

Buffel Grass (weed) – *Cenchrus ciliaris*

Information for Weed Risk Assessment under the Victorian *CaLP Act*

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Key information

When conducting a weed risk assessment into Buffel Grass (*Cenchrus ciliaris*) the Victorian Government is encouraged to consider listing the weed with a State-prohibited status. Key considerations include:

- The significant evidence from other states regarding the cultural, biodiversity, community safety (fire), tourism, and agricultural impacts of the weed, and the resultant opportunities for cross-sector collaboration to prevent and manage incursions of Buffel Grass
- The current low-level of infestation in Victoria, but extensive modelled potential distribution
- Effective current tools available for control and the high feasibility of eradicating new and existing incursions
- The economic cost of not acting early when controlling this weed, as currently being realised in South Australia and Northern Territory
- A Victorian declaration would align with federal legislation that lists Buffel Grass as a key threatening process, and recent evidence from international sources.
- Significant progress made in SA following declaration of Buffel Grass as a weed in 2015 (acknowledging the significant extent of infestation within SA at the time of declaration).
- Whether the weed risk assessment should be extended to include *Cenchrus pennisetiformis*

Contents

Key information	1
Status in other jurisdictions	3
Impacts of Buffel Grass.....	4
Cultural	4
Biodiversity.....	5
Community safety - fire	6
Tourism	6
Agriculture.....	6
Economy	7
Current and modelled distribution.....	7
Current.....	7
Modelled.....	9
Dispersal methods	11
Feasibility of control.....	11
Agency awareness.....	11
Community awareness	11
Best practice guidance.....	12
Control in Victoria	12
Herbicide use.....	12
Case studies.....	13
Appendix 1 – Peer-reviewed articles on the biodiversity impacts of Buffel Grass	15

Status in other jurisdictions

International – In September 2023, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report on Invasive Alien Species and their Control recognised Buffel Grass’s potential to completely take over arid ecosystems, forcing out native plant and animal species¹.

Federal – recognized as a key threatening process 2015 and Threat Abatement Advice issued – ecosystem degradation, habitat loss and species decline, impacting biodiversity assets and indigenous cultural sites². In 2022 Dr Fiona Fraser (Threatened Species Commissioner) highlighted the importance of states declaring Buffel Grass as a weed to provide the impetus to undertake strategic control³, as is underway for Gamba Grass⁴.

South Australia – 2015 declared a weed⁵– recognized as one of the greatest pest threats to the arid rangelands of South Australia. In September 2023 the SA government allocated \$2.3 million to reduce the threat of Buffel grass⁶. South Australia currently leads Australia in understanding and integrated control, providing clear research and guidelines for control, eg:

- Strategic Plan
https://cdn.environment.sa.gov.au/landscape/docs/aw/sa_buffel_grass_strategic_plan_2019-2024.pdf
- Factsheet
(https://www.pir.sa.gov.au/_data/assets/pdf_file/0011/275906/4108_PIRSA_factsheet_Buffel_Grass_Control.pdf)

Northern Territory – 2018 Management Guide issued⁷. Eradication is unlikely due to vast distribution, focus is on containment and protection of biodiversity, cultural and built assets. A Technical Working Group⁸ is currently preparing recommendations for the Minister by 30 November 2023 on listing Buffel Grass as a weed.

¹ 4/9/2023 <https://www.ipbes.net/IASmediarelease>

² DoE (2015) Threat Abatement Advice (*Cenchrus ciliaris* and *C. pennisetiformis*)
https://www.dcceew.gov.au/sites/default/files/env/pages/19e6108c-d6a4-489f-9ac9-9f0754788080/files/threat-abatement-advice-buffel-grass_1.pdf

³ Dr Fiona Fraser (Threatened Species Commissioner), 10 November 2022 <https://fb.watch/mZ-3SLA87G/>

⁴ Threatened species action plan 2022-2032 – towards zero extinction, see Threat 10 Gamba Grass
<https://www.dcceew.gov.au/sites/default/files/documents/threatened-species-action-plan-2022-2032.pdf>

⁵ Declared plant policy – Buffel Grass (*Cenchrus ciliaris* and *C.pennisetiformis*)
https://pir.sa.gov.au/_data/assets/pdf_file/0008/234548/buffel_grass_policy.pdf

⁶ 14/9/2023 [https://www.premier.sa.gov.au/media-releases/news-items/\\$2.2m-for-fight-against-buffel-grass-as-new-international-report-warns-of-its-threat-to-communities-and-the-environment](https://www.premier.sa.gov.au/media-releases/news-items/$2.2m-for-fight-against-buffel-grass-as-new-international-report-warns-of-its-threat-to-communities-and-the-environment)

⁷ Buffel Grass management guide for Central Australia
https://nt.gov.au/_data/assets/pdf_file/0017/231416/buffel-grass-management-guide-2018.pdf

⁸ Buffel grass technical working group <https://nt.gov.au/environment/weeds/weeds-in-the-nt/A-Z-list-of-weeds-in-the-NT/buffel-grass/technical-working-group>

Impacts of Buffel Grass

Recent research documenting the impacts of Buffel Grass is well summarized in Ryan-Colton (2020) *The Buffel kerfuffle: how one species quietly destroys native wildlife and cultural sites in arid Australia*⁹.

