



ON GROUND ►

BuffelpalooSA 2026

Day 1: On-ground Workshop Summary

Event summary



BuffelpalooSA 2026: Key outcomes and way forward

Prevent spread. Protect priority assets. Improve coordination. Secure long-term funding.

It can be done ...South Australia still has an opportunity to prevent buffel grass becoming an irreversible statewide problem - but it needs to ramp up now.

That was the message coming out of an intensive two-day buffel grass forum held in Port Augusta last week.

The all-in **multi-state, multi-sector, multi-stakeholder forum affectionately called BuffelpalooSA 2026**, brought together a tremendous amount of data and views, but one clear message was clear across the participants.

Preventing buffel grass from reaching a point where management becomes prohibitively difficult will require coordinated action, strong partnerships, sustained investment and a shared commitment to protecting South Australia's environmental, cultural and productive landscape values.

Who was in the room was an essential part of the success of the fast-paced sessions which generated a set of clear messages that will now be fed into submissions and enquiries into Buffel Grass management.

It was good to see researchers, government agencies, Traditional Owners, industry representatives, landscape boards, farming groups and community organisations all in working together to identify the science, governance and actions needed to address the spread of buffel grass.

This challenge is particularly complex because, while some pastoralists in arid regions use buffel grass as a hardy and dependable feed source, many others are concerned about its relentless spread into productive cropping land and conservation areas. Left unchecked, buffel grass can outcompete both agricultural and native species, reducing productivity in farming systems, increasing fire frequency and intensity, and causing significant and potentially irreversible damage to the biodiversity, ecological integrity and cultural values of iconic landscapes such as the Flinders Ranges.

Participants were strongly aligned on a central message: **buffel grass is more than a weed issue. It is a landscape-scale challenge affecting biodiversity, cultural values, fire regimes, infrastructure, and long-term land management.**

The pathway to success is clear: prevent spread, protect priority assets, improve coordination, strengthen knowledge and secure long-term funding.

By 2035, participants envisaged a statewide, well-funded and collaborative program that protects South Australia's biodiversity, cultural values, productive landscapes and communities from the impacts of buffel grass.

Theme	What we know	Priority actions	Success by 2035
Prevention & containment	- Early intervention and protecting buffel-free areas delivers the greatest return on investment. - Roads, rail corridors, machinery and transport networks remain the primary pathways for spread.	Strengthen weed hygiene, establish wash-down infrastructure, standardise hygiene protocols, and focus surveillance on transport corridors and emerging infestations.	Buffel spread is significantly reduced through consistent statewide prevention programs and strong hygiene practices across all sectors.
Protecting priority assets	High-value landscapes such as the Southern Flinders Ranges, Gawler Ranges, APY Lands, Yorke Peninsula coastal systems and Murraylands conservation reserves remain vulnerable and require prioritisation.	Coordinate landscape-scale management across tenures and direct resources toward protecting high-value environmental, cultural and agricultural assets.	Priority ecosystems, culturally significant landscapes and productive agricultural areas are protected from further invasion and degradation.
Management & restoration	One-off treatments rarely succeed. Effective management requires ongoing control, monitoring, restoration and long-term commitment.	Invest in sustained control programs, follow-up treatment, restoration activities and regional delivery capacity.	Long-term management programs deliver measurable reductions in buffel grass impacts and improved landscape resilience.
Governance & coordination	- Fragmented approaches limit effectiveness. - There is strong multi-sector support for improved statewide coordination and shared responsibility.	- A dedicated State Buffel Grass Coordinator is essential. - Maintain a strategic Steering Committee and operational Taskforce (with clarified roles and responsibilities).	Strong statewide leadership, coordinated decision-making and effective partnerships exist across government, Traditional Owners, industry and community sectors.
Funding & resourcing	Long-term funding was identified as the single most important enabler of success.	- Secure ongoing investment beyond short-term grant cycles. - Fund coordination, surveillance, research and on-ground management.	Stable, long-term funding supports coordinated statewide action and sustained management outcomes.

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Knowledge, mapping & monitoring	- Improved mapping, monitoring and data sharing are critical for prioritisation and strategic decision-making. - Climate modelling indicates buffel habitat is likely to expand under future conditions.	Develop statewide mapping standards, shared databases, monitoring systems and improved surveillance programs.	Shared mapping, monitoring and reporting systems support evidence-based decision-making and early detection of new threats.
Research & innovation	- Buffel grass is an ecosystem-transforming species that alters fire regimes, reduces biodiversity and impacts cultural values. - New control approaches and improved understanding are still required.	Coordinate research, investigate improved control methods, support innovation and evaluate management effectiveness.	Research continuously improves management effectiveness, supports adaptive decision-making and strengthens landscape protection outcomes.
Partnerships & shared responsibility	Effective management requires collaboration across government, Traditional Owners, industry, researchers, community groups and landholders.	Strengthen partnerships, improve stakeholder engagement and build shared ownership of the issue.	Buffel grass management is recognised as a shared responsibility with strong participation across sectors and jurisdictions.

Speakers

Buffel 101 - Identification and Biology

Delivered by Chris Brodie, State Herbarium of South Australia:

- Identification of buffel grass and similar species.
- Importance of collection records and herbarium specimens.
- Distribution mapping through ALA, AVH and iNaturalist.
- Seed longevity, spread mechanisms and establishment ecology.
- Importance of protecting high-value assets before infestations become established.



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Chris Brodie from the State Herbarium of South Australia opened the day by providing an engaging introduction to buffel grass, the role of the State Herbarium, and why good data is essential for understanding and managing invasive species. He explained that the herbarium houses more than 1.1 million preserved plant specimens, creating a permanent record of South Australia's flora and allowing researchers to track when and where species, including buffel grass, have spread over time.

