

**NEW ZEALAND PROGRESS REPORT ON CETACEAN RESEARCH, APRIL 2005 TO MARCH 2006,  
WITH STATISTICAL DATA FOR THE CALENDAR YEAR 2005**

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This report summarises information obtained from: Auckland (AU), Massey (MU), and Otago (OU) Universities, Auckland University of Technology (AUT), Dalhousie University (DAL), Te Papa Tongarewa Museum of New Zealand (TP), Department of Conservation (DOC), Operation Cétacés (OC), Orca Research Trust (ORT), Dolphin Watch Ecotours Picton (DWE), National Institute of Water and Atmospheric Science (NIWA), South Pacific Whale Research Consortium (SPWRC), Ministry of Fisheries (MFish), Cawthorn & Associates (CAW), and independent researchers.

### 1. Species and stocks studied

Common name	Scientific name	Area/stock(s)	Items referred to
Antarctic minke whale	<i>Balaenoptera bonarensis</i>	Area V	4.3, 8
Arnoux's beaked whale	<i>Berardius arnuxii</i>	NZ	4.3, 8
Beaked whales	Family <i>Ziphiidae</i>	NZ	4.3
Blainville's beaked whale	<i>Mesoplodon densirostris</i>	NZ	4.3
Bottlenose dolphins	<i>Tursiops truncatus</i>	NZ	2.1.1, 2.1.2, 3.1.1, 4.1, 4.3, 4.4, 8
Bryde's whale	<i>Balaenoptera edeni</i>	NZ	2.1.1, 3.1.1, 4.1, 4.3, 4.4, 8
Common dolphin	<i>Delphinus delphis</i>	NZ	2.1.1, 2.1.2, 3.1.1, 4.2, 4.3, 4.4, 5, 7.1, 8, 9
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	NZ	4.3, 8
Dense beaked whale	<i>Mesoplodon densirostris</i>	NZ	8
Dusky dolphin	<i>Lagenorhynchus obscurus</i>	NZ	2.1.2, 3.1.1, 8
Dwarf minke whale	<i>Balaenoptera acutorostrata</i>	NZ	4.3
Gray's beaked whale	<i>Mesoplodon grayi</i>	NZ	4.3, 8
Hector's dolphin	<i>Cephalorynchus hectori hectori</i>	NZ	2.1.1, 2.1.2, 3.1.1, 7.1, 8, 9
Humpback whale	<i>Megaptera novaeangliae</i>	NZ, Tonga, New Caledonia	2.1.1, 3.1.1, 4.1, 4.3, 4.4
Killer whale	<i>Orcinus orca</i>	NZ, Antarctica	2.1.1, 2.1.2, 3.1.1, 4.1, 4.4
Long finned pilot whale	<i>Globicephala melas</i>	NZ, Samoa	2.1.1, 4.3, 8
Maui's dolphin	<i>Cephalorynchus hectori maui</i>	North Island, NZ	2.1.1, 9
Pygmy blue whale	<i>Balaenoptera musculus breviceauda</i>	NZ	4.3
Pygmy right whale	<i>Caperea marginata</i>	NZ	4.3, 8
Pygmy sperm whale	<i>Kogia breviceps</i>	NZ	4.3, 8, 9
Southern bottlenose whale	<i>Hyperoodons planifrons</i>	NZ	4.3, 8
Southern right whale	<i>Eubalaena australis</i>	NZ	2.1.2, 4.1, 4.3
Southern right whale dolphin	<i>Lissodelphis peronii</i>	NZ	8
Sperm whale	<i>Physeter macrocephalus</i>	NZ	2.1.1, 8, 9
Straptooth whale	<i>Mesoplodon layardi</i>	NZ	4.3, 8
Striped dolphin	<i>Stenella coeruleoalba</i>	NZ	2.1.2

### 2. Sightings data

#### 2.1 Field work

##### 2.1.1 SYSTEMATIC

A. Schaffar (MU & OC) and C. Garrigue (OC) completed a pilot study investigating whale watching activities in the southern Lagoon of New Caledonia. This project was part of an on-going research programme on the biology and ecology of humpback whales wintering in New Caledonia since 1995. Land-based surveys were conducted from 14 July to 4 September 2005 using a theodolite and resulted in 40 independent tracking sessions of humpback whales. Vessels were present within 1000 metres of monitored whales 70% of the time, with a mean number of 2.3 vessels present. Mothers and calves were exposed to greater levels of whale watching activity than any other age/sex class. Further research is planned over the next two years to investigate whether or not the presence of vessels affects the behaviour of humpback whales in New Caledonia.