Cultural

Experience from Northern Territory and South Australia has identified the significant impacts of Buffel Grass on hunting, bush food and medicines, and cultural sites. Impacts are from both the invasion monoculture and the altered fire regime.



Figure 1 Indigenous Desert Alliance conference at Yulara, representation from 76 Central Land Council rangers, 2023.

The Umuwa Statement 2021 was presented at the 2022 Indigenous Desert Alliance conference. It begins “We the First Nations people of the desert did not bring Buffel Grass to this land. But it is here, and it is killing our Country and threatening our communities and culture.”

The statement continues “We are calling on all governments at all levels to recognize the impacts and the threats that Buffel Grass has on we, the First Nations people of Australia”. (Figure 2).

⁹ https://theconversation.com/the-buffel-kerfuffle-how-one-species-quietly-destroys-native-wildlife-and-cultural-sites-in-arid-australia-149456?fbclid=IwAR3wgQWmbx_32KrOV-D8m3bB8_IY62peFGbxGJGZbjqOsIQPkz-EVVUuWIY

DESERT IPA RANGERS STATEMENT ON BUFFEL GRASS 2021 (UMUWA)

GRASS 2021 (UMUWA)

The Umuwa Statement was presented by the APY Waru Rangers to the 2022 IDA Conference in November, where it received unanimous support. We are hopeful this statement will galvanise environmental groups and governments across the country to step up their efforts against the insidious threat of buffel grass.

We're publishing it in full in both Pitjantjatjara and English and hope that our readers will help spread this message far and wide.

By Langalki Robin, Joanne Ken and Dom Barry

Nganana Anangu tjutangku tjampi kuranya nyanga palunya ngalya katinytja wiyatu. Palu kuwari tjampi kuranya nganampa mantangka ngaranyi munu nganampa ngura kurani munu community munu culture kulu.

Tjampi kuranya ngalya katingu puluka tjutaku kutju mai munu ulpuru kulu wiyanytjikijangkku. Panya kuwari tjampi kuranya ala lipiringu munu iluntanu nganampa ngurangka. Ka nganana kuwari putu ngurini mai putitja tjuta. Panya tjala, malu, kampurarpa, wiriny-wirinyapa, ultukunpa, wangunu, kalu-kalu, arnguli, kurku munu punu putitja kutjupa tjuta kulu panya kuwari nganana putu ngurini munu nganampa tjulpuntjulpunpa munu inunyti kulu wiyaringu. Tjampi kuranya warpungkula pulkarangkupai warungku kamparyangka munu kapingku puyinyangka. Ka nganana nyanga palunya ngalya katinytja wiyatu panya tjampi kura nyanga paluru panya witu-witu pulka mulapa. Ka nganana mukuringanyi alpamilantjaku nganampa ngura malangkungku wiru kanyintjaku.

Ka kuwari tjilpi pampa tjuta ulanyi ngura nyanga palumpa. Panya kuwari ngura pulka tjuta anganu tjampi kuralu panya punu wiru tjuta pakantjijangka. Panya nganana kuwari tjiti tjuta katintja wiyaringu putikutu panya tjampi kuralu iwara patinu munu punu nganmanya pakantja tjuta wiyatu. Ka nganampa tjiti tjutangku kuwari putu nyanganyi panya tjampi kuralu uwankara patinu munu kuwari witu-witu pulka ngaranyi panya nganampa tjiti tjuta nintintjaku. Ka nganana nyanga palunya ngalya katintja wiyatu. Panya nganampa culture kuwari kurani, ka anangu tjuta kuwari tjituru-tjituru nyinyani.

Ka nyanga palunya nganana mukuringanyi tjampi kuranya alpamilantjaku. Munu tjampi kura nyanga paluru anu ngura winkikutu, munu tjimitringka tjarpangu, munu tjilpi tjutaku inkapaingka kulu. Ka tjiti tjuta nganmanya para-wirtjapakalpai pukulpa munu inkapai, ka kuwari wiyaringu. Ka tjampi kura nyanga palula, liru tjarpapai munu kumpilpa ngaripai ka tjilpi pampa tjana kulu kulira ngulurungkupai tjampi kuralu anganyangka ka nganana nyanga palula-tjanalanguru pikatjararingkupai, ngaalytjararinganyi panya tjampi kuralanguru warungku kampara pikantangkupai. Panya nganana tjampi kura nyanga palunya ngalya katinytja wiyatu. Panya nganampa anangu tjuta kuwari nguluringanyi pikatjararingkutjakutawara Panya nganana mukuringanyi pulkara alpamilantjaku nganampa ngurangka.

