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The occurrence and habitat use of common dolphins (*Delphinus* sp.) in the central Bay of Plenty, New Zealand



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Abstract

This thesis investigated the occurrence and habitat use of common dolphins (*Delphinus* sp.) inhabiting the central Bay of Plenty (BOP), North Island, New Zealand. Although common dolphins are the most prevalent species of dolphin found off the east coast of the North Island of New Zealand, there has been no long term empirical investigation of the species in the central BOP area. Behaviour of common dolphins in the presence of the observation platform was also assessed to investigate habitat use. Additionally, data describing other cetacean species occurring within this region are presented in order to place into context the importance of these waters for *Delphinus*. Sightings data were collected between March 1998 and May 2011 during 2364 boat-based surveys on board platform of opportunity, tourism vessel *Gemini Galaxsea* (a 60 ft ketch sailboat). Variables examined included location, group size, composition, water depth, time of day, seasonality, behaviour and the presence of associated species.

Common dolphins were encountered during 54% ($n = 1265$) of surveys, in water depths ranging from 5.0 to 197.0 m. *Delphinus* sightings primarily occurred in the area between Motiti Island, Mayor Island and Waihi on the mainland. Group size ranged from one to 500+ individuals and was significantly affected by the time of day, month and depth of sightings. The most frequently recorded group size involved 50 to 100 animals, with larger aggregations more frequent during the warmer austral months when nutrient upwelling leads to increased prey availability in coastal waters off the BOP. Groups containing immature animals accounted for 16% of total sightings and occurred throughout the year, although neonate calves were only reported during the warmer austral summer months, supporting the concept of reproductive seasonality in this population. Common dolphin groups sighted within the central BOP were reported in association with five marine mammal species and 14 avian species, most frequently with various species of petrel (Procellariiformes) and the Australasian gannet (*Morus serrator*). The year round occurrence of common dolphins within central BOP waters indicates that this region may be important for *Delphinus*.

Behavioural data were collected from 162 independent dolphin groups. Overall, forage, social and travel accounted for the majority of recorded behavioural states, while mill and rest were less frequent. Behaviour was influenced by water depth, with foraging dolphins encountered in the deepest waters. Behaviour also varied significantly according to group size, with

foraging occurring more often than expected in large groups and resting, socialising and milling occurring more often in smaller groups. The presence of immature animals also had a significant influence on common dolphin behaviour, with foraging occurring more often than expected in groups containing immature animals. The presence of associated species varied according to behaviour, with the majority of foraging groups occurring in the presence of Australasian gannets. Seasonal and diurnal peaks in behaviour were not evident. Social behaviours primarily occurred during summer when large nursery groups were also reported in the central BOP.

In order to place into context the use of central BOP waters for *Delphinus*, an investigation of other cetacean species using these waters was undertaken; eleven cetacean species (6 Mysticeti and 5 Delphinidae) were identified as utilising central BOP waters. Sightings primarily occurred in the area between Karewa Island, Mayor Island (Tuhua) and Motiti Island in the central BOP. The majority of delphinid sightings occurred in spring and involved the bottlenose dolphin, *Tursiops truncatus* (50.5%) and killer whale, *Orcinus orca* (42.9%). Pilot, *Globicephala* spp. (3.8%) and false killer whale, *Pseudorca crassidens* (2.9%) sightings were less frequent. Group sizes ranged from solitary to 200+ individuals. Calf presence was recorded for bottlenose dolphins during summer and autumn and killer whales during spring and autumn. Pilot and false killer whale calves were not recorded during the study period. The majority of baleen whale sightings occurred during winter and spring and involved minke, *Balaenoptera acutorostrata/bonaerensis* (44.3%), blue, *B. musculus* (19.0%) and Bryde's whales, *B. edeni* (16.5%). Humpback, *Megaptera novaeangliae* (10.1%), sei, *B. borealis* (8.9%) and southern right whale, *Eubalaena australis* (1.3%) sightings were less frequent. Group sizes ranged from solitary to four individuals, with results highly skewed towards solitary animals (79%). Cow-calf pairs were observed during spring for all baleen whales except sei and humpback. Cetaceans were primarily observed in association with the Australasian gannet as well as various species of petrel and shearwater (*Puffinus* spp.). Bottlenose dolphins and false killer whales were sighted together in mixed species groups. Bryde's whales were also sighted in association with common dolphins.

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