E. Martinez and M. Orams (MU) have completed the first year of a three-year field study looking at the impacts of vessel activity on the behaviour of Hector's Dolphins in Akaroa Harbour, Banks Peninsula. This study aims to determine and quantify the current level of vessel activity; whether such impacts are significant for the local Hector dolphin population; and whether these can be mitigated by appropriate changes to the dolphin-watching permit conditions. The research will utilise theodolite tracking and two-minute focal group scan sampling methodology from land and vessel based platforms, and will be analysed using Markov chain modelling.

W. Rayment and T. Webster (OU) compiled a photo-ID catalogue of Hector's dolphins in Akaroa Harbour during summer. The research is to be used as part of an ongoing study looking at the long-term impacts of vessel activity on Hector's dolphins.

G. de Tezanos Pinto and C.S. Baker (AU) are investigating the genetic diversity and population structure of bottlenose dolphins in NZ. This research aims to model trends in abundance for the Northland population, to investigate the population structure and genetic diversity of the species in coastal NZ waters, and their relationship to other bottlenose dolphin populations around the world. Since February 2005, a total of 49 daily surveys have been undertaken in the Bay of Islands (Northland) and eight in the Hauraki Gulf. The primary aims of these surveys were to collect individual photo-ID data and biopsy samples from bottlenose dolphins. Photo-ID effort included collection of more than 4000 photographs from 60 encounters. Combined photo-ID effort with MSc student F. Mourao (AU) included the addition of approximately 33 new individuals to the current photo-ID catalogue.

D. Lusseau (DAL), in collaboration with the Marine Mammal Research Group at OU and other groups, is continuing to investigate the dynamics of social relationships of bottlenose dolphins in Doubtful Sound. S.M. Lusseau and S. Wing (OU) published the results of a stable isotope study showing that bottlenose dolphins in Doubtful Sound rely heavily on locally produced prey items. D. Lusseau (OU) published further work on the impact of dolphin watching on bottlenose dolphins in Doubtful Sound showing that habitat displacement can occur and recommended the creation of a multi-level marine protected area to manage dolphin watching in Doubtful Sound.

M. Oremus (AU) completed genetic analyses of long-finned pilot whale samples collected from strandings around NZ between 1992 and 2005 (n = 344). Mitochondrial DNA genes and microsatellite genetic loci were analysed to clarify the social organisation of this species. Contrary to previous investigation in the North Atlantic, the results support the existence of unrelated matrilineal pods within the pods formed by this species. Analyses of kinship and relatedness were also undertaken to investigate the social dynamic of mass stranding, revealing a puzzling disruption of social bonds during these tragic events. Collaboration was initiated with the Department of Primary Industries, Water and Environment from Tasmania in order to investigate further the population structure of long-finned pilot whales in the Southern Hemisphere and the social dynamic of mass strandings. Since April 2005, a total of 54 new skin samples from long-finned pilot whales stranded around NZ were collected in collaboration with DOC. These were added to the existing data base held at AU, that now contains samples from 408 individuals.

S. Scali, M. Richlen, E. Slooten and S. Dawson (OU) carried out research on Maui's dolphin use of the harbours on the North Island west coast. PODs (Porpoise Detector Devices) have been used to make acoustic detections of Maui's dolphins and sightings have also been made from vessels and cliff top observation posts. So far, two summers of research have been carried out in the Manukau Harbour, and one summer in the Kaipara Harbour. Part of the Manukau harbour is included in a protected area created by MFish to reduce dolphin bycatch in fisheries. PODs recorded acoustic detections of Maui's dolphins inside both harbours. In the Manukau Harbour, Maui's dolphins regularly venture to the east of the protected area, into the inner part of the harbour where commercial and amateur gillnetting continues. None of the Kaipara Harbour area is protected, and the dolphins that entered this harbour were therefore exposed to commercial and recreational gillnet fisheries. This study will soon be extended to other harbours on the North Island west coast to assess the continued entanglement risk for this Critically Endangered population.

W. Rayment, E. Slooten, S. Dawson, T. Webster (OU) and S. Childerhouse (DOC) completed a series of offshore aerial surveys for Hector's dolphins at Banks Peninsula including three summer and three winter surveys. In summer, 80% of the population is inside the sanctuary (where commercial gillnetting is prohibited and amateur gillnetting is restricted). However, in winter, only 44% of the population is protected. This is consistent with research by S. DuFresne (OU) indicating that survival rates for the Banks Peninsula population are very low and the population is still slowly declining. Also at Banks Peninsula, Rayment and Webster continue acoustic monitoring of Hector's dolphins (using PODs) and gathering photo-ID data as part of an ongoing study. Rayment has recently completed fieldwork for a PhD studying the conservation biology of Hector's dolphin at Banks Peninsula. Fieldwork involved aerial surveys to investigate offshore distribution, acoustic monitoring to study habitat use and continuation of the long term photo-ID catalogue (started in 1984). Analysis will focus on providing information to improve the effectiveness of the Banks Peninsula Marine Mammal Sanctuary.