Ka nganana kuwari pulkara mukuringanyi government uwankarangu nganananya kulintjaku munu alpamilantjaku tjampi kura nyanga palunya wiyantjaku. Panya nganana rawangu wangkangi tjampi kura nyanga palunya palu mula-mulangku nganananya kulintja wiyatu. Ka nganana nyanga palunya mula-mula wangkara palyantjaku ngaranyi, ngura nganampa, culture munu community kulu kumpu ngarantjaku. Ka nganana mukuringanyi, governmentu tjampi kura nyangapalianguru alpamilantjaku. Munu nganana kuwari mayatja pulka tjutangka tjapini nyanga palunya nyakuntjaku, panya kuwari kurani tjampi kuralu nganampa ngurangka munu nganampa ngura pulka tjuta kulu. Nyanga palunya ngura nganampangka wiyantjaku.

Ka nganana Anangu tjuta tjungurungkula tjungungku palyanma tjampi kura nyanga palunya wiyantjikijangkku. Panya warka pulka mulapa nyangatja ngaranyi tjampi kuranya wiyantjaku. Ka nganana mukuringanyi governmentu kulu nganananya mula-mulangku pulkara alpamilantjaku.

Alinytjara-Wilurara region

We the First Nations people of the desert did not bring Buffel grass to this land. But it is here, and it is killing our country and threatening our communities and culture.

Buffel grass was brought to our country to feed cattle and keep down the dust. But it has spread across much of our land. It is choking our country. We can't get bushfoods where we used to. Honeyant, Malu (kangaroo) and our native plants are getting harder to find. Our wildflowers are disappearing. The Buffel grows too fast and burns too often for our country. It's the first plant that grows after rain and fire. While we didn't bring it here, we live with the consequences. We need support to get our healthy country back.

Older people mourn the country that used to be. The plants and animals, the special and sacred places are covered in Buffel where once many native plants grew. We can't take our kids out to learn culture, the hunting tracks are covered and the plants that sustained us for thousands of years are disappearing. Our kids are growing up seeing only country with Buffel grass and it's getting harder to teach our kids the stories for this country. It's threatening our culture, we didn't bring it here and our people are suffering the consequences. We need support to keep our culture strong.

Buffel grass is all around our communities. It grows right up to our houses, in our backyards, front yards, our kids' playgrounds and our cemeteries. Kids can't run around like they used to. The Buffel hides snakes and makes it hard for our old people to get around safely. We can't escape it. We suffer health problems like asthma from the Buffel flowers and the smoke from the fires. Our homes, communities and special sacred places are at threat from fire from Buffel grass. We didn't bring it here and our people are at risk. We need support to protect our communities.

We are calling on governments at all levels to recognise the impacts and the threats that Buffel grass has on us, the First Nations people of Australia. For too long we have been pushed to the side when making decisions about this tjampi kura (bad grass). We need serious action taken to reduce this threat to our country, our culture and our communities. We need support from governments and people to help us manage this dangerous weed that is taking over the deserts. We call on Federal, State and Territory Governments to recognise the threat of Buffel grass to our country, our culture and communities and do what is needed to stop the march of this weed across our country.

We stand together with desert people across Australia calling for support on this problem. Buffel grass is a dangerous threat to us, and we need to be resourced to manage it.

Figure 2 The Umuwa Statement 2021

Biodiversity¹⁰

Buffel Grass is a transformer weed. It can change the character of vegetation over substantial areas. The threats from Buffel grass in arid and semi-arid areas of Australia are at least, or greater than, the threat posed by invasive animals¹¹. Buffel Grass can also threatens riparian systems, can inhibit the abundance of native ground-layer plants, and reduces biodiversity.

The deep-rooted tussock growth forms dense stands and competes with native species including native grasses and wildflowers. This reduces food sources and habitat for native fauna, including reduced habitat patchiness. The cover of Buffel Grass is negatively associated with species richness, including a reduced diversity of invertebrates.

Buffel Grass is a perennial species. As it dries off between periods of growth, a high volume of dry plant material can accumulate, contributing to intense fires. Buffel Grass fueled fires are hotter, larger and more frequent than native grass fires (see also [Community safety – fire](#)). Evidence from

¹⁰ See Appendix 1 for additional references

¹¹ Read et al. (2020) "Ranking Buffel: Comparative risk and mitigation costs of key environmental and socio-cultural threats in central Australia" *Ecol. And Evol.* 10: 12745-12763
<https://researchonline.jcu.edu.au/66604/1/ece3.6724.pdf>

Central Australia demonstrates the altered fire regimes transform woodlands into highly flammable grasslands by killing fire sensitive woody vegetation¹².

Community safety- fire

High fuel loads from Buffel Grass are directly linked to increased fire risk. Buffel Grass fuels intense fires and exhibits quick regrowth supporting frequent subsequent fires. Because Buffel Grass is perennial, Buffel-fueled fires occur even in years without significant rainfall, such as 2019. Following high rainfall years, Buffel-fueled fires are particularly intense and extensive. By March 2024, 80% of the Northern Territory is expected to burn in Buffel-fueled bushfires¹³.

There is a significant risk to human life and infrastructure from Buffel-fueled fires. In August 2023, a planned burn near Alice Springs escaped, threatening the town. Northern Territory Parks and Wildlife senior director Chris Day pointed to the amount of Buffel Grass as a key contributing factor¹⁴. Buffel Grass has also been implicated in the 2023 Maui wildfires (Hawaii), that claimed 111 lives¹⁵.