Chris emphasised that while buffel grass management is often framed around controlling a weed, the real motivation is protecting South Australia's native biodiversity. He reminded participants that people working on buffel grass are "not haters, but lovers" of native plants, ecosystems and the species that depend on them.

The presentation provided an overview of buffel grass biology, including its high seed production, aggressive growth, ability to rapidly establish after rainfall, and capacity to persist in the seedbank for several years. Chris highlighted its resilience, noting that mature tussocks can survive for decades and quickly reshoot following rain or fire, making it a formidable invasion threat. He also discussed the two main buffel grass species present in Australia, *Cenchrus ciliaris* and *Cenchrus pennisetiformis*, and the importance of collecting seed heads to accurately distinguish between them.

A major focus of the talk was the value and limitations of distribution data. Using examples from iNaturalist, the Atlas of Living Australia and the Australian Virtual Herbarium, Chris demonstrated how mapping tools can help identify spread patterns and priorities but cautioned that maps are only as good as the records that support them. He encouraged land managers to submit observations and specimens wherever possible, stressing that today's record may become critical evidence for future management decisions.

Chris also explored the challenge of identifying buffel grass, particularly when plants have dried off or occur alongside similar species. He introduced several look-alikes, including birdwood grass, fountain grass, Rhodes grass and other *Cenchrus* species, highlighting the importance of careful identification before undertaking control work. Misidentification, he noted, can waste valuable resources and management effort.

Drawing on survey work conducted with the Northern and Yorke Landscape Board in 2024, Chris highlighted how buffel grass can be difficult to detect during dry years and reinforced the importance of understanding landscape context. He encouraged participants to think strategically about protecting key assets rather than simply targeting the largest infestations. Using the Southern Flinders Ranges as an example, he argued that small outlying infestations threatening high-value natural areas may warrant higher priority than larger, established populations elsewhere.

Chris concluded with a strong call for ongoing monitoring, data collection and collaboration. Whether through herbarium specimens, iNaturalist records or local surveys, he stressed that accurate records underpin effective management and are essential for tracking the spread of buffel grass and protecting South Australia's most valuable natural environments.

Soil Interactions and Distribution Drivers

Delivered by Sofie Costin, Flinders University:

- Roads are the strongest predictor of buffel occurrence.
- Soil phosphorus and pH strongly influence establishment.
- Climate change is likely to expand suitable buffel habitat beyond inland Australia, including further south, where 53% to 56% of mainland Australia will have moderate to high range suitability under future climate scenarios
- Research is underway into microbial interactions and soil feedback that may support buffel establishment.



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Sofie Costin's presentation explored the environmental and anthropogenic factors (roads) that best predict the current and future distribution of buffel grass across Australia, including with future climate scenarios. Drawing on predictive modelling and emerging ecological research, she provided insights into where buffel grass is most likely to establish and how this knowledge can support future management efforts.

Using a combination of climate, soil, topographic, vegetation and infrastructure datasets, Sofie developed distribution models to identify areas that are most suitable for buffel grass at a continental scale, now and in the future. One of the strongest predictors identified was proximity to roads. Roads not only create disturbance that favours buffel grass establishment but also act as major pathways for seed movement. This finding reinforced observations from land managers across the country that roadsides often serve as corridors for spread into previously uninfested landscapes.

The modelling also highlighted the importance of soil characteristics, particularly soil phosphorus levels and pH. Areas with higher phosphorus levels were more likely to support buffel grass establishment, suggesting that nutrient availability may be an important factor influencing invasion success. Soil pH was also identified as a significant predictor, indicating that certain soil conditions may make landscapes more susceptible to establishment than others.

A key finding from the research was that climate change is likely to increase the amount of land suitable for buffel grass. Current modelling indicates that large areas of South Australia already have moderate to high suitability, but future climate scenarios show this suitability expanding southwards. Under projected climate conditions, a much larger proportion of Australia may become vulnerable to buffel grass establishment, highlighting the need for early intervention and strategic surveillance in areas not currently affected.

Sofie also discussed the role of soil microbial communities, introducing a new area of research aimed at understanding interactions between buffel grass and the microscopic organisms living in the soil. Preliminary work suggests that buffel grass may alter microbial communities and nutrient cycling processes around its root systems. These changes could potentially create conditions that further favour buffel grass growth, reinforcing invasion success through positive feedback mechanisms.

To investigate these relationships, research teams have been sampling paired sites: buffel grass infestations and adjacent comparable uninvaded sites, across South Australia. The project is examining microbial communities in the rhizosphere, surrounding soils and biological soil crusts to determine how these factors influence establishment and spread. Understanding these processes may eventually lead to more targeted management tools and even future biological control opportunities.

Sofie concluded that buffel grass spread occurs through a combination of movement and establishment processes. Roads facilitate seed dispersal, while soil chemistry and microbial interactions influence where plants successfully persist. By better understanding these drivers, managers can improve surveillance, prioritise high-risk areas and develop more strategic approaches to preventing future invasions.

Ecological Impacts of Buffel Grass

Delivered by Dr Ellen Ryan-Colton:

- Buffel is a proven ecosystem transformer, with negative impacts on native vegetation abundance and composition across multiple habitat types and regions
- Native grasses, prostrate herbs, vines and ferns decline following invasion.
- Native shrubs decline following repeated buffel-fuelled fires.
- Now that buffel seeds are in the system, fires may be creating open space/elevated nutrients for buffel to germinate and expand into the fire scars
- Bird, reptile and ant communities all shifted with invasion, with insectivorous birds, ground-active fauna and ants that need hot open spaces particularly affected by buffel invasion
- Strong evidence supports buffel meeting criteria as a nationally significant environmental and cultural threat.



