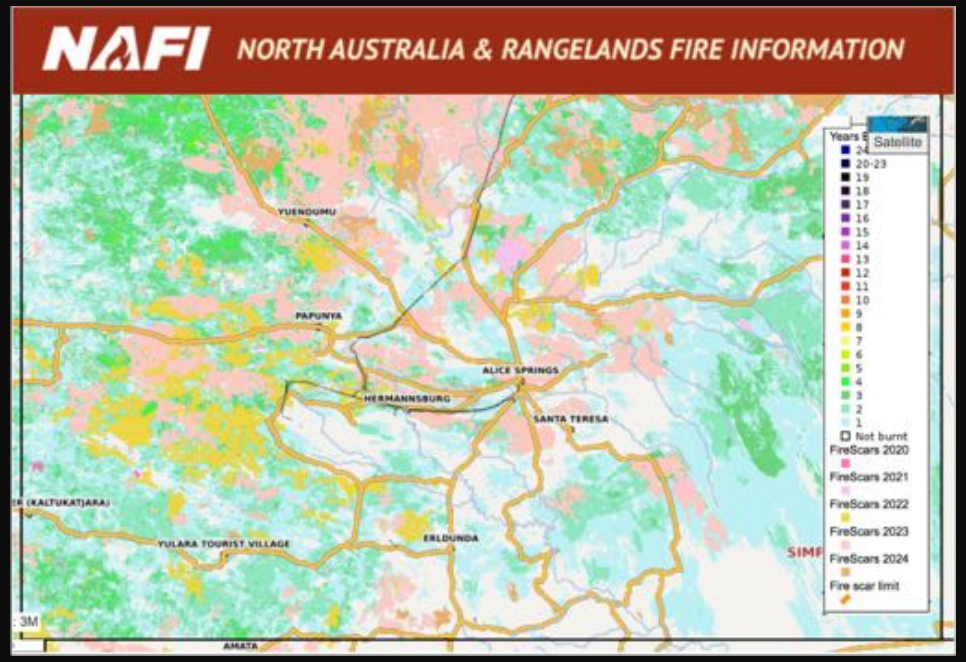
WILD FIRE IN CENTRAL AUSTRALIA

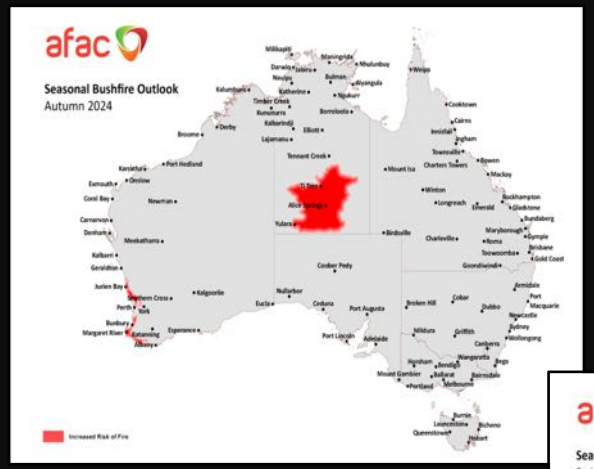
(AN EMERGING HEALTH THREAT)

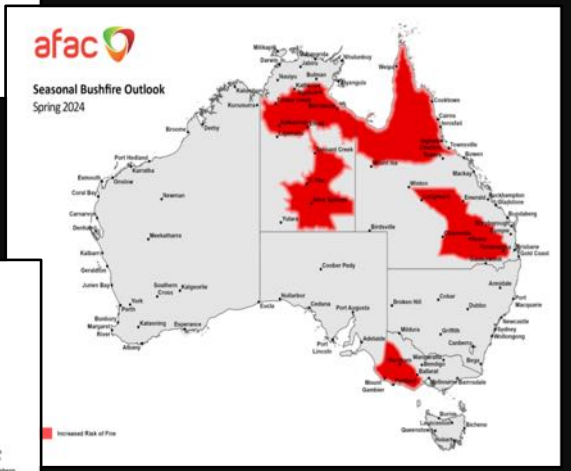
Jacqueline Arnold BA, BSN, MPH

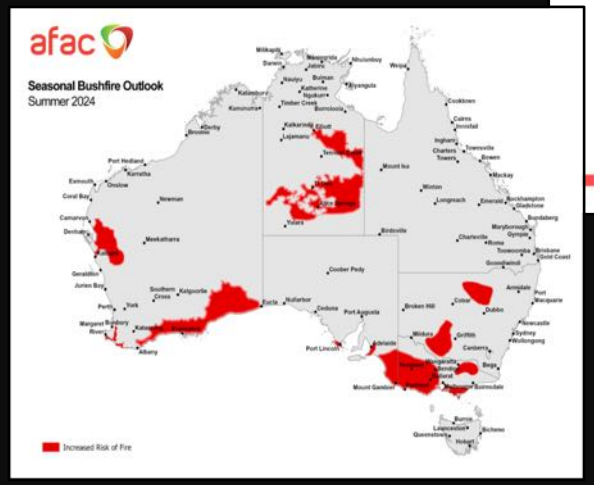
WILD FIRE RISK IN CENTRAL AUSTRALIA

The frequency, intensity and reach of wildfires in central Australia is increasing









WILD FIRE RISK IN MPARNTWE

Image: Enhanced satellite image showing the location of the fire front on Sunday, August 13, 2023. Source: EO Browser / Sentinel-2

Multiple fires burned to the west of Alice Springs earlier this month. *(ABC News: Alex Barwick)*

WHY ARE WILD FIRES IN CENTRAL AUSTRALIA GETTING WORSE?

afac Australian and New Zealand Council for fire and emergency services

Seasonal Bushfire Outlook for Autumn 2024

*"Above-relative surface fuel loads, continuity of grass fuels and high densities of invasive **buffel grass**, (Cenchrus ciliaris) in Central Australia and the Barkly regions contributed to large, landscape-wide wildfires over the last six months. In these regions, wildfire frequency is typically once a decade following a series of high rainfall events in the semi-arid to arid regions. However, recently burnt areas are carrying fire with average wind speeds due to **buffel grass** regrowth and curing."*

Seasonal Bushfire Outlook Winter 2023

*"Much of Central Australia is showing above normal fire potential for this outlook due to **reduced rainfall, higher temperatures, and higher fuel loads, including of the invasive Buffel Grass**."*

BUFFEL GRASS

Buffel grass infestation increases the frequency, intensity and spread of wildfires.