Tourism

Buffel-fueled fires change the landscape aesthetics and impact tourism infrastructure. This has a direct negative impact on tourism¹⁶. For example, almost half of Central Australia's Tjoritija / West MacDonnell National Park (94,000 ha) was burnt this year. This included the closure of and impacts to the world-renowned Larapinta Trail wilderness walk. Similar fires occurred at this location in 2001, 2011 and 2019, the latter particularly important because it occurred in the absence of significant rainfall¹⁷.

Agriculture

Buffel Grass was deliberately introduced for pasture production in the arid rangelands of Australia, particularly during the 1950s. There are now concerns about that Buffel Grass leads to a decline in pasture productivity over the long-term. Hybridisation amongst cultivars is likely to be occurring more than previously thought. Cultivars vary in palatability and replacement or hybridisation by less palatable forms of Buffel Grass result in reduced carrying capacity. The lack of diversity in Buffel Grass monocultures may also limit nutritive values due to pasture run-down. There are also livestock

¹² Schlesinger & Westerhuis (2021) Impacts of a single fire event on large, old trees in a grass-invaded arid river system. *Fire Ecology* 17(1):34

https://www.researchgate.net/publication/355974536_Impacts_of_a_single_fire_event_on_large_old_trees_in_a_grass-invaded_arid_river_system

¹³ ABC News 14 August 2023 "Northern Territory to see worst bushfire season in more than a decade due to high fuel loads" <https://www.abc.net.au/news/2023-08-14/worst-fire-season-in-a-decade-expected-for-northern-territory/102726614>

¹⁴ ABC News 21 August 2023 "National parks says Tjoritija / West Macdonnell fire fuelled by buffel grass" <https://www.abc.net.au/news/2023-08-21/national-parks-tjoritija-west-macdonnell-fire-buffel-grass/102746024>

¹⁵ Time Magazine August 2023 "Invasive plants brought to Maui by colonists helped fuel the wildfires" <https://time.com/6305735/invasive-plants-from-colonists-fueled-maui-wildfires/>

¹⁶ Read et al. (2020) "Ranking Buffel: Comparative risk and mitigation costs of key environmental and socio-cultural threats in central Australia" *Ecol. And Evol.* 10: 12745-12763

<https://researchonline.jcu.edu.au/66604/1/ece3.6724.pdf>

¹⁷ Schlesinger & Judd (2019) "The summer bushfires you didn't hear about, and the invasive species fuelling them" *The Conversation*, 12 March 2019 <https://theconversation.com/the-summer-bushfires-you-didnt-hear-about-and-the-invasive-species-fuelling-them-112619>

impacts due to the oxalates present, including oxalate poisoning in ruminants, and “Big Head” (calcium deficiency) in horses¹⁸.

Economy

The economic costs of Buffel grass include:

- Additional investment in fuel-reduction burning and response to Buffel-fueled bushfires
 - Northern Territory and South Australia are reporting significant economic costs due to the need to manage fire risk, protect community and tourism infrastructure and protect biodiversity assets from Buffel-fuelled fires.
- Costs of control of Buffel grass
 - Cost estimates for eradicating Buffel Grass from priority areas once established in the landscape are high. Costs of between \$50/ha in dry years and \$10,000/ha in wet years are documented from the 1,300 hectare Alice Springs Desert Park. This, and other control programs suggests a 20-year cost for 10,000 ha of over \$100,000,000¹⁹.
- Reduced revenue from tourism and agriculture

Current and modelled distribution

Current

Experience in South Australia has shown Buffel Grass can be slow to establish initially but it may spread readily beyond the introduction site under high summer rainfall. Observations in Victoria are that infestations are currently small and slow to spread and are able to be eradicated.

Following a sustained campaign between 2015-2020, primarily by Department of Transport (VicRoads) along major transport routes, the majority of known Buffel Grass incursions have been treated successfully. For example, in 2022/2023 Parks Victoria surveyed the Sturt Highway west of Lake Cullulleraine and found no Buffel Grass infestations. Prior to 2018 there were over 30 infestations reported.

Similarly, in 2020/2021 Mallee CMA drought relief crews surveyed previously recorded Buffel Grass locations and reported several areas where the weed is now absent. Notably, there are no recent records south of Ouyen (Figure 4). Records north of Ouyen are primarily along major transport routes (Figure 5).

Data on Buffel Grass observations in Victoria is currently held from 2015 to current. Although survey effort has not remained constant over the years, observations have declined from a peak in 2016/17 (Figure 3).

