



NESP Northern Hub

Mary River Senior District Ranger Steve Dwyer walks through recovering savanna.



Northern Australia  
Environmental  
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National Environmental Science Programme



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IMPACT STORY 2019

# New ways to manage gamba grass & fire in the NT's Mary River National Park

Invasive gamba grass is transforming Australia's northern savannas, replacing native species with dense stands of highly flammable grass that burns up to eight times the intensity of native grasses. NESP research is helping the rangers at Mary River National Park in the Northern Territory turn this invasion around, by guiding and providing evidence of the effectiveness of changes in their management activities to reduce fire frequency and carefully target spray treatments.

► [Find out more about this project](#)



NESP Northern Hub

Gamba transforms native savanna landscapes.



Gamba grass (*Andropogon gayanus*) transforms ecosystems. Within a decade of its arrival, a patch of Australian savanna woodland can begin to resemble an African grassland. Gamba grass first displaces the native grasses, creating a four-metre-tall, dense monoculture that burns at up to eight times the intensity of the native grasses. The heat from these fires kills the savanna eucalypts, as the canopy is frequently scorched and charred.

This savanna transformation is a situation that Mary River National Park rangers knew well. For many years, a northern section of the park was heavily infested with gamba. Each year, early in the dry season, rangers would undertake a program of management burning to safeguard the property to the park's north from a more devastating late-season fire. Despite their best efforts, the gamba-invaded area of the park began to look degraded. This change was documented by researchers in the NESP Northern Hub who have undertaken research in the park since the 1990s.

“Over time, I really noticed the difference that the gamba fires were having, killing the trees. I began to think we could possibly do something differently.”

– Mr Steve Dwyer, Senior District Ranger, Mary River National Park

Now, after trialling the changed management approaches, research supported by the Australian

Government's National Environmental Science Program has demonstrated the improvement in savanna health in areas invaded by gamba grass.

“We thought we might be documenting the degradation of a woodland, but we're actually seeing something positive and it's moving in the right direction,”

– Stever Dwyer

A partnership between the park rangers, Charles Darwin University's Dr Natalie Rossiter-Rachor and University of Western Australia's Associate Professor Samantha Setterfield has shown that a more strategic approach to gamba management, based on the biology of the plant itself, can foster the recovery of healthy native savannas.

The changed approach by park rangers included reducing the frequency of gamba burning. Rangers maintained fire breaks and responded quickly to stop any gamba wildfires that broke out. In the wet season, they sprayed the gamba, focussing on creating a 20-metre-wide buffer along the park's boundary, and then increased the area sprayed each year.

Excluding fire to protect the tree canopy helped deprive gamba of the resource it's most hungry for: full sunlight. It also helps maintain a dense layer of leaf litter that inhibits the germination of gamba seeds.



A gamba-infested area has been restored to native savanna woodland through diligent management of gamba and fire.



“If one of the key aspects for gamba health is fire, then you need to take fire out of the equation. So now, we spray it with herbicide, we exclude fire, we try to get shade back over it because gamba hates competition.”

– Steve Dwyer

The data collected during the research will help inform the integrated conservation strategy for the national park. Mr Dwyer says that having scientific data to quantify the ecological changes that he sees on the ground helps to refine and further develop the park rangers’ annual weed and fire management activities.

The data has also been an important part of the conversation with land managers about possible alternative approaches to gamba management, in locations where similar weed and fire management activities are appropriate.

“I can sit in as many meetings as I want and talk to people about it. But to have the data there, the photos there, over time; all of this has been extremely important so that we can put this management in place.”

– Steve Dwyer

Project leader Samantha Setterfield assessing savanna condition.



Edges of dense gamba showing eradication efforts.



## Research outputs

### Scientific papers

- [Navigating the fiery debate: The role of scientific evidence in eliciting policy and management responses for contentious plants in northern Australia](#) (September 2018)
- [Exotic grass invasion alters microsite conditions limiting woody recruitment potential in an Australian savanna](#) (April 2018)

### Report

- [Evaluation of satellite remote sensing pathways for mapping and monitoring of gamba grass for the Savanna Fire Management Methodology](#) (February 2019)

### Factsheet

- [Fire and weeds in the Top End](#) (start-up factsheet, November 2016)

### Video

- [Fire and weeds in the Top End](#) (July 2020)

### Project webpage

- [Fire and weeds in the Top End](#)

## Attributions

- Project leaders: Natalie Rossiter-Rachor (Charles Darwin University), Samantha Setterfield (University of Western Australia)
- Mary River National Park Rangers, both past and present, particularly Steve Dwyer (Senior District Ranger), Ian Bate, Ben Schumacher, Zac Pearce and Robert Goodman.
- NESP field survey team and data analysis: Chris Brock, Kris Brooks, Diego Alvarez Cortes, Michael Stauder, Fiona Freestone and Ashley Setterfield. We thank Lincoln Wilson and Julie Hearn (NT Parks, Wildlife and Heritage Division of the Northern Territory Government) for their feedback on the draft report.