- Creates an extremely high fuel load
- Burns very hot (900°C)
- Covers large areas with uniform intensity
- Has a positive fire feedback loop

The remains of a corkwood tree after an unplanned bushfire in an area heavily invaded by buffel grass near Simpsons Gap. Very few large old corkwood trees now remain in this area. Author provided

BUFFEL GRASS - FUELING WILD FIRES AROUND THE WORLD

tucson.com

Ecologists issue call to action after buffelgrass fire scorches saguaros in Catalinas

Henry Brean Aug 30, 2019 Updated Apr 18, 2022

ABC NEWS

Buffel grass prompts bushfire warning as weed infests unprotected states

By Tamara Clark | By Elise Kennedy | ABC Mildura-Swan Hill | Environment

Thu 8 Aug

A fire fuelled by buffel grass near Alice Springs. (Facebook: Bushfires NT)

In short:

Buffel grass is spreading to more Australian states, posing a significant threat as climate change increases fire risk.

In recent years, the highly flammable plant has fuelled devastating fires in the NT and on the Hawaiian island of Maui.

What's next?

An expert has called on the Australian government to declare buffel grass a weed of national significance.

12NEWS

News Weather Sports

ARIZONA

Apache Junction working to address invasive species to help reduce wildfires

Invasive species are believed to be increasing fire intensity across the Sonoran Desert.

Author: Colleen Sikora
Published: 9:13 PM PDT July 29, 2024
Updated: 9:13 PM PDT July 29, 2024

APACHE JUNCTION, Ariz — Researchers have identified invasive species as part of an increase in fire danger across the desert.

This is why the City of Apache Junction is trying various techniques to try and get them more under control and help prevent wildfires.

Both buffel grass and stinknet can be found in Silly Mountain Park in Apache Junction.

THE AUSTRALIAN BUSINESS JOURNAL

Home › Lifestyle

Invasive Buffel Grass That Helped Fuel Deadly Maui Fires Also Threatening Australia

by Simona Badita — September 26, 2023 in Lifestyle 0

INDEPENDENT

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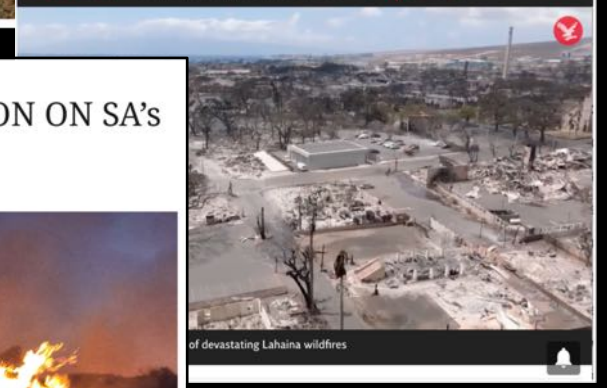
Highly flammable grasses in Hawaii fueled spread of deadly Maui wildfires, experts say

The death toll in the Maui wildfires surpassed 100 this this week and 1,000 are still missing

Andrea Cavallier • Thursday 17 August 2023 09:12 BST • Comments



of devastating Lahaina wildfires

COOBER PEDY NEWS & EVENTS

HOPE OF SOME SERIOUS ACTION ON SA's BUFFEL GRASS CRISIS!

BY COOBER PEDY REGIONAL TIMES ON NOVEMBER 28, 2024 • (3 COMMENTS)

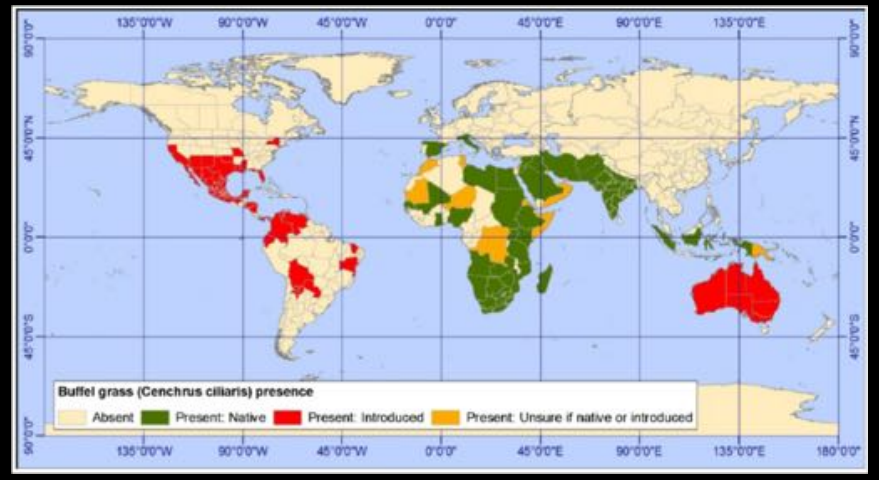
At Coober Pedy, volunteer firefighters have grave concerns about the out-of-control buffel grass problem across the state

WHAT IS BUFFEL GRASS & WHY ARE WE SURROUNDED BY IT?

Buffel grass (cenchrus ciliaris, c. pennisetiformis) is a perennial tussock grass native to parts of Africa, the Middle East and India.

It has been widely planted to support colonisation and beef production.

Buffel grass is highly invasive and continues to spread far beyond planted areas.



GRASS FUELLED WILD FIRES

Standing grass is:

Surrounded by oxygen

- can ignite easily
- grow rapidly

Directly affected by wind speed and direction

- can spread very quickly over many kilometres.
- slight wind change can steer the fire in many different directions.

BUFFEL GRASS INVASION - IMPACTS ON NATURAL PROTECTION FROM WILD FIRE

Buffel invasion impacts natural protection from wild fire by:

- Reducing areas of clear ground / natural fire breaks
- Reducing number of native fire retardant plants
- Reducing numbers of native animals that process fuel loads