B. Miller, S. Dawson and E. Slooten (OU) are carrying out research on the acoustic behaviour of sperm whales at Kaikoura. Acoustic arrays are used to determine the whales' underwater movements and sound production. This research programme includes acoustic abundance estimates, localisation of whales during diving, acoustic length estimates based on inter-pulse-interval measurements, and acoustic identification based on wavelet

coefficients.

J. Rodda (OU) has completed the second year of a three-year study of the population of Hector's Dolphins at Te Waewae Bay, Southland. The study is compiling a photo-ID catalogue to be used for analysis of spatial and temporal dolphin distribution, density, and fine-scale habitat usage within the bay. Investigations of prey distribution are planned.

R. Currey (OU) is carrying out PhD research on the conservation biology and behaviour of resident bottlenose dolphins in Doubtful Sound, Fiordland. Based on recent intensive photo-ID work, there are between 54 and 56 individuals in the population. The level of mortality has been unusually high for this population in the last two years. A long-term dataset will be used to estimate survival rates since the study began in 1990, and will allow comparison with other bottlenose dolphin populations. A further focus of the research is to assess critical habitats based on spatial patterns in dolphin distribution and behaviour. A hydrophone array is used to estimate foraging depths through the localisation of dolphin vocalisations. D. Rundgren (OU) continued research on distribution of bottlenose dolphins in Fiordland.

AU and SPWRC conducted humpback whale research in the Vava'u group of Tongan islands between 4 and 22 September 2005. Methods included the collection of photo-ID, biopsy samples and sloughed skin for DNA analysis, and the collection of acoustic data. During the 2005 field season, 73 pods of humpback whales were encountered (135 individual whales) over 18 days (163 hours on-effort time). Of all pods encountered, 49% (n=36) were solitary whales, 11% (n=8) were cow-calf pairs; 7% (n=5) were cow-calf-escort pods, and the remaining 33% (n=24) were pods of two or more whales. Of the solitary whales, 39% (14/36) were singers. Forty-three whales were individually photo-identified and added to the Tonga catalogue. Of these, eight individuals had been photo-identified previously in Vava'u. Eighteen photo-identified whales were also matched with a skin sample. Skin samples were collected from a total of 46 humpback whales (41 biopsy and five sloughed skin samples). Four hours of song was recorded from ten whales. Data analysis, including reconciling the photo-IDs with other catalogues and extracting DNA from the skin samples, is currently underway in collaboration with other members of the SPWRC.

E. Burgess and M. Orams (MU) began a dedicated field-based research project in January 2005 on the foraging ecology of common dolphins in the Hauraki Gulf as part of an on-going long term research programme. Vessel-based surveys are undertaken from a 5.6 m research vessel in the inner Hauraki Gulf. Focal follows and acoustic methods are also being used to examine the foraging strategies and inter-specific relationships of feeding groups.

M. Merriman and M. Orams (MU) completed a 2 year dedicated field-based research project on the behavioural ecology of bottlenose dolphins in the Marlborough Sounds. Vessel-based surveys were conducted from January to September 2005.

J. Smith and M. Orams (MU) are undertaking a quantitative analysis of the effects of vessel traffic on the behaviour of the East Australian humpback whales off Cape Moreton, Queensland, Australia. Methods will include observations from a land-based observational platform (Cape Moreton, Moreton Island) using a digital video camera attached to a theodolite scope in order to record position and behaviour of both vessels and whales.

N. Wiseman and C.S. Baker (AU) are investigating the population ecology of Bryde's whales in the Hauraki Gulf. The primary aims of the research are to investigate the seasonal abundance, presence/absence of individual whales, and the reproductive isolation of the Hauraki Gulf Bryde's whales with adjacent areas. This is being investigated by collecting biopsy samples from Bryde's whales in the Hauraki Gulf. Fifteen samples were collected between April 2005 to April 2006, and 13 new individuals were added to the photo-ID catalogue. Contrary to previous assumptions, preliminary results suggest that the highest seasonal encounter rates with Bryde's whales were during the winter.

