

**NEW ZEALAND PROGRESS REPORT ON CETACEAN RESEARCH, APRIL 2001 TO MARCH 2002,
WITH STATISTICAL DATA FOR THE CALENDAR YEAR 2001**

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This report summarises information obtained from: Auckland, Massey, and Otago Universities, Te Papa Museum of New Zealand, Department of Conservation, Ministry of Fisheries, New England Aquarium, NIWA, and independent researchers.

1. Species and stocks studied

Common name	Scientific name	Area/stock(s)	Items referred to
Andrews beaked whale	<i>Mesoplodon bowdoini</i>	NZ	4.3
Beaked whales	Family <i>Ziphiidae</i>	NZ	9
Bottlenose dolphins	<i>Tursiops truncatus</i>	NZ	2.1.1, 2.1.2, 3.1.1, 4.1, 4.3, 9
Bryde's whale	<i>Balaenoptera edeni</i>	NZ	2.1.1, 2.1.2, 3.1.1, 4.3
Common dolphin	<i>Delphinus delphis</i>	NZ	2.1.1, 3.1.1, 4.2, 4.3, 7.1, 8
Dusky dolphin	<i>Lagenorhynchus obscurus</i>	NZ	4.2, 4.3, 7.1
Gray's beaked whale	<i>Mesoplodon grayi</i>	NZ	4.3
Hector's dolphin	<i>Cephalorhynchus hectori</i>	NZ	2.1.1, 3.1.1, 4.1, 4.2, 7.1, 9
Humpback whale	<i>Megaptera novaeangliae</i>	Area V	3.1.1, 6.2, 9
Killer whale	<i>Orcinus orca</i>	NZ	2.1.1, 3.1.1, 4.1, 9
Longman's beaked whale	<i>Indopacetus pacificus</i>	NZ	9
Minke whale	<i>Balaenoptera acutorostrata</i>	Area V	2.1.1
Pygmy right whale	<i>Caperea marginata</i>	NZ	4.3
Pygmy sperm whale	<i>Kogia breviceps</i>	S. Hemisphere	4.3, 8
Southern right whale	<i>Eubalaena australis</i>	NZ	3.1.1, 4.1, 9
Sperm whale	<i>Physeter macrocephalus</i>	NZ	2.1.1, 3.1.1, 4.3
Straptoothed whale	<i>Mesoplodon layardi</i>	NZ	4.3
Striped dolphin	<i>Stenella caeruleoalba</i>	NZ	4.3

2. Sightings data

2.1 Field work

2.1.1 Systematic

The second year of a three-year aerial survey of Bryde's whales was conducted off New Zealand's north-eastern coast between Cape Colville and North Cape by A. Baker (Dept of Conservation). Flights were undertaken along a predetermined track at monthly intervals, and whale sightings were logged on a GPS. Bryde's whales were present in inshore coastal waters in all months. Numbers increased in October through March, coinciding with increasing spring SST. Associated species were common dolphins, bottlenose dolphins and killer whales. Gannets, petrels and dolphins associate with Bryde's whales in differing ratios when feeding, depending on food source. Calves have been sighted in summer, and a foetus was recorded in late December.

D. Neumann and M. Orams (Massey Univ.) have completed a 3-year investigation of the behaviour and ecology of short-beaked common dolphins. This includes collecting data on activity budgets, seasonal movements, feeding strategies, and interactions with swim-with-dolphin tourism using photo ID and boat based behavioural observations. The bulk of the study was conducted around Whitianga on the Coromandel Peninsula, and comparative observations were undertaken around Whakatane in the Bay of Plenty. 408 distinct individuals have been identified, 18 of them were resighted at some stage over the 3-yr period. K. Stockin and M. Orams (Massey Univ.) continue research on common dolphins in the Hauraki Gulf investigating ecology and the impacts of tourism.

P. Ensor has been involved with the NILS 2001 and SOWER 2001/02 line transect research cruises investigating the distribution and abundance of whales, primarily minke.