SMOKE

BUSHFIRE SMOKE IN THE BARKLY 2023

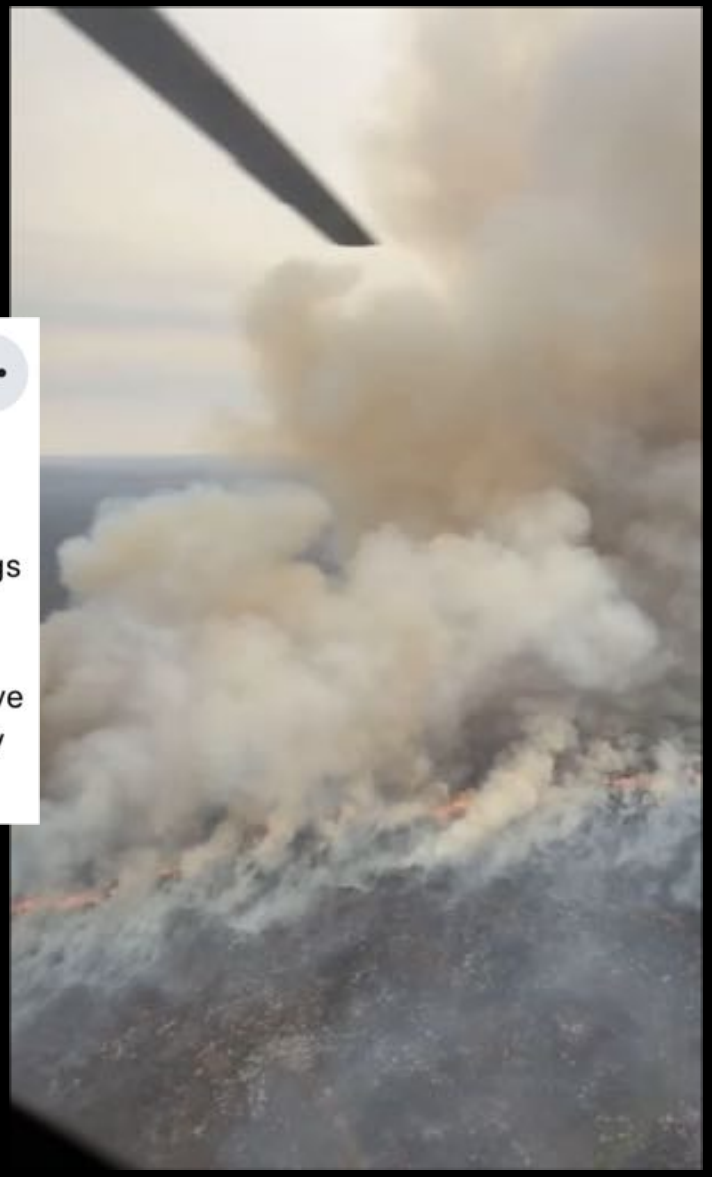
BUSHFIRE SMOKE IN MPARNTWE 2023

VIEW FROM THE AIR

Bushfires NT
8 November 2023 ·

Aircraft have been out mapping the active fire around Alice Springs this morning.

Thick smoke from fires surrounding Alice Springs is likely to impact the township and surrounds today and may be a risk to people with respiratory ailments. Take precautions if you have a medical condition that may be exacerbated by bushfire smoke:



VIEW FROM THE GROUND

HEALTH SERVICE IMPACTS IN CENTRAL AUSTRALIA

In 2023 *Alice Springs Hospital* published a *Smoke and Air Quality Warnings for Central Australia Region* which stated:

"Alice Springs Hospital has seen a significant number of presentations to ED as a result of respiratory distress due to smoke from fires in the region. The poor air quality and particle concentration will be affecting all areas including remote locations.

Many of the patients presenting with respiratory conditions are improving much more slowly than under normal conditions. It is expected that length of stay, bed occupancy and patient flow may be affected as well as attendance to ED and remote community clinics.

NT Health staff are encouraged to consider the risk of smoke inhalation to themselves and their patients and take appropriate precautions. Health Clinics should also plan for increased presentations."

BUSH FIRE SMOKE

The smoke generated by bushfires can affect health over large geographical areas.

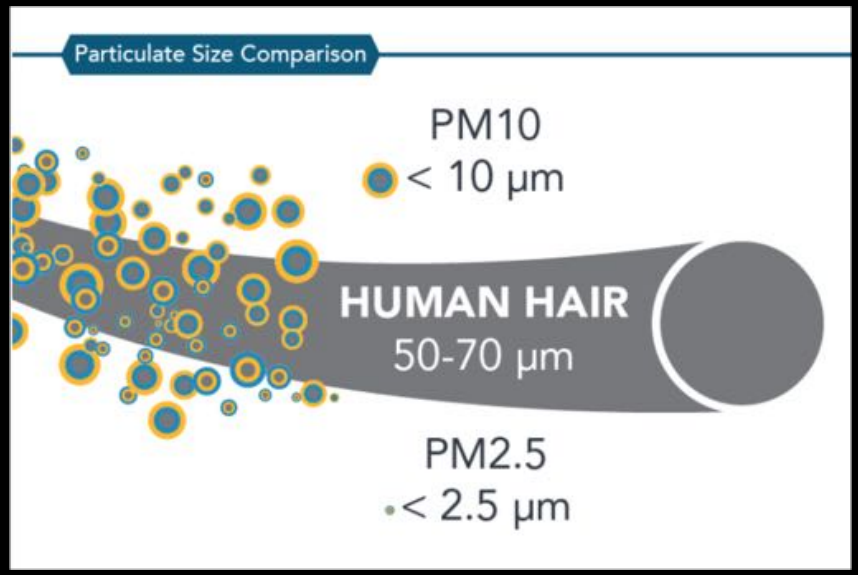
Particulate matter represents the main component of bushfire smoke and poses the primary threat to health.

PM_{10} – particles smaller than 10 microns in diameter

- Contributes to visible smoke haze
- Can irritate the eyes, throat and lungs

$PM_{2.5}$ – particles smaller than 2.5 microns in diameter

- Too small to be seen
- Can cross
  - from lungs into blood stream
  - from nasal mucosa into the central nervous system
- Trigger oxidative stress in organs and systemic inflammation



