A theodolite tracking study of baleen whales in Geographe Bay, Western Australia

Salgado Kent, Chandra*[1], Marley, Sarah[1], Bouchet, Phil[2] & Nagy, Jared[1]

[1] Centre for Marine Science and Technology, Curtin University, GPO Box U1987, Perth, Western Australia 6845
[2] Centre for Marine Futures, University of Western Australia, 35 Stirling Highway, Crawley, Western Australia 6009
c.salgado@cmst.curtin.edu.au

A detailed behavioural study of baleen whales was conducted at Geographe Bay (Western Australia, 115 °E, 33° S) between November 4th and December 12th, 2010 using theodolite tracking (from an elevation of 52m) to document: (1) whale species present in Geographe Bay, and (2) how whales use the Bay. Noise was simultaneously logged to capture whale vocalisation and song during their migration through Geographe Bay to obtain a deeper understanding of the context of whale vocalisations during migration. While part of Geographe Bay has been earmarked over past years as an integral part of the Southwest Marine Parks management plan because of its recognised ecological values, little emphasis has been made on its significance as a whale migratory and resting area. A total of ~110 hours of observation were made over 32 days, with 317 groups of whales sighted including 309 groups of humpback whales, 7 groups of blue whales, and 1 group of minke whales. Most groups within 2 km of the observation station were positively confirmed as cow-calf pairs. During the study, 280 vessels were detected. Nine whale-vessel interactions where vessels approached to within 50 meters of the whales were recorded as focal follows. During these focal follows, behavioural changes including cessation of resting were observed upon approach of the vessels. Based on this study (which only included a third of the humpback whale migration season), it is clear that a large number of various species of whales at a vulnerable stage of their life histories utilize Geographe Bay – specifically cow-calf pods migrating through protected waters, and taking a final opportunity to rest and for calves to gain size and strength for increased survivorship during the long migration to feeding grounds in the Antarctic. While the number of whales using Geographe Bay is growing, so are boat activity and tourism. Increasing environmental pressures from a growing human population in Australia's South West highlights the need for further focus on research and management of resting and migration whales.

Synthesis of marine species data for the Kimberley region

Sampey, Alison*[1], Bryce, Clay[1], Fromont, Jane[1], Morrison, Sue[1], Marsh, Loisette[1], Hosie, Andrew[1], Huisman, John[2], Davie, Peter[3], Schlacher-Hoenlinger, Monika[3], Glasby, Chris[4], Willan, Richard[4], Hutchings, Pat[5] & Richards, Zoe[5].

[1] Department of Aquatic Zoology, Western Australian Museum, Locked Bag 49, Welshpool DC WA 6986
[2] Western Australian Herbarium, Department of Environment and Conservation, Locked Bag 104, Bentley DC WA 6983
[3] Queensland Museum, PO Box 3300, South Brisbane Qld 4101
[4] Museum and Art Gallery of the Northern Territory, GPO Box 4646, Darwin NT 0801
[5] Australian Museum, 6 College Street, Sydney NSW 2010
alison.sampey@museum.wa.gov.au

The Kimberley region is currently of great interest due to rapidly expanding development in oil and gas, fishing, aquaculture, and tourism. It is recognised as a relatively pristine area with a high diversity of habitats and species, but there is very little published information on the species present in the region. Museums and herbaria are the repositories of species diversity datasets and house specimens collected over many decades (1880s – present). The Western Australian Museum has led 8 major biodiversity expeditions (1988-2006) to the Kimberley region, but the species lists generated from these were mostly presented in unpublished reports and are not readily accessible to managers and researchers who are interested in the biological values of the region. We considered the Kimberley region to be defined by the following coordinates: SE: 19°S, 121° 34' E; SW: 19°S, 118° 15' E; NE: 12°S, 129° E; NW: 12°S, 121° E. This included the Kimberley coastline and the continental shelf edge atolls of the Sahul Shelf. We collated our institutions' data on marine plants (seagrasses, mangroves and macroalgae), sponges, cnidaria (predominately hard corals), free living worms (predominately polychaetes), crustaceans (mainly decapod crustacean and barnacles), molluscs (predominately macromolluscs > 10 mm), echinoderms, brachiopods, ascidians, bryozoans and fishes and found > 30,000 specimen records representing ~6000 shallow water (<30 m) marine floral and faunal species now known from the area. This represents a minimum diversity estimate and much work remains to be done to identify and describe new species already housed in our collections, as well as to undertake further expeditions to adequately survey the biodiversity of this region. We have a series of papers in preparation for publication by the end of 2011, where we will provide a review of the species currently known from the Kimberley from our institutions databases with commentary on the diversity trends, collection and taxonomic gaps for our respective taxa. Here we present a summary of this research.

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