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  - Ngaanyatjarra Council – Alex Knight

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Copyright statement

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<td>AW</td>
<td>Alinytjara Wilurara</td>
</tr>
<tr>
<td>CP</td>
<td>Conservation park</td>
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<tr>
<td>DBCA</td>
<td>Department of Biodiversity, Conservation and Attractions</td>
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<td>DEW</td>
<td>Department for Environment and Water</td>
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<tr>
<td>EPBC</td>
<td>Environment Protection and Biodiversity Conservation</td>
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<td>GVD</td>
<td>Great Victoria Desert</td>
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<tr>
<td>GVDDBT</td>
<td>Great Victoria Desert Biodiversity Trust</td>
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<tr>
<td>IBRA</td>
<td>Interim Biogeographic Regionalisation for Australia</td>
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<tr>
<td>IPA</td>
<td>Indigenous Protected Area</td>
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<tr>
<td>MT</td>
<td>Maralinga Tjarutja</td>
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<tr>
<td>NR</td>
<td>Nature reserve</td>
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Executive summary

The Great Victoria Desert (GVD) is the largest desert in Australia and contains significant biodiversity and cultural values. The key threats to the GVD include increasing tourism, mining exploration and encroachment of pest animals and weed species, such as buffel grass. Buffel grass presently has a limited distribution within the GVD and if left to extend its range biodiversity and cultural values may be significantly impacted. To address this threat, the Buffel grass free Great Victoria Desert (GVD) project was initiated, with the goal to eradicated buffel grass from the GVD.

The Buffel grass free GVD project is an activity within the broader 10 Deserts Project (the project) – the largest Indigenous led connected conservation network on earth. The 10 Deserts project aims to support Traditional Owners (TOs) at a local and regional level to realise environmental, social, cultural and economic outcomes upon their desert lands.

To work towards achieving a buffel grass free GVD the objectives of this plan are to:

• identify and map existing buffel grass infestations within the GVD
• improve the capacity and capability of land managers to manage buffel grass
• reduce buffel grass infestations through active management
• prevent new infestations of buffel grass from establishing in the GVD.

The GVD has been divided into buffel grass management zones based on the Interim Biogeographic Regionalisation for Australia (IBRA). The six subregions of the IBRA GVD bioregion form the management zones. For each of the management zones, management strategies have been applied with recommended management actions for on-ground activities. Additional supporting operational information has been provided in the buffel grass toolbox.

This plan is a working adaptive management plan for a five-year period between 2018–2023 and will be reviewed on an annual basis to incorporate learnings and new information to guide the ongoing management activities to achieve a buffel grass free GVD.
1. Introduction

The GVD region is located in the southern rangelands of Western Australia (WA) stretching into the north western half of South Australia (SA). The region is, ‘characterised by dunefields with playa lakes and lunettes. Vegetation is predominantly Marble gum, Mulga and Yarldariba (Ooldea Mallee) over spinifex grassland. Most of the bioregion is unallocated Crown Land, conservation reserves and Aboriginal land.’ (Dept. of the Environment and Energy, 2008). Only a small proportion of the GVD on the eastern and western margins is grazed under pastoral leases. The region has high biodiversity values with minimal weeds known to exist.

Buffel grass (*Cenchrus ciliaris* and *Cenchrus pennisetiformis*) is a weed that is encroaching into the GVD and is widely recognised as a serious invasive species that has already impacted upon the cultural and biodiversity values of the landscape. To enable buffel grass to be effectively managed by the land managers within the GVD, the plan has divided the GVD in its six nationally recognised IBRA sub-bioregions and recommend targeted management actions for each.

![Buffel grass weed](Photo: Buffel grass weed)

The **buffel grass free GVD project** is one of the land management activities in the broader 10 Deserts Project (the project) – the largest Indigenous-led connected conservation network on earth. The project aims to support Traditional Owners (TOs) to realise environmental, social, cultural and economic outcomes upon their desert lands. The key to realising these outcomes is building the capacity of Indigenous people and organisations to look after country and respond to threats at both a local and regional level.
The buffel grass free GVD project will enable Indigenous groups and other stakeholders to work together to collate cross-border (SA and WA) data, assess cross-border resources and develop a single action plan that can be effectively undertaken across the GVD.

Currently there are a number of different land management plans and strategies in use by various stakeholders that include buffel grass management. In preparing this document, relevant local, regional and state plans were reviewed; and the aims, objective(s) and management actions of these plans have guided the development of this integrated buffel grass management plan for the GVD.

**Aim**
The aim of this plan is to work towards the eradication of buffel grass in the GVD by minimising the impacts of buffel grass on cultural and environmental values through active buffel grass management. The overall project goal is to achieve a buffel grass free GVD.

This plan brings together the existing knowledge available on buffel grass management as an integrated plan with the aim to support the existing plans, provide broad operational management actions where no plan currently exists and provide guidance to future plans developed by regions and communities.

**Objectives**
The objectives of this plan are to:
- identify and map existing buffel grass infestations within the GVD
- improve the capacity and capability of land managers to manage buffel grass
- reduce buffel grass infestations through active management in the GVD
- prevent new infestations of buffel grass from establishing in the GVD.

**Consultation**
This plan recognises the extensive consultation that has taken place to create the existing regional and local level plans to manage buffel grass across the wider rangelands and desert region that includes the GVD.

Organisations consulted included:
- Arid Lands Environment Centre (ALEC) – coordinated the former 10 Desert initiative, which was a collaboration of conservation groups, Indigenous land managers and natural resource management organisations to support on-ground land management, of which the buffel grass free GVD was one of the potential projects identified
- Natural Resources Alinytjara Wiluṟara (AW NRM) – a South Australian government agency that delivers a diverse range of environmental programs on behalf of the AW NRM Board. The roles and responsibilities of NRM within SA are legislated under the Natural Resources Management (NRM) Act 2004.
- Anangu Pitjantjatjara Yankunytjatjara (APY)/APY Land Management (APY) – is incorporated by the Anangu Pitjantjatjara Yankunytjatjara Land Rights Act 1981. APY Land Management was established in 1990 to assist Pitjantjatjara and Yankunytjatjara people (Anangu) to realise their aspirations to protect the natural and cultural values of their land. Today land management undertakes a range of biodiversity conservation and cultural protection projects.
- Charles Darwin University – collaborating with APY Land Management to deliver their biodiversity conservation and cultural protection projects within the APY Lands.
- Maralinga Tjarutja (MT) and Oak Valley community – MT lands located in the far western region of SA, was handed back to the Maralinga people in January 1985. Maralinga people resettled on the land in 1995 and named it the Oak Valley community. Oak Valley Inc. has project managed the establishment and development of the community including the provision of housing, roads and infrastructure.
- Spinifex Land Management (SLM) – is a non-governmental organisation that assists in the delivery of community and environmental programs on behalf of the Pila Nguru Aboriginal Corporation. The SLM ranger program and Pila Nguru staff deliver the Spinifex Health Country Plan, in which buffel grass management is a key project.
- Department of Biodiversity, Conservation and Attractions (DBCA) – is a WA government agency which promotes biodiversity and conservation to enrich people’s lives through sustainable management of WA’s species, ecosystems, lands and the attractions in the department’s care.
- Rangelands NRM (WA) – is a natural resource management organisation that supports land managers in the rangelands (approximately 220 million hectares) of WA. The organisation supports innovation, helping communities to improve land health and productivity, and address threats such as fire and invasive species (weeds and feral animals).
- Great Victoria Desert Biodiversity Trust (GVDBT) – established in 2014 by the Tropicana Joint Venture as part of its offset strategy for the Tropicana Gold mine in WA. The trust’s focus is on conserving and increasing the knowledge of biodiversity in the GVD.
- Ngaanyatjarra Council (Aboriginal Corporation) – is the principal governance organisation in the Ngaanyatjarra Lands and represents the interests of around 2000 Ngaanyatjarra, Pintupi and Pitjantjatjara Traditional Owners (Yarnangu) who reside in the twelve-member communities of the Ngaanyatjarra Council.
The council is involved in a variety of initiatives relating to health, education, training, employment, housing, law and justice matters, finance, land management and a variety of viable commercial enterprises

- Friends of the GVD – provides voluntary assistance to DEW and AW NRM staff in caring for the parks and reserves in the SA section of the GVD and to promote and provide educational material on the GVD region to the general public

- Indigenous Desert Alliance (IDA) – aims to connect Indigenous rangers who are working on desert country throughout WA, SA and the Northern Territory (NT) to support cultural, environmental and social outcomes.
**Existing plans**
The following plans were reviewed. Their aims, goals, objective(s), and actions relating to the management of buffel grass in the GVD were considered for inclusion in this plan:

- PIRSA SA *Buffel Grass Strategic Plan 2012–2017* (under review)
- AWNRM have two documents which are focused on buffel grass management, the *AW Buffel Grass Operational Strategy 2018–2023* (draft) and the *Buffel Grass Best Practice Management Guide 2018*
- AWNRM *Far West Coast (SA) Heathly Country Plan*
- A consolidated buffel grass management plan does not exist for the APY Lands region, however each of the Indigenous Protected Area (IPAs) plans within the APY region provide some actions focused on buffel grass management as well as guidance by the *AW Buffel Grass Operational Strategy*
- *Warru Recovery Plan – recovery of Petrogale lateralis, MacDonnell Ranges race in South Australia 2010–2020*
- Rangelands NRM (WA) *Spinifex Lands Healthy Country Plan*
- DEW management plans for the Mamungari, Yellabinna, and Tallaringa conservations reserves
- GVDBT has developed an *Adaptive Management Implementation Plan (AIMP) for the GVD*. It has two parts: part a) strategic plan and part b) work plan

A brief summary of the management aims, goals, objective(s) and actions for each of the plans reviewed is included in [Appendix A](#).