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Dr Ellen Ryan-Colton examined the ecological consequences of buffel grass invasion, drawing on extensive research conducted across the APY Lands and arid Australia. Her talk addressed a key question often raised by land managers and communities: why is buffel grass considered one of Australia's most significant environmental weeds? Using long-term monitoring data, she demonstrated that buffel grass is not simply another invasive species but an ecosystem transformer capable of altering vegetation, fire regimes and wildlife communities across entire landscapes.

A major focus of the presentation was the use of historical biodiversity survey data collected across the APY Lands during the 1990s and subsequent resurveys of the same sites decades later. This before-and-after-control-impact approach allowed researchers to compare areas that remained largely native with areas that had become heavily invaded by buffel grass over 25 years. The results showed substantial changes to vegetation structure and composition following invasion. Native grasses, vines, trailing plants and small ferns all declined as buffel grass became dominant, resulting in a simplification and homogenisation of plant communities that were once highly diverse and unique.

Dr Ryan-Colton also highlighted changes occurring in the woody vegetation layer. Over time, sites that became invaded ended up with 5% lower in overstorey shrub cover compared to sites that remained native. with fire-sensitive shrubs showing most relative loss of cover with invasion. When looking at all overstorey - trees and overstorey shrubs – there was a significant shift in composition where fire sensitive overstorey species are dropping out, and fire tolerant species are holding on. This signals a major shift in fire regimes in the arid zone – where some element of the fire regimes are not supporting fire sensitive vegetation to persist. This could be as a result of buffel fires, which burn hotter and more frequently than native fuels. This trend represents a significant concern in arid ecosystems where recovery can be slow and many long-lived species provide important habitat and cultural values.

The presentation examined the strong feedback relationship between buffel grass and fire. Buffel grass produces large amounts of highly flammable biomass, increasing fire frequency and intensity. Following fire, buffel grass recovers rapidly and often outcompetes native plants attempting to regenerate. This creates a cycle in which fire promotes further buffel dominance, which in turn increases the likelihood of future fires. Research presented during the session showed that while native shrub communities can persist under natural fire regimes, repeated burning in buffel-invaded areas leads to significant declines in shrub cover and ecosystem health.

Examples from Central Australia illustrated the severity of these impacts. In some cases, large buffel-fuelled fires caused extensive damage to mature river red gums, with 54% mortality of river red gums exposed to buffel fires, and the remainder lost on average 79% of their canopy.

Dr Ryan-Colton also explored the impacts on fauna. Research comparing invaded and non-invaded sites found consistent declines among ground-dwelling and habitat-specialist species. Bird communities became less diverse, with reductions in ground-foraging and insect-eating birds, and all seed-eating birds except those far-ranging nomadic species. Reptile communities shifted away from small ground-active species and open-habitat specialists, while ant populations declined by 50%, particularly species reliant on native grass seeds and open ground. These findings suggest buffel grass invasion triggers cascading effects throughout ecosystems, impacting multiple levels of biodiversity.

She concluded that the evidence clearly demonstrates buffel grass is an ecosystem transformer. By altering plant communities, changing fire behaviour and reducing habitat suitability for a wide range of fauna, including across multiple habitat types and regions, buffel grass is driving significant ecological change across arid Australia. Dr Ryan-Colton emphasised that addressing this challenge will require ongoing partnerships between researchers, land managers including Traditional Owners and community organisations, policy experts, and advocacy groups, to ensure the best available science informs management and conservation action.

Research Priorities Workshop Update

Presented by Dr Ellen Ryan-Colton and Sofie Costin.

National research priorities identified:

1. Spread and risk prediction.
2. Ecology and species interactions.
3. Management effectiveness.
4. Community and social science.
5. National coordination and evidence sharing.
6. Integration with pastoral and production systems.



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Dr Ellen Ryan-Colton and Sofie Costin provided an update on a recent national workshop that brought together researchers, government agencies, landscape boards, non-government organisations and land managers to identify future research priorities for buffel grass management. The session highlighted the growing national momentum behind buffel grass research and the need for stronger coordination between science, policy and on-ground management.

The presenters explained that while significant progress has been made in understanding the ecology and impacts of buffel grass, many critical knowledge gaps remain, especially around tools and techniques, social science and capabilities for management. To help address these gaps, a workshop involving 32 participants from 17 organisations and five key sectors was convened in June. The aim was to develop a nationally coordinated research agenda that supports practical management outcomes and contributes to the long-term goal of reducing buffel grass impacts across Australia.

The workshop was built around three key objectives for buffel grass management: preventing further spread, breaking the buffel grass-fire cycle, and protecting and restoring priority landscapes and environmental assets. Participants emphasised that these objectives require a shift from site-by-site management to broader landscape-scale solutions supported by robust science and collaboration.

Through the workshop, six major research themes were identified. The first focused on spread, risk and surveillance, including improved mapping, predictive modelling and identification of high-risk invasion pathways. The second examined ecology, genetics and species interactions, with a focus on understanding how buffel grass interacts with native ecosystems and whether different varieties exhibit different invasion behaviours.

The third theme centred on management tools and effectiveness. Participants called for more coordinated testing of herbicides, control techniques and integrated management approaches to better understand what works in different environments, and with demonstration sites and experimental testing and monitoring to demonstrate management effectiveness. Importantly, they also highlighted the need to connect weed control with ecosystem restoration, ensuring that control efforts are followed by recovery of native species and habitats rather than creating bare ground vulnerable to reinvasion.

A fourth priority area focused on social science and community engagement. The presenters noted that buffel grass remains a highly contested issue in some parts of Australia, particularly where it has been used as a pasture species. Understanding stakeholder perspectives, barriers to action and motivation for management was considered essential for achieving lasting outcomes and building support for coordinated responses.

