

EXECUTIVE SUMMARY (English)

The Indo-Pacific humpback dolphin (*Sousa chinensis* - locally called the Chinese white dolphin) has not been well-studied in most portions of its range. This two-year project reports on the results of a long-term study on this species in Hong Kong. The specific objectives of the study, as defined in the study brief and inception report, are to:

- 1) Assess in detail the spatial and temporal pattern of distribution and abundance of Chinese white dolphins in Hong Kong, using the data and photographic records collected from systematic line-transect surveys commissioned by the Government Representative,
- 2) Determine the age and gender of stranded humpback dolphins and finless porpoises, and
- 3) Collect biopsy samples from 30 live specimens of the Chinese white dolphin for gender determination and tissue contaminant analyses.

Line transect surveys using 12-15 m vessels have been conducted from late 1995 through 2007, to estimate the abundance and population trends of Indo-Pacific humpback dolphins in Hong Kong and adjacent waters of China's Pearl River Estuary (a total area of around 3,514 km²). Distribution patterns, as well as data from photo-identification and molecular genetic studies, indicate that a single population inhabits this area and its range covers over 1,800 km². We used 20,127 km of sighting effort data collected in Hong Kong between 2004 and 2006 during conditions of Beaufort 3 or better, along with 1,204 on-effort sightings, to estimate current levels of abundance. Density and abundance were estimated for eight survey areas in which dolphins were sighted. All of the areas with dolphin sightings were influenced to varying degrees by freshwater discharge from the Pearl River. Four other areas in Hong Kong's eastern waters with little or no influence from the Pearl River had no dolphin sightings, despite extensive survey effort. There was substantial variation in the densities of dolphins in different areas and seasons. The highest total of the estimates for any one season was 193 dolphins in autumn. Including dolphins in Chinese waters, the total population size is considered to be about 1,300-1,500 animals. We also examined trends in abundance in five survey areas around Lantau Island. Although there was no consistent temporal pattern in abundance estimates, areas with heavy development and/or ship traffic showed evidence of declines and those with lighter development showed some evidence of increases. The trends analyses do not indicate a

sustained decline in overall population size; however they do suggest that dolphins are shifting out of areas with heavy development, such as North and East Lantau. More work is needed to establish the population's overall status, but a shift in Hong Kong's development philosophy will be needed to ensure their long-term survival.

In order to contribute to the long-term database for examining life history parameters of Hong Kong cetaceans, we estimated ages and determined genders for 58 animals stranded in Hong Kong (23 humpback dolphins and 35 finless porpoises). Ages were estimated by thin sectioning teeth and reading Growth Layer Groups (GLGs) in teeth. Genders were determined by gross examination of specimens, and by laboratory analysis of the ZFX and ZFY genes. The average age of specimens was 10.9 (range=0-26) for humpback dolphins and 11.5 (range=0-28) for finless porpoises. The sex ratio was biased towards males for both species. It has been determined that 53% of humpback strandings in Hong Kong are young-of-the-year (<1 year old). This is a high proportion, possibly related to high concentrations of organochlorines in dolphin tissues. Further elucidation of the color pattern development of the humpback dolphin population was possible, based on the present results. It is clear that both sexes lose spotting once it develops, with females doing so more quickly than males, and most females become unspotted in old age. More work is needed to clarify the specifics of the color pattern development.

We conducted a biopsy sampling study of Indo-Pacific humpback dolphins in Hong Kong between October 2004 and January 2006. Dolphins were sampled with a Barnett Ranger RX-150 crossbow. In total, 87 shots were taken at ranges of 8-28 m, and 36 samples were collected. The hit rate was 56.3%, and the success rate was 41.4%. There was a significantly better chance of hitting the dolphin with the dart when animals were closer to the shooter (all hits were at < 23 m distance). Dolphin reactions to the procedure were mostly slight, with a few moderate reactions, but no extreme ones. Dolphins reacted similarly to hits and misses (with only a somewhat higher chance of a moderate reaction for hits), which suggests that their reaction can best be characterized as a startle response. All reactions were short-term, and there was virtually no evidence of long-term impacts on behavior, social organization, or distribution patterns. Wounds appeared to heal well, and were covered-over with tissue in < 21 days. When conducted carefully by experienced persons, biopsy sampling of this dolphin population can be done safely and effectively.

In conclusion, the study was a success and the dolphin population shows indications of being viable. A series of recommendations for management and future research are made.