



Kakadu Research News October 2013

Improving biodiversity conservation
in northern Australia

Cat fence construction begins

There are fewer and fewer small mammals across our tropical savannas every year. It's estimated that feral cats kill up to 75 million native mammals every night across the country. They are established in every habitat in mainland Australia, including Kakadu National Park.

Our researchers are doing experiments in Kakadu and other areas to measure just how much impact cats have on small mammals.

In September, construction began on two cat-proof fences near Kapalga. Jabiru Area School students undertook work placements with the company that contracted for the construction.



The two enclosure areas are 800 x 800m (6.4 hectares). Over the next couple of years the team will

compare the number of mammals in the fenced 'cat free' area with mammal numbers in other areas.

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Tracking the movements of big fish between the rivers and floodplains

Fish tagging began in the second week of October to help CDU researchers better understand the movements of three key fish species in Kakadu (forktail catfish, mullet, and barramundi).

Forktail catfish



Mullet



Barramundi



A total of 150 fish (50 of each species) will be tagged with radio and acoustic transmitters and their movements monitored every two weeks from now until June 2014.

Researchers have been investigating where the fish move in the main channel, floodplain and estuary of the South Alligator River system, which will help improve our understanding of habitat use, seasonal behaviour and breeding migrations, and provide us with vital ecological information for protecting tropical rivers and their fish populations.

Fish were collected from the South Alligator River within Yellow Water, Home, and Mardugul billabongs. Acoustic trackers were attached to large fish in the lower South Alligator River to see where and how far they move. The fish will be radio-tracked by boat and helicopter.



The project team is consulting closely to ensure research activities do not cause disruption or intrude upon sacred sites. A field work plan will be provided to Parks before each survey, and casual employment is offered to Traditional Owners during most of the boat and helicopter tracking trips.

Monitoring water and tides in the Alligator rivers

In September Northern Australia hub researcher David Williams (AIMS) gave a presentation to Parks staff about his project, which is building our understanding of which freshwater Kakadu floodplain areas could be affected by sea water when sea levels rise.



David Williams presents to Kakadu staff

David is studying the water and mud flowing in the East and South Alligator rivers and building a model to help predict changes.

Is saltwater intrusion affecting the South Alligator floodplain?

Rising sea levels can bring saltwater into freshwater wetlands, which will affect the plants and animals of the wetland.

In June, researchers collected soil samples from the South Alligator floodplain to investigate the influence of saltwater intrusion on biodiversity.



Sea level rise will bring salt water onto some floodplain areas

Using genetic methods researchers have already identified over 25,000 different types of bacteria and other tiny animals in soil collected from the South Alligator River floodplains. Lab analysis of the most recent samples is now underway. Researchers are looking at the diversity of life in the soil and what types of bacteria and

tiny animals you expect to see in different environments, such as soils with different levels of salt. This will be helpful to monitor for any future changes that could be caused by sea level rise, or human impacts.

Research protocols finalised

At its meeting last month, the Kakadu Board of Management endorsed a set of protocols for NERP researchers working in Kakadu National Park. The protocols are designed to create positive relationships between researchers, Bininj and Parks Australia.



Park rangers contribute local knowledge and expertise to NERP research

The protocols have been in development since 2012, when the advantages and disadvantages of undertaking research in Kakadu were discussed by Bininj at a special meeting run by Kakadu National Park. Positive outcomes identified by Bininj include:

- Opportunities for employment and training;
- Development of partnerships that include two-way learning and mutual benefit;
- Awareness raised about environmental change; and
- The development of long-term friendships, and formal recognition and acknowledgment of Bininj research involvement.

Problems encountered in interacting with researchers included:

- Limited or negligible cross-cultural understanding by researchers;
- Failure of researchers to follow protocols and seek appropriate permission from Traditional Owners to undertake research on country;

- Removal of cultural property without permission;
- Inadequate communication of both research proposals and results; and
- Lack of research benefit to Bininj including failure to provide opportunities for research experience with Bininj rangers and poor recognition of Bininj research contributions.

The protocols aim to reduce the likelihood of these problems occurring, and build on the positive outcomes of research happening in Kakadu. The agreement will operate throughout the life of the NERP research and will be revisited periodically. The agreement will also serve as a model for other research in Kakadu. Please contact Jaana Dielenberg or Anne O’Dea for more information (details on the last page).