The fifth theme identified the need for stronger national coordination, improved sharing of data and research findings, and greater collaboration between organisations. Participants recognised that advances are being made of the mapping front for example by multiple states, and now is the time to coordinate these efforts to avoid duplication. Similarly, whilst much research has focussed on impacts, these could be synthesised at a national level, covering different ecosystems, to determine where knowledge gaps remain. .

Finally, the workshop highlighted the importance of strengthening links between environmental and pastoral research. Presenters stressed the value of undertaking “stakeholder-neutral” research that benefits multiple sectors, such as reducing fuel loads, improving landscape resilience and understanding the productivity implications of buffel grass in grazing systems. They also identified future opportunities in areas such as remote sensing, fire behaviour modelling, microbial ecology, restoration science and biological control.

Dr Ryan-Colton and Sofie concluded by inviting participants to contribute feedback on the draft national research plan. They emphasised that effective buffel grass management will require strong partnerships between researchers, land managers, Traditional Owners, government agencies and community organisations, ensuring future research directly supports practical, on-ground outcomes.

Statewide Mapping and Remote Sensing

Presented by Chris Auricht:

- Remote sensing can detect broad buffel patterns but reliable landscape-scale mapping remains challenging.
- Roads, railways and drainage lines and other disturbed areas can be vectors for spread and due to size are difficult to detect with Landsat or Sentinel.
- Better ground-truth data, particularly related to infestation size and percentage cover are required to improve and validate models.
- Mapping is currently most useful as a prioritisation and surveillance tool rather than a definitive inventory.



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In his presentation, Chris Auricht outlined ongoing efforts to determine whether remote sensing technologies can be used to map buffel grass distribution across South Australia at a landscape scale. The project aims to support surveillance, prioritisation and management by identifying areas where buffel grass is most likely to occur, while also highlighting the challenges involved in detecting an invasive species across such large and diverse environments.

Chris explained that the project builds on previous work undertaken in the Northern Territory and applies a similar concept using freely available satellite imagery, rainfall data and machine-learning techniques to identify patterns associated with buffel grass. The concept is based on buffel grass responding strongly to rainfall events, producing distinctive growth patterns that may be detectable through spectral signatures captured by satellites. By combining this information with vegetation indices and environmental data, researchers can create probability maps showing where buffel grass is likely to occur.

A key focus of the presentation was understanding model accuracy and the importance of interpreting results carefully. Chris noted that while computer models can generate impressive-looking maps, the value of those products depends on the quality of the underlying data and how accuracy is measured. Different validation methods can produce very different results, meaning that seemingly high levels of accuracy may not always reflect real-world performance. This highlighted the need for caution when using remote sensing products to guide management decisions.

The project utilised Sentinel-2 satellite imagery, rainfall information, vegetation indices and machine-learning approaches such as Random Forest modelling. Early trials focused on known buffel grass infestations and areas where control work had occurred. Results suggested that buffel grass often displays unique spectral and seasonal responses which can sometimes be distinguished from surrounding vegetation. However, researchers also found that other vegetation types and environmentally productive areas, such as drainage lines, can produce similar signatures, creating challenges for reliable detection.

Field data from locations including northern South Australia and the Ooldea region were used to test and refine the models. Mapping outputs frequently highlighted roads, rail corridors and drainage networks, which aligns with known patterns of buffel grass spread. While this demonstrated that the modelling approach was detecting meaningful environmental signals, it also reinforced how important local knowledge remains when interpreting the results. Satellite analysis alone cannot yet distinguish every buffel grass infestation with complete confidence.

A major limitation identified during the project was image resolution. Many buffel grass infestations occur as small patches that are smaller than, or similar in size to, a single satellite pixel. This makes it difficult to accurately detect infestations, particularly where plant densities are low. Chris stressed that improved field

data, including information on infestation size and percentage cover, would significantly improve future modelling efforts.

Looking ahead, the project will investigate higher-resolution imagery, including commercial satellite products and drone-based approaches. Drone technology offers the potential to capture much finer-scale information and may improve detection in priority areas such as roadsides and rail corridors. Researchers are also exploring opportunities to combine mapping outputs with other modelling approaches to help identify future invasion risks and management priorities.

Chris concluded that remote sensing shows promise as a screening and prioritisation tool, but cannot currently replace field survey or be treated as a confirmed statewide Buffel distribution map. Its most useful role at present is to help direct field surveillance, select monitoring windows, assess known treatment areas and identify where better field observations are needed.

Buffel Busting: Best Practice Control – As We Know It

Presented by Sam Doudle, Oak Valley Rangers

- Integrated management using herbicide, fire, slashing, brushing and manual removal.
- Importance of treating both mature plants and emerging seedlings.
- Follow-up control is critical to long-term success.
- Control timing should align with rainfall and active plant growth.
- Disturbance can stimulate new germination if not carefully managed.
- Restoration and competition from desirable species are important after control.
- Long-term commitment is essential, with success measured over years rather than single treatments.



Sam Doudle shared practical, on-ground lessons from years of buffel grass management across remote and culturally significant landscapes. The presentation focused on what is currently working in the field and reinforced that there is no single solution to buffel grass management. Instead, successful programs rely on combining multiple techniques over many years and maintaining a strong commitment to follow-up control.

A central message was that buffel grass management requires persistence and long-term thinking. While herbicide remains one of the most effective tools available, it is rarely enough on its own. Control efforts must account for the plant's extensive seedbank, ability to rapidly regenerate after rainfall and capacity to recolonise treated sites. Participants heard that every control action creates opportunities for new germination, meaning monitoring and repeat treatment are critical components of any successful program.