C. Nichols, G. Stone (New England Aquarium) and A. Hutt (Dept. of Conservation) completed the second field season in a two year project to observe Hector's dolphin behaviour around swim/tour boats from aboard the tour vessels, with simultaneous cliff-side theodolite observations in Akaroa Harbour. G.Stone, A.Yoshinaga (New

England Aquarium) and A. Hutt also continued a mother/calf pair habitat use study in the Banks Peninsula area.

E. Slooten, S. Dawson, W. Rayment and H. Nollens (Otago Univ.) carried out an aerial survey to estimate the proportion of the Hector's dolphin population found within the four nautical mile offshore boundary of the Banks Peninsula Marine Mammal Sanctuary. This was a line-transect survey, with lines running at a 45 degree angle from the coastline, out to 15 nautical miles offshore. Preliminary analysis indicates that in mid-summer approximately 20% of the population is found offshore of the sanctuary boundaries. The survey will be repeated in winter to quantify seasonal changes in distribution, and in the effectiveness of the sanctuary.

D. Lusseau, D. Rundgren, S. M. Lusseau and O. Boisseau (Otago Univ.) studied the population size, residency pattern, acoustic behaviour, diet and behavioural ecology of bottlenose dolphins in Fiordland. From January 2001 to January 2002 they spent 108 days in Doubtful and Milford on effort. In both fjords the impact of tourism activities on the resident populations was assessed and a study of the vocalisation pattern of bottlenose dolphins was made. Three Fiordland-wide distribution surveys were conducted from the research vessel *Malaika wai peponii*. Further investigation next year of vessel impacts will focus on assessing the impact of the research vessel using land-based observations. A new part of the project was started by S. Maersk (Otago Univ.) in January 2002 looking at the food web position of the dolphins in Doubtful Sound using carbon/nitrogen stable isotopes. Initial trials with taking skin scrapings, using a velcro pad, were abandoned due to difficulties of obtaining samples and the dolphins' responses to sampling. Trials with nets, sampling containers and pumps are underway to obtain faecal samples, and intestinal skin. It is also planned to develop a hydrophone array to assess spatial variations in vocalisations, 3-D movements and behaviour of dolphins.

Researchers at the University of Otago (S. DuFresne, S. Dawson and E. Slooten) continued an on-going program of photo-ID surveys of Hector's dolphin in the Banks Peninsula Marine Mammal Sanctuary. The primary objective is to provide a quantitative assessment of the effectiveness of the sanctuary by refining estimates of adult survival rates. It is expected that the study will be completed in late 2003.

S. Dawson and E. Slooten (Otago Univ.) collected skin samples from Hector's dolphins at Porpoise Bay (Southland) to provide information on population structure. F. Pichler and K. Russell (Auckland Univ.) will be carrying out the genetic analysis of these samples. S. DuFresne, D. Clement, E. Slooten and W. Rayment (Otago Univ.) wrote several reports summarising research data on Hector's dolphins, to inform decisions on mussel farming applications (see publications below).

A three-year project by D. Clement (Otago Univ.) continued to collect distribution and density data for Hector's dolphins in both the Banks Peninsula and Westport areas between April 2001 and April 2002. This study aims to compare the changing oceanography of the study areas with seasonal and inter-annual fluctuations in relative distribution and densities of dolphins to investigate high and low areas of use. Approximately 4,228 km of perpendicular and alongshore line-transects were surveyed comprising 700 dolphin sightings and 830 oceanographic samplings.

Researchers from Otago University (C. Richter, M. Q. Rhineland, N. Jaquet) continued their fieldwork on sperm whales off Kaikoura. C. Richter, S. Dawson and E. Slooten completed their study to assess the impact of current whale watching activities on sperm whales. Over four years (1998-2001) 1,676 sightings from the research vessel and 435 from shore were recorded. Blow interval decreased in the presence of the research vessel and/or whale-watching platforms. Whale-watching boats and planes, individually or together, caused increases in time spent at the surface, the frequency and amount of heading changes, and in the case of boats, a decrease in the time to the first click. Behavioural changes were more severe in transient whales, which are probably less acclimatised to boats. Current whale-watching effort is high, in good weather on a typical summer's day, an individual resident whale is accompanied by one or more whalewatch boats for 40% of his surfacings in daylight hours. This research on the effects of whale watching is part of a wider ecological research program that uses oceanographic data collection, photographic identification, acoustics and photogrammetric measurements of whale length in order to study distribution, residency, habitat use, diving, foraging behaviour and vocal behaviour.

