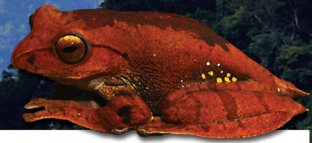


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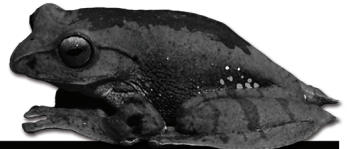
## Research Chair



A Contribution to Biodiversity and Environmental Conservation in Sarawak

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Universiti Malaysia Sarawak  
Kota Samarahan

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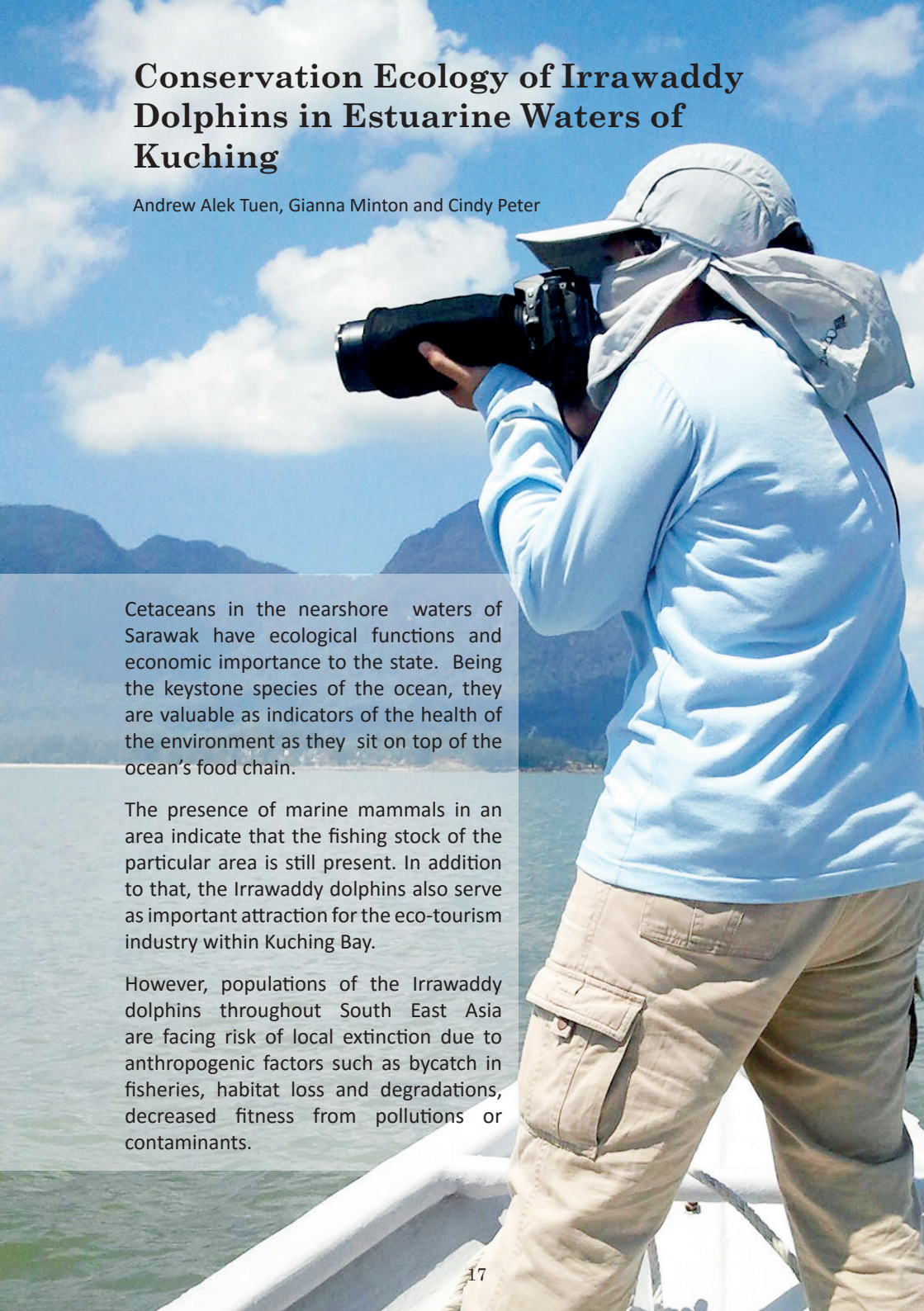
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Irrawaddy dolphins in estuarine waters of Kuching



# Conservation Ecology of Irrawaddy Dolphins in Estuarine Waters of Kuching

Andrew Alek Tuen, Gianna Minton and Cindy Peter



Cetaceans in the nearshore waters of Sarawak have ecological functions and economic importance to the state. Being the keystone species of the ocean, they are valuable as indicators of the health of the environment as they sit on top of the ocean's food chain.