Importance of connection between rivers and floodplains

Stuart Bunn’s research team (GU) is looking at how much animals move between floodplains and rivers and where they get most of their food from.

Early results from field work show that during the dry season, large animals are getting much of their food from different areas compared with smaller animals.

Animals such as small fish survive mainly on food from within dry-season waterholes but larger animals get most of their food from sources outside the waterholes.

For example crocodiles mainly feed on mammals from the surrounding savanna, and large fish such as barramundi feed on floodplains and in saltwater. This highlights how important floodplains are to maintaining healthy fish and wildlife populations.



The project team has also found that underwater plants are an important place for algae to grow, and that this algae is a vital part of the food web. Vertical grasses like the weed para grass, support very little algae, and therefore reduce food within the food web where they prevent other plant species from growing.



Para grass is an exotic weed species, but it now covers large areas of some floodplains.

We greatly appreciate our partnership with

Kakadu staff and Traditional Owners. This partnership has opened doors for a much better understanding of the food webs in Kakadu.

Thank you to Park staff and Traditional Owners who have provided samples of their catch, including pigs, buffalo, goanna, and wallaby. People have given us about 50 samples already.

We are still looking for samples of many of the big animals that the research team can’t catch, like file snakes, turtles, magpie geese, crocodiles and wallabies. We would also like shell from croc or goose eggs. If you are a Kakadu Traditional Owner who hunts, you can help by giving us a small piece of your catch.

Please tell us what it is, where it came from and when you caught it. It needs to be raw and kept frozen. Please give the samples to Anne O’Dea at the Bowali Visitor Centre, or call researcher Dominic Valdez on 07 3735 4370.



Researchers Dominic Valdez, Fernanda Adame, Neil Pettitt and Doug Ward

Important bush tucker areas

Researchers Kelly Scheepers and Emma Ligtermoet (CSIRO) have been talking with Kakadu and Gunbalanya Traditional Owners about important bush tucker places for hunting and fishing, and the changes to these places on the floodplains

Informed by the interviews with Traditional



Kelly Scheepers



Emma Ligtermoet

Owners, the researchers have produced maps of the important bush tucker places, and identified where weed and saltwater impacts are a concern for people. Since July 2013, the researchers have been engaging with Traditional Owners to get their feedback on the maps. If any Traditional Owners are interested in discussing the maps, please contact Kelly Scheepers on 8944 8412 or kelly.scheepers@csiro.au or Anne O'Dea at Bowali.

River sharks and sawfish in Kakadu

Many of you may already be aware of the river shark and sawfish sampling Peter Kyne (CDU) and his team have been undertaking in Kakadu National Park. Fishes are caught using gill nets. A small genetic sample is clipped from their fin and a series of measurements are taken before they are released.

In a laboratory Peter and his team are looking at the genes in the small fin samples. The genes tell us which sawfish or river sharks are related to each other and will help work out roughly how many sawfish and river sharks are using Kakadu waterways.

A recent survey of the East Alligator River (downstream of Cahill's Crossing) found a previously unknown population of the endangered northern river shark. The river provides critical habitat for all life stages, from young sharks to

adults. Together with the South Alligator River population that the team is studying, this finding in the East Alligator demonstrates the national and global importance of Kakadu National Park for this species. This research is part of an ongoing program of monitoring. Traditional Owners who would like to participate in the ongoing program of monitoring can contact Anne O'Dea.

Along with many Park staff and Traditional Owners, this project will be featured in the fourth episode of an ABC series on Kakadu, which will air at 7.30pm on Sunday, October 27, 2013.



Sawfish (Photo: Kate Buckley, Territory Wildlife Park)

What is the Northern Australia hub?

The Northern Australia hub is a research group funded by the Australian Government's National Environmental Research Program (NERP). We are working to improve biodiversity conservation in Northern Australia's tropical savannas and the region's wetlands, waterways and estuaries.

Thanks to Kakadu National Park staff who have supported and participated in our research.

We greatly value the input of Traditional Owners to research happening on their country. If you are interested in paid work opportunities, or want to know more about any of the projects please contact:

- Jaana Dielenberg (NERP, Darwin)
08) 8946 6761 or
jaana.dielenberg@cdu.edu.au
- Anne O'Dea (Kakadu National Park, Jabiru)
08) 8938 1155 or
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