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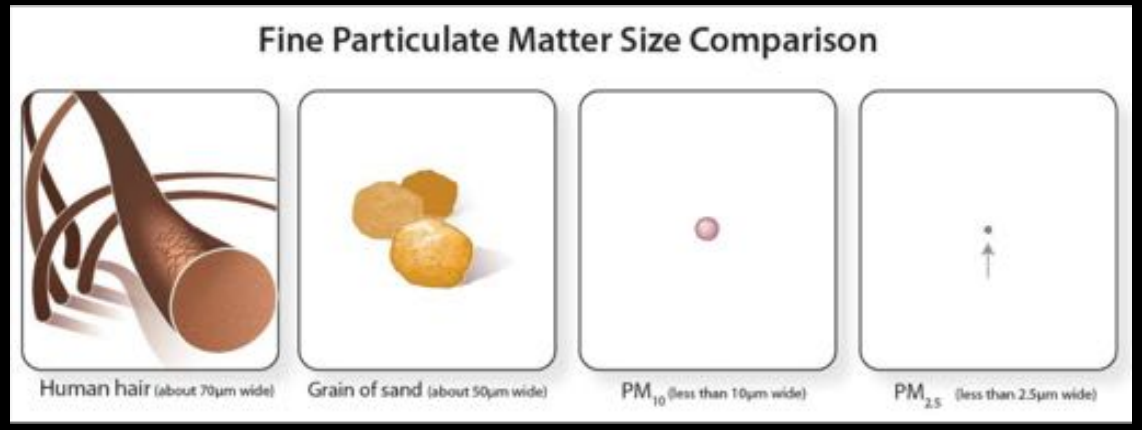
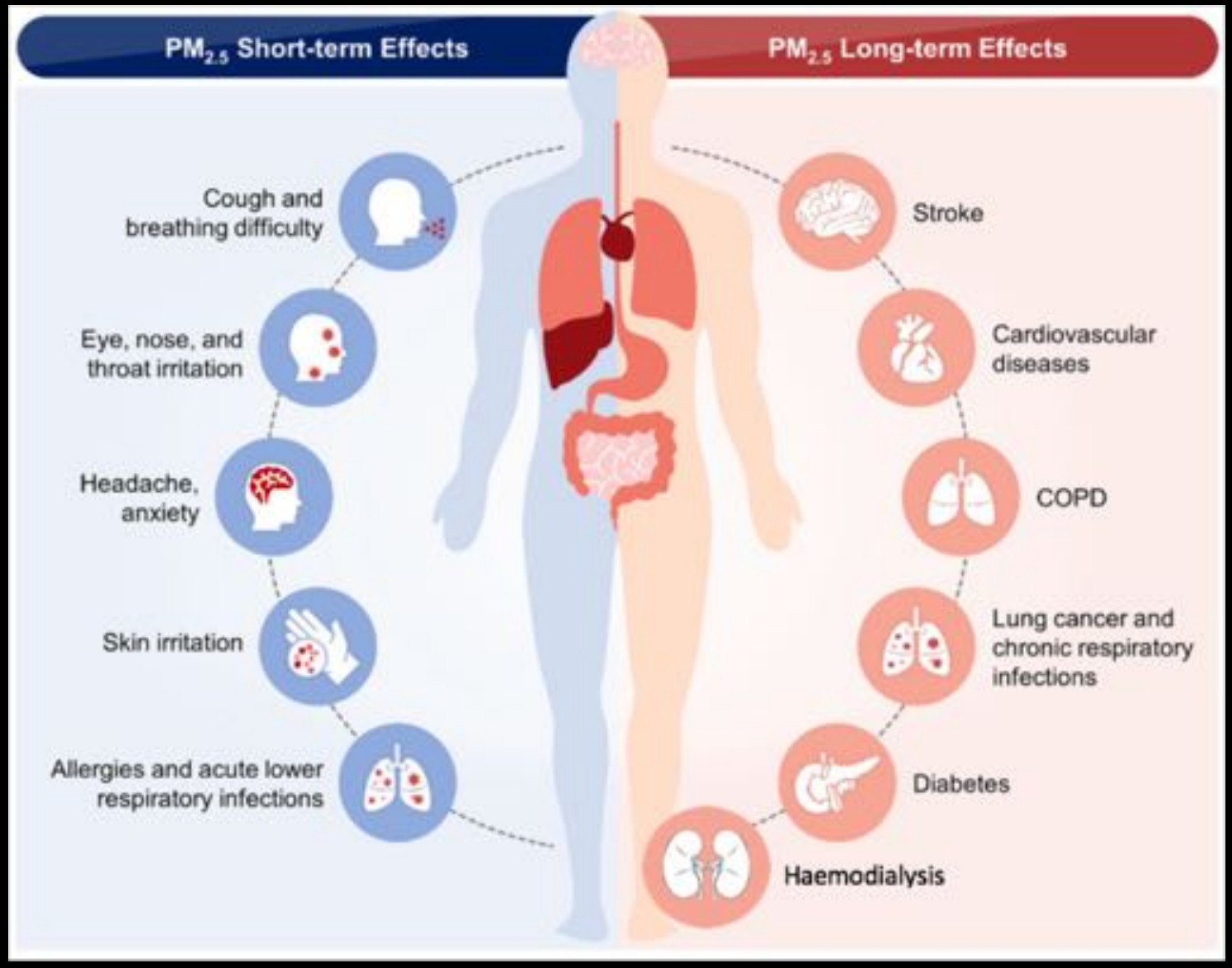


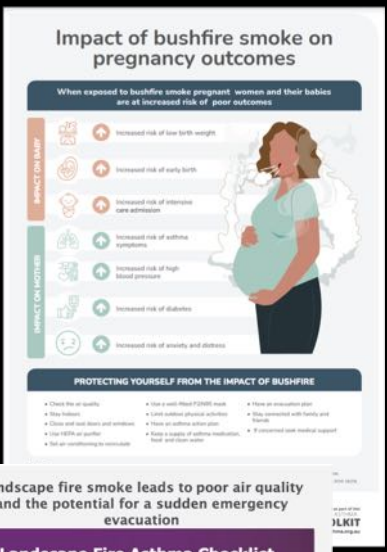
HEALTH IMPACTS OF BUSHFIRE SMOKE



VULNERABLE GROUPS

POPULATIONS MOST AT RISK

- People with lung disease
- Pregnant women
- Breastfeeding women
- Children
- The elderly
- People with diabetes
- People with cardiovascular disease



HEALTH SERVICE IMPACTS

A large body of evidence indicates that bush fire smoke increases rates of:

- Respiratory medication use
- Ambulance calls
- Emergency department visits
- Hospital admissions
- All-cause mortality

HOW TO PROTECT YOURSELF AND OTHERS FROM BUSHFIRE SMOKE

National Centre for Epidemiology & Population Health
Research School of Population Health
College of Health & Medicine

Australian National University

NATURAL PROTECTION FROM BUSH FIRE SMOKE

Natural ecosystems with a diversity of ground, mid and upper storey vegetation.

- Decreases smoke dispersal
- Filters particulate matter

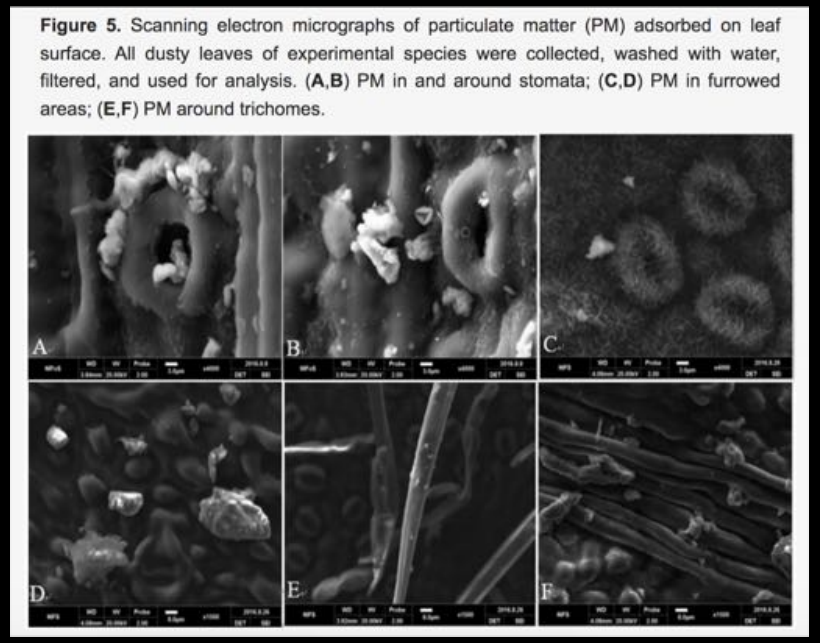


Figure 5. Scanning electron micrographs of particulate matter (PM) adsorbed on leaf surface. All dusty leaves of experimental species were collected, washed with water, filtered, and used for analysis. (**A**,**B**) PM in and around stomata; (**C**,**D**) PM in furrowed areas; (**E**,**F**) PM around trichomes.