**Review and adaptive management**
This plan will be reviewed annually and will be improved and updated based on learnings and any new information that becomes available.

Annual progress reports on this project activity will be prepared by the 10 Deserts Project. A review of progress and shared findings will be conducted by the GVD working group.

The review will capture:

- feedback from users of the plan
- updated buffel grass maps and datasets
- refined management actions and outcomes.

This information will be incorporated into the updated plan.
2. Great Victoria Desert

2.1 Description
The GVD bioregion is characterised by longitudinal sand dunes, salt lakes, open plains and has a diverse range of flora and fauna. The region covers an area of 42,246,564 ha (425,465 km²) and stretches across fifty-two per cent (52%) of WA and forty-eight per cent (48%) of SA. The majority of the GVD is unallocated Crown Land with numerous conservation reserves and Indigenous lands. There is no freehold land located within the GVD. Pastoral development in the bioregion is confined to peripheral areas in the south and east where water and feed are available in particular years, depending largely on climatic conditions.

The IBRA classifies Australia’s landscapes into 89 large geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. These 89 bioregions are further refined to form 419 subregions. The GVD has been classified as one of the IBRA bioregions and is further divided into six IBRA subregions (Figure 1):

- GVD01 – Shield
- GVD02 – Central
- GVD03 – Maralinga
- GVD04 – Kintore (CER02 ‘Watarru’ subregional bioregion is encompassed within GVD04)
- GVD05 – Tallaringa
- GVD06 – Yellabinna

Figure 1: Great Victoria Desert IBRA sub regions
2.2 Biodiversity values

A report of species occurrences sourced from the Atlas of Living Australia – GVDIBRA region report (accessed 10 August 2018) records 4,321 individual species across plants, fungi, vertebrates and invertebrates, including:

- 12 migratory environment protection and biodiversity conservation (EPBC) listed species
- 2,229 species, spanning over 400 vertebrate species and more than 1350 plants species.

Some of the vertebrate species with an under-threat status under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) include the:

- Sandhill Dunnart, *Sminthopsis psammophila* (endangered)
- Southern Marsupial Mole, *Notoryctes typhlops* (endangered)
- Malleefowl or Nganamara, *Leipoa ocellata* (vulnerable)
- Black Footed Rock Wallaby or Warru, *Petrogale lateralis* (vulnerable)
- Bilby, *Macrotis lagotis* (vulnerable)
- Western Quoll or Chuditch, *Dasyurus geoffroii* (vulnerable)
- Crest-tailed Mulgara, *Dasycercus cristicauda* (vulnerable)
- Princess Parrot, *Polytelis alexandrae* (vulnerable)
- Great Desert Skink, *Liopholis kintorei* (vulnerable)
- Greater Stick Nest Rat, *Leporillus conditor* (vulnerable).

Some of the plant species with an under-threat status under the EPBC Act include the:

- Victoria Desert Smoke Bush, *Conospermum todii* (endangered)
- Ponton Creek Mallee, *Eucalyptus articulata* (vulnerable)
- Ooldea Guinea-Flower, *Hibbertia crisupla* (vulnerable)
- Yellow Swainson-pea, *Swainsona pyrophila* (vulnerable)
- Bead Samphire, *Tecticornia flabelliformis* (vulnerable).
2.2 Cultural values

The presence of buffel grass in the GVD region presents threats to not only biodiversity values but also to the cultural values of the region. Buffel grass was originally planted around some communities to help minimise the dust to prevent health problems. These plantings now encompass some communities and given the high fire risk associated with buffel grass, these communities now face a significant fire risk.

Buffel grass also impacts upon culturally significant native plants, animals and sites. It can impede access and increases the fire risk to culturally significant sites. It impacts cultural significant plants through rapid growth on limited moisture and competition for nutrients, space and light. While dense buffel grass monocultures decrease the amount of cultural significant native animals, through reduction of available food sources, and habitat, this in turn affects activities like hunting.
3. Buffel grass

3.1 Description
Buffel grass is an introduced deep-rooted tussock forming perennial grass which is found across much of the Australian continent, especially in arid and semi-arid areas. It grows rapidly in response to minimal rainfall and is capable of producing prolific amounts of seed quickly, that is easily dispersed by water, wind and easily attaches to clothes and fur. Vehicle and machinery movement aid its dispersal. Buffel grass is tolerant of grazing, drought and fire making it an excellent competitor with native plant species.

It was introduced as a means of dust suppression and erosion control around communities and as a pastoral plant in WA, the far north of SA and the NT. Communities and their assets are now facing increased threat from fire due to the increased biomass and flammability that buffel grass presents. The expansion of buffel grass into the wider landscape of the GVD region will negatively affect cultural and environmental assets.
3.2 Distribution of buffel grass across the GVD

In the GVD region, buffel grass is predominately associated with road, rail, track and trail networks and around communities. While most of the GVD region remains free of buffel grass, extensive widespread populations exist to the north of the GVD in northern APY Lands, and in the NT and significant roadside infestations exist to the east of the GVD region along the Stuart Highway. West of the GVD there is limited distribution data, but it is known to be utilised as a pastoral grazing species and is likely to similarly extend along the margins of the road network.

![Buffel grass distribution](image)

*Figure 2: Buffel grass distribution*
3.3 Impacts of buffel grass
Buffel grass is drought and fire tolerant and has a rapid growth response following small amounts of rain. It can produce a prolific amount of seeds in a short period of time following germination. These characteristics make it an effective competitor for light, moisture and nutrients and it easily displaces native plant species, affecting the availability of food and shelter for native wildlife.

It has already invaded extensive areas to the north of the GVD, which has transformed native grassy ecosystems into monocultures of buffel grass at a landscape scale. This has occurred over a relatively rapid time period following the expansion of buffel grass with wet summer seasons. When dense monocultures form, the deep-rooted tussocks of buffel grass capture sediment, which alters the path of watercourses further altering the landscape.

Significantly, buffel grass invasion, impacts upon culturally important activities such as hunting and collection of bush foods and medicines. The impacts are due to its rapid growth in response to minimal rainfall and prolific seeding ability, which easily displaces native flora through completion for space, nutrients and suppressing germination invading and outcompeting local native plant species.

Buffel grass threatens cultural assets and the safety of communities, through increased risk of destruction and degradation of assets via fire and through limiting access to cultural sites. This increased fire risk, intensity and frequency, combined with higher fuel load and the ability to quickly re-sprout post-fire alters fire regimes. This regime change significantly influences the ability of native plant and animal species to survive, reproduce and persist within the landscape.

3.4 Legislative status of buffel grass in the GVD

3.4.1 Commonwealth
Buffel grass has been recognised under an overarching key threatening process ‘Novel biota and their impact on biodiversity’ under the EPBC Act.

National threat abatement advice has been developed by the Department of the Environment 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)

3.4.2 South Australia
Buffel grass is recognised as a declared plant under the Natural Resource Management (NRM) Act 2014 (currently under review). The sale and movement of buffel grass is prohibited in SA and depending on the NRM region, enforced
control (AW, northern and Yorke and SA Arid Lands NRM regions) or enforced
destruction (remainder of SA) is required.

3.4.3 Northern Territory
Buffel grass is not recognised by the NT government as a declared weed under
the Weeds Management Act 2001. Current efforts focus on raising awareness of
buffel grass, its advantages and disadvantages, encouraging landholders to
manage it appropriately and preventing inadvertent spread.

3.4.4 Western Australia
Buffel grass is recognised as a permitted organism by the WA Department of
Primary Industries and Regional Development under section 11 of the Biosecurity
and Agriculture Management Act 2007 for the whole of state and is not assigned
to any control category for a local government area at this time.
3.5 Buffel grass management – commonalities and constraints in the GVD

Stakeholders consulted in the formation of this plan recognise the negative impact on biodiversity and cultural values that buffel grass presents. Buffel grass management is highlighted in many plans as being high priority for management, with several plans developing buffel grass specific projects and actions.

While buffel grass is recognised as a serious threat to biodiversity and cultural values, it is prized as a pasture species in the pastoral region and is a low priority for management by pastoralists adjacent to the GVD.

The principal constraints to undertaking buffel grass management in the GVD are:

- financial resources
- labour capacity
- access to equipment and herbicides
- accessibility to remotely located infestations.

