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SURVEYS OF MARINE MAMMALS IN THE BAY OF BRUNEI, MALAYSIA

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INTRODUCTION

Throughout the years, expanding human populations together with rapid development in coastal area has resulted in negative impacts and over – exploitation of marine resources. Worldwide, marine mammals are one of the worst affected, and they have also been directly exploited by people for various uses. Many factors have contributed to a decline in marine mammal numbers worldwide, including incidental capture habitat loss due to land reclamation and pollution decades of active hunting for meat consumption, and intensive fisheries exploitation.

In Malaysia, as in the rest of the Southeast Asian countries, little reliable information has been published regarding marine mammal. Data on "how many there are" and "where they can be found" have remained unanswered. Subsequently, lacks of interest among local scientists as well as the difficulties to gain funds for research has resulted in little attention being focussed on the status of marine mammals in Malaysian waters. This lack of scientific studies and low public awareness have led to concerns about the status of marine mammals in Malaysian waters, particularly the dugong, and hence further studies such as the one described here are required.

So far, a total of 27 species of marine mammals have been recorded in Malaysian waters (Jaaman *et al.*, 2010; Ponnampalam, 2012; Jamal-Hisne *et al.*, 2013), including cetaceans and one sirenian. The occurrences of marine mammals, namely; the Irrawaddy dolphin (*Orcaella brevirostris*), Indo-Pacific humpback dolphin (*Sousa chinensis*), and dugong (*Dugong dugon*) in the Malaysian Bay of Brunei have been reported by Jaaman & Lah-Anyi (2003), Rajamani (2009), Rajamani & Marsh (2010), Jaaman *et al.* (2011), Jaaman (2010) and Lim & Kamaruzzan (2012).

This study aimed to undertake a comprehensive study of the distribution and abundance of marine mammals in the Malaysian water of Brunei Bay using anecdotal information and scientific documentation studies. Data gained will generate

represent a baseline of the current status, and enhance understanding of marine mammals in the bay. New issues which arise from this analysis lead to further marine mammal studies. This study will also indirectly assist policy makers to draft suitable policies and regulations in order to remain the sustainability of the marine mammal populations in Malaysia.

MATERIALS AND METHODS

Study Area

The Malaysian Bay of Brunei is a cupped, indented bay located on the northwest of Borneo Island. Under Malaysian jurisdiction, the bay consists of three different fisheries management units from the Federal Territory of Labuan, State of Sabah and State of Sarawak, which shared together with The Sultanate of Brunei Darussalam. The bay is sheltered from any direct seasonal changes brought from the South China Sea waters by a chain of small islands alongside the Federal Territory of Labuan. The bay is calm and shallow in the near coastal area and gets deeper gradually towards the open waters (Linden *et al.,* 1992). There are several seagrass beds reported around Brunei bay but these have yet been scientifically mapped, except in Lawas (Ahmad-Kamil *et al.,* 2013).

The region is heavily exploited for its fisheries, which consists of mainly small artisanal and coastal fisheries. Destructive fisheries practices such as the use of explosive and cyanide are still prevalent and widely used by the communities. These undeniably pose serious threats to marine mammals around the bay. Furthermore, the threats worsen with the coastal industrializations and human population growth at Brunei Bay, which resulted in coastal pollution and habitats loss (Jamal-Hisne *et al.,* 2013).

Boat Survey

Between April 2013 and October 2015, 11 boat surveys were conducted throughout the bay. These survey trips were carried out in both the Southwest and Northeast seasonal monsoons and during inter-monsoons using local fisherman's wooden or fibreglass-coated boats, with fixed survey design evolved to focus along the coastline of the Malaysian Bay of Brunei. Two additional surveys were conducted in waters further than the designated routes (>10 km from land) using a Class B local fishing trawler (Figure 1).