Aiming to assess the extent of the overlap between the distribution of Hector's dolphin and fisheries (on a spatial and temporal basis) along the northeast coast of the New Zealand' South Island (Buller Region), Eduardo Secchi (Otago Univ.) has been collecting data on recreational setnet fishery through fishing diaries distributed to amateur fishers and by beach surveys. Data on commercial setnet fishing effort and distribution was obtained from records supplied by the Ministry of Agriculture and Fisheries (Wellington). Since March 2000, seasonal patterns of dolphin's distribution and density have been studied through systematic boat surveys. Two different sampling designs (one set of transects parallel to coast and another set of transects perpendicular to coast) were used to test for

differences in dolphin's distribution and density according to distance from shore on a seasonal basis. Almost 2,000km of transect lines have been run. E. Secchi has also been carrying out a photographic identification study of Hector's dolphins in the Buller region. About 350 photos have been taken. All photographs where dolphins present conspicuous marks have been stored in a catalogue and will be compared with photos from the previous studies (by Stephan Bräger), which contain photos from most of the West Coast (from 1994 to 1997). This will be used to investigate if Hector's dolphin have a highly clumped and restricted distribution or if they move through adjacent areas. The photos will also be used to complement studies on site fidelity.

E. Martinez (Otago Univ.) is investigating the effects of dolphin watching on Hector's dolphins at Motunau. The research uses cliff-top observations (with a theodolite) and vessel based observations (including photo-ID) to study the movements and behaviour of Hector's dolphins in the presence and absence of boats. One of the aims is to compare results from Motunau with those previously gathered at Porpoise Bay. E. Green and E. Martinez (Otago Univ.) are also investigating the effects of dolphin watching on Hector's dolphins in Porpoise Bay, Catlins. They use cliff-top (with a theodolite) and boat observations to study the movements and behaviour of Hector's dolphins in the presence and absence of boats and swimmers. The main aims are to a) compare results with data previously gathered at Porpoise Bay by Lars Bejder during the austral summers 1996/1996 and 1996/1997 and b) provide Department of Conservation with recommendations for the management of tourist activities.

2.1.2 Opportunistic, Platforms of Opportunity

K. Thompson (Auckland Univ.) carried out sighting surveys in the Hauraki Gulf (36°10' S to 36°60' S) on board the commercial whale watch vessel, Dolphin Explorer. This study is investigating the local Bryde's whale population using photo-identification and behavioural observation. Thirty surveys (e.g. 150 hours of on-water effort) were conducted between the 4th October 2001 – 15th March 2002. Twelve whales were sighted during eight encounters and a further 38 whales were sighted by Dolphin Explorer crew during 21 encounters. Of these, 47 whales were confirmed as Bryde's whales by direct observation and photography of lateral rostral ridges. Preliminary analysis of minimum residency times from animals seen at least twice during the sampling period (n = 6 of 12 identified individuals) suggest that whales spend periods of at least 20 days in the Gulf. Single animals were most frequently encountered (54%, n = 14 of 26). One mother-calf pair was seen during February/March 2002.

Ongoing photo-id research on bottlenose dolphins, using the dolphin-tour boats as the research platform, continues in the Bay of Islands. J. Berghan and R. Constantine (Auckland Univ.) have continued to take photographs on an opportunistic basis and there have been 18 new dolphins photo-identified during the past year. Further work by R. Constantine found that this population ranges along the north-eastern coast of the North Island between Doubtless Bay and Tauranga. Comparison of the catalogue to bottlenose dolphin images from the Marlborough Sounds (taken by S. Brager, R. Constantine, and I. Visser) suggests that this is an isolated population. A closed population estimate found there are 446 (95% CI 418-487) dolphins that use the Bay of Islands as part of their home range, although no dolphins are resident in the Bay of Islands. J. Berghan and A. Fleming (Dept. of Conservation) continue to monitor the type and duration of vessel contact with bottlenose dolphins in the Bay of Islands.