Stakeholders expressed a willingness to share resources and labour, where possible, to implement buffel grass management actions.

The development and implementation of weed spread prevention and hygiene procedures was identified by many stakeholders as a means to limit the expansion from communities and along roads and tracks. Additional infrastructure and equipment may need to be purchased and maintained; along with educational, awareness and training material and signage developed to enable the implementation of the weed spread prevention and hygiene procedures.

The ongoing implementation of the plan and continuation of buffel grass management is dependent upon an appropriate level of funding being available and continued support and engagement with stakeholders across the GVD region.
4. Management strategies

4.1 Weed management principles

It is recommended the buffel grass free GVD project adopt weed management principles that:

- maximise the impact and effectiveness of management actions
- management efforts focus on targeting outliers, isolated plants and small infestations first and then target a reduction of the core and heavy infestations
- where asset protection is the desired outcome, focus on infestations located at the asset and maintain and increase a buffer around the asset.

After the initial management actions the ongoing maintenance and follow-up on is critical to achieving long-term management of buffel grass.

4.2 Pathways and vectors

Surveillance and management activities should be focussed on the pathways (avenues through which buffel grass can enter and be moved around the GVD) that exhibit a high risk for the movement of buffel grass. These pathways include:

- vehicular tracks and rail corridors including turnouts, culverts and parking areas especially those areas leading from known buffel grass infestations
- walking tracks which extend from and through infested buffel grass areas
- creeks and waterholes
- stock watering points
- gates and grids (that is, instances where vehicles stop or are vibrated, allowing seed to drop or be shaken loose)
- camp sites.

The principal vectors (means by which buffel grass can be transported along a pathway) of spread are via vehicles and equipment used for the formation and maintenance of roads, pads and mining exploration, and slashing and mowing activities.

To limit movement via these vectors, it is recommended that those organisations undertaking these types of activities have a machinery and vehicle hygiene policy with procedures in place that are executed and enforced by their respective organisation. Other vectors considered low risk include movement of seed attached to animals on fur and humans on clothing, wind and water.
4.3 Management strategies

4.3.1 Strategy 1: Preventing infestations
Preventing buffel grass from entering or spreading within the management area and establishing new infestations. Management actions include:

- minimising the risk of entry or spread of buffel grass into and within the management area through weed hygiene procedures
- preventing entry to high risk buffel grass infestations where possible and minimising traffic through existing infestations
- preventing or at the very least discouraging the use of buffel grass within the management area
- preventing or minimising domestic animals from moving through infestations
- conducting training and awareness activities for the community to enable early identification and detection of new infestations
- encouraging compliance with weed hygiene procedures and avoiding travelling through infestations and off-track driving
- conducting ongoing surveillance for new incursions of buffel grass.

4.3.2 Strategy 2: Eradicating infestations
Completely removing buffel grass infestations from the management area. Management actions include:

- conducting detailed surveillance and mapping to locate all infestations
- destroying all infestations including seedbanks.

4.3.3 Strategy 3: Destroying priority infestations
Destroying infestations to reduce the extent of buffel grass in the management area
Management actions include:

- conducting detailed surveillance and mapping to locate infestations
- prioritising which infestations to destroy in consultation with local communities
- destroying priority infestations, aiming for local eradication at feasible sites
- preventing entry to management area and movement within
- conducting buffel blitzes to target priority infestations with a concentrated team effort in a short period of time.
4.3.4 Strategy 4: Containing infestations

Containing core infestations of buffel grass in the management area. Management actions include:

- conducting surveillance to locate and map the extent of core infestations
- controlling the boundaries of core infestations, aiming for a significant reduction in weed density
- controlling all outliers from core infestations and preventing the spread into other areas by implementing hygiene and weed spreading prevention measures.
5. Management zones

The GVD is divided into the following six IBRA subregions (refer section 2.1):

- GVD01 – Shield
- GVD02 – Central
- GVD03 – Maralinga
- GVD04 – Kintore (CER02 ‘Watarru’ subregional bioregion is encompassed within GVD04)
- GVD05 – Tallaringa
- GVD06 – Yellabinna.

These sub regions have been selected to define buffel grass management zones within the GVD. The management actions described in section 4.3 have been applied to each of the six GVD management zones based upon the:

- current actions being undertaken by land management groups
- known buffel grass distribution information
- relationship of buffel grass to pathways and vectors within each region
- proximity of buffel grass to cultural sites
- proximity of buffel grass to threatened flora and fauna sites.
5.1. Management zone GVD01–Shield

Figure 3: GVD01–Shield
### Table 1: GVD01 – Shield

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</tr>
<tr>
<td><strong>NRM region</strong></td>
</tr>
</tbody>
</table>
| **Traditional Owner groups:** | • Cosmo Newberry Aboriginal Corporation  
| | • Waturta  
| | • Yilka |
| **Other stakeholders** | • Desert Support Services  
| | • Department of Biodiversity, Conservation and Attractions  
| | • Arid Lands Environment Centre  
| | • Great Victoria Desert Biodiversity Trust |
| **Indigenous Protected Area** | • None present |
| **Conservation reserves:** | • De La Poer Range Nature Reserve (NR)  
| | • Queen Victoria Spring NR  
| | • Plumridge Lakes NR |
| **Communities** | • Cosmo Newberry (Yilka)  
| | • Laverton (just outside) |
| **Plans covering the region** | • GVDBT Adaptive Management Implementation Plan |
| **Buffel grass distribution** | • Buffel grass distribution in this region is unknown |

### Management strategy: Further information needs to be collected to decide on a management strategy

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Management actions recommended</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
</table>
| GVD01: 01           | • Source data via surveillance or other data collection avenues to establish baseline buffel grass distribution data on all roads and tracks within the management zone. | • Rangelands NRM (WA)  
| | | • Desert Support Services |
5.2. Management zone GVD02 – Central

Figure 4: GVD02 – Central
### IBRA subregion: GVD02 – Central

<table>
<thead>
<tr>
<th>Area</th>
<th>12,590,867 ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRM region</td>
<td>Rangelands NRM (WA)</td>
</tr>
<tr>
<td>Traditional Owner groups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spinifex Land Management</td>
</tr>
<tr>
<td></td>
<td>Pila Nguru Aboriginal Corporation</td>
</tr>
<tr>
<td></td>
<td>Ngaanyatarra Aboriginal Corporation</td>
</tr>
<tr>
<td>Other stakeholders</td>
<td>Desert Support Services</td>
</tr>
<tr>
<td></td>
<td>Department of Biodiversity, Conservation and Attractions</td>
</tr>
<tr>
<td></td>
<td>Arid Lands Environment Centre</td>
</tr>
<tr>
<td></td>
<td>Great Victoria Desert Biodiversity Trust</td>
</tr>
<tr>
<td>Indigenous Protected Area</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ngaanyatjarra IPA</td>
</tr>
<tr>
<td>Conservation reserves</td>
<td>Plumridge Lakes NR</td>
</tr>
<tr>
<td></td>
<td>Yeo Lake NR</td>
</tr>
<tr>
<td></td>
<td>Neale Junction NR</td>
</tr>
<tr>
<td></td>
<td>Great Victoria Desert NR</td>
</tr>
<tr>
<td>Communities</td>
<td>Tjuntjuntjara (south of region)</td>
</tr>
<tr>
<td></td>
<td>Ilkurlka</td>
</tr>
<tr>
<td>Plans covering the region</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spinifex Health Country Plan</td>
</tr>
<tr>
<td></td>
<td>Ngaanyatjarra IPA Management Plan</td>
</tr>
<tr>
<td></td>
<td>GVDBT Adaptive Management Implementation Plan</td>
</tr>
<tr>
<td>Buffel grass distribution</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Core infestation surrounding Tjuntjuntjara. Infestations have been mapped along the principal track and roads leading from the community</td>
</tr>
</tbody>
</table>