The presentation highlighted the importance of targeting both mature plants and seedlings. Removing adult plants without addressing future seedling emergence can simply restart the invasion cycle. Likewise, disturbing buffel grass through slashing, burning or mechanical removal can trigger mass germination events if not followed by further management.

Sam described how integrated management approaches are delivering the best outcomes. Techniques such as burning, slashing, brushing and manual removal are most effective when strategically combined with herbicide application. Fire can reduce biomass and expose seedlings, while follow-up herbicide treatments help reduce regrowth. Similarly, slashing can improve spray coverage but should not be viewed as a standalone control option.

The session also stressed the importance of timing. Effective control is highly dependent on rainfall and active plant growth. Treatments applied during periods of moisture stress are less likely to achieve successful results because plants are not actively growing and translocating herbicides. Managers were encouraged to carefully monitor seasonal conditions and respond quickly following significant rainfall events.

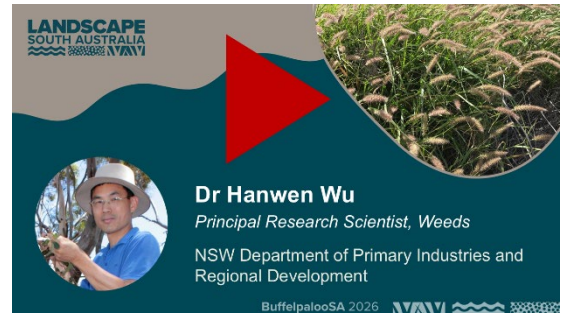
Another key theme was restoration. Presenters noted that simply removing buffel grass may leave bare ground vulnerable to reinvasion. Long-term success is more likely where desirable native species are encouraged or actively re-established to provide competition and stabilise the site. This reinforces the transition from weed control alone to broader ecosystem restoration.

Overall, the presentation demonstrated that effective buffel grass management relies on patience, multiple treatment methods, strategic timing and repeated follow-up. Success is measured not by a single control event, but by sustained effort over many years.

Herbicide Options and Future Directions

Presented by Dr Hanwen Wu

- Overview of herbicide approaches currently being used for buffel grass control.
- Practical lessons from large-scale field programs.
- Combining chemical and non-chemical control methods delivers better outcomes.
- Importance of follow-up treatment after fire, slashing or post-emergent herbicides.
- Challenges associated with large-scale and remote-area control.
- Comparison of buffel grass and African lovegrass management.
- Review of current herbicide options and permit arrangements.
- Importance of growth stage and seasonal timing.
- Assessment of emerging herbicide options requiring further research.
- Potential role for residual herbicides to suppress seedlings.
- Future herbicide trials recommended to improve control outcomes.



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Dr Hanwen Wu presented an overview of current herbicide options and future opportunities for improving buffel grass management, drawing on extensive experience researching invasive grass species, particularly African lovegrass. He highlighted the similarities between African lovegrass and buffel grass, noting that both species were intentionally introduced for pasture and soil stabilisation purposes, are highly drought tolerant, produce large quantities of seed, tolerate grazing and fire, and are extremely difficult to manage once established. These shared characteristics provide valuable lessons that can be applied to buffel grass control programs.

A key theme of the presentation was the importance of understanding the two main targets of any buffel grass management program: established mature plants and newly emerging seedlings. While much attention is often focused on killing mature plants, Dr Wu stressed that successful long-term management must also address the continual emergence of seedlings from the soil seedbank. Activities such as spraying with post-emergent herbicides, slashing or burning may remove existing plants, but they can also create ideal conditions for large numbers of new seedlings to emerge if follow-up management is not implemented.

Dr Wu reviewed several herbicide groups currently available for grass weed control. Glyphosate remains a widely used and cost-effective option because it is readily translocated throughout actively growing plants. However, glyphosate is non-selective and can affect desirable vegetation as well as the target weed. Grass-selective herbicides can provide more targeted control but often achieve better results on younger plants and may require repeat applications to effectively manage mature buffel grass infestations.

The presentation emphasised that timing is critical for herbicide success. Applications should ideally occur after significant rainfall when plants are actively growing and able to absorb and translocate herbicides effectively. Treatments applied during periods of drought stress often result in poor control because herbicides do not move adequately through the plant. Rainfall, soil moisture, plant growth stage and seasonal conditions all influence outcomes and should be carefully considered when planning control programs.

Dr Wu talked about the potential role of residual herbicides in suppressing seedling emergence. Although residual products present additional considerations regarding environmental impacts and application timing, they may help reduce the number of follow-up treatments required by controlling new germination events after mature plants have been removed. He noted that further investigation and field evaluation of several chemical options could provide new opportunities for buffel grass management in different environments.

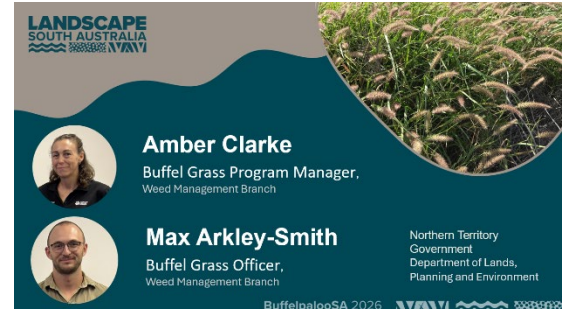
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The presentation concluded by reinforcing that herbicides alone are unlikely to provide a complete solution. Long-term success will require integrated approaches that combine chemical control with techniques such as burning, slashing, manual removal and restoration of desirable vegetation. Continued research and herbicide trials will be essential to improving control effectiveness and supporting managers working across a wide range of landscapes and infestation levels

Northern Territory Buffel Program

Presented by Amber Clarke and Max Arkley-Smith

- Buffel grass declared a weed in the Northern Territory in 2024.
- Focus on preventing spread and protecting cultural and environmental assets.
- Major investment in mapping and surveillance programs.
- Development of new field data collection and GIS mapping systems.
- Integrated management using fire, herbicide, slashing and manual removal.
- Strong partnerships with Aboriginal ranger groups and land managers.
- Long-term focus on strategic management rather than eradication.