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/season/	Catalogued (Y/N)	Catalogue total	Contact person/institute
Bottlenose dolphin	Fin/body	Doubtful Sound	1990-2002	Yes	83	D. Lusseau/ Otago Univ.
Bottlenose dolphin	Fin/body	Milford Sound	2000-2002	Yes	50	D. Lusseau/ Otago Univ.
Bottlenose dolphin	Fin/body	Bay of Islands	1993-2002	Yes	392	R. Constantine/ Auckland Univ.
Brydes whale	Fin/body	Hauraki Gulf	2001-02	Yes	>20	K. Thompson/ Auckland Univ.
Common dolphin	Fin/body	Whitianga/ Whakatane	1998-2001	Yes	408	D. Neumann/ Massey Univ.
Hector's dolphin	Fin/body	North I.	1998-2002	Yes	34	K. Russell/ Auckland Univ.

Hector's dolphin	Fin/body	East South I. West South I.	1984-2002 1994-1997, 2001-2002	Yes	500	E. Slooten/ Otago Univ.
Humpback whale	Fluke	Area V	1991-2002	Yes	440	R. Constantine, C. S. Baker/ Auckland Univ.
Humpback whale	Fluke	New Zealand	1995-2002	Yes	6	R. Constantine/ Auckland Univ.
Killer whale	Fins/saddles/ eye patches	NZ	1993-2000	Yes	117	I. Visser/ The Orca Project
Killer whale	Fins/saddles/ eye patches	Area V	2001	Yes	11	C. Olavarría/ Auckland Univ.
Southern right whale	Callosities/ lip lines	Area V	2001	Yes	2	C. Olavarría/ Auckland Univ.
Southern right whale	Callosities/ lip lines	NZ sub-antarctic	1995-1999	Yes	402	N. Patenaude/ Auckland Univ.; B. Todd/ Project Tohora
Sperm whale	Fluke	Kaikoura	1990-2002	Yes	190	E. Slooten/ Otago Univ.

3.1.2. Artificial Marking Data

None

3.1.3 Telemetry Data

None

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
Bottlenose dolphin	NZ	9	No	0	9	D. Neumann/ Massey Univ.; K. Russell/ Auckland Univ.
Hector's dolphin	NZ	24	Yes	23	116	K. Russell, F. Pichler/ Auckland Univ.
Hector's dolphin	Porpoise Bay	21	Yes	0	?	E. Slooten, S. Dawson/Otago Univ., K. Russell, F. Pichler/ Auckland Univ.
Killer whale	Area V	1	Yes	0	1	C. Olavarría/ Auckland Univ.
Southern right whale	Area V	1	Yes	0	1	C. Olavarría/ Auckland Univ.

4.2 Samples from directed catches or bycatches

Species	Area/stock	Calendar year/ season total	Archived (Y/N)	Tissue type(s)	Contact person/institute
Common dolphin	NZ	10	Yes	Skin, blubber, fixed tissues, skeletons	P. Duignan/ Massey Univ.
Dusky dolphin	NZ	3	Yes	Skin, blubber, fixed tissues, skull	P. Duignan/ Massey Univ.
Hector's dolphin	NZ	23	Yes	Skin, blubber, fixed tissues, skeletons	P. Duignan/ Massey Univ.; A. van Helden/ Museum of NZ

4.3 Samples from stranded animals

Species	Area/stock	Calendar year (total)	Archived (Y/N)	Tissue type(s)	Contact person/institute
Andrews' beaked whale	NZ	1	Y	Skin, blubber	M. Dalebout/ Auckland Univ.