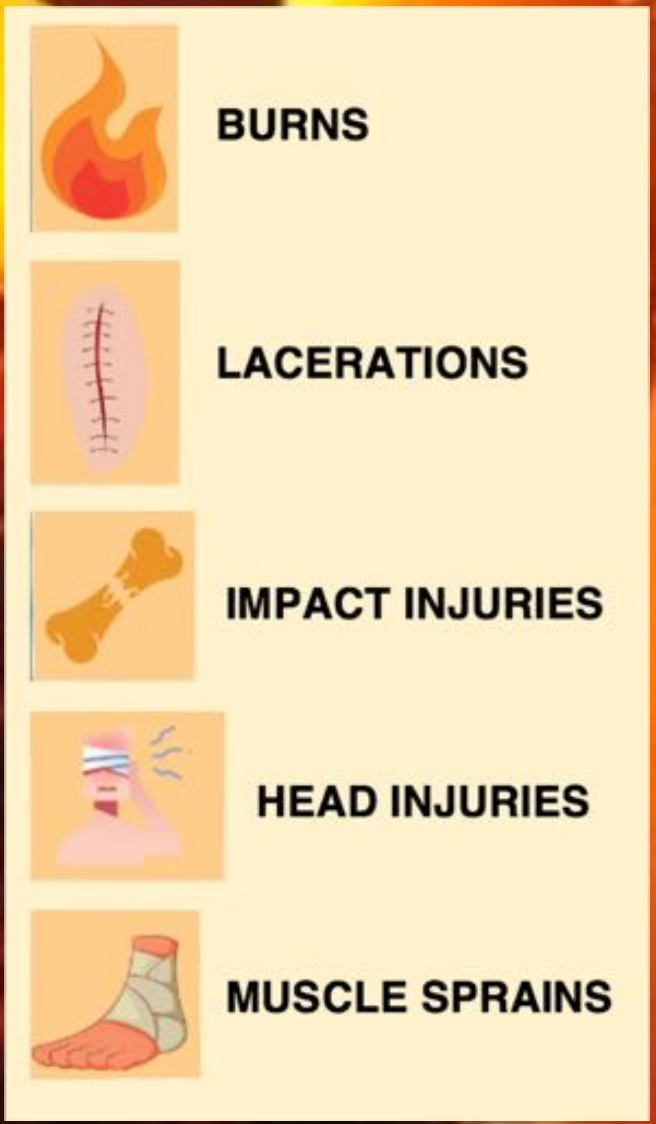
A LANDSCAPE IN CENTRAL AUSTRALIA WHERE BUFFEL FUELED FIRES HAVE WIPED OUT NATIVE VEGETATION

INJURY

Wild fires can cause serious injury and death

Physical injuries can occur when people:

- Are trapped
- During firefighting efforts
- During evacuations



MENTAL HEALTH

Wild fires can trigger new, and exacerbate existing mental health problems

Lived experience of bushfire has been found to increase the occurrence of psychological and behavioural disorders such as:

- Anxiety
- Depression
- Post-traumatic stress disorder
- Substance misuse

The effects can persist for years after the impact

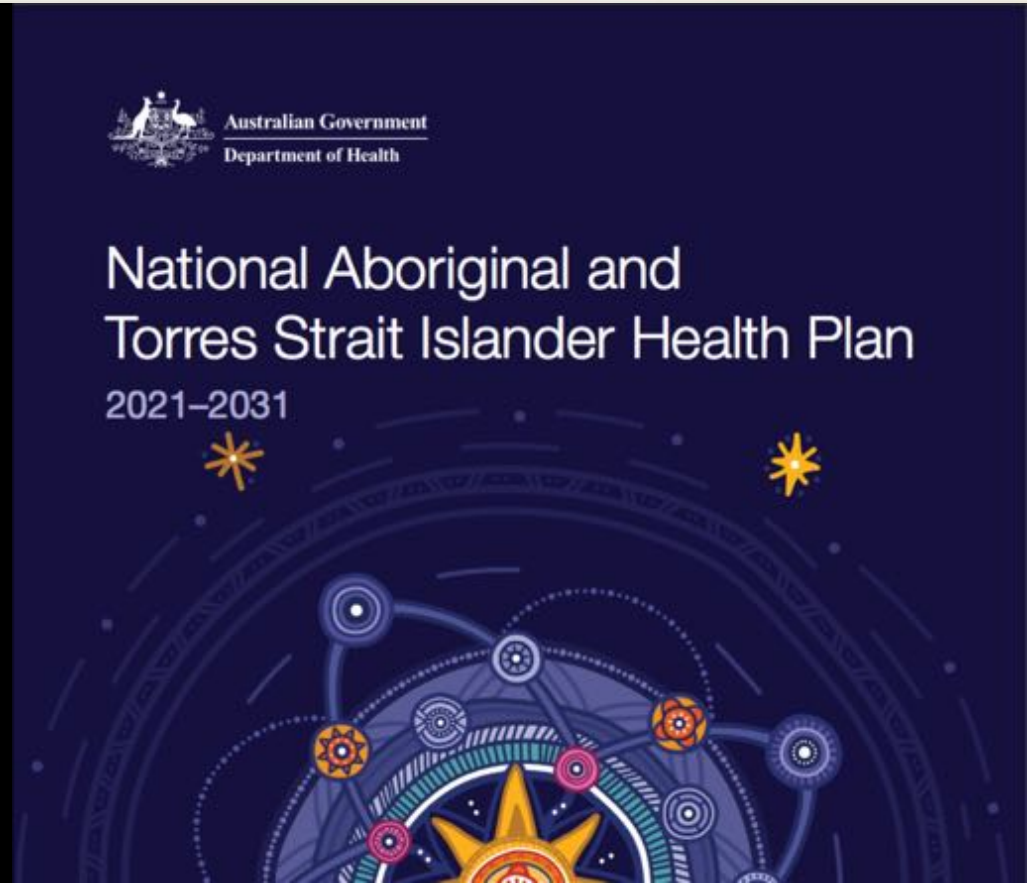
CULTURE

Culture is a foundation for Aboriginal and Torres Strait Islander health and wellbeing. It is a protective factor across the life course, and has a direct influence on broader social determinants outcomes. Gains across these broader determinants, in turn, reinforce cultural connectedness, maintenance, resurgence, nation building and pride in cultural identity.

Culture and country are inseparable.