N. Wiseman, G. de Tezanos Pinto (AU) and K. Stockin (MU) continue surveys of the outer Hauraki Gulf area. This research aims to obtain individual photo-ID photographs to provide information on population structure, demography and habitat use for Bryde's whales, bottlenose dolphins and common dolphins respectively. In addition, skin samples are collected from Bryde's whales and bottlenose dolphins using a Paxarms biopsy system to continue genetic analyses of these species.

P. Ensor participated as a team leader during the 2005 NILS cruise in the North Atlantic, and also acted as cruise leader on the 2005/06 IWC-SOWER circumpolar cruise, Area III of the Antarctic.

N. Gibbs and S. Childerhouse (DOC), with the support of many volunteers, undertook a land and vessel-based survey of humpback whales in Cook Strait between 18 June and 2 July 2005. This was the second dedicated humpback whale survey in NZ since whaling finished in 1964. Ex-whalers were the primary land-based spotters. From 139 hours (land) and 12 hours (vessel) observation, 12 pods of 18 humpback whales were observed. Ten

photo-IDs and 11 genetic samples were obtained. Seven individuals were both photographed and biopsy sampled.

I. Visser (ORT) continued research on killer whales around NZ, with most work conducted in the north of the North Island. Emphasis was on photo-ID, foraging behaviour and associations whilst foraging.

### 2.1.2 OPPORTUNISTIC, PLATFORMS OF OPPORTUNITY

A. & D. Englehaupt (DWE) collected opportunistic data on all dolphin groups (bottlenose, common, dusky, Hector's) encountered during Dolphin Watch Ecotours trips in the Marlborough Sounds throughout the year. Locations, estimated group sizes and presence of calves were collected for all groups and photo-ID's and behavioural states were collected when possible.

M. Cawthorn (CA) continues to collate incidental sightings of whales in the south west Pacific and examine historical whale distribution records with regard to modern bathymetry. He also continues to develop and test equipment to mitigate the accidental bycatch of pinnipeds and cetaceans in commercial fisheries.

G. de Tezanos Pinto (AU) conducted a total of 7 surveys during 2005 onboard permitted marine mammal tour vessel operators in the Bay of Islands (Northland). The primary objective of these surveys was to collect individual photo-ID data of bottlenose dolphins in the area including data on mother-calf associations, group size and composition, location and behaviour. Individual photo-IDs were opportunistically collected from killer whales encounters in the Bay of Islands, including the collection of two biopsy samples.

H. McConnell (DOC) coordinated the collection of opportunistic sightings of southern right whales around the NZ mainland provided by researchers, the public and DOC staff. In addition to opportunistic sightings, genetic sample collection was also being undertaken around NZ to determine if individuals seen around the main two islands of NZ are genetically or geographically isolated from our sub-Antarctic populations. A total of 6 genetic samples were collected in the 2005 season.

J. Berghan and R. Constantine (AU) continue research on bottlenose dolphins in Northland and Auckland. Photo-ID has occurred opportunistically since 1999 and involved efforts by researchers from the UA, MU, and the whale-watch company, Dolphin Explorer. There are approximately 150 dolphins currently in the catalogue and it is currently being updated now that it has been compared to the Bay of Islands catalogue held at the University of Auckland. The results of resightings within the Hauraki Gulf, and between the Gulf and the Bay of Islands, are currently being prepared for publication.

K. Stockin and E. Burgess (MU) continue to undertake opportunistic surveys onboard the whale-watch vessel 'Dolphin Explorer'. Photo-ID recorded for 2004/2005 include the following species: common dolphin, Bryde's whale, bottlenose dolphin, killer whale and striped dolphin.

E. Martinez (MU) is conducting opportunistic vessel-surveys using local tour operators as support vessels for her PhD research. Data collection is focusing on the behavioural ecology of Hector's dolphins in the presence of vessels and/or swimmers in Akaroa Harbour. Photo-ID of individuals encountered around dolphin-watching and dolphin-swimming operations has also been initiated.

## 2.2 Analyses/development of techniques

None.