¹⁸ Desert Knowledge CRC (2006) Report 17: Friedel et al. “Buffel grass: both friend and foe”

<http://www.nintione.com.au/resource/DKCRC-Report-17-Buffel-Grass.pdf>

¹⁹ Read et al. (2020) “Ranking Buffel: Comparative risk and mitigation costs of key environmental and socio-cultural threats in central Australia” *Ecol. And Evol.* 10: 12745-12763

<https://researchonline.jcu.edu.au/66604/1/ece3.6724.pdf>

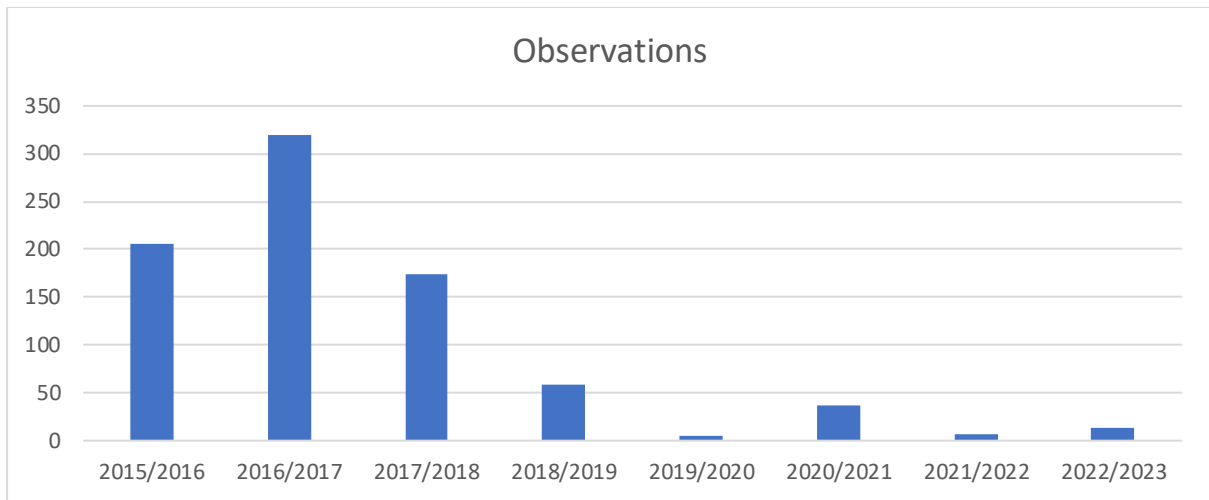


Figure 3 Number of Buffel Grass observations in Victoria (nb. Survey effort has not been constant across years)

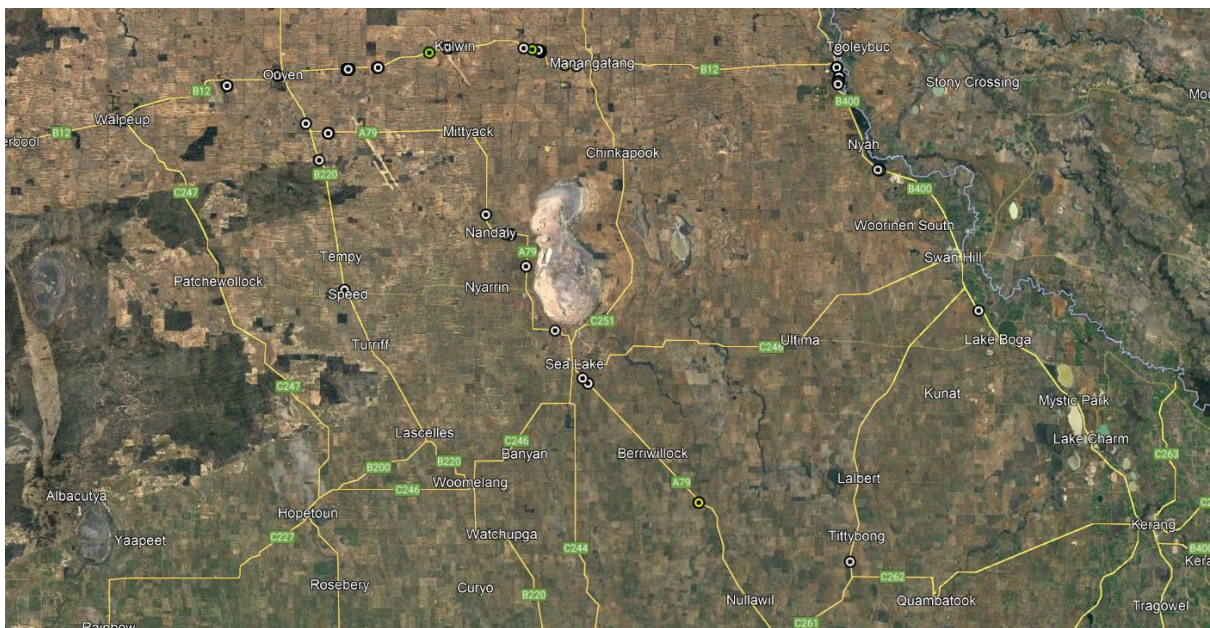


Figure 4 Observations of Buffel Grass south of Ouyen, Victoria from community and agency records. Red 2021-22 and 2022-23, Orange 2020-2021, Yellow 2019-2020, Green 2018-2019, White 2017-2018, 2016-2017, 2015-2016



Figure 5 Observations of Buffel Grass north of Ouyen, Victoria from community and agency records. Red 2021-22 and 2022-23, Orange 2020-2021, Yellow 2019-2020, Green 2018-2019, White 2017-2018, 2016-2017, 2015-2016

Modelled

Hybridisation amongst Buffel Grass cultivars is believed to have enabled further adaptation allowing cultivars to spread well beyond areas where they were originally planted and into environments once thought unsuited to their survival²⁰.