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Amber Clarke and Max Arkley-Smith provided an overview of the Northern Territory's rapidly evolving buffel grass management program, highlighting both the scale of the challenge and the progress being made since buffel grass was declared a weed in the Northern Territory in July 2024. They explained that while buffel grass is highly widespread in many parts of Central Australia, management efforts are focused on slowing further spread, protecting high-value assets and improving the information needed to guide strategic decision-making.

A major theme of the presentation was the importance of good data. The presenters noted that one of the biggest constraints facing buffel grass management in the Territory has been a lack of accurate distribution mapping. Existing records provided only a partial picture of buffel grass occurrence, making it difficult to prioritise investment or measure management outcomes. In response, the Northern Territory Government has invested heavily in mapping and surveillance programs, including the development of new GIS systems and mobile field data collection tools. These initiatives are helping build a much clearer understanding of where buffel grass occurs, where it is spreading and which areas remain relatively free of infestation.

The presenters outlined the significant government commitment to buffel grass management, including dedicated staff positions and a state-wide program focused on strategic control. Rather than aiming for complete eradication, which is considered unrealistic in many heavily infested areas, the program seeks to protect culturally and environmentally significant landscapes, prevent further expansion into new regions and reduce impacts along key transport corridors.

Practical examples demonstrated how integrated management approaches are being applied in remote environments. These approaches combine herbicide treatment, manual removal, fire and ongoing follow-up monitoring. Particular emphasis was placed on the value of partnerships with Aboriginal ranger groups, who contribute local knowledge, undertake on-ground control activities and help monitor priority areas across vast and often remote landscapes.

The presentation also showcased examples of innovative field operations in difficult-to-access locations, where management activities have involved helicopters, volunteer programs and coordinated follow-up efforts. The presenters stressed that even small, isolated infestations can become major problems if left unmanaged and that early intervention remains one of the most cost-effective management approaches.

Amber and Max concluded that while buffel grass presents an enormous challenge across the Northern Territory, strong partnerships, improved mapping, strategic prioritisation and integrated management are creating a foundation for more effective long-term control. They emphasised that protecting buffel-free areas and high-value cultural and environmental assets remains the highest priority and offers the greatest opportunity for lasting success.

Buffel Grass Hygiene

Presented by Simon Roos-Freeman

- Roads and transport corridors are major pathways for buffel grass spread.
- Vehicles, machinery, contractors and operators can unintentionally move seed.
- Weed hygiene should be a routine part of operations.
- Importance of carrying and using weed hygiene kits.
- Clean-down procedures should be built into contracts and work programs.
- Machinery design can reduce seed accumulation and spread.
- Prevention is often simpler and cheaper than control.



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Simon Roos-Freeman delivered a practical and highly relevant presentation focused on one of the simplest yet most important aspects of buffel grass management: preventing its spread through effective weed hygiene. While acknowledging that most people working in land management understand the importance of hygiene practices, Simon stressed that the challenge is maintaining those practices consistently over time. His session served as a reminder that everyone involved in field operations, from land managers and contractors to agency staff and volunteers, has a role in preventing the unintentional movement of buffel grass.

Simon encouraged participants to think about weed spread from the perspective of the plant itself. Buffel grass, like many invasive species, relies on various mechanisms to move through the landscape, including wind, water, animals and human activity. For buffel grass, one of the most significant modern spread pathways is transport infrastructure. Roads, rail corridors and disturbed sites provide ideal conditions for establishment while also creating pathways for seeds to travel long distances. This helps explain why weed distribution maps so often mirror transport networks.

The presentation highlighted how easily weed seeds can become attached to vehicles and machinery. Tyres, mudguards, undercarriages, slashing equipment, grills, trailers and even boots can all carry seed from one location to another. Simon provided examples where roadside infestations had likely been spread through contractor activities and machinery movement, demonstrating how even well-intentioned management operations can unintentionally contribute to weed spread if hygiene is overlooked.

A strong emphasis was placed on practical solutions. Simon demonstrated how relatively inexpensive weed hygiene kits can help operators remove seeds before leaving a site. Simple equipment such as brushes, scrapers, blowers and cleaning tools can dramatically reduce the risk of transporting weed material. He also highlighted examples of contractors who had modified machinery to carry cleaning equipment on-board and reduce areas where seeds could accumulate. These small design improvements can have significant benefits for long-term weed management.

Beyond individual actions, Simon argued that weed hygiene must become embedded within organisational systems. Agencies, contractors and land managers should include weed hygiene requirements in contracts, work plans, inductions and staff training programs. Adequate time should also be allocated for clean-down procedures rather than treating them as optional activities undertaken only when convenient.

Throughout the presentation, Simon reinforced the message that preventing new infestations is often far easier and less costly than attempting to control established populations. By adopting consistent hygiene practices and fostering a culture of responsibility, land managers can significantly reduce the risk of spreading buffel grass and other invasive species across South Australia's landscapes.