**Management strategy:** Destroy infestations

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Management actions recommended</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVD02: 01</td>
<td>• Reduce isolated infestations back to core infestations around communities on the Tjuntjuntjara to Oak Valley road</td>
<td>• Spinifex Land Management&lt;br&gt;• Pila Nguru Aboriginal Corporation&lt;br&gt;• Ngaanyatjarra Aboriginal Corporation&lt;br&gt;• Rangelands NRM</td>
</tr>
<tr>
<td>GVD02: 02</td>
<td>• Reduce isolated infestations back to core infestations Tjuntjuntjara to Ilkurlka. Continue to reduce core</td>
<td>• Rangelands NRM&lt;br&gt;• Spinifex Land Management</td>
</tr>
<tr>
<td>Management action #</td>
<td>Management actions recommended</td>
<td>Lead organisation(s)</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>GVD02: 03</td>
<td>Destroy isolated infestations along the road between Ilkurlka to Irrunytju</td>
<td>Rangelands NRM, Spinifex Land Management, Ngaanyatjarra Aboriginal Corporation</td>
</tr>
<tr>
<td>GVD02: 04</td>
<td>Tjuntjuntjara to Rawlinna, reduce isolated infestations back to core infestations. Continue to reduce core infestations around communities</td>
<td>Rangelands NRM, Pila Nguru Aboriginal Corporation</td>
</tr>
<tr>
<td>GVD02: 05</td>
<td>Conduct surveillance and destroy any infestations found along the Anne Beadell Hwy. Investigate the opportunity to provide information to permit holders regarding buffel grass awareness, spread prevention and vehicle hygiene</td>
<td>Rangelands NRM, Desert Support Services, Maralinga Tjarutja/Oak Valley</td>
</tr>
<tr>
<td>GVD02: 06</td>
<td>Conduct surveillance and destroy any infestations found along the Connie Sue Hwy. Investigate the opportunity to provide information provided to permit holders regarding buffel grass awareness, spread prevention and vehicle hygiene</td>
<td>Rangelands NRM, Desert Support Services</td>
</tr>
<tr>
<td>GVD02: 07</td>
<td>Conduct a buffel blitz in the Ilkurlka region. Control isolated infestations in the surrounding road network. Key focus areas are the road north to Irrunytju and east along Anne Beadell Hwy through the Mamungari CP, while reducing isolated infestations around communities</td>
<td>Rangelands NRM, Alinytjara Wilurara NRM, Spinifex Land Management, Ngaanyatjarra Aboriginal Corporation, Maralinga Tjarutja/Oak Valley</td>
</tr>
<tr>
<td>Management strategy: Destroy infestations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management action #</td>
<td>Management actions recommended</td>
<td>Lead organisation(s)</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------</td>
<td>----------------------</td>
</tr>
</tbody>
</table>
|                     | infestations back to the core infestation on the road south to Tjuntjuntjara  
- Conduct surveillance and control along Anne Beadell east of Ilkurlka to Neale Junction/Cosmo Newberry | |
5.3. Management zone GVD03 – Maralinga

Figure 5: GVD03 – Maralinga
### Table 3: GVD03 – Maralinga

<table>
<thead>
<tr>
<th>IBRA subregion: GVD03 – Maralinga</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area</strong></td>
</tr>
<tr>
<td><strong>NRM region</strong></td>
</tr>
<tr>
<td><strong>Traditional Owner groups</strong></td>
</tr>
<tr>
<td><strong>Other stakeholders</strong></td>
</tr>
<tr>
<td><strong>Indigenous Protected Area</strong></td>
</tr>
<tr>
<td><strong>Conservation reserves</strong></td>
</tr>
<tr>
<td><strong>Communities</strong></td>
</tr>
<tr>
<td><strong>Plans covering the region</strong></td>
</tr>
<tr>
<td><strong>Buffel grass distribution</strong></td>
</tr>
</tbody>
</table>

### Management strategies:
- **East – Destroy infestations**
- **Central – Destroy infestations**
- **West – Destroy infestations**

#### Management actions recommended

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East – Destroy infestations</td>
<td></td>
</tr>
<tr>
<td><strong>GVD03: 01</strong></td>
<td>Alinytjara Wilurara NRM, Maralinga Tjarutja</td>
</tr>
<tr>
<td>Undertake surveillance and opportunistically control all outlier infestations along Anne Beadell Hwy</td>
<td></td>
</tr>
<tr>
<td>Investigate the opportunity to provide information to</td>
<td></td>
</tr>
</tbody>
</table>
Management strategies:
- East – Destroy infestations
- Central – Destroy infestations
- West – Destroy infestations

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Management actions recommended</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVD03: 02</td>
<td>Undertake surveillance and control outlier infestations on roads from Ooldea to Maralinga</td>
<td>Alinytjara Wiluṟara NRM, Maralinga Tjarutja</td>
</tr>
<tr>
<td>GVD03: 03</td>
<td>Undertake surveillance and control existing isolated infestations on the Ooldea to Oak Valley, Lake Dey Dey Road</td>
<td>Alinytjara Wiluṟara NRM, Maralinga Tjarutja</td>
</tr>
<tr>
<td>GVD03: 04</td>
<td>Undertake surveillance and control outlier infestations along Maralinga to Emu Junction track</td>
<td>Alinytjara Wiluṟara NRM, Maralinga Tjarutja, Defence</td>
</tr>
<tr>
<td>Central – Destroy infestations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GVD03: 05</td>
<td>Conduct a buffel blitz at Oak Valley community to prevent spread from community to surrounding landscape</td>
<td>Alinytjara Wiluṟara NRM, Maralinga Tjarutja</td>
</tr>
<tr>
<td>GVD03: 06</td>
<td>Conduct a buffel blitz at Maralinga Village to prevent spread from community to surrounding landscape</td>
<td>Alinytjara Wiluṟara NRM, Maralinga Tjarutja, Defence</td>
</tr>
</tbody>
</table>
| GVD03: 07           | Undertake surveillance and destroy infestations on tracks through Mamungari CP (e.g. Anne Beadell Hwy)  
|                     | Investigate the opportunity to provide information to permit holders regarding buffel grass awareness, spread prevention and vehicle hygiene | Alinytjara Wiluṟara NRM, Maralinga Tjarutja |
| GVD03: 08           | Undertake surveillance and control outlier infestations along the Oak Valley to Voakes Hill Track | Alinytjara Wiluṟara NRM, Maralinga Tjarutja |
Management strategies:
- East – Destroy infestations
- Central – Destroy infestations
- West – Destroy infestations

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Management actions recommended</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>West – Destroy infestations</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| GVD03: 09 | - Control all isolated infestations back to core infestations along the Oak Valley - Tjuntjuntjara Aboriginal Business Road  
- Reduce core infestation around communities | - Alinytjara Wiluğara NRM  
- Rangelands NRM  
- Maralinga Tjarutja  
- Spinifex Land Management |
5.4. Management zone GVD04 – Kintore

Figure 6: GVD04 – Kintore
### Table 4: GVD04 – Kintore

**IBRA subregion: GVD04 – Kintore**

<table>
<thead>
<tr>
<th><strong>Area</strong></th>
<th>4,961,542 ha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NRM region</strong></td>
<td>Alinytjara Wilurara NRM</td>
</tr>
</tbody>
</table>
| **Traditional Owner groups** | Anangu Pitantjatjara Yankunytjatjara  
Maralinga Tjarutja  
Spinifex Land Management  
Ngaanyatjarra |
| **Other stakeholders** | Desert Support Services  
Arid Lands Environment Centre  
Great Victoria Desert Biodiversity Trust |
| **Indigenous Protected Area** | Watarru IPA  
Walalkara IPA  
Antara – Sandy Bore IPA  
Apara – Makiri-Punti IPA  
Kalka – Pipalyatjara IPA  
Ngaanyatjarra IPA |
| **Conservation reserves** | Mamungari Conservation Park |
| **Communities**   | Watarru (no permanent residents)  
Walalkara Homeland  
Kaljiti (Fregon)  
Mimili  
Umuwa (NE of region)  
Kalka and Pipalyatjara (NW of region)  
Kanpi and Nyaprai (N of region) |
| **Plans covering the region** | Spinifex Healthy Country Plan  
Ngaanyatjarra IPA Management Plan  
AW NRM Buffel Grass Strategic Plan And Operational Strategy  
SA Buffel Grass Strategic Plan |
| **Buffel grass distribution** | Infestations exist along the length of the Indulkana/Mimili/Kaljiti road. Parts of this road pass through the Kintore subregion and buffel grass infestations also occur on pastoral tracks coming off the main road to wells and bores. Management should be focussed on these source entry points to reduce the risk of movement into the wider landscape  
Infestations along this road of importance to biodiversity and cultural sites include the track to Victory Well, other tracks in the Antara-Sandy Bore IPA and the tracks to Amurroona Homeland, which all occur east of the Kintore subregion but can be a source of entry into the subregion. Minor infestations along the road from Kaljiti (Fregon) to Makiri in the Apara Makiri Punti IPA |
IBRA subregion: GVD04 – Kintore
** NB ** CER02 Bioregion “Watarru” is encompassed by GVD04

- Watarru community (technically within IBRA Bioregion CRE02 Watarru) limit spread from community to surrounding landscapes, potential buffel blitz location
- Kaltjiti (Fregon) to Walalkara Homeland road – both localities have buffel grass surrounding the buildings, with much less at Walalkara Homeland, and some buffel grass along the roadside closer to Kaljiti. Buffel grass also spreading down Officer Creek from Kaltjiti into the north eastern part of Walalkara IPA
- Road from Pipalyatjara to Watarru at border of Kalka-Pip IPA and Watarru IPA

Management strategies:
- East – Contain infestations
- West – Destroy infestations

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Management actions recommended</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>East – Contain infestations</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| GVD04: 01           | • Establish and maintain a buffer along the main road edge to reduce movement along road corridor and into surrounding landscape along Indulkana/Mimili/Kaljiti road and associated tracks, including to Victory Well | • Alinytjara Wilùrara NRM  
  • Anangu Pitjantjatjara Yankunytjatjara Land Management |
| GVD04: 02           | • Reduce core infestation around Walalkara Homeland and work from south to north along Officer Creek conducting yearly follow up to limit spread into Walalkara IPA | • Alinytjara Wilùrara NRM  
  • Anangu Pitjantjatjara Yankunytjatjara Land Management |

