THE BEHAVIOUR AND ECOLOGY OF SHORT-BEAKED COMMON DOLPHINS (*Delphinus delphis*) ALONG THE EAST COAST OF COROMANDEL PENINSULA, NORTH ISLAND, NEW ZEALAND

- with a note on their interactions with humans

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This dissertation is my own composition.

All sources have been acknowledged.

No part of this work has been submitted

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PUBLICATIONS

The following have been produced during the Ph.D. candidature, as a result of the research presented in this dissertation :

Publications in peer-reviewed journals

Neumann, D.R. (2001). Seasonal movements of short-beaked common dolphins (*Delphinus delphis)* in the northwestern Bay of Plenty, New Zealand: The influence of sea-surface temperature and "El Niño/La Niña". *New Zealand Journal of Marine and Freshwater Research, 35:,* 371-374.

Neumann, D.R. (2001). The activity budget of free-ranging common dolphins (*Delphinus delphis*) in the northwestern Bay of Plenty, New Zealand. *Aquatic Mammals, 27 (2):* 121-136.

Neumann, D.R. & M.B. Orams. (2001). Feeding strategies of short-beaked common dolphins (*Delphinus delphis*), in the northwestern Bay of Plenty, New Zealand. *Marine Mammal Science,* under review.

Neumann, D.R., A. Leitenberger & M.B. Orams. (2001). Long-term tracking of common dolphins in New Zealand - a photo-catalogue of easily recognizable individuals. *New Zealand Journal of Marine and Freshwater Research*, under review.

Neumann, D.R., K. Russel, M.B. Orams, C.S. Baker & P. Duignan. (2001). The common dolphin's codpiece : A new tool for sexing *Delphinus delphis* at sea. *Aquatic Mammals*, submitted.

Other publications

January 1999-July 2001. Quarterly updates on common dolphin research in the Whale and Dolphin Adoption Project Newsletter, by D. Neumann.

April 1999. Massey University magazine, pp. 21-22 : "A passion for dolphins", by L. Granville. Article about the common dolphin research project.

March 2000. Spirits of the sea magazine, p. 3 : "Dolphins under human threat", by D. Neumann.

April 2000. New Zealand Fishing News, p. 30 : "Dolphin article irresponsible". Letter to the editor by D. Neumann.

March 2001. Marine mammals of the Bay of Plenty, by J. Berghan, edited by R. Constantine, pp. 11-16 : "Common dolphins", by D. Neumann.

Presentations at professional meetings

Neumann, D.R. 1999. Seasonal movements of short-beaked common dolphins *(Delphinus delphis)* in the northwestern Bay of Plenty, New Zealand: The influence of sea-surface temperature and "El Niño/La Niña". *13th Biennial conference on the biology of marine mammals, Wailea, Maui, Hawaii, USA, 28 November - 3 December, 1999.*

Neumann, D.R. and M.B. Orams. 2001. The effects of tourism on common dolphins (*Delphinus delphis*) in the northwestern Bay of Plenty, New Zealand. *Southern Hemisphere Marine Mammal Conference, Philip Island, Victoria, Australia, 28 May - 1 June, 2001.*

Neumann, D.R. 2001. Activity budget and feeding strategies of short-beaked common dolphins (*Delphinus delphis*) in New Zealand. *14th Biennial conference on the biology of marine mammals, Vancouver, Canada, 27 November - 3 December, 2001.*

Public presentations and media appearances

10.3.2000. Public seminar, Mercury Bay area school, Whitianga, hosted by Forest and Bird Society. 60-min presentation on the biology of common dolphins.

14.3.2000 - TV3 News (6 p.m.) - "Love hurts", 3-min interview with Darren McDonald on the dangers dolphins face today.

14.3.2001 - Seaweek seminar, Auckland Museum, hosted by the Whale and Dolphin Adoption Project. 30-min presentation on common dolphins and swim-with-dolphin tourism. Hon. Sandra Lee, Minister of Conservation in attendance.

18.3.2001 - Radio New Zealand, Spectrum programme 1144, "Dirk and the dolphins". 20-min interview with David Steemson on dolphin biology and conservation.

18.4.2001 - Radio New Zealand, Kim Hill programme. 15-min live interview on dolphin biology and conservation.

21.4.2001 - Public seminar, Whakatane, hosted by Dept. of Conservation. 60-min presentation on common dolphins and swim-with-dolphin tourism.

4.7.2001 - Auckland Science Fair, Massey University, Albany. Two 45-min presentations on the biology of common dolphins and the logistics of field research.

ABSTRACT

This thesis provides new insights into the behavioural ecology of free-ranging short-beaked common dolphins (*Delphinus delphis*), in New Zealand. A preliminary assessment of common dolphin-human interactions was also carried out as part of this 3-yr field study (1998-2001). 166 surveys were conducted in the greater Mercury Bay area, on the east coast of Coromandel Peninsula, North Island, New Zealand. These led to 105 focal group follows, with a total of 118.2 h spent following common dolphins. Seasonal movements of common dolphins were uncovered, and are apparently tied to fluctuations in sea surface temperature.

Common dolphins appear to live in a fission-fusion society. Groups frequently merged and split again. The merging of groups was often accompanied by either sexual, or feeding activity. 408 individual dolphins were identified from photographs of their dorsal fins. No evidence of long-term associations between individuals was found. Resightings of identifiable dolphins indicate movement of individuals between Mercury Bay and the Hauraki Gulf, as well as between Mercury Bay and Whakatane.

This study provides the first activity budget for common dolphins in the wild. Common dolphins spent 55.6% of their time traveling, 20.4% milling, 16.2% feeding, 7.1% socialising, and 0.7% resting. This proportion did not change significantly by season, or from year to year. Common dolphins were found to feed on at least six different fish species. A number of different feeding strategies were employed to capture these fish. Some of these techniques had previously been observed in bottlenose dolphins and orca, but have never before been described for common dolphins.

The results of this study suggest that common dolphins can potentially be negatively affected by interactions with humans. Boat traffic appears to disturb some dolphin groups, especially those containing few individuals. However, commercial tourism appeared to have little impact on the dolphins, at this study site. Few attempts at swimming with common dolphins resulted in a sustained interaction, but unsuccessful attempts did not elicit an obvious negative response. Fishing poses the greatest threat of physical injury and possible mortality to common dolphins. Several key issues were identified, and their value in managing human-dolphin interactions is discussed.

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