Bottlenose dolphin	NZ	1	Y	Skin, blubber	D. Steel & M. Dalebout/ Auckland Univ.
Bottlenose dolphin	NZ	1	Y	Skin, blubber, fixed tissues	P. Duignan/ Massey Univ.
Bryde's whale	NZ	1	Y	Skin, blubber	D. Steel & M. Dalebout/ Auckland Univ.
Common dolphin	NZ	5	Y	Skin, blubber	D. Steel & M. Dalebout/ Auckland Univ.
Common dolphin	NZ	3	Y	Skin, blubber, fixed tissues	P. Duignan/Massey Univ.
Dusky dolphin	NZ	4	Y	Skin, blubber	D. Steel & M. Dalebout/ Auckland Univ.
Dusky dolphin	NZ	1	Y	Skin, blubber, fixed tissues	M. Dalebout/ Auckland Univ.
Gray's beaked whale	NZ	6	Y	Skin, blubber	M. Dalebout/ Auckland Univ.
Gray's beaked whale	NZ	1	Y	Skin,blubber	M. Dalebout/ Auckland Univ.; P. Duignan/ Massey Univ.
Pygmy right whale	NZ	2	Y	Skin, blubber, fixed tissues	P. Duignan/ Massey Univ.
Pygmy sperm whale	NZ	1	Y	Skin, blubber	D. Steel & M. Dalebout/ Auckland Univ.
Pygmy sperm whale	NZ	8	Y	Skin, blubber, fixed tissues	P. Duignan/ Massey Univ.
Sperm whale	NZ	1	Y	Skin, blubber	D. Steel & M. Dalebout/ Auckland Univ.
Straptoothed whale	NZ	3	Y	Skin, blubber	M. Dalebout/ Auckland Univ.
Straptoothed whale	NZ	1	Y	Skin, blubber, fixed tissues	P. Duignan/ Massey Univ.
Striped dolphin	NZ	2	Y	Skin, blubber	D. Steel & M. Dalebout/ Auckland Univ.
Striped dolphin	NZ	3	Y	Skin, blubber, fixed tissues	P. Duignan/ Massey Univ.

4.4 Analyses/development of techniques

None.

5. Pollution studies

None.

6. Statistics for large cetaceans

6.1 Direct catches (commercial, aboriginal and scientific permits) for the calendar year 2000

None.

6.2 Other non-natural mortality for the calendar year 2000

R. Constantine (Auckland Univ.) compiled reports of two humpback whales entangled in crayfish pots in June 2001. One whale was off the Kaikoura Peninsula and the other was to the north of Kaikoura. One whale was entangled by its pectoral fin and was cut free by a local whale-watching boat. The other whale was more severely entangled, with a line wrapped around its rostrum and peduncle, but this was also cut free by a local fisherman. Both whales were released alive.

6.3 Earlier years' statistics

No amendments.

7. Statistics for small cetaceans

7.1 For the calendar year 2000

Species	Area/stock	Directed catch		Incidental mortality			Live-capture
		Reported	Est. total	Reported	Est. total	Source	Reported
Common dolphin	NZ	nil	nil	3 ^{1,2}	?	Gillnet/ Trawl	nil
Dusky dolphin	NZ	nil	nil	3 ^{1,2}	?	Trawl	nil
Hectors dolphin	North Island, West Coast	nil	nil	3 ²	?	Gillnet	nil
Hectors dolphin	South Island, West Coast	nil	nil	6 ²	?	Gillnet	nil
Hectors dolphin	South Island, East Coast	nil	nil	4 ²	?	Gillnet	nil

¹ details provided by R. Blezard, Dept of Conservation and S. Baird, NIWA from data collected by Scientific Observer Programme of Ministry of Fisheries,

² details provided by N. Gibbs, Massey Univ. from data collected from Carcass Recovery Programme of Dept of Conservation, Carcass Recovery Programme

7.2 Earlier years' statistics

No amendments.

8. Strandings

A. van Helden (Te Papa/Museum of NZ) maintains the NZ stranding database and marine mammal collection. The total number of reported strandings for this period is 59 incidents involving 70 animals. This excludes those animals that have been reported but for which stranding data forms have not been received by the Museum of New Zealand Te Papa Tongarewa before the end of March. At least 16 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: *Balaenidae* 3.39%, *Balaenopteridae* 3.39%, *Ziphiidae* 11.86%, *Delphinidae* 57.63%, *Physeteridae* 23.73%. The representation in number of animals for the different families that stranded in this period are: *Balaenidae* 2.86%, *Balaenopteridae* 2.86%, *Ziphiidae* 10%, *Delphinidae* 64.29% and *Physeteridae* 20%. The species with the highest incidents of strandings were Common dolphins with 14 incidents and Pygmy sperm whales with 13 incidents. The largest number of animals of a species to strand was 21 for Common dolphins. The total number of animals refloated for this period was 12, 2 of which re-stranded and died, therefore 10 are presumed to have survived.