**West – Destroy infestations**

| GVD04: 03           | • Implement yearly surveillance and opportunistic control on:  
  o Kaljiti to Mount Davies road track | • Alinytjara Wilùrara NRM  
  • Anangu Pitjantjatjara Yankunytjatjara Land Management |
### Management strategies:
- **East** – Contain infestations
- **West** – Destroy infestations

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Management actions recommended</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
</table>
| GVD04: 04           | • Conduct a buffel blitz at Watarru community area, control outliers’ infestations and aim to reduce core infestations                                                                                                                                                             | • Alinytjara Wiluṟara NRM  
• Anangu Pitjantjatjara Yankunytjatjara Land Management                                                                                           |
| GVD04: 05           | • Conduct a buffel blitz at Walalkara Homeland and Officer Creek, control outlier infestations and aim to reduce core infestations                                                                                                                                               | • Alinytjara Wiluṟara NRM  
• Anangu Pitjantjatjara Yankunytjatjara Land Management                                                                                           |
| GVD004: 06          | • Conduct a buffel blitz at Victory Well in Antara Sandy Bore IPA, including source population along track from main road into Victory Well  
• Control outliers up the creek line at Victory Well and reduce core infestation in car parking/lower creek area and treat trackside                                                                                     | • Alinytjara Wiluṟara NRM  
• Anangu Pitjantjatjara Yankunytjatjara Land Management                                                                                           |
5.5. Management zone GVD05 – Tallaringa

Figure 7: GVD05 – Tallaringa
### Table 5: GVD05 – Tallaringa

<table>
<thead>
<tr>
<th>Area</th>
<th>• 3,663,149 ha</th>
</tr>
</thead>
</table>
| NRM region | • Alinytjara Wilurara NRM  
• SA Arid Lands NRM |
| Traditional Owner groups | • Anangu Pitjantjatjara Yankunytjatjara  
• Antakirinja Matu-Yankunytjatjara Aboriginal Corporation  
• Maralinga Tjarutja |
| Other stakeholders | • Desert Support Services  
• Arid Lands Environment Centre  
• Australian Government (Defence)  
• Department of Planning Transport and Infrastructure SA |
| Indigenous Protected Area | • Mt Willoughby IPA  
• Antara – Sandy Bore IPA |
| Conservation reserves | • Tallaringa Conservation Park |
| Communities | • None present |
| Plans covering the region | • Tallaringa Conservation Park Management Plan  
• AW NRM Buffel Grass Strategic Plan and Operational Strategy |
| Buffel grass distribution | • Extensive roadside infestations exist along the Stuart Highway (Coober Pedy to Marla), which runs along the east boundary of the Tallaringa bioregion boundary. Only isolated occurrences have been recorded within the bioregion |

### Management strategy – Contain infestations

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Management actions recommended</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
</table>
| GVD05: 01           | • Conduct yearly surveillance within two weeks of significant rainfall and opportunistically implement control to limit the spread from the dense infestations along the Stuart Highway, on roads and pastoral tracks heading westward, including the dog fence access track | • Alinytjara Wilurara NRM  
• Department of Planning Transport and Infrastructure SA |
### Management strategy – Contain infestations

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Management actions recommended</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
</table>
| GVD05: 02           | • Implement spread prevention and hygiene awareness education through signage along Anne Beadell Highway at Dog Fence Boundary and at entry to Tallaringa CP  
• Investigate the opportunity to provide information to permit holders regarding buffel grass awareness, spread prevention and vehicle hygiene | • Alinytjara Wilurara NRM  
• Maralinga Tjarutja                                                                                                                                  |
| GVD05: 03           | • Conduct a buffel blitz to remove infestations within Tallaringa Conservation Park and around Mabel Creek/Manguri/Mount Clarence area along the Anne Beadell Highway and Coober Pedy to Emu Junction. Destroy infestations along roadsides to prevent entry into the GVD region between Marla to Mintabie/Wallatinna | • Alinytjara Wilurara NRM  
• Anangu Pitjantjatjara  
• Yankunytjatjara  
• Maralinga Tjarutja                                                                                                                                  |
5.6. Management zone GVD06 – Yellabinna
<table>
<thead>
<tr>
<th><strong>IBRA subregion: GVD06 – Yellabinna</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area</strong></td>
</tr>
</tbody>
</table>
| **NRM region** | • Alinytjara Wilu̱rara NRM  
| | • Eyre Peninsula NRM  
| | • SA Arid Lands NRM |
| **Traditional Owner groups** | • Maralinga Tjarutja  
| | • Antakirinja Matu-Yankunytjatjara Aboriginal Corporation |
| **Other stakeholders** | • Desert Support Services  
| | • Arid Land Environment Centre  
| | • Australian Government (Defence)  
| | • Road and rail authorities (national and state) |
| **Indigenous Protected Area** | • Yellabinna Yumburra Co-Management Board |
| **Conservation reserves** | • Yellabinna Wilderness Area and Regional Reserve  
| | • Yumbarra Conservation Park  
| | • Pureba Conservation Park |
| **Communities** | • None present  
| | • Ceduna (south of region) |
| **Plans covering the region** | • Yellabinna Reserves Plan  
| | • AW NRM Buffel Grass Strategic plan and Operational Strategy  
| | • Far West Coast Healthy Country Plan  
| | • SA Buffel Grass Strategic Plan |
| **Buffel grass distribution** | • Extensive road and rail corridor infestations have been recorded from Tarcoola to Ooldea within the Yellabinna bioregion boundary |

### Management strategy – Destroy infestations

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Management actions recommended</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
</table>
| GVD06: 01           | • Conduct yearly surveillance and control on:  
|                     | o Ooldea to Maralinga track  
|                     | o Yalata to Ooldea track  
|                     | o Dog fence access track | • Alinytjara Wilu̱rara NRM  
|                     | • Maralinga Tjarutja |
| GVD06: 02           | • Investigate the opportunity to provide information to permit holders regarding buffel grass awareness, spread prevention and vehicle hygiene  
|                     | • Implement spread prevention and hygiene awareness | • Alinytjara Wilu̱rara NRM  
|                     | • Maralinga Tjarutja |
### Management strategy – Destroy infestations

<table>
<thead>
<tr>
<th>Management action #</th>
<th>Management actions recommended</th>
<th>Lead organisation(s)</th>
</tr>
</thead>
</table>
| GVD06: 03           | - Establish and maintain buffers to reduce spread from the Tarcoola to Ooldea road and rail corridor into the surrounding landscape. Aim to control yearly after summer rainfall events  
- Instigate a bare (no vegetation) ballast +5m (service access track) requirement on either side of rail line. Liaise with rail authorities to utilise Barton siding facilities, amenities and access to water, when conducting management operations along the corridor | - Alinytjara Wiluγara NRM  
- Maralinga Tjarutja  
- Road and rail authorities (national and state) |
6. Buffel grass management toolbox

This toolbox gathers together information and hyperlinks to the various options regarding buffel grass management. The document hyperlinks maintained by multiple sources have been verified as accessible at time of document creation.

6.1 Factsheets

PIRSA host a buffel grass information web page that contains a variety of information on identification, chemical control, trial reports, SA roadside survey results and a variety of other factsheets and videos associated with buffel grass management. The PIRSA buffel grass page can be accessed via:


Factsheets on the PIRSA page include:

- Buffel grass – Declared plant fact sheet
- PIRSA factsheet – Buffel grass control
- PIRSA factsheet – Buffel grass hygiene
- PIRSA factsheet – Buffel grass identification
- PIRSA factsheet – Buffel grass herbicide trials
- PIRSA factsheet – Buffel grass decision tool for buffel grass control


Buffel Grass Management Guide for Central Australia, Northern Territory Government, Department of Environment and Natural Resources. This guide provides advice on how to manage buffel grass as strategically, cost effectively and efficiently as possible, in pastoral and non-pastoral situations.


All factsheets listed above are available as full documents – see Appendix B: Buffel grass factsheets and information guides.
6.2 Resources

There are a variety of resources managed by the land management groups across the GVD. These include:

- chemical knapsacks
- pressure spray units and handlines (Quik Spray units)
- small and large boom spray units, some with boom-less jets for accessibility
- tractor mounted slashers
- brush cutters
- contractors.

The principal limiting resources indicated by the stakeholders are financial and the capability and capacity of people to undertake the management tasks. In addition, the BFGVD project should look at supporting the training of land managers for:

- chemical awareness, safe use and application
- data entry and collection
- establishment and maintenance of monitoring processes.

The table below provides a summary of the resources that stakeholders have indicated may be available to assist with the project.