Increased frequency, intensity and spread of wild fires:

- Incinerates country
- Disrupts, and in some cases discontinues, cultural practices including caring for country activities such as traditional burning



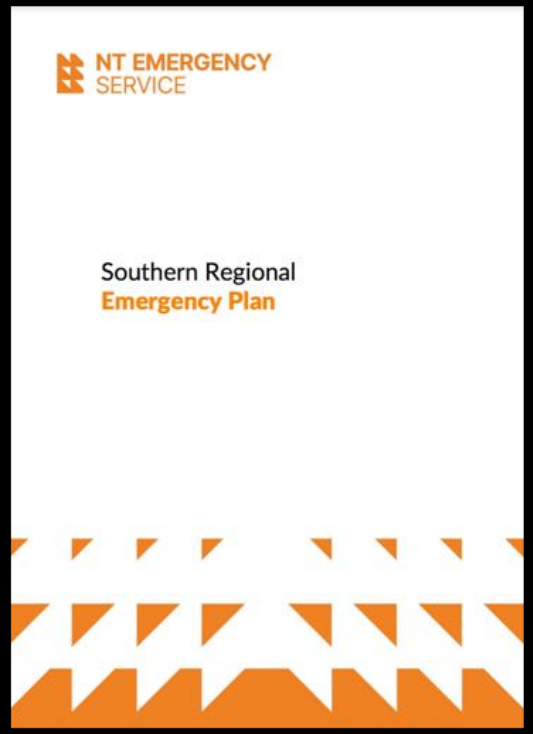
ECONOMIC IMPACTS

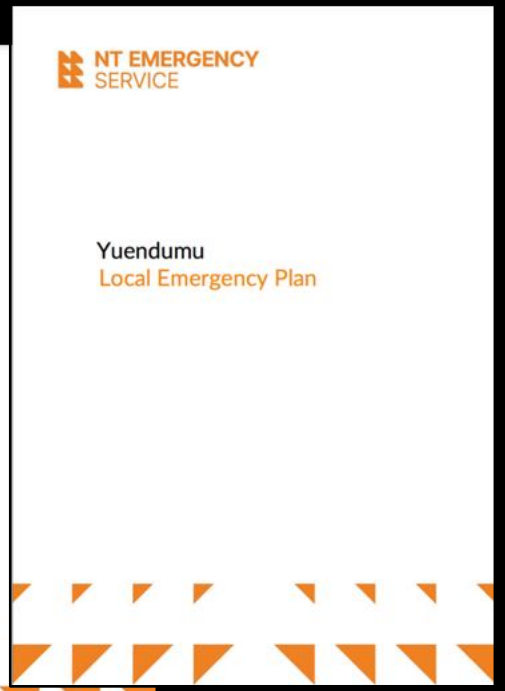
A recent estimate of the burden of bushfires in Australia over 10 years from 2021 to 2030 predicted:

- Healthcare costs arising from deaths for smoke-related conditions, hospitalizations = **$110 million**.
- The impact on gross domestic product = **$17.2 billion**.

PREPARATION

PREPARATION

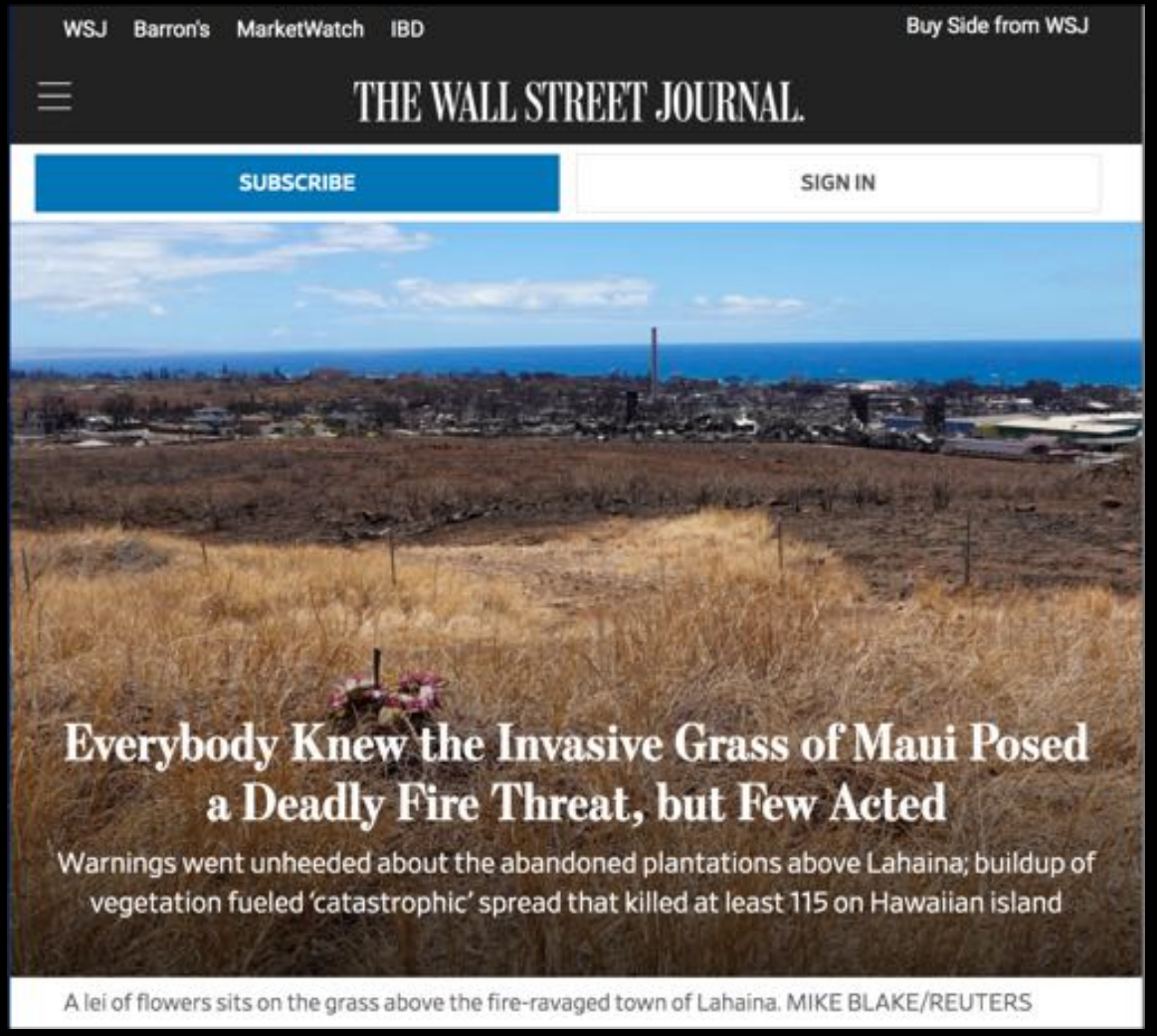




MANAGING RISK

In December 2023 John Patterson, Chief Executive Officer of the *Aboriginal Medical Services Northern Territory* stated:

*"**Buffel grass is destroying our people's health, our culture and our country. We have an opportunity to change this**…The fires earlier this year are a demonstration of the danger buffel grass poses to our whole community, and particularly those with respiratory conditions like asthma"*



Preparing for bushfires and your responsibilities

Bushfires: landholder responsibilities
Support for landholders and communities to meet their responsibilities.

