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# Cultural burning revives a Kakadu wetland

A powerful melding of traditional Aboriginal knowledge of land management and Western ecological science is producing outstanding results in a 'Burning for Biodiversity' project in Kakadu National Park.

On a floodplain of the South Alligator River, traditional custodians together with Parks Australia, the Environmental Research Institute of the Supervising Scientist (ERISS) and CSIRO have combined their talents to enhance a Ramsar-listed wetland by returning to

traditional fire management. Through the national Bushfire Cooperative Research Centre, the team is now evaluating the project's environmental and cultural benefits. Results so far are very promising.

CSIRO research officers, Mr Peter Christophersen and partner Ms Sandra McGregor, who live in Kakadu with their four children, have applied their traditional know-how and scientific skills to initiate and lead implementation of the Boggy Plain burning project since 2002.

'This is not as easy as it sounds,' says

Christophersen. 'We came up against both cultural and institutional difficulties. For a long time, Indigenous people have been marginalised when it comes to natural resource management and we think bureaucracies need to be more flexible to engage Aboriginal people in land management.'

Dr Alan Andersen of CSIRO Sustainable Ecosystems says effective engagement of Aboriginal people in natural resource management is a key issue for the Northern Territory.

'Aboriginal people represent a large



**Peter Christophersen and Sandra McGregor are demonstrating the importance of incorporating Indigenous knowledge into natural resource management. The Boggy Plain project facilitates the passing down of traditional knowledge to the next generation.** Randy Larcombe

proportion of the population, have an enormous wealth of ecological knowledge, gained from 40 000 years or more of living in this environment, yet have had relatively little involvement in formal land management,' says Andersen. 'Peter and Sandra wanted to change this and that was the rationale for the project.'

'With mentoring from Sandra's mother

Violet, who has a vast store of traditional wetland knowledge, they have applied traditional know-how to dramatically transform the wetlands of Boggy Plain from a dense thicket of grass into a mosaic of habitats that are rich in biodiversity,' Andersen says. 'At the same time, this has greatly enhanced its usefulness to the cultural value of the clan's family estate at

**The big advantage in central and northern Australia, compared to much of southern Australia, is that the traditional knowledge is still there to be tapped.**

Boggy Plain in terms of better food resources.'

Boggy Plain is an important freshwater wetland that serves as habitat for species including the magpie goose (historically, up to 85% of the total Northern Territory's magpie geese have gathered there to feed at times) and the long-necked turtle. These species, along with a range of water plants, are cherished food resources for Aboriginal people of the area. The problem is that, following removal of the introduced Asian water buffalo in recent decades, the native grass (*Hymenachne acutigluma*) has spread and dominated the wetland – not only reducing habitat diversity, but also limiting access for hunting and food gathering. Native water chestnuts (*Eleocharis*), wild rice (*Oryza*) and red lilies (*Nelumbo*), which are food for the magpie geese, are also displaced by the rampant grass. It is believed that water buffalo controlled the *Hymenachne* in much the same way that Aboriginal fire management did prior to European settlement.

So how does traditional fire management work at Boggy Plain? Christophersen and McGregor explain that they have returned to a pattern of repeated burning over November and December when the wetland has limited standing water, and few birds are in residence. The *Hymenachne* is still green, so the first fires just burn the drier bases, causing the grass to fall over and die. This provides fuel for subsequent fires, which are all relatively low in intensity, and the surrounding woodland margins are burnt early in the dry season (April–May) to prevent the flames escaping into the broader landscape.

The firestick is used in this way every year to keep on top of the fast growing *Hymenachne* that otherwise dominates the wetland.

'With help from Parks Australia and ERISS we have used Western science to monitor changes in the vegetation after

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**Magpie goose eggs are traditional plains food.** Peter Christophersen

burning,’ McGregor says. ‘We have used both remote sensing and ground-based surveys.’

Specifically, they assessed changes in the wetland vegetation by means of historic aerial photos taken between 1950 and 1991, Landsat satellite imagery, real-time, high-resolution Quickbird satellite images, and ground-based surveys.

Results have been gratifying with a much more mixed species community structure and greater biodiversity in burnt areas than in unburnt controls. After traditional burning, much of the clogging *Hymenachne* has been replaced by other plant species and there is more open water, which is particularly beneficial for wetland birds.

Peter and Sandra are now working with their CSIRO colleagues to conduct an economic evaluation of enhanced wetland resources to traditional custodians.

Ultimately, there is great potential to extend the methods used at Boggy Plain to other parts of Kakadu, and the project could serve as an internationally significant model for integrating Indigenous and Western knowledge systems.

‘The big advantage in central and northern Australia, compared to much of southern Australia, is that the traditional knowledge is still there to be tapped,’ Andersen says.

This should lead to more widespread benefits in terms of both traditional resource use and conservation of biodiversity.

● Steve Davidson

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**The spectacular red lily (*Nelumbo*), an iconic Kakadu species and bush food for both humans and magpie geese.** ERISS/CSIRO Tropical Ecosystems Research Centre



**Views over Boggy Plain in 2003 (left) and 2005 (right), showing the progressive reduction of choking grasses and the return of open water, red lilies and water chestnuts.** Peter Christophersen