Table 7: Stakeholders and potential resources

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Labour and operational resources</th>
<th>Provision of funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desert Support Services</td>
<td>Oversight of 10 Deserts project</td>
<td>Yes</td>
</tr>
<tr>
<td>Arid Lands Environment Centre</td>
<td>Coordination of BFGVD working group</td>
<td>No</td>
</tr>
<tr>
<td>WA Department of Biodiversity Conservations and Attraction</td>
<td>Predominately use contractors e.g. SLM</td>
<td>Potential</td>
</tr>
<tr>
<td>Natural Resources Alinytjara Wiluŋara</td>
<td>On ground coordination</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Spray equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access to contractors</td>
<td></td>
</tr>
<tr>
<td>Pila Nguru Aboriginal Corporation/Spinifex Land Management</td>
<td>On ground labour limited, active ranger teams, but have many other jobs</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Spray equipment including knapsacks, pressure handline, boom spray, brush cutters and flamethrower (on loan)</td>
<td></td>
</tr>
</tbody>
</table>
6.3 Management method selection
A combination of methods in an integrated management approach is likely to be required to successfully tackle buffel grass infestations. The methods used to control buffel grass will be influenced by many factors, including:

- density of infestations, that is, more dense infestations will take longer to achieve control and also influence the equipment required to undertake management
- distribution of the infestations, i.e. more widely distributed infestations may increase the labour required and also influence the equipment used to undertake management
- availability of equipment
- financial resources
- labour resources
- site accessibility
- access to water and water quality
- seasonal conditions
- cultural considerations
- environmental considerations.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Labour and operational resources</th>
<th>Provision of funds</th>
</tr>
</thead>
</table>
| • Maralinga Tjarutja and Oak Valley Community | • Just appointed ranger coordinator  
• Seeking to engage a dedicated buffel grass coordinator for MT region | • No |
| • Anangu Pitjantjatjara Yankunytjatjara/APY Land Management | • Spray equipment, knapsacks, Quik spray (requires repair), slasher  
• Active buffel grass working group.  
• On ground labour limited, active ranger teams, but have many other jobs  
• Seeking to engage a dedicated buffel grass coordinator for APY region | • No |
| • Great Victoria Desert Biodiversity Trust | • Predominately use contractors e.g. SLM | • Potential |
| • Ngaanyatjarra Council | • Limited resources – labour and equipment  
• Buffel grass management a low priority | • No |
Cultural considerations will be a principal factor in deciding which method will be employed to manage buffel grass incursion and ultimately undertaken.

### 6.4 Management methods

#### 6.4.1 Prevention of spread
This includes:
- excluding people and vehicles from travelling through areas of high infestation
- managing vehicle traffic to only use defined tracks, no off-track driving
- maintaining buffer areas around buildings, communities, cultural sites and alongside frequently used tracks and trails through dense buffel grass infestations
- grading roads from areas of no or low buffel grass presence into areas of higher buffel grass infestation
- implementing weed hygiene procedures including removing seeds, soil and plant debris from vehicles, machinery, equipment and clothing
- providing information to people accessing the GVD on the impact of buffel grass and vehicle and equipment hygiene to prevent its spread.

#### 6.4.2 Mechanical control
This includes:
- removing buffel grass by hand pulling, grubbing, and scalping for small and isolated infestations, or in sensitive areas. Being aware that older tussocks have an extensive fibrous root mass, which can be difficult to remove via this method
- preventing seed setting and allow better chemical uptake by slashing (brush cutter, mower or tractor mounted slasher) buffel grass to remove the bulk of material. Vehicle and equipment hygiene are essential if using this method
- removing the surface growth and top 10cm of soil by scalping. This method must be followed up with another method to prevent buffel grass from re-establishing in the cleared area.

#### 6.4.3 Strategic grazing
This includes:
- targeted grazing, utilising cattle or feral herbivores, such as camels, donkeys or horses, to prevent seed set and remove bulk of material, which allows better chemical uptake. This method could be investigated for wide scale infestations that border the GVD, if minimal cultural or biodiversity
impacts would be experienced. The stocking rate needs to be managed to align with buffel grass growth and climatic conditions.

6.4.4 Fire
This includes:
• using fire as a part of an integrated approach to destroying surface seed, preventing seed set and/or removing bulk of material to allow better chemical uptake.

6.4.5 Chemical control
This includes:
• using the three primary active constituents in various formulations and strengths recommended for buffel grass management: glyphosate, flupropanate and pine oil.

Table 8: Active constituents used for buffel grass management

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Form</th>
<th>Active constituent</th>
<th>Chemical application rate</th>
<th>Water application rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundup powerMAX</td>
<td>Liquid</td>
<td>Glyphosate 540 g/L</td>
<td>4 L/ha or 700 ml/100 L</td>
<td>300 L/ha</td>
</tr>
<tr>
<td>Roundup Biactive</td>
<td>Liquid</td>
<td>Glyphosate 360 g/L</td>
<td>5 L/ha or 800 ml/100 L</td>
<td>300 L/ha</td>
</tr>
<tr>
<td>Taskforce</td>
<td>Liquid</td>
<td>Flupropanate 745 g/L</td>
<td>3 L/ha or 300 ml/100 L</td>
<td>1000 L/ha</td>
</tr>
<tr>
<td>GP Flupropanate</td>
<td>Granular</td>
<td>Flupropanate 86.9 g/kg</td>
<td>25 kg/ha or 2.5 g/m²</td>
<td>N/A</td>
</tr>
<tr>
<td>Bioweed</td>
<td>Liquid</td>
<td>Pine Oil 600 g/L</td>
<td>2% of mixture</td>
<td>1000 L/ha</td>
</tr>
</tbody>
</table>

Note: Application rates will vary for densities of less than 100%, refer to permits and product label for additional rates.
Source: NR AW Buffel Grass Best Practice Management Guide.

South Australia has undertaken efficacy trials with glyphosate, flupropanate and fluazifop-P, hand pulling and burning to determine a favourable treatment in the arid environment (see Appendix A for results). There are other active constituents that exist and are permitted for use in buffel grass management but would require trials to evaluate their effectiveness in the arid environment.

APVMA Permit Per9792 (http://permits.apvma.gov.au/PER9792.PDF) allows for the use of the active constituents glyphosate, flupropanate, fluazifop-P, haloxyfop, imazamox, and imazethapyr for the management of tussock grasses, including buffel grass.
Numerous chemical application methods exist, including:
- low-pressure hand spray
- knapsack
- pressured hand line
- boom/boomless or aerial spray.

The most appropriate application method would need to be evaluated for each management situation. For example, low-pressure hand spray or knapsack would not be appropriate for large and dense infestations, but may be appropriate for treating small, isolated infestations or those in culturally or environmentally sensitive areas. The decision support tool will assist in making the evaluation see Appendix A.

6.4.6 Long term management options
This includes:
- replacing buffel grass with native plants. Chemical control or scalping of ground to remove existing buffel grass and ongoing follow-up, may be required before this can be implemented. Species selection will be crucial, where buffel grass has been actively used for dust suppression around communities, to ensure fire threat is not increased and that the replacement species will still provide adequate dust suppression
- working with neighbouring management bodies and organisations to reduce and prevent spread of existing broad scale buffel grass infestations to achieve a buffel grass free buffer around the GVD.

PIRSA have developed a decision support tool to assist land managers to determine which control method or herbicide is appropriate to use in which location. A full-size PDF version of the decision support tool factsheet is available in Appendix B: Buffel grass facts and information guides.
Figure 9: Decision support tool for buffel grass control
7. Data management

In order for a collaborative and coordinated approach for the strategic management of buffel grass in the GVD, data needs to be shared and easily accessible by land managers. The review of data will help to guide future management decisions and assist in the aim of a buffel grass free GVD.

This project has collated the buffel grass data from multiple sources (PIRSA, DEW, NRM regions, DTPI, and other land management groups) across the GVD into one dataset, which will be accessible via the data administrators to GVD land managers. The BFGVD working group will determine the conditions for the administration of the dataset and the conditions associated with database access.

It may not be prudent to release the distribution information directly into the public domain, as some distribution information may be associated with sites of cultural significance. The dataset should be administered by preferably one administrator and the metadata document would ideally contain caveats outlining access, use and publication approvals and conditions. The basic buffel grass location and management data should be uploaded or sent to the data administrator on a regular basis (minimum timeframe of every six months).

Only distribution data that has been approved for public release should be uploaded on public data share sites, such as Atlas for Living Australia or Australasian Virtual Herbarium Virtual Herbarium.

Existing applications and software in use are:

- Fulcrum, used by SLM and being investigated by AW NRM
- Cybertracker, currently used by AW NRM
- Avenza Maps, currently used by APY Land Management
- ArcGIS/ArcPad, used by PIRSA.

Ideally one collection platform would be utilised across the whole of the GVD for uniformity, ease of data transfer, and consistency in data capture. However, whether collected via a digital platform or paper records, key attributes need to be collected.

Key attributes to be collected include:

- location/GPS
- date
- recorder
- agreed density or cover abundance classes e.g. 1-5%, 5-25%, 25-50%, 50-75%, 75-100% (how many plants and how close are they to each other)
• agreed distribution definitions (e.g. how many hectares, and where are they situated across the landscape)
• management action taken e.g. surveillance or monitoring, control
• control action (what type of control e.g. no treatment, digging out, chemical applied)
• treatment stage e.g. initial, first follow-up, second follow-up, third follow-up, maintenance treatment
• comments.

