Managing weed and sea level rise threats to Kakadu's tropical river floodplains

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Climate change and weed invasion are key management issues for Kakadu National Park.

Para grass (*Urochloa mutica*) and olive hymenachne (*Hymenachne amplexicaulis*) are exotic grasses that are spreading across some areas of Kakadu floodplains, replacing native grasses and significantly reducing biodiversity. By the end of this century large areas of floodplains may also be inundated with saltwater due to rising sea levels.

The combined effects of weeds and climate change could seriously affect Traditional Owners, the tourism sector and the environment. Managers are now faced with complex decisions about where to dedicate limited resources to conserve the most valuable areas.

A team of researchers funded by the National Environmental Research Program is working with Parks Australia staff and Traditional Owners to predict which areas of Kakadu's floodplains are most at risk from saltwater intrusion, and how sea level rise and weeds might affect the habitats of important wildlife such as the iconic magpie geese (*Anseranas semipalmata*). These waterbirds are critically dependent

Murrumburr Traditional Owner and Kakadu National Park Ranger Jessie Alderson (L) provides advice to Northern Australia hub researcher Samantha Setterfield (R) on highly valued sites within Kakadu

Kakadu Traditional Owners are helping researchers understand when and what they are harvesting from the floodplains

on a handful of freshwater aquatic plants for food and nesting, and these plants will be susceptible to saltwater inundation and the spread of aquatic weeds in the future.

Knowing which areas are most at risk from weeds and saltwater will help Traditional Owners and park managers prioritise areas for investment. For example, the Boggy Plain-Mumakala wetlands on the South Alligator River floodplain contain the most important magpie geese dry season refuge in Australia because its extensive stands of water chestnut (*Anas castanea*), a tall sedge with bulbs, provide a critical food source. Up to 80 per cent of the magpie geese population are dependent on these wetlands during the dry season.

Charles Darwin University lead researcher Dr Samantha Setterfield believes it is important not to lose the gains that have been won managing other weeds in Kakadu National Park, like mimosa.

"Kakadu has invested more in weed control than most other national parks, but strategic decisions still need to be made about how and where to invest the funding available," Dr Setterfield said.

"For decades, park's staff have made a concerted effort to control weeds, and prompt action has meant the park remains free of mimosa infestations. However, the resources available are still not adequate to control all the highest priority weeds within Kakadu.

"The good news is there is very little para grass on the South Alligator River floodplain, meaning that with a relatively small budget and a strategic approach, we can eradicate these infestations.

"We now have a model that can predict the spread of weeds over the next 10, 20 and 30 years across all Kakadu floodplains, and by layering other maps we are developing which show important bush tucker spots and predicted sea level rise, we start to get a very good picture of which areas need immediate attention."

By mid 2014, the project is expected to deliver a map-based decision support tool that will draw all aspects of the research together. The research team is also working with park's staff and Traditional Owners to develop agreed and clearly defined management targets and indicators to monitor floodplain health.