



A prescribed gamba grass burn south of Darwin, photo Glenn Campbell.



**Northern Australia  
Environmental  
Resources  
Hub**

National Environmental Science Programme

# Fire and weeds in the Top End

Start-up factsheet

## Weed invasions can change fire regimes and transform ecosystems

Parts of northern Australia's valuable landscape have been transformed by weeds and changed fire patterns. Coupled with land clearing for agricultural development, this has impacted significantly on ecological, social and cultural assets.

One example is the Northern Territory's greater Darwin region and Daly River catchment, where areas of tropical savanna have been invaded by weeds that threaten native plants and animals and impede access to parts of the landscape. Some of the grassy weeds here such as gamba grass produce high fuel loads, ultimately leading to more intense fires.



This research is taking place in the greater Darwin region and Daly River catchment in the Northern Territory.

Invasion by gamba grass and the resulting changes to fire regimes has the ability to significantly alter ecosystem processes and may eventually lead to ecosystem failure. However, our current understanding about the combined impacts of these threats and the action needed to improve ecosystem function is limited.

## Overview

This project will:

- inform better planning and management around weeds such as gamba grass based on an improved ability to predict catchment-scale changes that may lead to ecosystem failure
- assess the use of fire behaviour models and fire spread simulators for northern Australia
- produce conceptual models of savanna transformation following invasion by high biomass grassy weeds
- improve understanding of the impact of gamba invasion on ecosystems and how this relates to the severity of invasion and fire impacts
- provide evidence-based advice on how to account for gamba grass-invaded savanna in the federal government's Carbon Farming Initiative savanna burning methodology.



# Predicting ecosystem impacts of gamba invasion will improve planning and management

This project will draw on existing information about the impacts of land clearing, gamba invasion and changes to fire patterns on the natural landscape. Researchers will collect additional data where necessary and use this information to model the likely scenarios of changes in ecosystem function over the next 30 years in the Darwin and Daly regions. This information is critical to land use planning and management to predict, and hopefully prevent ecosystem failure.

## Project activities

- Evaluate and adapt fire behaviour models and spread simulators for use in gamba-invaded savanna
- Quantify the impact of gamba grass invasion on changes to soil erosion and altered inputs to streams
- Assess biodiversity assets (fauna) and restoration potential (native plant seedbanks) in areas of extremely degraded savanna.

## Anticipated outputs

- Guidelines for use of fire and weed spread modelling for catchment-wide management planning
- Recommendations on the use and application of remote sensing technologies for detecting and mapping gamba grass and similar weeds
- Peer-reviewed scientific publications.



Tree death after gamba grass fire, photo Natalie Rossiter-Rachor.



Gamba grass tussocks up close, photo Michael Lawrence-Taylor.

## Who is involved?

This project is being led by [Dr Natalie Rossiter-Rachor](#) at [Charles Darwin University](#) and [Associate Professor Samantha Setterfield](#) at [The University of Western Australia](#).

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For further information and project updates, visit the project webpage at [www.nespnorthern.edu.au/projects/nesp/fire-weeds-top-end](http://www.nespnorthern.edu.au/projects/nesp/fire-weeds-top-end)



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