To ensure consistency and comparability across the GVD the key attributes to be collected and applicable method of doing so, need to be created and agreed to amongst stakeholders as the buffel grass mapping standards. This will be developed for the next revision of this plan in 2019.
8. References


Rangelands NRM. Rangelands NRM Regional Plan


9. Appendices

Appendix A: Plans reviewed in preparation of this document

This plan acknowledges the vast amount of work that has contributed to the management of buffel grass to date and a summary of key documents reviewed in preparation of this plan is included in this section.

Primary Industries and Regions South Australia (PIRSA)

South Australian Buffel Grass Strategic Plan – GVD 2012–2017 (currently under review) identifies four goals for SA. The plan divides SA into three management zones, each with defined management actions.

Goals:

- Goal 1 – exclude the entry of buffel grass into SA and prevent its movement within the state (all zones)
- Goal 2 – manage impacts of buffel grass in zone 1
- Goal 3 – contain spread of buffel grass in zone 2, and destroy infestations in zone 3
- Goal 4 – build capacity to manage buffel grass (all zones).

Zone 1: Manage buffel grass

<table>
<thead>
<tr>
<th>Management aim</th>
<th>To reduce the overall impacts of the buffel grass through targeted management including protection of key site’s assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRM boards</td>
<td>Alinytjara Wilurara – Anangu Pitjantjatjara Yankunytjatjara (APY) Lands; SA Arid Lands – Marla Oodnadatta NRM district</td>
</tr>
<tr>
<td>Status</td>
<td>Numerous, extensive, widespread infestations, particularly in the far north-west</td>
</tr>
</tbody>
</table>
### Zone 2 – Contain spread

<table>
<thead>
<tr>
<th>Management aim</th>
<th>To significantly reduce the extent of buffel grass in zone 3, locating and destroying all infestations aiming for local eradication at feasible sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRM boards</td>
<td>SA Arid Lands (SAAL) excluding Marla-Oodnadatta NRM Group Northern and Yorke (upper north sub-region)</td>
</tr>
<tr>
<td>Status</td>
<td>Mostly relatively small, widely scattered, localised infestations, but some larger infestations requiring greater effort to control, for example:</td>
</tr>
<tr>
<td></td>
<td>• townships along major roads, in particular Port Augusta, Pimba, Copley, Glendambo, Kingoonya, Tarcoola</td>
</tr>
<tr>
<td></td>
<td>• National Highway 1 road reserve and adjoining land between Port Augusta and Port Pirie</td>
</tr>
<tr>
<td></td>
<td>• the rail corridor (Interstate Main Line) between Port Augusta and Wynbring (SAAL and AW NRM)</td>
</tr>
<tr>
<td></td>
<td>• the North Flinders District (SAAL)</td>
</tr>
<tr>
<td></td>
<td>• parts of Innamincka Regional Reserve (SAAL)</td>
</tr>
</tbody>
</table>

### Zone 3 – Destroy infestations

<table>
<thead>
<tr>
<th>Management aim</th>
<th>To prevent the ongoing spread of buffel grass into clean or priority areas within or beyond zone 2, aiming for a significant reduction in all infestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRM boards</td>
<td>Alinytjara Wiluŋara – Maralinga Tjarutja (MT) Lands south of the northern boundaries of Mamungari and Tallaringa Conservation Parks</td>
</tr>
<tr>
<td>Status</td>
<td>Predominantly small, widely scattered localised infestations, currently known to occur in EP, NY, AMLR, SAMDB and the MT Lands of the AW NRM Board. Not yet recorded in SE or KI</td>
</tr>
</tbody>
</table>
Figure 10: Buffel grass management zones within SA
Alinytjara Wiluara (AW) NRM

AW NRM has two documents which focused on buffel grass management, the *AW buffel grass operational strategy 2018–2023* (Draft) and the *Buffel grass best practice management guide 2018*, which supports the operational strategy.

**AW buffel grass operational strategy**

<table>
<thead>
<tr>
<th>Vision</th>
<th>Healthy people and communities working together to protect culture and country</th>
</tr>
</thead>
</table>
| **Goals** | **•** Manage buffel grass impacts on hunting, bush foods and medicines, special sites and the impact of fire on the safety on Anangu.  
  **•** Minimise the impacts of buffel grass on:  
  o industries, such as pastoralism, tourism, carbon farming and others associated with the land  
  o the landscape and important plants and animals |
| **Strategies** | **•** Strategy 1: Destroy infestations of buffel grass south of the APY Lands in the AW region by 2025  
  **•** Strategy 2: Detect, manage and monitor buffel grass at priority sites within the APY Lands  
  **•** Strategy 3: Raise awareness among the general public and key stakeholders, in particular Aboriginal communities  
  **•** Strategy 4: Promote research and development to increase effectiveness of buffel grass management. |

Strategies defined in the document are under pinned by several activities for each strategy.

Alinytjara Wilurara NRM, *Far west coast (SA) healthy country plan*

The *Far west coast healthy country plan* identifies buffel grass as one of the threats to the plan’s targets and is one of the plan’s key projects.

<table>
<thead>
<tr>
<th>Project</th>
<th>Buffel grass eradication: We will keep managing buffel grass until there is none left in our country and stay vigilant to stop it from spreading again</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective</strong></td>
<td>Aim to eradicate buffel grass in all of our parks by</td>
</tr>
<tr>
<td><strong>Strategies</strong></td>
<td>Work with partners in regional approach to eradicate buffel grass</td>
</tr>
</tbody>
</table>
Anangu Pitjantjatjara Yankunytjatjara (APY) Lands
The APY region has significant widespread buffel grass infestations that are closely associated with the road network of the northern part of the region, which act as a source of infestation for the southern portion. Stakeholders in the APY region identified that while eradication may not be achievable via current methods in the northern portion of the APY, eradication could be achieved in the southern APY, where sporadic and isolated infestations exist.

The AW NRM Buffel grass operational strategy recommends that the ‘development of a surveillance and control regime for the APY Lands is a priority action for zone 1 (as defined in the SA Buffel grass strategic plan) and that this ‘plan should be undertaken in close consultation with community to identify priority sites of cultural and environmental significance.’

Management actions for buffel grass are not captured in a single plan for the APY region; they are however guided by actions outlined within each of the IPA plans and the Warru recovery plan.

IPAs within APY Lands
Below is a summarised list of actions concerning buffel grass management for each IPA within the APY Lands region.¹

Figure 11: IPAs within the GVD

¹ Summary provided by Carolina Silva, Ecologist, APY Land Management, pers comm.
<table>
<thead>
<tr>
<th>IPA</th>
<th>Actions</th>
</tr>
</thead>
</table>
| Antara Sandy Bore IPA      | • To protect nearby populations of the Everard Garland Lily (*Calostemma abdicat*)  
                                • To reduce buffel grass spread into the valley around Victory Well                                                                 |
| Apara Makiri Punti IPA     | • To target buffel grass control on outlying patches at Ititja, along the Fregon-Makiri Road, Wilpantangu rockhole and Aliwanyuwanyu Creek, also at Pinanti and along the access roads south of Amata  
                                • Infestations are mainly along major roads                                                                                   |
| Kalka – Pipalyatjara IPA   | • To work together with the Warru (rock wallaby) team to treat buffel grass on Maku Valley and avoid spreading. In addition, to do on-ground monitoring to identify infestations around key cultural and ecological assets, as identified with traditional owners and rangers.  
                                • To revisit the buffel grass photopoints within management focus areas to assess the effectiveness of control techniques. There are significant broad scale infestations in this IPA |
| Walalkara IPA              | • To focus buffel grass control around Walalkara homeland, Officer Creek and other areas where buffel grass infestations are manageable  
                                • To revisit the buffel grass photopoints within management focus areas to assess the effectiveness of control techniques  
                                • Infestations in this IPA are still controllable                                                                          |
| Watarru IPA                | • Control infestations along major roads and infestations at isolated locations throughout the IPA  
                                • This IPA is probably the least affected by buffel grass                                           |
Warru Recovery Plan
The recovery plan of the Black-flanked Rock-wallaby (Warru), *Petrogale lateralis*, MacDonnell Ranges race in SA identifies buffel grass as a serious threat to Warru populations, their habitat, and food sources. The plan also highlights specific actions, listed below, in relation to buffel grass management:

<table>
<thead>
<tr>
<th>Action</th>
<th>1.1.6 Encourage and support production and implementation of APY Lands Buffel Grass Management Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Ensure management plan has a site-specific focus, in particular minimising impact of buffel grass spread on New Well, Kalka, Alalka and Warru Pintji site</td>
</tr>
<tr>
<td></td>
<td>• Discuss the possibilities of the formation of a ‘Buffel Blitz Team’</td>
</tr>
</tbody>
</table>

Rangelands NRM (WA) Spinifex Lands Healthy Country Plan
The *Spinifex Lands healthy country plan* has a specific project with defined actions focussed on the management of buffel grass.