## 3. Marking data

### 3.1 Field work

#### 3.1.1 NATURAL MARKING DATA

Species	Feature	Area/stock	Calendar year / no. photographed	Catalogued (Y/N)	Catalogue total	Contact person/institute
Bottlenose dolphin	Dorsal fin	NZ	2005/150	Y	170	A. Englhaupt (DWE)
Bottlenose dolphin	Dorsal fin	Marlborough Sounds	2003-2005/?	Y	>300	M. Merriman (MU)
Bottlenose dolphin	Dorsal fin	North Island	2005/~150	Y	423	G. de Tezanos Pinto / F. Mourao (AU)
Bottlenose dolphin	Dorsal fin	Northland, Hauraki Gulf	2005/?	Y	150	R. Constantine (AU) / J. Berghan
Bryde's whale	Dorsal fin	Hauraki Gulf	2005-06/13	Y	74	N. Wiseman/ C.S. Baker (AU)
Common dolphin	Dorsal fin	NZ	2005/15	Y	10	A. Englhaupt (DWE)
Common dolphin	Dorsal fin	Hauraki Gulf	2002-2006/?	Y	>350	K. Stockin (MU)

Dusky dolphin	Dorsal fin	NZ	2005/300	Y	400	A. Enghaupt (DWE)
Hector's dolphin	Fin/body	Akaroa Harbour, Banks Peninsula	2005/39	Y	39	L. Allum (DOC)
Hector's dolphin	Dorsal fin	NZ	2005/150	Y	20	A. Enghaupt (DWE)
Hector's dolphin	Dorsal fin	Banks Peninsula	2005-2006/?	Y	?	E. Martinez (MU)
Humpback whale	Fluke	NZ	2005/10	Y	26	N. Gibbs (DOC) / R. Constantine (AU)
Humpback whale	Fluke	Tonga	2005/43	Y	616	R. Constantine (AU)
Killer whale	Dorsal fin	NZ	2005/30	N	?	A. Enghaupt (DWE)

There are many other photo-ID catalogues held and maintained by researchers in NZ. Only the catalogues that have been actively maintained, added to, and reported on in 2005/06 have been reported here. For a more detailed list of existing catalogues please consult previous National Progress Reports and individual researchers.

### 3.1.2. ARTIFICIAL MARKING DATA

None.

### 3.1.3 TELEMETRY DATA

None.

### 3.2 Analyses/development of techniques

None.

## 4. Tissue/biological samples collected

### 4.1 Biopsy samples

Species	Area/stock	No. collected in 2005/06	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Bottlenose dolphins	NZ	50	Y	50	149	G. de Tezanos Pinto (AU)
Bryde's whale	Hauraki Gulf	27	Y	18	27	N. Wiseman/ C.S. Baker (AU)
Humpback whale	NZ mainland	11	Y	11	23	D. Steel (AU)
Humpback whale	Tonga	46	Y	46	>500	D. Steel (AU)
Killer whales	NZ	2	Y	2	?	G. de Tezanos Pinto (AU)
Southern right whales	NZ mainland	6	Y	19	19	D. Steel (AU)

### 4.2 Samples from directed catches or bycatches

DOC field staff and other researchers continue to collect samples from bycaught and beachcast cetaceans.

Species	Area/stock	Calendar year/season total	Archived (Y/N)	Tissue type(s)	Contact person/institute
Common dolphin	NZ	2004/2005 / 25	Y	Skin	K.Stockin / P.Duignan (MU)
Common dolphin	NZ	2004/2005 / 10	Y	Stomachs, skulls teeth, blubber, fixed tissues	K.Stockin / P.Duignan (MU); A. van Helden (TP)

### 4.3 Samples from stranded animals

Species <sup>1</sup>	Area/stock	Calendar year/season total	Archived (Y/N)	Tissue type(s)*	Contact person/institute
Arnoux's beaked whale	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Blainville's beaked whale	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Bottlenose dolphin	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Bryde's whale	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Common dolphin	NZ	2005-06/13	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>

Common dolphin	NZ	2005-06/?	Y	Skin, blubber, stomachs, teeth	K. Stockin / P. Duignan (MU)
Common dolphin	NZ	2005-2006/?	Y	Skulls	K. Stockin / P. Duignan (MU)
Cuvier's beaked whale	NZ	2005-06/3	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Dwarf minke whale	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Gray's beaked whale	NZ	2005-06/14	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Humpback whale	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Long-finned pilot whale	NZ	2005-06/53	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Pygmy blue whale	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Pygmy right whale	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Pygmy sperm whale	NZ	2005-06/13	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Southern bottlenose whale	NZ	2005-06/2	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Southern minke whale	NZ	2005-06/2	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Southern right whale	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Sperm whale	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Straptooth whale	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Unknown	NZ	2005-06/6	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>
Unknown beaked	NZ	2005-06/1	Y	Skin and blubber	D. Steel (AU) <sup>1</sup>

<sup>1</sup> Two of the minke whales, the pygmy blue whale, three of the Gray's beaked whales and the straptooth whale were all primarily identified to species level by genetic analysis with comparison to reference sequences held at [www.dna-surveillance.auckland.ac.nz](http://www.dna-surveillance.auckland.ac.nz). For the remaining samples, genetic analysis confirmed morphological identification made by DOC field staff or A. van Helden (TP).

