

## **KIMBERLEY ISLANDS WILDLIFE: Outcomes of the 2006-2010 biological survey**

On 6 April 2011, Greg Keighery, Senior Principal Research Scientist at the Department of Environment and Conservation (Science), spoke to the Kimberley Society about work that he, Lesley Gibson and Michael Lyons had been doing. His summary appears below.

The North Kimberley is one of Australia's 15 biodiversity hotspots, where no animal or plant is known to have gone extinct. It is one of the world's last remaining wilderness areas. There are, however, worrying trends indicating that biodiversity loss may occur because of changed fire regimes, overgrazing, predation by feral animals and the arrival of cane toads. However, so far the north Kimberley appears resilient to these threats, because of the high productivity, high rainfall, rugged sandstone country ameliorating fire by creating refugia and a low number of cats and foxes.

Kimberley islands are large and numerous, and islands are highly significant as refuges because they are sheltered from mainland disturbances (no cats, cattle, fewer fires and weeds). They are also microcosms of the mainland and contain many of the plants and animals found in the North Kimberley. These islands have the potential as refuges for fauna threatened on the mainland. They are important for Marine turtle nesting beaches and seabird breeding. They are also culturally important to indigenous communities in the region. Despite this island values are potentially under threat from mining, tourism, gas and oil exploration, fishing and pearl farming.

To protect island (and north Kimberley) values, baseline information on the biodiversity values of these islands is needed to inform policy and management development, in consultation with Traditional Owners to also preserve cultural values and share ecological knowledge.

However, biological information was poor. Of 152 islands between 100 and 999 hectares in size, 122 had no information and 30 had limited information. Of 31 islands over 1,000 hectares, 17 had limited data and only Koolan had comprehensive data.

### **Survey Aims**

The aims of the survey were to:

- Build on existing knowledge of targeted components of biodiversity.
- Identify locations of species susceptible to mainland threats, including cane toads.
- Provide baseline information for future monitoring/survey.
- Provide information that can assist land management decisions.

Species likely to be impacted by mainland threats (incl. cane toads): Mammals, Reptiles, Frogs, Land & aquatic Snails, Plants and Birds were selected for survey.

Twenty-six islands were selected for detailed survey based on size (largest preferred), geological diversity & geographic coverage. Three teams of four field biologists (terrestrial zoologists, botanists and land snail expert) and two Traditional Owners were established and they sampled sites for six days. Teams transferred between sites by helicopter with logistical operations run out of a base camp. There were dry and wet season surveys – with different strategies.

Mammals were sampled using Elliott and cage traps, reptiles with funnel traps, spotlighting was used to record geckos and mammals, general foraging for snails and reptiles, ultrasonic recording for bats, sightings for birds, vocal recording for frogs and vegetation quadrates (50 x 50m) and foraging for plants.

### **Results**

Many new island localities and records for mammals, including Golden-backed tree rat, Northern quoll and Agile wallaby on Adolphus, Red-cheeked dunnart on Sir Graham Moore, Northern quolls and golden bandicoots on Storr Island. Most islands had increases in recordings of 30-90%. Twenty-four of the 25 Kimberley bats were recorded on islands,

with up to 11 species recorded on a single island. The Kimberley endemic Yellow-lipped Bat was recorded on seven islands.

Many new reptile records were made including, Taipan (Middle Osborne), Gwardar (Sir Graham Moore), Black-headed Python (Boongaree) and Carpet Python (Mary Island). Many frogs were first records for the islands.

A particular highlight were the land snails. Preliminary results indicate that over 90 species were recorded of which at least 72 are new and there are five new genera. Almost all species are endemic to the islands, i.e. they do not occur on the mainland. Each island tends to support a unique suite of species.

Plants, of course, located hundreds of new records and have greatly increased the flora lists for all islands surveyed. Some highlights are a new species of *Calandrinia* found on Mary Island and a new *Cleome* sp. from Bigge Island. The majority of islands are long unburnt and an additional suite of post-fire taxa remain undetected. Island plant richness driven by diversity of geologies on each and the presence/absence of vine thicket/rainforest patches. The southern islands relatively poor richness, associated with absence of volcanics/basalts and lower rainfall.

Kimberley islands have very few weeds, except for the ubiquitous *Passiflora foetida*. Islands with settlement history have largest numbers of weeds, for example : Sunday Island (23 spp.) – Buffel grass and garden escapes – and Koolan Island (43 spp.).

## The Future

All papers recording the results of this survey are being submitted to the [Records of the Western Australian Museum](#) for publication. It is producing *Supplement 81, Biodiversity values on selected Kimberley islands, Australia*, in partnership with the Western Australian Department of Environment and Conservation. As each paper is completed and edited, it is being published online in downloadable .pdf form. When all papers have been accepted and published online, they will be produced in print form as a Supplement of the Records of the Western Australian Museum. The papers published so far include:

L.A. Gibson and N.L. McKenzie, Identification of biodiversity assets on selected Kimberley islands: background and implementation (pp. 1-14)

L.A. Gibson and N.L. McKenzie, Occurrence of non-volant mammals on islands along the Kimberley coast of Western Australia (pp. 15-40)

L.A. Gibson and F. Köhler, Determinants of species richness and similarity of species composition of land snail communities on Kimberley islands (pp. 41-66)

N.L. McKenzie and R.D. Bullen, An acoustic survey of zoophagic bats on islands in the Kimberley, Western Australia, including data on the echolocation ecology, organisation and habitat relationships of regional communities (pp. 67-108), with separate electronic appendices.