

## **EXECUTIVE SUMMARY**

### **Final Report on Monitoring of Marine Mammals in Hong Kong waters – Data Collection (2009-10)**

This one-year marine mammal monitoring project funded by the Agriculture, Fisheries and Conservation Department, represents a continuation and extension of a long-term research programme on local dolphins and porpoises conducted by Hong Kong Cetacean Research Project since 1995. The main goal of this study was to collect systematic data for the assessment of distribution and abundance of Chinese white dolphins and finless porpoises in Hong Kong, and to take photographic records of individual dolphins to update the photo-identification catalogue.

From April 2009 to March 2010, 179 line-transect surveys with 5,602.7 km of survey effort were conducted among nine survey areas in Hong Kong. From these surveys, 271 groups of 1,062 Chinese white dolphins and 72 groups of 148 finless porpoises were sighted. Dolphins were mostly sighted in West and Northwest Lantau, while porpoises were often found in South Lantau and Po Toi waters. When compared to previous distribution records, much fewer dolphins were sighted in Northeast Lantau, while more porpoises were sighted in the offshore waters of South Lantau in 2009-10. Combined dolphin encounter rate of survey areas around Lantau was 6.3 sightings per 100 km of survey effort, which was the lowest among recent years of monitoring. During 2002-09, annual dolphin encounter rates were fairly stable in Northwest and West Lantau, but appeared to decline in Northeast Lantau in recent years. On the contrary, no apparent trend was observed in annual encounter rate of porpoises from 2002-09, but temporal trend of porpoise encounter rate in southern waters during their peak months of occurrence showed a steady increase in recent years after a noticeable decline in earlier years.

Habitats utilized the most by dolphins and porpoises in 2009-10 were located along the west coast of Lantau and offshore waters of South Lantau respectively. With a much larger dataset from 2002-09, important dolphin habitats were located around Tai O Peninsula, Lung Kwu Chau, near Fan Lau and Kau Ling Chung, while moderate dolphin usage was also recorded near the Brothers Islands, Sham Shui Kok, Black Point and west of Sha Chau. On the other hand, important porpoises habitats during winter and spring months in 2004-09 were identified at the waters south of Tai A Chau, the offshore waters of Southeast Lantau, around Shek Kwu Chau and the southeast corner of Cheung Chau, while the waters around Po Toi Islands recorded intense porpoise usage during summer and autumn months of the six-year period.

Dolphin group sizes ranged from singles to 18 animals, with an overall mean of 3.9 animals per group. Large aggregations of dolphins were found near the Brothers Islands, along the west coast of Lantau and north of Lung Kwu Chau. Porpoise group sizes tended to be small, with an overall mean of 2.1 animals per group. In 2009-10, five unspotted calves and 67 unspotted juveniles were sighted, and they mostly occurred along the west coast of Lantau, north of Lung Kwu Chau and near the Brothers Islands. After a noticeable decline in calf encounter rate in West Lantau from earlier years, such trend appeared to be reversed in recent years. Monthly occurrence of young calves showed that more calves were likely born in late spring, but it is difficult to define the peak calving period as their occurrence was relatively stable from April through November. Moreover, a total of 44 and 26 dolphin sightings were associated with feeding and socializing activities respectively. Temporal trend in percentages of these activities among all dolphin groups showed a steady increase in recent years.

Over 29,000 photographs of Chinese white dolphins were taken during vessel surveys throughout the study period. A total of 153 individuals with 434 re-sightings were identified, 32 of which were newly-identified individuals. A majority of re-sightings were made in West and Northwest Lantau, and frequent individual movements between these two areas were observed. Many new individuals identified from previous monitoring periods were frequently re-sighted around Lantau in 2009-10, showing their increased reliance on Hong Kong waters.

Several life history parameters of Chinese white dolphins were examined for the first time using long-term photo-identification data. Examination on colour pattern development revealed that juvenile and subadult females likely go through the mottled stage quicker, and reach the speckled stage as young adults or older subadults. At the speckled stage, most of the females are probably sexually mature, and many of them start to give birth. Female spotted adults are found to be all adults with some older ones, and some of the spotted adults will finally reach the unspotted stage that should comprise of mostly old females. On the contrary, the juvenile and subadult males will go through the mottled stage much slower, with some retain heavy spotting even when they become sexually mature. Some of the sexually mature males and older males will reach the speckled stage, but these adult males rarely become spotted or unspotted adults, probably except the very old ones. This colour pattern development theory was further verified by stranding cases of Chinese white dolphins.

Life span of individual dolphins was estimated based on their colour pattern and

sighting history. A great proportion of examined individuals are sexually mature adults, many of which have survived well into their twenties and thirties. Their relatively long life span is vital to the sustainability of a healthy dolphin population. It also appeared the females survived longer than males, probably due to the higher pollutant loads in males that may affect their immune system and overall health. Moreover, female-calf association and calving interval of 60 females were examined. Many calves were seen only once with their mothers, likely a result of low calf survival rate, which was also confirmed by the stranding data. The higher mortality rate of young calves may be linked to the negative impacts of water pollution, increased acoustic disturbances from vessels and dolphin-watching activities. Recommendation was made to protect important dolphin nursery habitats to alleviate these impacts on calf survival. In addition, the minimum period of female-calf associations averaged 20.4 months, with most calves being associated with their mothers for less than 24 months. The maximum calving interval averaged 62.6 months. In summary, although the local dolphins likely enjoy longer life span, the females appear to have long calving interval, while their calf survival rate and fecundity are fairly low. All these life history parameters should be closely monitored in the future, to verify these findings with a larger sample size.

Ranging pattern analysis revealed that most individual dolphins utilized the waters of Northwest, Northeast and West Lantau, and their core areas were often centered on the Sha Chau and Lung Kwu Chau marine park, the Brothers Islands, and the west coast of Lantau. A large percentage of year-round residents were found to center their core areas on the Brothers Islands, which should be considered important dolphin habitat. Temporal change in their range use there should be carefully monitored in light of future habitat loss due to reclamation works in nearby waters.

Finally, 18 educational seminars were held at local schools during the study period. The topic presented to the students included up-to-date information on local dolphins and porpoises gained from the long-term monitoring study, the threats they faced, as well as measures implemented by AFCD for marine mammal conservation. Through this integrated approach of research and education programme, the public can gain first-hand knowledge about cetaceans from marine mammal researchers.