

The dispersal, impact and management of buffel grass in desert Australia

Buffel grass is a perennial tussock grass native to Africa, India and Asia.

Since its introduction to desert Australia for land rehabilitation and pastoral purposes, it has spread widely across many land types.

In recent years there has been growing concern about its impacts on conservation areas, and researchers have estimated that over 60% of mainland Australia is suited to buffel grass.

This Desert Knowledge CRC project provides information and tools to help meet the challenge of managing buffel grass in desert Australia.

It also points to areas for further investigation in sustainable management of buffel grass for production and biodiversity conservation.

Good information is the basis of sustainable management in any ecosystem. Desert systems are increasingly affected by buffel grass, a non-native species, and careful management is required to limit the loss of biodiversity values. At the same time, the production benefits of buffel grass on grazing lands need to be maintained.

Our limited knowledge about the dispersal and impact of buffel grass in these systems is a barrier to integrated regional planning, better environmental impact assessment and sustainable management for production and conservation.



Buffel grass hybrid Gayndah strain

With the support of the Desert Knowledge CRC, a project team involving Parks and Wildlife NT, CSIRO, James Cook University and the Threatened Species Network undertook preliminary studies on the dispersal and impacts of buffel grass in central Australia, with the aim of improving our understanding of buffel grass and how to manage it sustainably.

Results:

- aerial survey was a valuable tool for mapping presence of buffel grass on conservation areas
- hybridisation amongst varieties is likely to be occurring, leading to greater local adaptation across desert regions
- buffel grass on rocky hillslopes in central Australia did not have much effect on biodiversity, when dry seasonal conditions suppressed growth.



Buffel grass at Simpsons Gap National Park

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Aerial mapping of buffel grass in conservation areas: a case study

Aerial survey of Watarrka National Park proved to be a quick way to collect information on buffel grass cover over a large geographic area, especially in more remote or rugged areas.

Aerial mapping was less costly than extensive ground-based surveys and can be repeated to monitor change over time. Buffel grass was more widely spread than previous records showed, especially for the more inaccessible areas of the park, enabling better targeted control by land managers.

What did we find out about buffel grass dispersal and population dynamics?

We combined the data from the aerial survey of Watarrka National Park with known environmental variables to create a model for predicting probable buffel grass spread. We found that the distance to drainage and tracks, ruggedness, hummock grass cover and soil texture were the most important variables in determining the occurrence of buffel grass.

Genetic analysis of samples of buffel grass from apparently different varieties growing on both Woodgreen Station and Watarrka National Park produced a surprising result. When we compared 11 common commercial varieties with these samples, some had a high degree of similarity and some were identical. However, some samples had affinities to more than one variety, indicating that hybridisation was occurring.

We propose that new strains better adapted to local conditions are forming through this hybridisation. New forms may be better adapted to the environmental conditions but may not be so good for pastoral uses. One consequence may be that selective grazing on pastoral lands will lead to an increased dominance of unpalatable forms of buffel grass.

Biodiversity impacts of buffel grass in central Australia

At Watarrka National Park at least 28% of rare species had some of their habitat occupied by buffel grass, and some of the habitats with the highest plant diversity coincided with the current and predicted occurrence of the grass. We found that buffel grass occurred in over 90% of the areas where melaleucas grew, which greatly increases the risk to their habitat from grass fire.

We studied biodiversity impacts in witchetty-mulga shrublands in rocky hillslopes north of Alice Springs. Buffel grass has extensively colonised this habitat in the last decade. We had very low rainfall during the study period and so we could not demonstrate that buffel grass had a significant effect on biodiversity.

This does not mean that there is no long term impact, but that the levels of buffel grass cover were likely to have been too low to show an effect. We know from other central Australian studies in different habitats and conditions that buffel grass can indeed impact on ground vegetation and invertebrates.

Future research

We believe that further long-term research is necessary to:

- identify the range of tools for managing buffel grass
- focus attention on generally acceptable management actions
- quantify social, environmental and economic benefits and costs
- and develop a framework for a national policy on buffel grass.



Buffel grass stabilises a ponding bank on Woodgreen Station

Core partners

Central Land Council (CLC)
Charles Darwin University
Commonwealth Scientific and Industrial
Research Organisation (CSIRO)
Curtin University of Technology
Desert Peoples Centre
Government of Western Australia
Northern Territory Government
Office of Indigenous Policy
Coordination (OIPC)

Centre partners

Griffith University
James Cook University
Murdoch University
Newmont Australia
University of South Australia

Associate partners

Department of Primary Industries, NSW
Flinders University
(Centre for Remote Health)
South Australian Department of Water,
Land and Biodiversity Conservation
Southern Cross University
Tapatjatjaka Community
Government Council
The Australian National University
The University of Adelaide
The University of Queensland
The University of Western Australia
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Affiliate partners

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