Bay and nearby ocean beaches. All measurements are collected according to Norris (1961) "Standardised methods for measuring and recording data on the smaller cetaceans". For further details contact W. Dunn, Dolphin Research Institute.

9. Other studies and analyses

Queensland Parks and Wildlife Service: Marine Wildlife Stranding and Mortality Database QLD

The database summarises all records of sick, injured or dead marine wildlife reported to QPWS. Most records of individual strandings are supplied by QPWS and GBRMPA staff. Other records were received directly via members of the public including Sea World and Underwater World. The database also contains all reported marine mammal and marine turtle mortality within the Queensland Department of Primary Industries Shark Control Program. Up to the end of 1999 *Tursiops truncatus* and *Tursiops aduncus* have been recorded as *Tursiops truncatus*. The QPWS stranding program allows identification of areas where there are greater threats to coastal cetacean, pinniped and turtle species.

University of Sydney: Reproduction in Marine Mammals NSW

Commenced in 1997, the project involves using post-mortem blubber biopsies to develop a method to gauge the reproductive status of wild cetaceans with minimal intervention.

James Cook University - Dept of Tourism, and Museum of Tropical Queensland QLD

Routine documentation of general behaviour of dwarf minke whales during encounters, as well as their interactions with the drifting vessel and snorkellers hanging from two 50 m ropes trailed upwind of the drifting vessel. The latter information, in conjunction with experiential data collected from passengers, crew and dive boat managers, is used to refine the guidelines proposed for swimmer-dwarf minke whale interactions in Arnold and Birtles (1999) – see section 11.1.

Jason Gedamke (University of California, Santa Cruz) QLD

Analysis of vocalisations of dwarf minke whales, data collection via a hydrophone array trailed from *Undersea Explorer* and in an untended array off Lizard Island. The combination of acoustic recording with surface and underwater observations (in collaboration with the above) allows joint exploration of the context of dwarf minke whale vocalisations.

Ms Pam Stacey (Augustana University College, Canada) & Dr Peter Arnold (Museum of Tropical Queensland) QLD
Completed a worldwide literature review on the Irrawaddy dolphin current to May 1999.

Ms Isabel Beasley (Ph.D candidate, James Cook University) QLD

Examining intraspecific variation throughout the geographical range of the Irrawaddy dolphin, based on examination of skeletal material (especially the skull) within museums throughout Europe, the United States, south-east Asia and Australia. Both marine and freshwater populations have been examined. Additional material has been collected for genetic analysis. This is a collaborative study (eg with Dr Peter Arnold on osteology).

Dolphin Society: "Dolphin within" research project NSW

The project has been underway since 1994. It examines human responses to interactions with non captive dolphins.

Australian Dolphin Research Foundation SA

Surveys of Gulf St Vincent to determine distribution of bottlenose and common dolphins using vessels of convenience.

Eubalaena Pty Ltd SA

A project to assess the habitat preference by right whales on the Australian coastline was commenced. The multi-year project will identify and where possible quantify features of preferred right whale habitats and compare them with areas that are rarely or never used by right whales. It will include an assessment of areas of historic significance to the species but which show little or no present day use. It is intended that the project will allow threats related to loss of habitat or displacement from preferred habitats, along with anthropogenic threats from conflicting uses within critical habitats, to be addressed more effectively.

RMIT University - Dept of Applied Biology and Biotechnology: Impacts of cetacean based eco-tourism on bottlenose dolphins VIC

This study monitored whistle production of bottlenose dolphins in the presence and absence of dolphin-swim charters as a means of understanding the response to vessels, from December 1998 to April 1999. Forty-six hours of sound recordings were made from a total of 66 commercial boat trips each lasting an average of 4.13 hours. The success rate of these trips in encountering dolphins was 78.8%. When dolphins were observed a hydrophone was immersed into the water and sound recording initiated. Simultaneously behavioural recordings were made using a 1-minute interval focal group sampling method. Dolphin behaviour was categorised as either travel, feeding or social behaviour and the number of whistles produced was catalogued according to these behavioural states. The three types of vessel approach observed were the i) parallel ii) direct and iii) J approach. A total of 257 commercial boat approaches were studied (mean = 4.0 approaches per group of dolphins sighted) and the mean interaction time with a group of dolphins was 32min (range: 4-151min). The most common approach type observed was the parallel approach, which is the recommended approach type in Victoria, Australia.

The number of whistles produced during the first minute of an approach by a boat indicate that these dolphins are most likely to whistle at higher rates during a direct approach when travelling. A tour operator was also more likely to use a direct approach when the dolphins were observed travelling. Sound recordings from a control boat that was stationary and anchored at the time of sighting was used to determine if sound production differed in the presence and absence of tour vessels. The mean number of whistles produced per minute by the dolphins during travel behaviour was greater when commercial tour operators were present (0.678 whistles per minute) than when they were not (0.02 whistles per minute). Whistle production was at its greatest during social behaviour (mean number of whistles per min=4.51) and least during travel behaviour (mean number of whistles per minute=0.68). We suggest

that dolphins are whistling to maintain group cohesion as a response to vessels. Impacts of cetacean based ecotourism on the animals being observed remain unclear.

Dept of Conservation and Land Management WA: additional research in WA

Common name	Principal Researcher	Subject
Bottlenose dolphin	Rebecca Donaldson	Ecology of Bottlenose Dolphins in Cockburn Sound (PhD thesis)
Bottlenose dolphin	M. Heithaus	Importance of benthic fish communities to Bottlenose dolphin diet. (Shark Bay. PhD thesis)
Bottlenose dolphin	M. Kruetzen	Genetic study of Bottlenose Dolphins along WA coastline (PhD thesis)
Bottlenose dolphin	Dr A. Samuels	Behavioural ecology of juvenile dolphins in Shark Bay
Bottlenose dolphin	Dr J. Mann	Behaviour and communication in Bottlenose dolphins in Shark Bay
Bottlenose dolphin	S. Mills	Analysis of provisioned dolphin beach visitation patterns at Monkey Mia, Shark Bay. (Hons. Thesis)

Licensed commercial whale watching for southern right and humpback whales WA

Data for the 1998 season: 85 licenses issued; 23,678 passengers (Metropolitan Perth waters), 11,662 passengers (Country-based licences). 23 commercial dolphin watching licences were also issued during 1998.

Dr Graham Ross - Australian Biological Resource Study ACT

Collaborating in an ongoing study of the morphology of genus *Sousa*, contributing to a revision of the genus. The study complements current studies on the genetics of the genus.

Deakin University - Warrnambool: Blue whale study VIC/SA

The area under study is clearly a significant feeding area for an unknown number of blue whales during the austral summer and autumn. Up to 32 blue whales have been sighted during aerial surveys, with whales present for up to 6 months of the year. Unique oceanographic conditions prevail in this region, and promote the production of abundant Euphausiid prey. This research is relevant to the questions of stock identity and population trends, feeding ecology, environmental change, scientific aspects of sanctuaries, and whale watching.

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11. Publications

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University of Tasmania

Preliminary reports are produced for the Tasmania Parks and Wildlife Service after every stranding event. These can be obtained from the Parks and Wildlife Service or the University of Tasmania.

Annual reports are produced for Environment Australia, detailing strandings and research conducted from samples collected at each of these events. These can be obtained from the Marine Group, Environment Australia.