P. Duignan and N. Gibbs (Massey Univ.) continue to autopsy stranded cetaceans and/or those killed in fishing operations to determine cause of death, disease, and investigate biology.

9. Other studies and analyses

R. Constantine (Auckland Univ.) continues to collate fluke photos of humpback whales in the New Zealand region. Fluke photos of three humpback whales were taken off Kaikoura in June 2001 and another fluke photo taken in 1995 was also supplied. Two whales photographed off New Zealand have been matched to whales photographed in New Caledonia (catalogue curated by C. Garrigue) but no further matches have been made to photos from other areas of Oceania (catalogues curated by members of the South Pacific Whale Consortium).

M. Dalebout (Auckland Univ.) completed her PhD dissertation entitled, "Species identity, genetic diversity and molecular systematic relationships among the Ziphiidae (beaked whales)". A brief summary of the findings of this research follows. A reference database of mitochondrial DNA sequences was compiled for all 20 recognised ziphiid species to aid in species identification. All reference sequences were derived from validated specimens, which were often represented only by bone or teeth. For three species, holotypes were sampled. Phylogenetic analyses using this database led to the discovery of a new, previously unrecognised species of beaked whale (Dalebout *et al.* 2002), new specimens of Longman's beaked whale (*Indopacetus pacificus*, a species known previously from only two partial skulls) and the synonymy of a third (*M. traversii* = *M. bahamondi*; see also van Helden *et al.* (2002). Phylogenetic reconstructions based on sequence data from three mitochondrial and two nuclear loci (total, 2815 bp) using neighbour-joining, parsimony, and maximum likelihood methods, resolved many of the sister-species relationships in this group. Inferred relationships among *Mesoplodon* beaked whales indicated that cranial and tooth morphology may be far more variable between closely related species than previously assumed. It is suggested that the geographic

distribution of *Mesoplodon* species with similar or divergent tooth morphology is likely due to a combination of sexual selection and selection for species recognition. Investigation of mtDNA diversity among a number of beaked whale species indicated that nucleotide diversity was generally lower in this group than in other wide-ranging oceanic cetaceans. The cause of this low diversity was not clear but may be indicative of overall low abundance. Particularly low levels of diversity were found in Baird's beaked whale *Berardius bairdii*, Arnoux's beaked whale *B. arnuxii* and the northern bottlenose whale *Hyperoodon ampullatus*. Strong geographic structure in haplotype frequencies was observed among a worldwide sample of Cuvier's beaked whales *Ziphius cavirostris*.

N. Patenaude (Auckland Univ.) completed her PhD dissertation entitled, "Demographic and genetic status of southern right whales at the Auckland Islands, New Zealand". The distribution of southern right whales at the Auckland Is was restricted to waters surrounding Port Ross where up to 165 whales could be found on a single day. The yearly winter presence of a large number of whales, the presence of mothers and calves, and the frequency of social groups confirm that the Auckland Islands are a primary wintering habitat and calving ground for southern right whales in New Zealand waters. Of 30 southern right whales photo-identified at Campbell Is., four showed within- and/or between-year movements with the Auckland Islands suggesting that right whales from both island groups are part of one intermingling sub-Antarctic population. The New Zealand sub-Antarctic stock was estimated at 936 whales (95% C.I. 740-1140), including 330 reproductive females, based on capture-recapture analysis using natural markings. Significant mitochondrial DNA differentiation ($F_{ST} = 0.14150$; $F_{ST} = 0.23701$; $p < 0.001$) among four wintering southern right populations (South Africa, Argentina, Western Australia and sub-Antarctic New Zealand) suggested low levels of interchange, limited largely to adjacent populations within ocean basins. The historical abundance of New Zealand southern right whales was estimated at between 15,000 and 17,000 using historical catch records and a deterministic density-dependent demographic model. Genetic modeling of the impact of past whaling suggested that the current low mtDNA diversity of the New Zealand southern right whale is likely the outcome of a severe and prolonged bottleneck. The recent illegal Soviet whaling, although brief, hindered the demographic and genetic recovery of this population.