Fire safety on rural blocks
Tips on how to keep your home safe for bushfire season.

Install and maintain firebreaks
Be prepared, install your firebreaks.

Permit to burn and lighting fires
Find out when you need to get a permit to burn, and what you need to do.

Fire bans and fire danger periods
What you can or can't do during a fire ban and fire danger period, and how it's announced.

Property bushfire management and survival plans
Developing a property bushfire management plan and how to prepare, act and survive in the event of a bushfire.

Report bushfire arson and suspicious fires
You must report suspicious fire behaviour.

Bushfire seasons
Bushfire seasons in Top End and Central Australia.

Driving near bushfires
Find out what to do in the NT when driving around bushfires.

Mental health after bushfires
Bushfires can be traumatic, find out where you can get help to talk with someone.

Protect your business from bushfires
Steps for businesses to take before, during and after a bushfire.

Staying safe from bushfire smoke
What to do if you're affected by bushfire smoke and how to get help.

Fire weather forecast areas
What fire weather forecast areas are, how they are defined and how to view them.

MANAGING RISK

Healthy Country = Healthy People

Functioning natural ecosystems, with a diversity of native plants and animals provide critical defense against many health risks.

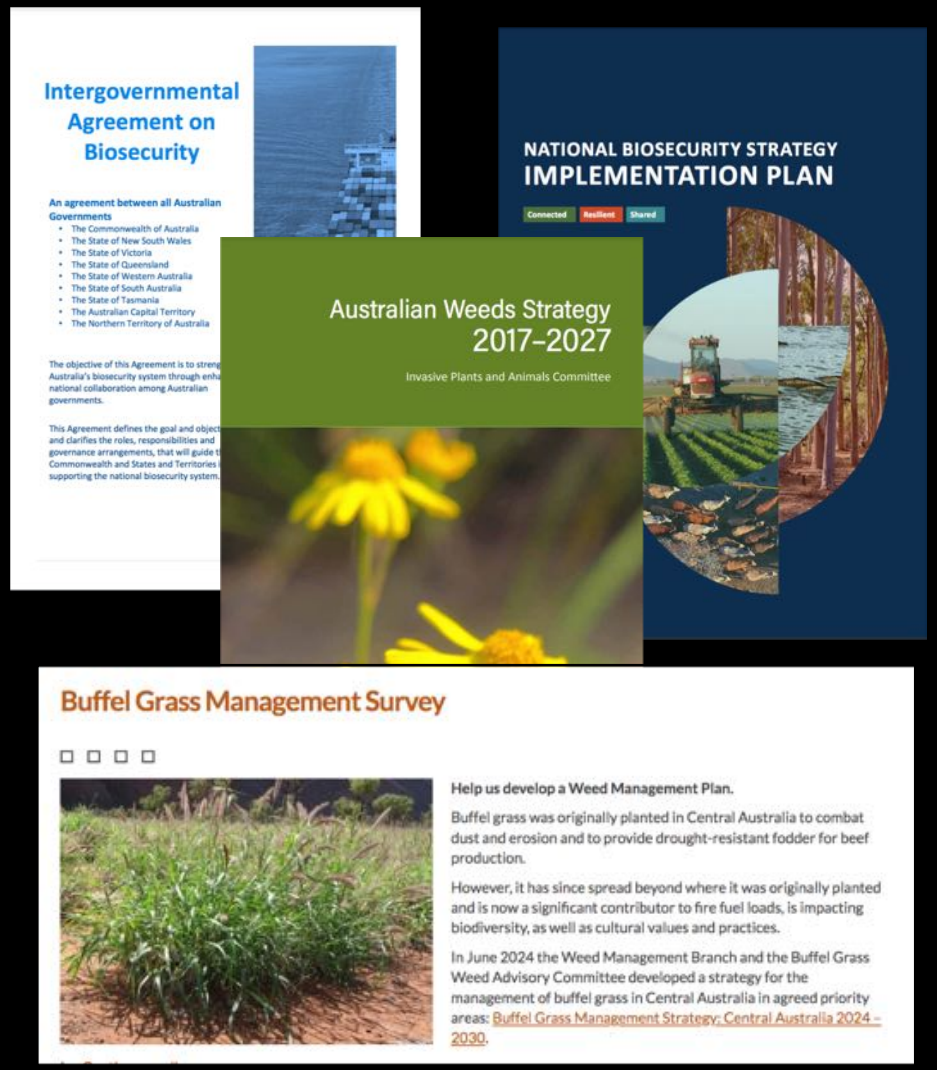
MANAGING RISK – CLIMATE ACTION

MANAGING RISK - BIOSECURITY

Australian governance of invasive weeds falls under National Biosecurity Arrangements.

These arrangements and the strategies and plans that fall under them, are regularly reviewed.

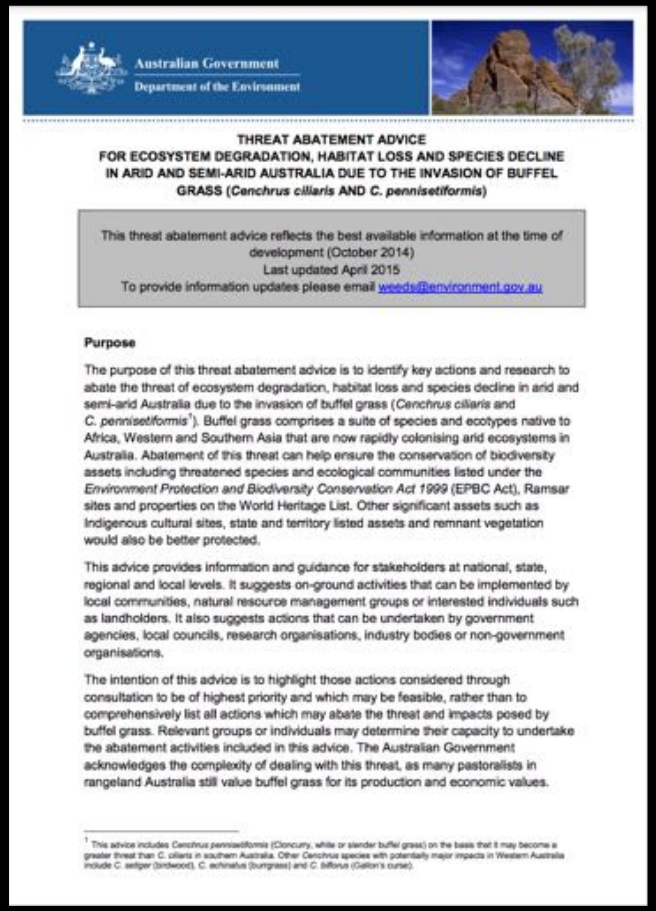
Engaging with this governance is a critical responsibility for members of the public and professionals whose lives and work are impacted by invasive species.