The current, modelled habitat suitability for Buffel Grass encompasses most of the Mallee CMA region. However, the extent of the Buffel Grass threat increases under climate change models. The projected future habitat suitability for Buffel Grass in Victoria will include North Central, Wimmera, Goulburn Broken and even parts of North East CMA (Figure 6)²¹.

²⁰ https://nt.gov.au/_data/assets/pdf_file/0017/231416/buffel-grass-management-guide-2018.pdf

²¹ Scott JK (2014) Australian rangelands and climate change – *Cenchrus ciliaris* (buffel grass). Ninti One Limited and CSIRO, Alice Springs.
http://www.nintione.com.au/resource/AustralianRangelandsAndClimateChange_CenchrusCiliarisBuffelGrass.pdf

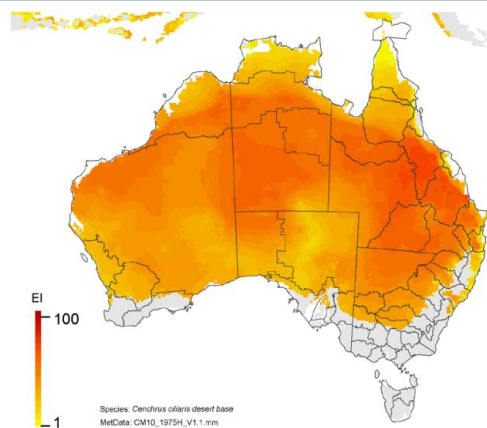


Figure 3. NRM regions and species distribution model for buffel grass (*Cenchrus ciliaris*) using CLIMEX. The higher the value for Ecoclimatic Index (EI), the more suitable is the climate for buffel grass. Values of EI = 0 (grey areas) indicate regions where populations will not persist. CLIMEX parameters for this model were modified from Lawson et al. (2004) and can be found at <http://data.csiro.au>.

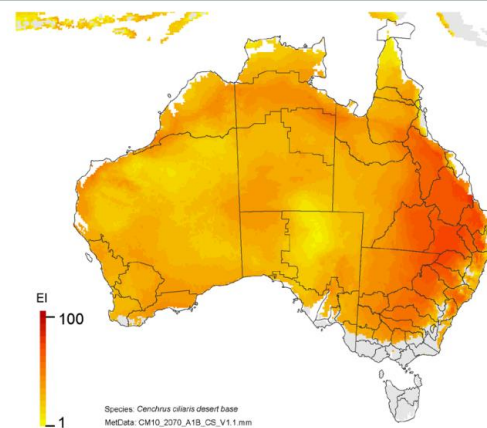


Figure 4. NRM regions and projected distribution of buffel grass in Australia as indicated by the CLIMEX Ecoclimatic Index (EI) using CSIRO Mk3 projections for 2070 based on the A1B SRES emissions scenario. The CLIMEX parameters are those used in Figure 3.

Figure 6 Scott JK (2014) Australian rangelands and climate change – *Cenchrus ciliaris* (buffel grass). Ninti One Limited and CSIRO, Alice Springs.

Modelling under climate change scenarios highlights that management of Buffel Grass will become more important in south-eastern Australia (Figure 7)²².

Fig. 7 Change in projected high suitability between the current climate and 2070 high emissions scenario, where shades of brown reveal regions of increasing suitability and shades of blue decreasing suitability

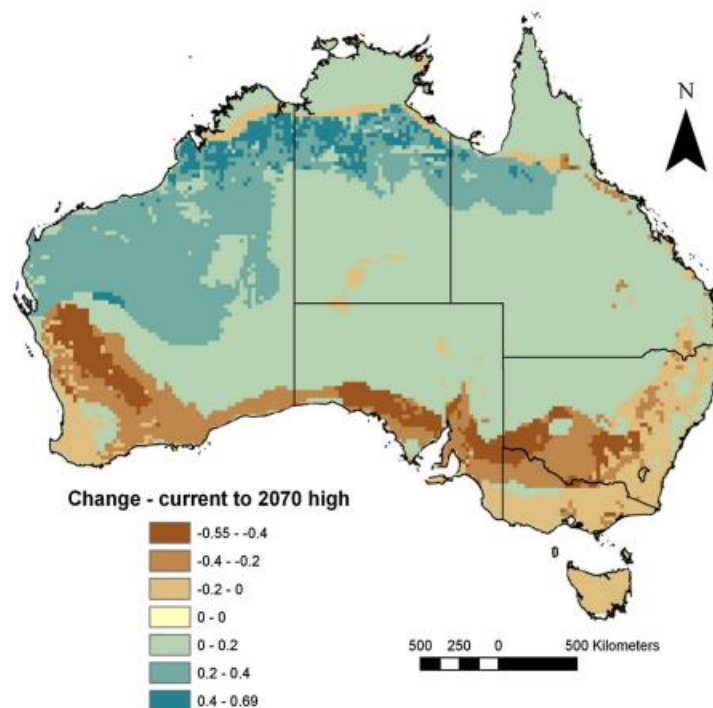


Figure 7 Suitability of habitat for Buffel Grass will increase (brown areas)

²² Martin et al. (2015) Buffel grass and climate change: a framework for projecting invasive species distributions when data are scarce. <https://www.taramartin.org/wp-content/uploads/2015/09/martin-et-al-biol-inv-2015.pdf>

Dispersal methods

Buffel grass can be spread by grass seeds on people, animals, machinery and equipment and via wind and water. Spread along major transport routes is assisted by vehicle draughts and movement of soil and plant material by grading and slashing.