<table>
<thead>
<tr>
<th>Objective</th>
<th>In 10 years (2025) buffel grass is gone from Spinifex country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator</td>
<td>Distribution of buffel grass and other invasive weeds</td>
</tr>
<tr>
<td>Strategies</td>
<td>Remove buffel grass from all country managed by SLM</td>
</tr>
<tr>
<td>Actions</td>
<td>• Survey, record and manage weed populations along all Spinifex and Pilki access routes</td>
</tr>
<tr>
<td></td>
<td>• Survey, record and manage weed populations around Tjuntjuntjara</td>
</tr>
<tr>
<td></td>
<td>• Purchase and maintain spray equipment</td>
</tr>
<tr>
<td></td>
<td>• Reduce new weeds coming into country using quarantine and wash down measures</td>
</tr>
<tr>
<td></td>
<td>• Place awareness signs at the edge of Spinifex country</td>
</tr>
<tr>
<td></td>
<td>• Work with Oak Valley to survey, record and manage weed populations in Mamungari Conservation Park</td>
</tr>
<tr>
<td></td>
<td>• Negotiate contracts with mining company for SLM to undertake contract weed management services</td>
</tr>
</tbody>
</table>
There are three principal nature reserves under the management of the Department for Environment and Water in the SA portion of the GVD: Mamungari Conservation Park; Tallaringa Conservation Park; and the Yellabinna Reserves complex.

Buffel grass is highlighted as a threat amongst other exotic/pest weeds in the three plans that covers the reserves:

- **Mamungari Conservation Park Management Plan 2011**
- **Tallaringa Conservation Park Management Plan 2018**
- **Yellabinna Reserves Management Plan 2013**

**Mamungari Conservation Park Management Plan 2011**

<table>
<thead>
<tr>
<th>Plan</th>
<th>Mamungari conservation park management plan makes reference to introduced plant species that are increasing due increased visitation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective</strong></td>
<td>Prevent the spread of exotic plant species and introduced animals within the park</td>
</tr>
<tr>
<td><strong>Strategy</strong></td>
<td>Record weed distribution and abundance and formulate and implement weed eradication program</td>
</tr>
</tbody>
</table>

**Tallaringa Conservation Park Management Plan 2018**

<table>
<thead>
<tr>
<th>Plan</th>
<th>Buffel grass is recognised as a significant threat within the plan. Buffel grass is managed in the park in line with the <strong>SA Buffel grass strategic plan</strong> (2012), which identifies this region as a priority area (zone 3). Due to the scale of Tallaringa Conservation Park, control measures are primarily focused in those areas where the risk of spread is highest. Spot control of buffel grass is undertaken at Bon Bon Station in partnership with Bush Heritage Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective</strong></td>
<td>Protect, enhance, and restore Tallaringa Conservation Park to ensure healthy country that is ecologically balanced and well understood in terms of significant species and threatening processes</td>
</tr>
</tbody>
</table>
| **Strategy** | • Implement control programs for targeted exotic species within a regional context, focussing efforts at kapi (water) sites and other ecologically sensitive sites  
• Map and prioritise sites for buffel grass control. Adaptively control the pest grass through initiatives such as educating park visitors on how they can help with management |
Yellabbinna Reserves Management Plan 2013

The Yellabbinna reserves plan identifies pest plants including buffel grass as key threats to biodiversity and cultural values. ‘Pest plant and animal control programs are designed to minimise impacts on natural ecological processes, important sites such as water points and species of conservation significance’. The objectives and strategies that are pertinent to buffel grass management are listed below.

| Plan | The Yellabbinna reserves plan identifies pest plants including buffel grass as key threats to biodiversity and cultural values. ‘Pest plant and animal control programs are designed to minimise impacts on natural ecological processes, important sites such as water points and species of conservation significance’. The objectives and strategies that are pertinent to buffel grass management are listed below. |
| Objective | Conserve the natural and cultural values within the reserves and the mallee woodland ecosystem |
| Strategy | Monitor and manage pest plant and animals, in particular camels, in collaboration with the AW NRM Board, the Dog Fence Board, TOs, the local community and volunteer groups |
| Objective | Minimise and manage the impacts of mineral exploration and mining |
| Strategy | Evaluate and, as appropriate, approve mineral exploration and mining proposals that include effective biosecurity measures to address the risk of weed infestation and colonisation both during and after completion of activities |
**Great Victoria Desert Biodiversity Trust (WA)**

| Plan | The GVDBT has developed an *adaptive management implementation plan* (AIMP) for the GVD. The plan identifies buffel grass as a specific threat to the GVD region and includes a specific project dedicated to buffel grass management in the work plan |
| Objective | By 2026, all known buffel grass infestations in key areas are reduced or maintained with no outliers. The focus of this project will be to concentrate resources where success is likely to be achieved (pick our battles) and ‘jump on’ new infestations. Over time, additional effort will be placed on education and hygiene with stakeholders in the region |
| Strategy | Implement integrated buffel grass management. The focus of this project will be to concentrate resources where success is likely to be achieved (pick our battles) and "jump on" new infestations |
| Actions | • Mapping buffel grass infestations  
• Analysis of available resourcing for buffel grass management  
• Work with buffel grass free GVD  
• Buffel grass (integrated weed) management plan  
• Prioritisation of control via buffel grass prioritisation planning tool  
• Knockdown/follow up – (eradication/control/contain)  
• Provide training and equipment  
• Public/management contractor education  
• Monitoring program – effectiveness of management actions  
• Surveillance to identify new infestations  
• Communities to eradicate and contain  
• Ranger patrols (mapping, controlling, monitoring)  
• Mine site weed hygiene  
• Joint management  
• Fee for service by TOs for land managers and industry  
• Buffel grass decision making tool is available |
## Plan

*Ngaanyatjarra IPA Plan of Management 2016–2021*, lists buffel grass as a weed that already has major infestations within the area.

## Objective

Protect the diverse flora resources of the Ngaanyatjarra Lands through minimising weed infestation.

## Strategies

- Locally implement targeted weed management
- Control isolated weed introductions where feasible
- Continue to map existing weed infestations for collation with L&C GIS database
- Identify and map new weed infestations for collation with L&C GIS database
- Create associated resources such as weed identification booklets for use in the field to raise awareness
- Liaise with external NRM groups/organisations such as Desert Discovery, to collaborate and/or support survey projects identified as supporting IPA objectives and TO/community member priorities.
- L&C management to identify funding opportunities for projects that support biodiversity and the region’s natural resources
- Liaise with external NRM groups/organisations to monitor progress towards biological controls of buffel grass and adopt proven methods
Appendix B: Buffel grass factsheets and information guides
(Double click on each image to open the full pdf document)

PIRSA Declared Plant Buffel grass factsheet

PIRSA Buffel Grass Control factsheet

PIRSA Buffel Grass Identification factsheet

PIRSA Buffel Grass Hygiene factsheet
PIRSA Buffel Grass Herbicide Trials factsheet

**Factsheet**

**Nutritional value of common pastoral grasses to livestock**

**Factsheet**

**PIRSA Buffel Grass Decision Tool for Buffel Grass Control factsheet**

**Buffel Grass Guide for Central Australia**

**Factsheet**

**Background**

Buffel grass is an exotic species of grass native to South Africa, which is now widely grown throughout the world. It is known for its ability to grow in a wide range of conditions and its use in areas where other grasses cannot survive. Buffel grass is commonly used in pastures, golf courses, and sports fields due to its durability and adaptability. It is also valued for its ability to provide food and habitat for wildlife.

**Habitat and distribution**

Buffel grass is native to South Africa and has been introduced to many countries around the world. It has been grown as a pasture grass, ornamental, and for erosion control on slopes. Buffel grass is adapted to a wide range of climates and soil types, making it a valuable choice for farmers and land managers.

**Uses**

Buffel grass is used in a variety of ways, including:

- **Pasture management:** Buffel grass is a popular choice for pasture management due to its ability to grow in a wide range of conditions.
- **Agricultural use:** Buffel grass is used for forage, hay, and grain production.
- **Land reclamation:** Buffel grass is used to reclaim land that has been degraded by erosion or pollution.
- **Recreation:** Buffel grass is used in parks and recreational areas as a drought-tolerant, low-maintenance alternative to traditional lawns.
- **Wildlife habitat:** Buffel grass provides food and habitat for a variety of wildlife species.

**Management**

Buffel grass management involves a combination of cultural, mechanical, and chemical practices to control its growth and spread. Cultural practices include proper soil management, irrigation, and fertilization to promote healthy growth. Mechanical practices involve mowing, grazing, and hand weeding to control the spread of Buffel grass. Chemical practices involve the use of herbicides to control Buffel grass and other weeds.

**Conclusion**

Buffel grass is a valuable grass species that can be used effectively in a variety of settings. Proper management practices are essential to ensure that Buffel grass is used to its fullest potential while minimizing its impact on the environment. By understanding the ecology and biology of Buffel grass, land managers can develop effective management plans that promote its use as a valuable resource.