



Nature under fire in Australia's tropical savannas

The tropical savannas of northern Australia are highly vulnerable to changes in climate as well as to more direct human impacts. Addressing these challenges will require urgent, coordinated action at all levels.

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01 — Ant ecologists from Charles Darwin University conducting a study in savanna woodland near Darwin. The total number of ant species in Australia's tropical savannas is thought to far exceed any other region globally. Photo: Francois Brassard.

02 — Rugged sandstone dissected by creeks and rivers is typical of much of the Arnhem Plateau in the Northern Territory and is known locally as "Sand Country." Photo: Charles Darwin University.



Stretching across the northernmost 20 percent of the continent, from Western Australia's rugged Kimberley to Queensland's Cape York Peninsula, Australia's tropical savannas are one of the earth's largest and most intact tropical ecosystems. The savannas are defined by three inter-related features: an intense wet-dry seasonal rainfall cycle driven by the northern Australian monsoon, a variable and diverse mix of trees and grasses, and frequent fires, typically relatively low in intensity by comparison with southern Australian bushfires.

Despite the environmental extremes, these landscapes harbour extraordinary biodiversity and support a rich array of wildlife found nowhere else, including the Gouldian finch and frilled-neck lizard, and lesser-known but globally significant insect communities (including several thousand species of ants).

Despite their apparent health though, the savannas are facing a suite of escalating threats – invasive species, intensifying fires, expanding land clearing, water extraction and climate change – the interaction of which have the potential to irreversibly disrupt and destroy their ecosystems. Some components of biodiversity are already in rapid decline: once-common mammals, such as the northern quoll and black-footed tree-rat, have disappeared from large parts of their former range, and many seed-eating birds, like the golden-shouldered parrot and partridge pigeon, are now scarce. Even within renowned conservation reserves such as Kakadu National Park, populations of many native animals have collapsed.

Although fire is a natural and ancient element of the tropical savannas, many native species are sensitive to shifts in the timing and intensity of fires. In the last century, fire regimes have shifted from

small, frequent, and relatively gentle burns, managed traditionally by First Nations peoples, to extensive, high-intensity fires late in the dry season. These late-season fires are often exacerbated by exotic pasture grasses, such as gamba (*Andropogon gayanus*) and buffel (*Cenchrus ciliaris*), both of which lead to dramatically hotter and more destructive fires. Meanwhile, feral buffalo and pigs further degrade habitats, especially fragile wetlands, and feral cats prey upon vulnerable native wildlife, especially in the aftermath of these high-intensity fires.

Climate change is further amplifying existing pressures on the tropical savannas, triggering cascading ecological impacts. Longer, hotter and drier dry seasons are fuelling more frequent and intense wildfires, reducing the availability of standing water, and pushing fire-sensitive species and habitats closer to collapse. These compounding effects weaken ecosystem



03 — A relatively high-intensity fire (typical of those later in the dry season), in savanna woodland at Berry Springs in the Northern Territory. Photo: Francois Brassard.

04 — These dramatic cliffs are on the southern shore of Bathurst Island in the Northern Territory are a source of ochre for local Tiwi people. Photo: Francois Brassard.

05 — The Arnhem Plateau is a globally significant hotspot of biodiversity and endemism within northern Australia. Photo: Charles Darwin University.

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resilience, making savanna landscapes more vulnerable to invasive species, habitat degradation, and species loss.

Weak environmental protections are failing to safeguard these landscapes. Land clearing, primarily for agriculture and infrastructure, compounds all other impacts, particularly in biodiversity hotspots with higher rainfall, such as the regions around Darwin. Protections across the north are piecemeal and poorly enforced. Most notably, in the Northern Territory, pastoral leaseholders can clear thousands of hectares of land with minimal oversight, typically requiring only a permit from the Pastoral Land Board, which has no explicit legal requirement to consider the impacts of land clearing on biodiversity or broader ecological values. The legislative vacuum has allowed land clearing approvals in the NT to balloon over the last decade, reflecting a “development-at-all-costs” mentality of successive territory governments. Such ad hoc approaches not only erode ecological values but also undermine opportunities for integrated

landscape planning, sustainable land use, and long-term regional resilience.

There is also an urgent need for regulation of land clearing at the Commonwealth level. Numerous reviews and analyses of the effectiveness of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) have shown that it has failed to protect biodiversity since its introduction.¹ Since then, a vast area (around 8 million hectares Australia-wide) of likely threatened species habitat has been cleared without formal assessment under the act, suggesting that successive Australian governments have turned a blind eye to illegal clearing. The Australian government is currently working to reform the EPBCA and it is critical that a strong and enforceable regulatory framework is established to protect the natural values of the tropical savannas.

Indigenous-led initiatives are an essential part of the way forward. Successful fire management programs, like the Ecofire Project in the Kimberley, and the West Arnhem Land Fire Abatement Project,



demonstrate how combining traditional ecological knowledge and customary burning practices with Western science (including the use of satellite data) can achieve multiple benefits. Such programs are reducing the occurrence of high-intensity wildfires and greenhouse gas emissions, protecting fire-sensitive habitats, and creating much-needed social, cultural, environmental and economic benefits for First Nations communities and landowners.

The expansion of Indigenous Protected Areas (IPAs), funded by the Commonwealth government, further highlights what can be achieved when Traditional Custodians are empowered to care for Country. IPAs are voluntarily declared areas of land or sea where Indigenous Traditional Custodians work to protect biodiversity and cultural values. IPAs across Australia now cover around 104 million hectares, making up over half of Australia's National Reserve System, delivering nature conservation gains while also providing on-Country employment and community development opportunities through Indigenous ranger programs.

Australia's tropical savannas are highly vulnerable to changes in climate, as well as to more direct human pressures – and responding to the scale of these challenges will require more than purely local initiatives. There needs to be stronger environmental protections at local, state, territory, and Commonwealth levels, with the introduction of rigorous biodiversity conservation legislation. Effective monitoring and planning needs to be implemented across all land tenures. Threatened species listings need genuine legal weight and strong enforcement, and proposals for further land clearing must face stringent scrutiny, backed by robust science and transparency in decision making. Urgent action needs to be taken to protect these precious areas for the species that live in them, as well as for the communities and professions shaping our future landscapes.



1. Michelle Ward et al., "Lots of loss with little scrutiny: The attrition of habitat critical for threatened species in Australia," (2019) in *Conservation Science and Practice* 1 (11) e117; Graeme Samuel, *Independent Review of the EPBC Act – Final Report* (2020), Department of Agriculture, Water and the Environment, Canberra, dceew.gov.au/environment/epbc/our-role/reviews/epbc-review-2020