Dinner speakers

Member of Parliament and Chair of the Parliamentary Inquiry into Buffel Grass

The speaker outlined the progress of the current South Australian parliamentary inquiry into buffel grass, explaining that the committee had recently held its first hearing and was working to build a stronger understanding of the issue among parliamentarians. They reflected on first hearing about buffel grass several years earlier from community advocate Bren Saunders and described how that conversation ultimately led to establishing the inquiry after entering Parliament. The speaker encouraged all attendees to make submissions, emphasising that the inquiry is seeking practical policy solutions, funding opportunities and strategies to improve long-term buffel grass management. They stressed the importance of hearing directly from people working on the ground and acknowledged the value of the shared knowledge and collaboration taking place at the workshop. ¹

Taigen Ryan (Invasive Species Council)

Representing the Invasive Species Council, Taigen described the organisation's role as a donor-funded environmental advocacy group able to champion issues and operate in policy spaces where other organisations may be constrained. She explained her work connecting invasive species management with cultural and First Nations priorities, highlighting buffel grass as a major focus. Teegan praised the proactive approach being taken in South Australia and highlighted the Council's advocacy efforts over the past 12 to 14 months, including supporting the continuation of the buffel grass coordinator position and helping drive broader policy discussions. Looking beyond South Australia, she discussed efforts to pursue a federal inquiry and secure national-scale funding and coordination to address buffel grass more effectively across Australia.

Kim Krebs, General Manager, Alinytjara Wilurara Landscape Board

Kim Krebs provided a powerful overview of South Australia's buffel grass journey and the leadership role played by the Alinytjara Wilurara Landscape Board. She outlined the threat buffel grass poses to culture, Country and biodiversity, particularly across the APY Lands, Maralinga Tjarutja lands and the far west coast. While acknowledging the scale of the problem, Kim emphasised that effective management remains achievable through coordinated action.

She reviewed key milestones including the declaration of buffel grass in South Australia in 2015, the development of the State Buffel Grass Strategy and recent efforts to reinvigorate statewide collaboration. Kim highlighted the 2024 ministerial roundtable, the development of a statewide business case and the collaborative work of government agencies and landscape boards to identify solutions. She explained that an estimated \$15-16 million over seven years could significantly improve buffel grass management through better coordination, research, compliance and on-ground action.

Using time-lapse imagery and mapping data, Kim demonstrated how rapidly buffel grass is spreading along road and rail corridors, reinforcing the need for urgent and sustained investment. Despite the challenges, her central message was optimistic: buffel grass is a manageable problem if governments, communities and organisations work together.

Dr Ellen Ryan-Colton

Dr Ellen Ryan-Colton focused on the critical connection between research, advocacy, policy and management. She reflected on how momentum around buffel grass has grown significantly since 2015, particularly through stronger partnerships between researchers, First Nations communities, environmental organisations and land managers.

A key theme of her presentation was the importance of elevating First Nations voices. Dr Ryan-Colton highlighted major advocacy initiatives such as the Umuwa Statement and the work of Traditional Owners who have consistently raised concerns about buffel grass impacts on culture, knowledge transmission and Country. Drawing on her research and collaborations in the APY Lands, she showed how cultural impacts have become increasingly recognised alongside biodiversity impacts.

She described how this growing body of evidence influenced national weed policy, including the incorporation of cultural impacts into national weed risk assessments. Dr Ryan-Colton also highlighted the strong support behind the current Weeds of National Significance nomination, noting that 83 organisations had backed the proposal. Looking internationally, she pointed to the inclusion of buffel grass cultural impacts in global invasive species assessments as evidence that the issue is now recognised beyond Australia.

Her presentation concluded with an optimistic message that partnerships, diverse forms of evidence and continued research are driving meaningful policy change. She noted that important decisions on national recognition are imminent and stressed the need to maintain momentum through landscape-scale solutions and long-term investment in knowledge, skills and management capacity.

Regional Mapping Workshop Summary

Northern and Yorke Region

Current Control Focus

Control activities since recent rainfall have concentrated on:

- The area between the Southern Flinders Ranges and the coastline.
- Highway corridors leading south toward Adelaide.
- Eastern incursions moving toward the ranges.
- Ongoing repeat treatment across known infestations.

Future Control Priorities

- Continued containment between the ranges and highway corridors.
- Protection of Yorke Peninsula coastal environments.
- Preventing spread into currently uninfested inland areas.
- Repeat treatment of previously controlled infestations.

Key Vectors

Primary spread pathways identified:

- Augusta Highway.
- Horrocks Highway.
- Tourism and caravan traffic.
- Lifestyle movement and transport corridors.

Priority Assets to Protect

Participants identified:

- Southern Flinders Ranges.
- Mount Remarkable area.
- Carooona/Wirrabara and adjacent higher rainfall country.
- Yorke Peninsula coastal dune systems.
- Upper Yorke Peninsula habitats.

Areas Currently Largely Free of Buffel

- Significant portions of central Yorke Peninsula.
- Large tracts of coastal habitat remain relatively free from infestation.

Successes

- Isolated infestations of 10-20 plants have been successfully controlled.
- Southern agricultural areas have benefited from cropping systems limiting establishment.
- Strategic control around small, isolated outbreaks has delivered positive outcomes.

Challenges

- Narrow containment zone between transport corridors and the ranges.
- Continual reinvasion pressure from major highways.
- Need for stronger cross-boundary coordination.

SA Arid Lands Region

Current Control Focus

Major efforts have targeted:

- Port Augusta to Southern Flinders corridors.
- Augusta Highway.
- Outback Highway.
- Areas surrounding Lake Gairdner.
- Far West Coast and Gawler Ranges buffers.
- Stuart Highway western incursions.
- Great Victoria Desert interface.

Future Control Priorities

- National parks and reserves.
- Railway corridors.
- Ongoing roadside containment.
- Flood-affected northern infestations.
- Remote infestations accessible through New South Wales and Queensland routes.

