Appendix 13.15

Marine Protected Areas

Marine Protected Areas, or MPAs have become a popular way to help maintain or restore marine habitats, by curtailing fishing (such as set-netting or trawling), industrial activities including shipping and oil and gas development, and giving speed restrictions to watercraft. Hoyt (2005, 2011) provided a synopsis of MPAs designed primarily for improving demographic parameters for whales, dolphins, and porpoises. Hoyt (2011) listed some of the major tenets of MPA development as:

1)   defining critical habitat needed for feeding, breeding, calf rearing, socializing, and resting (Commission on Geosciences, Environment, and Resources 2000); and
2)   establishing an ecosystem-based management plan, of maintaining the structure and function of the environment (UNESCO 2009).

The 570 (as of 2011) MPAs designated for or potentially useful for cetaceans range from "in name only" parks that are not at all or not well enforced, to those that are managed, such as the Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP) in northwestern Hong Kong (http://www.afcd.gov.hk/english/country/cou_vis/cou_vis_mar/cou_vis_mar_des/cou_vis_mar_des_sha.html). The SCLKC MP is only about 12 km^2 in size, but deemed successful because of the hotspot of Chinese White Dolphin (CWD) activity around the marine park area (Hung 2008, Hoyt 2011, p. 342).

While most marine parks are considerably larger than 100 km^2, a small percentage (<5%) are less than about 20 km^2, thus in line with what is possible in the restricted waters of Hong Kong. Hoyt (2011) indicated that most of these smaller MPA do not have enough data on cetaceans present or reputed to be present to allow for an assessment of whether they are of value to the cetaceans. However, several MPAs are providing positive indications that they are providing protection and conservation of cetaceans, notably:

- the Walker's Cay Marine Park (15.5 km^2) of the Bahamas which appears to provide habitat protection for dolphins (Hoyt 2011);
- Niumi National Park (49 km^2) of the Republic of Gambia which is considered to protect both manatees and dolphins (Reeves 2009);
- the Satapada/Chiliko Dolphin Sanctuary (30 km^2) and Ayeyerwady River Dolphin Protected Areas (74 and 36 km^2), which are believed to be critically important to conservation of populations of Irrawaddy dolphins, *Orcaella brevirostris* (Smith et al. 2009) along the north-central Indian Ocean shore;
- the Sonkhla Lake Dolphin Protected Area of Thailand (26 km^2) which covers a substantial part of the local Irrawaddy dolphin population's habitat (Smith et al. 2007);
- The Kiunga Marine National Reserve (25 km^2) of East Africa is showing indications of being helpful to Indo-Pacific humpback dolphins and Indo-Pacific bottlenose dolphins (*Tursiops aduncus);* and
- A very small area off Easter Island (Chile), at only 1.1 km^2 "could be useful for cetacean habitat protection" (Hoyt 2011, p. 322).

The best example of the success of a Marine Protected Area is that of the 1170 km^2 Banks Peninsula Marine Mammal Sanctuary (South Island, New Zealand), established to protect Hector's dolphins (*Cephalorhynchus hectori)*, largely by enforcing an elimination of near-shore set net fisheries in which these small dolphins become entangled (Slooten et al. 1992). According to a rigorously applied model to estimate annual survival from photo-identification data, there are clear indications that Hector's dolphins survived significantly better after (1988-2006) than before (1986-1987) the establishment of the Sanctuary, with an overall 6% increase in mean annual population growth (Gormley et al. 2012).

While the well-studied Banks Peninsula Marine Mammal Sanctuary is considerably larger than what exists and is proposed for Hong Kong waters, two smaller areas that are already protected off the west coast of the North Island of New Zealand are believed to be useful for helping the critically endangered Maui's dolphin (*Cephalorhynchus hectori maui*), according to Hoyt (2011, p. 388). These are the Parininihi Marine Reserve (18 sq. km) and the Ngā Motu/Sugar Loaf Island Marine Protected Area (7.5 km^2).

Probably more important than size, however, is the usefulness of the habitat to the animals being managed (see Hoyt 2005, 2011). It is well-recognized that, to be most effective, marine parks should cover waters in which cetaceans occur in the highest densities and/or in which they undergo critical life functions (i.e., feeding, breeding, mating, migrating, resting, etc.). And of course, the parks need to be regulated in a way that effectively restricts or eliminates threats to the animals (such as non-selective or over-fishing, high-speed vessel traffic, habitat loss, pollution, and harassment by anthropogenic activities).

For some areas, especially if large MPAs are not feasible, protected areas may still function effectively if connected by sufficiently wide and enforced "corridors" or area networks that protect patches of habitat use for the cetaceans, such as (for example) a patch for feeding, one for resting, one for calving, and one for dolphin prey, i.e. fish rearing habitat (Hoyt 2011). Such MPA's, connected or not, are believed to function co-operatively and potentially synergistically (IUCN-WCPA 2008). It is considered that, the above examples of apparent usefulness of even some very small MPAs provide justification for the development of others in Hong Kong waters.

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