Areas of disturbance are opportunistically colonized, but Buffel can also invade undisturbed native vegetation.

In Victoria, known infestations are primarily along major transport routes. There is a risk that 4WD tourism will introduce Buffel seeds directly to remote areas of Victoria's Mallee National Parks and reserves.

Feasibility of control

Agency awareness

There is high agency awareness of the significant threat posed by Buffel Grass with the species listed as a key weed in the following strategies and plans:

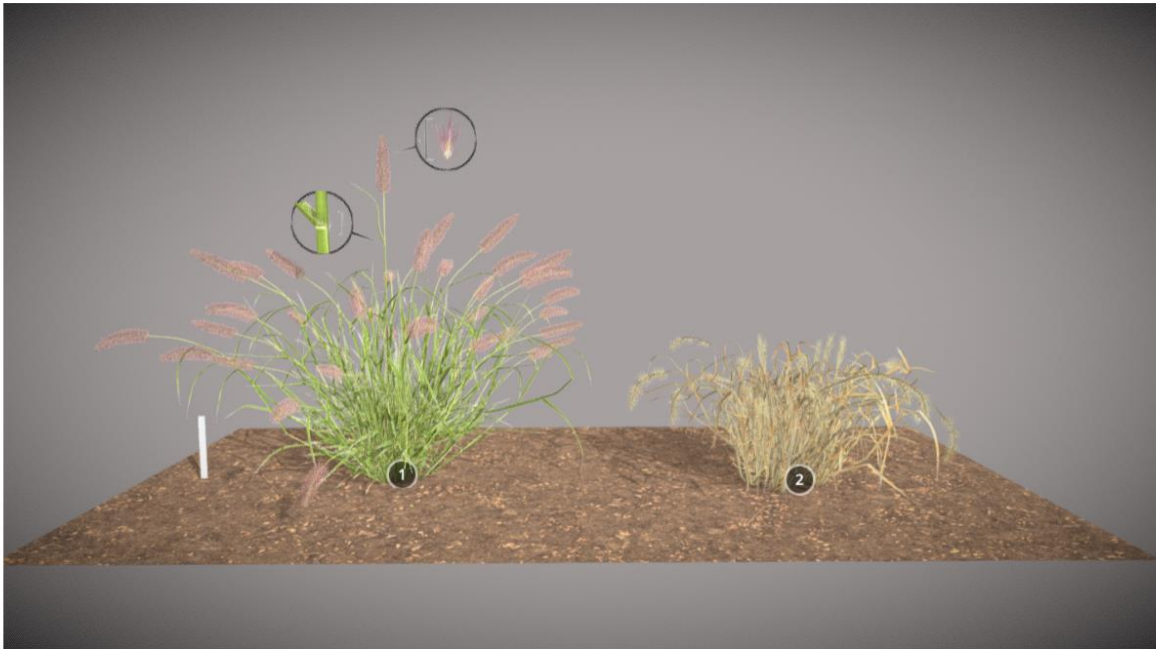
- Mildura Rural City Council Invasive Plants and Animals Plan 2020-2024
- Mallee CMA Regional Catchment Strategy 2022-28
- DEECA Advisory list of Environmental Weeds in Victoria 2022
 - Has a weed risk-rating of 32.2 (very high risk)
- Parks Victoria – Conservation Action Plans – Mallee and River Red Gum 2019-2024
- DEECA Action Statements 2023 – eg Heath Skink and Mallee Emu Wren
- Parks Victoria and DEECA Forest Fire Management operational planning

Despite mention in these plans, the priority placed on control of Buffel Grass has primarily developed through individual knowledge by key staff. Change of staff means education on the importance of early action needs to recommence, sometimes delaying treatment of the weed. Declaration as a state-prohibited weed under the *CaLP Act* would increase the efficiency of the current high level of community and agency engagement.