WHAT CAN BE DONE TO MITIGATE THE THREAT POSED BY BUFFEL GRASS INVASION?

Australia's *Threatened Species Scientific Committee* has issued comprehensive advice and actions under the Australian *Environmental Protection and Biodiversity Conservation Act* that can mitigate the threat posed by buffel grass invasion[63].

Following this advice is important for protecting the health of people living in Australia.



Australian Government
Department of the Environment

THREAT ABATEMENT ADVICE FOR ECOSYSTEM DEGRADATION, HABITAT LOSS AND SPECIES DECLINE IN ARID AND SEMI-ARID AUSTRALIA DUE TO THE INVASION OF BUFFEL GRASS (*Cenchrus ciliaris* AND *C. pennisetiformis*)

This threat abatement advice reflects the best available information at the time of development (October 2014)
Last updated April 2015
To provide information updates please email weeds@environment.gov.au

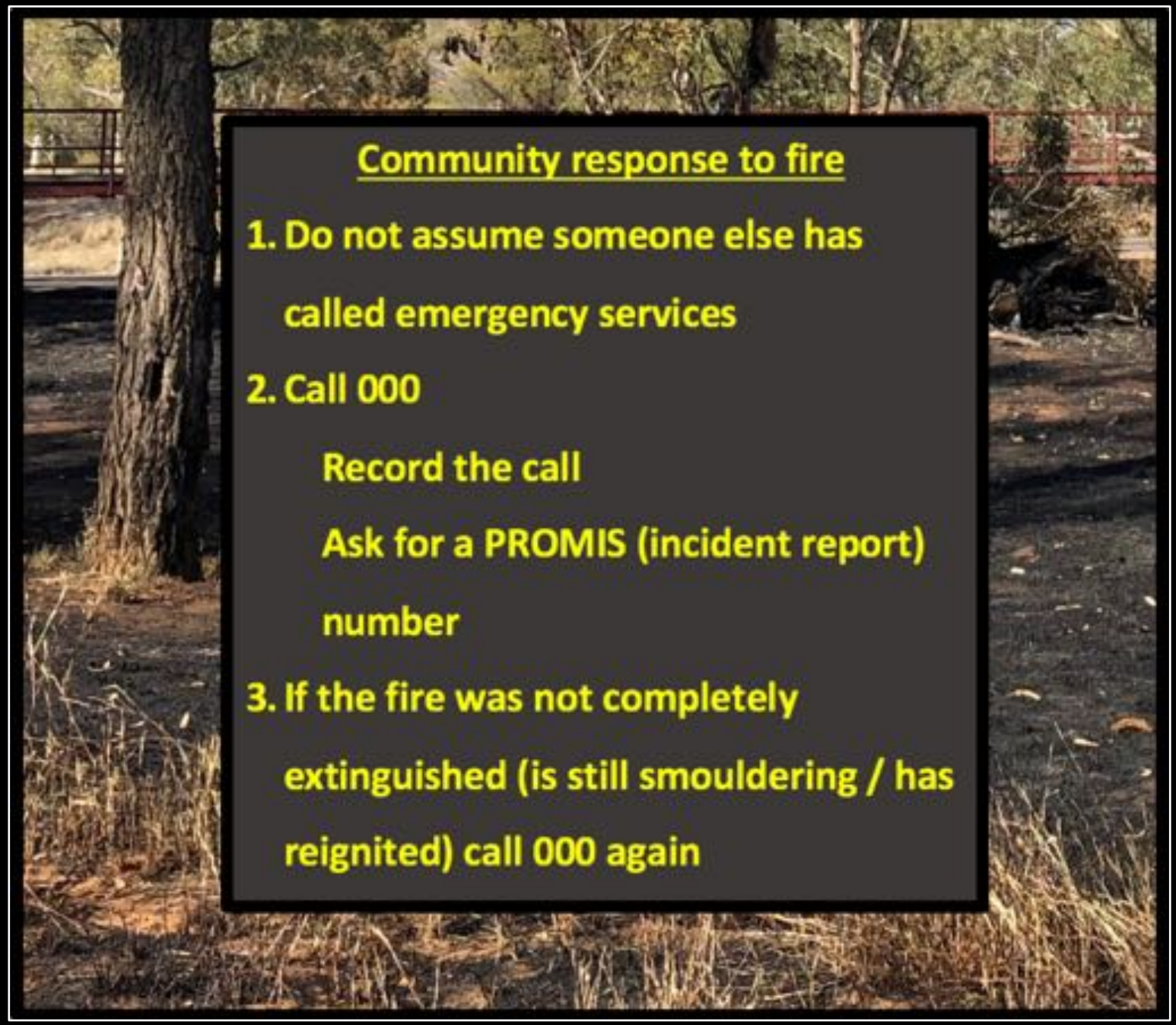
Purpose

The purpose of this threat abatement advice is to identify key actions and research to abate the threat of ecosystem degradation, habitat loss and species decline in arid and semi-arid Australia due to the invasion of buffel grass (*Cenchrus ciliaris* and *C. pennisetiformis*[1]). Buffel grass comprises a suite of species and ecotypes native to Africa, Western and Southern Asia that are now rapidly colonising arid ecosystems in Australia. Abatement of this threat can help ensure the conservation of biodiversity assets including threatened species and ecological communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), Ramsar sites and properties on the World Heritage List. Other significant assets such as Indigenous cultural sites, state and territory listed assets and remnant vegetation would also be better protected.

This advice provides information and guidance for stakeholders at national, state, regional and local levels. It suggests on-ground activities that can be implemented by local communities, natural resource management groups or interested individuals such as landholders. It also suggests actions that can be undertaken by government agencies, local councils, research organisations, industry bodies or non-government organisations.

The intention of this advice is to highlight those actions considered through consultation to be of highest priority and which may be feasible, rather than to comprehensively list all actions which may abate the threat and impacts posed by buffel grass. Relevant groups or individuals may determine their capacity to undertake the abatement activities included in this advice. The Australian Government acknowledges the complexity of dealing with this threat, as many pastoralists in rangeland Australia still value buffel grass for its production and economic values.

[1] This advice includes *Cenchrus pennisetiformis* (Cloncurry, white or slender buffel grass) on the basis that it may become a greater threat than *C. ciliaris* in southern Australia. Other *Cenchrus* species with potentially major impacts in Western Australia include *C. setiger* (birdwood), *C. echinatus* (burrgrass) and *C. biflorus* (Gallon's curse).


Community response to fire
1. Do not assume someone else has called emergency services
2. Call 000
Record the call
Ask for a PROMIS (incident report) number
3. If the fire was not completely extinguished (is still smouldering / has reignited) call 000 again