P. Duignan, G. Jones and colleagues (MU) continue to undertake autopsies of stranded and bycaught marine mammals to investigate cause of death and investigation of biology and ecology.

#### 4.4 Analyses/development of techniques

G. de Tezanos Pinto and C.S. Baker (AU) continue to investigation of the molecular ecology of bottlenose dolphins in NZ. Fourteen unique haplotypes (maternal lineages) were identified for Northland (n=44). The frequency of haplotypes by sex showed no strong evidence of sex bias. One haplotype dominated by males was not found in the other populations. The relatively large number of representative haplotypes found in Northland, provides the potential for more detailed analysis of habitat usage and social association patterns among maternal lineages. Analysis of the mitochondrial DNA control region between the three NZ populations (Northland, Marlborough Sounds and Fiordland) showed significant genetic differentiation and relative isolation between them. Northland had higher genetic diversity values than expected, which suggested genetic interchange with a pelagic population or a more recent colonisation event. There was one NZ maternal lineage (haplotype) that was shared with Samoa, although there were no shared haplotypes between NZ and other populations in the Pacific Ocean (French Polynesia, Japan, China, Kiribati and Hawaii). Moreover, a hierarchical analysis by ocean basin did not show any shared haplotypes between ocean basin.

J. Jackson (AU) is investigating the relationship between demographic and genetic estimates of cetacean abundance, with a view to improving on existing logistic demographic and coalescent-based genetic simulation programs by incorporating the influence of one on the other. This work is done in collaboration with A. Rodrigo and A. Drummond (AU). Humpback mitochondrial control region data amplified by members of SPWRC are also being analysed in order to refine estimates of mutation rate, diversity and migration rates between breeding populations across the South Pacific.

E. Carroll (AU) has recently completed an MSc entitled 'The demographic and genetic bottleneck of the southern right whale' in conjunction with C.S. Baker (AU) and N. Patenaude (MU).

C. Olavarria, C.S. Baker and G. de Tezanos Pinto (AU) continue the investigation of molecular ecology of killer whales. The analysis of mtDNA control region sequences (12) from samples collected from strandings and biopsy samples in the North Is., South Is., Chatham Is. and near the Ross Sea revealed five unique haplotypes defined by eleven variable sites. The most common haplotype was found in all except two samples, one from the North Is. and another one from the South Is. Samples from more distant locations (Chatham Is., south of South Is. and Ross Sea) represented unique maternal lineages. The observed diversity and geographic maternal segregation may be the result of a strong phylopatry and population structuring, or less likely, the presence of

different *morpho-types* in the data set.

K. Stockin and D. Lambert (MU) continue to collect and analyse skin samples from common dolphins. All samples (beachcast animals only) have been extracted, sexed, sequenced (D-loop region of the mtDNA) and analysis of the results is currently being undertaken.

N. Wiseman (AU) continued to collect skin samples from Bryde's whales in the Hauraki Gulf. All stranded samples and fifteen biopsy samples have been extracted, sexed and sequenced (D-loop region of the mtDNA) and genotyped.

C. Olavarría (AU) continues with his doctoral research on South Pacific humpback whales population structure using molecular markers. A recent analysis of over a thousand mtDNA control region sequences showed significant differentiation between six breeding grounds (Western Australia (D stock), New Caledonia (Eii1 sub-stock), Tonga (Eii2 sub-stock), Cook Islands (F stock), French Polynesia (F stock) and the Pacific coast of Colombia (G stock)), suggesting that the Cook Islands and French Polynesia should be considered two stocks, not the single F stock proposed previously. Other research is related to sex bias on population structure of breeding grounds, rate of interchange between New Caledonia and Tonga breeding grounds and the differentiation between feeding areas of the Antarctic Stock I.

## 5. Pollution studies

K. Stockin, P. Duignan and M. Orams (MU) continue to process blubber, liver and kidney samples from beachcast and bycaught common dolphins around the North Island of NZ. Samples were analysed for trace metals PCBs and organochlorines. Pollutant levels and off-loading between genetically determined mother-calf pairs has been examined. An analysis of results is currently being undertaken.

## 6. Statistics for large cetaceans

### 6.1 Direct catches (commercial, aboriginal and scientific permits) for the calendar year 2005

None.

### 6.2 Non-natural mortality for the calendar year 2005

None.

#### 6.2.1 STRANDINGS OR DEAD WHALES ENCOUNTERED AT SEA

See section 8 for a summary of strandings. Full details of individual strandings are held in the NZ National Stranding Database and requests for this information should be made to A. van Helden (TP).