The presence of marine mammals in an area indicate that the fishing stock of the particular area is still present. In addition to that, the Irrawaddy dolphins also serve as important attraction for the eco-tourism industry within Kuching Bay.

However, populations of the Irrawaddy dolphins throughout South East Asia are facing risk of local extinction due to anthropogenic factors such as bycatch in fisheries, habitat loss and degradations, decreased fitness from pollutions or contaminants.

Irrawaddy dolphins in Kuching Bay



At the time of the proposal (2009), there were only two PhD level cetacean specialist in Malaysia and they were located in Peninsular Malaysia and in Sabah. There was no Sarawakian specialists with qualifications higher than a Bachelor's degree. We aimed to rectify that by training local scientists to Masters level and providing training for other UNIMAS staff through dolphin project. This project code is SRC/04/2009/01.

Taking all of these into consideration this study was initiated with the following objectives:

1. To map the seasonal distribution of Irrawaddy dolphins in Kuching Bay.
2. To determine the habitat preferred by Irrawaddy dolphins in Kuching Bay.
3. To obtain absolute abundance estimates of Irrawaddy dolphins in Kuching Bay using photo-identification.
4. To further the training of local scientists in conservation-based dolphin research methods.





Some of the key findings and outputs from the study include:

1. Irrawaddy dolphins occur both in the Santubong-Salak estuary and Bako-Buntal estuary.
2. Irrawaddy dolphins were encountered in depths ranging from 2.0-5.4 m in the Kuching Bay. Their distribution was also affected by distance to shore and distance to river mouth and their occurrence along the coast of Kuching Bay are influenced by the tidal change, coming into the bay and rivers during high tide possibly to feed.
3. The best mark-recapture estimate for Irrawaddy dolphins derived from photographs of left sides and right sides of dorsal fins was about 233 individuals (CV = 22.5%, 95% CI 151–360). However, this number could fluctuate due to births or death and monitoring of the population via photo-identification technique needs to be carried out consistently.
4. Resighted dolphins showed a high degree of site fidelity with some dolphins confining just within the Santubong-Salak estuary while a small proportion of the resighted dolphins ranged further, moving between the two estuaries from one month to another or from one year to the next.
5. Graduation of two Masters student, Cindy Peter in 2012 and Anna Norliza Zulkifli Poh in 2013.

Cindy Peter attended the 21st Biennial Conference on the Biology of Marine Mammals in San Francisco, USA in December 2015 and was partially supported by the Shell Chair. She won the Stephen Leatherwood Memorial Award for the best presentation by South Asia or South East Asian researcher and received numerous exposures in local and international media.



The information from the study was presented in journal, conferences and postgraduate thesis.

1. Peter C, Zulkifli Poh AN, Ngeian J, Tuen AA & Minton G (2016). Identifying habitat characteristics and critical areas for Irrawaddy Dolphin, *Orcaella brevirostris*: implications for conservation. In Tuen AA & Das I (eds.). *Naturalists, Explorers and Field Scientists in South-East Asia and Australasia*. Topics in Biodiversity and Conservation (15). Springer International Publishing, pp. 225–238. ISBN 978-3-319-26161-4.
2. Van Bressems MF, Minton G, Sutaria D, Kelkar N, Peter C, Zulkarnaen M, Mansur RM, Porter L, Rodriguez Vargas LH & Rajamani L (2014). Cutaneous nodules in Irrawaddy dolphins: an emerging diseases in vulnerable populations. *Diseases of Aquatic Organisms*, 107: 181–189. doi:10.3354/dao02689.
3. Minton G, Peter C, Zulkifli Poh N, Ngeian J, Braulik G, Hammond PS & Tuen AA (2013). Population estimates and distribution patterns of Irrawaddy dolphins (*Orcaella brevirostris*) and Indo-Pacific finless porpoise (*Neophocaena phocaenoides*) in the Kuching Bay, Sarawak. *Raffles Bulletin of Zoology*, 61: 877–888.
4. Peter C (2012). Distribution patterns, habitat characteristics and population estimates of Irrawaddy dolphins in Kuching Bay, Sarawak. *MSc thesis*.
5. Zulkifli Poh AN (2013). Habitat characteristics and overlap of small cetaceans in Kuching Bay, Sarawak. *MSc thesis*.
6. Minton G, Zulkifli Poh AN, Ngeian J, Peter C & Tuen AA (2012). Four simple questions: evaluating the effectiveness of half-day community workshops designed to increase awareness of coastal cetacean conservation issues in Sarawak, Malaysia. *Applied Environmental Education and Communication*, 11(2): 99–107.
7. Minton G, Peter C & Tuen AA (2011). Distribution of small cetaceans in the nearshore waters of Sarawak. *Raffles Bulletin of Zoology*, 59: 91–100.