K. Russell (Auckland Univ.) collected a total of 24 biopsy samples from North Island Hector's dolphins during the summer of 2000/2001. Amplification and sequencing of the mtDNA control region revealed only the single haplotype reported previously by Pichler and Baker (2000). The sex ratio of the sampled animals was approximately equal. A set of 20 microsatellites has been screened for potential use in DNA profiling for individual identification. Continued collection of photographs confirmed that the number of distinctively marked individuals in this population is low, without only an additional six dolphins added to the catalogue in the past 12 months. The rate of public sighting reports increased during 2000/2001, as has the incidents of beachcast animals. In the last 12 months, six Hector's dolphins have been found beachcast along the West Coast of the North Island. Information on each of these animals has been added to the Stranding Database. A North Island Hector's dolphin sighting network has been operating since 1997 in conjunction with DoC. In November 2000, WWF-NZ became active in soliciting public sighting reports by the implementation of a 0800 hotline to report sightings. All sighting reports are forwarded to myself and added to the sighting log, a total of 68 in the past year.

K. Russell, R. Constantine, C.S. Baker, C. Olvarria (Auckland Univ.) and M. Donoghue (Dept. of Conservation) continued ongoing humpback whale research around the island group of Vava'u, the Kingdom of Tonga. This was the 9th year of research in this region. Research was undertaken during part of the austral winter. Over the 33-day research period, 117 groups of whales were encountered equating to a total of 271 whales (cumulative figures). Photographs and/or biopsies were obtained from all but seven encounters. A total 81 individual fluke identification photographs were added to the Tonga Humpback whale catalogue this season. Biopsy samples were collected from 86 whales, of these 12 were slough skin samples and 74 were biopsy samples. All the samples were successfully extracted. Sequencing for the control region of mtDNA has been undertaken and the results are currently in the process of analysed. Of the 81 whales identified from fluke photographs, eleven were also biopsied and their sex was determined and added to the photo-ID catalogue. Fourteen recording of humpback whale song were obtained during the field season. For each animal an entire cycle of its song was recorded, this equates to 560 minutes of song.

I. Visser (Orca Project) continues research on killer whales around New Zealand. Research uses photo-ID and both surface and underwater behavioural observations to investigate ecology and behaviour.

Preliminary results of D. Clement (Otago Univ.) confirm earlier research on seasonal changes in the offshore distribution of Hector's dolphins. Of sightings made out to four nautical miles off Banks Peninsula, 92% were within one nautical mile (1.853km) from shore during summer. During the colder winter months this drops to 59% and dolphins are more commonly seen along or outside the Sanctuary's (four nautical mile) offshore boundary. Seasonal differences in sighting rates suggest that the Sanctuary protects less than 23% of the population during the winter months. Aerial surveys will be conducted this coming winter, specifically designed to provide data on the proportion

of the population that is found within the sanctuary boundaries.

D. Clement's (Otago Univ.) preliminary analysis of summer abundance and distribution data from the 1980s and 1990s has revealed "hotspots" of Hector's dolphin density around the South Island. These analyses also yielded localised dolphin "hot spots" around Banks Peninsula and random sub-sampling of the sixteen-year dataset helped determine the consistency of these summer "hot spots" over time. The results, if they remain consistent during the current studies, indicate that the dolphins have consistent preferences for specific areas around the Peninsula.

Associate Professor Ewan Fordyce from Otago University has been carrying out studies on the comparative osteology and cranial anatomy of bottlenose dolphins, using skeletons at the National Museum of Natural History, Smithsonian Institution.

10. Literature cited

None

11. Publications

11.1 Published or 'In Press' papers only

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