#### 6.2.2 OBSERVED OR REPORTED SHIP STRIKES

None.

#### 6.2.3 FISHERY BYCATCH

None.

### 6.3 Earlier years' statistics

No changes.

## 7. Statistics for small cetaceans

### 7.1 For the calendar year 2005

Whale species	No.	Date	Location	Fat e	Targeted fish species	Gear	How observed ?	Source or contact
Common dolphin <sup>1</sup>	1	08/05	42°39' S; 170°03' E	D	Barracouta <i>Thyrsites atun</i>	Trawl	F	MFish
Hector's dolphin	11	Various	Various	D	Various demersal spp.	GNS	DA	H. McConnell (DOC)

<sup>1</sup> Landed dead, marked and discarded. Information provided by S. Baird (NIWA) under contract to NZ Ministry of Fisheries

### 7.2 Direct catches (commercial, aboriginal and scientific permits) for the calendar year 2005

None.

### 7.3 Non-natural mortality for the calendar year 2005

None.

**7.3.1 STRANDINGS OR DEAD SMALL CETACEANS ENCOUNTERED AT SEA**

See section 8 for a summary of strandings. Full details of individual strandings are held in the NZ National Stranding Database and requests for this information should be made to A. van Helden (TP).

**7.3.2 OBSERVED OR REPORTED SHIP STRIKES**

None.

**7.3.3 FISHERY BYCATCH**

See Section 7.1.

**7.4 Earlier years' statistics**

No changes.

**8. Strandings**

A. van Helden (TP) maintains the NZ National Stranding Database. The total number of reported strandings for the period April 2005 to March 2006 is 92 incidents involving 562 animals. This excludes those animals that have been reported but for which stranding data forms had not been received by the Museum of New Zealand Te Papa Tongarewa before the end of March. At least 17 different species were recorded in the database for this period. The representation in the number of incidents of strandings for the different families that stranded in this period are: *Neobalaenidae* 1.1%, *Balaenopteridae* 6.5%, *Ziphiidae* 15.2%, *Delphinidae* 57.6%, *Physeteridae* (including *Kogiidae*) 19.6%. The representation in number of animals for the different families that stranded in this period are: *Neobalaenidae* 0.02%, *Balaenopteridae* 1.1%, *Ziphiidae* 3.2%, *Delphinidae* 85.4% and *Physeteridae* 4.4%. The species with the highest incidents of strandings were Long-finned pilot whales with 23 incidents, but some of these represent beach cast animals that may have come from previous strandings. The second most commonly stranded cetacean was common dolphins with 19 incidents. The largest number of animals of a species to strand was 475 for Long-finned Pilot whales. The total number of animals refloated for this period was 119, 12 of which restranded and died, 107 are therefore presumed to have survived.

Species	No. of strandings	No. of individuals	No. re-floated	No. re-stranded
<b>RIGHT WHALE</b>				
Pygmy right whale	1	1	0	0
Total for: right whale	1	1	0	0
<b>RORQUAL</b>				
Antarctic minke whale	4	4	2	1
<i>Balaenoptera</i> sp.	1	1	0	0
Bryde's whale	1	1	0	0
Total for: rorqual	6	6	2	1
<b>BEAKED WHALE</b>				
Arnoux's beaked whale	1	1	0	0
Cuvier's beaked whale	1	1	0	0
Gray's beaked whale	7	9	0	0
Dense beaked whale	1	1	0	0
<i>Mesoplodon</i> sp.	1	1	0	0
Southern bottlenose whale	2	4	0	0
Straptooth whale	1	1	0	0
Total for: beaked whale	14	18	0	0
<b>DOLPHIN</b>				
Bottlenose dolphin	2	2	0	0
Common dolphin	19	23	5	0
Dusky dolphin	2	2	1	0
Hector's dolphin	6	9	1	1
Long finned pilot whale	23	475	109	10
Southern right whale dolphin	1	1	0	0
Total for: dolphin	53	512	116	11
<b>SPERM WHALE</b>				
Pygmy sperm whale	16	23	1	0
Sperm whale	2	2	0	0
Total for: sperm whale	18	25	1	0



<b>Total:</b>	92	562	119	12
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S. O'Shea and colleagues (AUT) continue to investigate strandings of cetaceans in NZ. Research has included undertaking a detailed examination of one dead pilot whale that includes CT scan (in conjunction with Middlemore Hospital), forensic pathology report (in conjunction with Auckland Hospital), and a parasitology report (in conjunction with Cawthron Institute). S. O'Shea (AUT) continues to collect stomach samples of teuthophagous whales to investigate diet.