Community awareness

There is a growing community awareness of the potential impacts of Buffel Grass on the Victorian environment. This is driven by the experience in other states of the devastating environmental and fire safety impacts of the weed. For example, Friends of Mallee Conservation landcare group received \$7,800 funding in 2022-23. This is being used to

- develop a 3D computer model of Buffel Grass to facilitate identification (Figure 8)
- preparation and distribution of "Buffel Buster" packs to naturalist and 4WD groups that spend time in the remote Mallee national parks eg Victorian Malleefowl Recovery Group
- Developing a project on iNaturalist to facilitate sharing of observations
- Training for agency staff and contractors in Buffel identification
- Mapping of current and new infestations of Buffel Grass



Buffel grass (*Cenchrus ciliaris*) TEST

3D Model

Figure 8 The Buffel Grass 3D model is currently (8/9/2023) in the test phase. Completed models for other weeds can be seen here <https://sketchfab.com/dpicomms/collections/weeds-44b20964799f488fa02a243b4ccba0f5>

Best practice guidance

Eradication of new and existing Buffel Grass incursions in Victoria is highly feasible. Significant research has already been conducted in South Australia, producing key resources such as:

- Decision Tree (https://www.pir.sa.gov.au/_data/assets/pdf_file/0007/288664/PIRSA_factsheet_Buffel_Grass_Control_Decision_Tool_FA2_CJ.pdf)
- Best Practice Guide (<https://cdn.environment.sa.gov.au/landscape/docs/aw/aw-buffel-grass-best-practice-guide-2018.pdf>)

Control in Victoria

Herbicide use

In Victoria, small infestation of fewer than ten plants can be manually removed. Smaller plants can be grubbed out completely, and larger plants can have the flowerheads removed and marked for future herbicide application. Larger infestations are effectively controlled with application of Glyphosate, with followup treatment for up to four years.

In other states, the use of Flupropanate is registered under minor use permit APVMA PER9792. This permit does not currently extend to the Victorian jurisdiction. Extension of this minor use permit needs to be investigated.

The recent use of 2% Pine Oil (Bioweed) is not widely adopted in Victoria, but has been shown in South Australia to control aerial and surface seed, thereby reducing follow up control requirements.

Case studies

West of Lake Cullulleraine

Extensive control work from 2015-2020 by (now) Department of Transport has significantly reduced infestations along the Sturt Highway. Survey by Parks Victoria contractors in 2022-2023 found no infestations west of Lake Cullulleraine. Prior to 2018 there were over 30 infestations reported.

Merbein

The largest known Buffel Grass infestation was in Merbein - Dalmura Avenue / Wentworth Road (roadside managed by Mildura Rural City Council - Figure 9). This site provides an example of the importance of listing Buffel Grass under the *CaLP Act* to ensure all agencies are aware of the urgency of treating infestations. It also shows good agency collaboration and the effectiveness of control tools.

The weed was first reported by community observation and use of the “Snap Send Solve” app²³ in February 2022. The infestation was on a roadside managed by Mildura Rural City Council, adjoining areas of public land managed by DEECA and Parks Victoria, as well as private farmland.

Treatment at this site was delayed for several months whilst new staff at Mildura Rural City Council came to grips with the risk posed by this weed. Initially MRCC indicated they were unable to treat the weed because it was not a listed species under the *CaLP Act*. Fortunately, the Mallee CMA stepped in and engaged weed contractors to remove seed heads and spray the weed with glyphosate in June 2022. Whilst this was outside the ideal treatment window it served to reduce seed set and minimize spread.

When the MRCC biodiversity manager returned from leave, treatment of the weed by MRCC staff was swift, decisive, and timely. Spraying with glyphosate in December 2022 (ideal treatment window) showed a high kill rate. Despite this success, weed seed in the soil will require follow up treatment of scattered plants for up to four years.

²³ Snap Send Solve - <https://www.snapsendsolve.com/victoria/>



Figure 9 Dalmura Ave, Merbein infestation prior to treatment.

Appendix 1 – Peer-reviewed articles on the biodiversity impacts of Buffel Grass

1. Wright *et al.* (2021) [Buffel grass \(*Cenchrus ciliaris*\) eradication in arid central Australia enhances native plant diversity and increases seed resources for granivores](#)
2. Schlesinger *et al.* (2020) [Response of reptiles to weed-control and native plant restoration in an arid, grass-invaded landscape](#)
3. Palmer *et al.* (2020) [The diversity of thrips \(Insecta: Thysanoptera\) on buffel grass \(*Cenchrus ciliaris*\) is markedly lower than on native grasses in an urban landscape](#)
4. Edwards *et al.* (2019) [Invasive grass affects seed viability of native perennial shrubs in arid woodlands](#)
5. Young *et al.* (2018) [Zebra Finches forage on seed from invasive Buffel Grass, but prefer seed from two common native grasses](#)
6. Godfree *et al.* (2017) [Why non-native grasses pose an existential threat to biodiversity conservation and connectivity in multiple-use landscapes](#)
7. Young *et al.* (2014) [Habitat use and behaviour of birds in areas invaded by buffel grass \(*Cenchrus ciliaris* L.\) and in restored habitat](#)
8. Marshall *et al.* (2014) [Detecting new Buffel grass infestations in Australian arid lands: evaluation of methods using high-resolution multispectral imagery and aerial photography](#)
9. Schlesinger *et al.* (2013) [Spatial pattern and severity of fire in areas with and without buffel grass \(*Cenchrus ciliaris*\) and effects on native vegetation in central Australia](#)
10. Marshall *et al.* (2012) [Buffel grass \(*Cenchrus ciliaris*\) as an invader and threat to biodiversity in arid environments: A review](#)