The tissue and DNA archive held at the University of Auckland currently contains approximately 1000 samples from 34 species, including one porpoise, 9 mysticete, 14 odontocete and 11 beaked whale species. This archive is curated by C.S. Baker and D. Steel (UA).

K. Stockin, P. Duignan, G. Jones and M. Orams (MU) collected all available biological samples/data from the Lucas Creek common dolphin mass stranding. During each necropsy the following samples were taken; teeth (age determination), stomachs (diet determination), blubber and various organs (toxicology), bloods (health and disease) and reproductive organs (life history).

### 9. Other studies and analyses

The NZ Department of Conservation continues to manage and advocate for the improved protection of cetaceans in NZ waters. Several key initiatives include:

- (1) the recent release for public comment of a draft Marine Protected Areas Policy that identifies Marine Mammal Sanctuaries, as provided for under the Marine Mammals Protection Act 1978, as possible tools that could contribute to the envisaged network of Marine Protected Areas;
- (2) DOC and MFish are currently jointly preparing a Threat Management Plan for the endemic South Island Hector's dolphin found in the South Island, and the closely related North Island cogener, Maui's dolphin. Both subspecies are threatened by incidental take in coastal gill nets. The plan will identify all the threats that these dolphins are subject to including other forms of fishing, tourism impacts, pollution etc and will recommend actions to mitigate these threats;
- (3) Over the past year H. McConnell and other DOC staff have worked with other government agencies and industry to develop a set of guidelines to minimise the impacts of seismic surveys on marine mammals. These guidelines represent the first comprehensive work that has been undertaken in NZ to address the issue of impacts of seismic surveys on marine mammals. The guidelines therefore herald a sound progression towards mitigating potential impacts of these surveys in NZ waters. The guidelines are non-statutory and will be adopted on a voluntary basis. To date industry has been very positive towards adopting the recommendations given. The guidelines are available from the following link: [www.pepanz.org/downloads/Offshore\\_Seismic\\_Guidelines.pdf](http://www.pepanz.org/downloads/Offshore_Seismic_Guidelines.pdf). Associated reference documentation is available from: [http://www.pepanz.org/downloads/Offshore\\_Seismic\\_Guidelines-background.pdf](http://www.pepanz.org/downloads/Offshore_Seismic_Guidelines-background.pdf)

F. Gomez-Villota and S. O'Shea (AUT) have been investigating the diet of sperm whales in NZ. The cephalopod prey from 15 male sperm whales were described comprising 37 species in 16 families. Twenty three species are likely to be consumed in NZ waters and a further 10 and 4 species are considered to be preyed upon in South Tasmanian and Antarctic waters respectively. An apparent shift in the diet of sperm whales in NZ since the 1960's probably reflects changes in the abundance of important prey species. E. Beatson and S. O'Shea (AUT) have been investigating the diet of pygmy sperm whales. The stomachs of 25 pygmy sperm whales stranded in NZ between 1991 and 2003 were examined. Diet included fish and crustaceans, but was mainly comprised of cephalopods. Cephalopod prey were from 31 species and 14 families, dominated by juveniles of *Histioteuthididae* and *Cranchiidae*.

A. Gormley (OU) is developing a Bayesian estimate of adult survival using long-term mark-recapture data, that also includes covariates for capture probability. The estimate will be one input into a stochastic matrix population model. The model itself will then become an input into a Bayesian decision analysis model that will provide a formal way of ranking and/or choosing an optimal management decision. This model will be used for Hector's dolphins in the first instance, but will be suitable for other marine mammal populations.

K. Stockin, L. Meynier, M. Bando, P. Duignan (MU) continue research on the diet of common dolphins from NZ beachcast and bycaught animals. To date, stomach content analyses have been conducted on 38 common dolphins. K. Stockin, M. Orams and P. Duignan (MU) and Anton van Helden (TP) continue to collect common dolphin skulls for morphometric analyses. K. Stockin, V. Binedell and M. Orams (MU) are using Markov-chain analysis to analyse the behavioural ecology of common dolphins in the Hauraki Gulf in relation to the tour vessel dolphin explorer.

The 8th Annual Meeting of the South Pacific Whale Research Consortium was held at the University of Auckland 8-12 February, 2005. Over thirty participants attended, including researchers and wildlife managers from throughout the region. As usual, much of the meeting was devoted to the consideration of data collected

during synoptic humpback whale research programmes, including the matching of fluke catalogues and genetic analyses. Several new matches were made between existing catalogues, demonstrating a significant degree of interchange between over-wintering grounds.

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None.

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