Priority Assets

Three key landscape priorities:

1. Flinders Ranges.
2. Gawler Ranges.
3. Ooldea and adjoining intact arid habitats.

Successes

- Limiting southward advance of buffel.
- Strong outcomes from repeat spraying programs.
- Reduced regrowth observed after multiple years of follow-up treatment.
- Increased investment and external funding.
- Successful integration of slashing and herbicide treatments.

Ongoing Challenges

- Flooded and inaccessible locations.
- Mining and industrial access restrictions.
- Extremely remote infestations.
- Residential urban infestations, particularly around Port Augusta and Coober Pedy.
- Multiple land managers and ownership complexities.

Green Adelaide Region

Known Infestation Areas

- Bowden/Brompton precinct.
- Port Road vicinity.
- Anzac Highway corridor.
- Other disturbed urban development sites.

Observations

- Most infestations are associated with transport hubs.
- Machinery movement appears to be a major pathway.
- Development sites create ideal establishment opportunities.

Workshop Discussion Points

- Whether buffel poses the same ecological risk in metropolitan Adelaide as in arid regions.
- Whether efforts should focus on eradication or preventing spread into higher-value regions.
- The need to integrate buffel management with broader weed eradication programs.

Key Risk Factors

- Significant soil disturbance.
- Constant movement of machinery and fill.
- Construction activity creating establishment niches.

Eyre Peninsula Region

Current Situation

Participants reported EP remains in a comparatively favourable position:

- Few major infestations.
- Most outbreaks detected early.
- Strong landholder cooperation.

Current Control Areas

Control is focused on:

- Transport routes.
- Highways.
- Railway corridors.
- Isolated roadside infestations.
- Creekline incursions.
- Areas around silos and transport depots.

Assets to Protect

Top priority:

- Gawler Ranges.
- Western EP landscapes.
- Nullarbor interface areas.

Successes

- Strong community reporting.
- Rapid response capability.
- Ongoing contractor-supported control.
- Integration of buffel control with African lovegrass, fountain grass and innocent weed programs.
- Long-term maintenance of highway corridors.

Challenges

- Railway corridors.
- Monitoring remote areas.
- Maintaining surveillance over extensive transport pathways.

Murraylands and Riverland Region

Current Situation

- Infestations remain relatively limited.
- Most populations are small and isolated.

Priority Assets

Key conservation areas requiring protection include:

- Ngarkat Conservation Park.
- Billiatt Conservation Park.
- Karte Conservation Park.
- Danggali Conservation Park.

Key Vectors

- Major highway corridors.
- Vehicle movement routes.

Challenges

- Limited knowledge of infestation status in the pastoral zone.
- Need for improved surveillance in remote areas.

Successes

- Capacity to revisit infestations annually.
- Rapid response to newly detected outbreaks.
- Several infestations already under effective management.

Alinytjara Wilurara (AW) Region

Existing Infestations

Major infestations occur:

- Along transport corridors.
- Adjacent to railway corridors.
- Around APY Lands transport routes.

Control Delivered

Control has occurred along:

- Eyre Highway.
- Cook area.
- Ooldea region.
- Maralinga Tjarutja lands.
- Watarru IPA.
- Community areas supported by local ranger groups.

Future Priorities

- Revisit all priority infestations multiple times annually.
- Maintain suppression along transport corridors.
- Continue ranger-led management efforts.

Main Vectors

- Transcontinental rail corridor.
- Eyre Highway.
- Stuart and access road systems.

Assets Requiring Protection

- Country south of Maralinga.
- Jigu Jigu areas.
- Remaining buffel-free desert country.

Successes

- Significant reduction along sections of Eyre Highway.
- Strong ranger involvement.
- Multi-agency cooperation.
- Long-term repeat control producing measurable reductions.

Challenges

- East-West rail corridor.
- APY regions where infestations are extensive.
- Water logistics.
- Extreme remoteness.
- Huge operational costs associated with repeated treatment.

Future focused discussion and workshop

The group identified the key issues, priorities and strategic themes they wanted carried forward into Day Two discussions. Attendees identified a series of recurring priorities that reflected both operational challenges and broader strategic needs.

19 key themes were identified by the group

High priority

1. Attracting sufficient long-term funding and identifying new funding sources

Raised repeatedly throughout the day and specifically referenced by landscape boards, ARTC, researchers and operational staff as a limiting factor for almost every aspect of buffel management.

2. Coordinated weed hygiene strategies across South Australia

One of the strongest recurring themes, appearing throughout the afternoon presentations, Menti results and final discussion.

3. Improved weed hygiene infrastructure (wash-down facilities and hygiene stations)

Closely related to the above but specifically raised multiple times as a practical action, including public washdown points, contractor facilities and hygiene stations.

4. Coordinated landscape-scale management across regions and stakeholders

Frequently discussed during mapping sessions and final discussions, particularly regarding corridors, asset protection and cross-tenure management.

5. Consolidated mapping, data management and information sharing

Repeatedly identified as critical by researchers, managers and NT officers. Common concern that everyone is collecting data differently.

6. Greater involvement of rail and transport corridor managers

Specifically mentioned numerous times during corridor discussions, mapping exercises and the closing session.

Medium-high priority

7. Cross-border cooperation between jurisdictions and agencies

Discussed regularly, particularly regarding NT, Queensland, NSW and SA coordination.

8. Identification and prioritisation of high-value ecosystems, species and assets

A major discussion area linked to protecting priority sites rather than treating all infestations equally.

9. Better engagement with the pastoral sector

Repeatedly referenced in discussions around WoNS, management acceptance and future strategy development.

10. Establishment and ongoing support of a dedicated Buffel Grass Coordinator role

Strong support because the role is already viewed as adding value and facilitating collaboration.

11. Harnessing technology to improve monitoring and control efficiency

Featured strongly through mapping, remote sensing, drones and monitoring discussions.

12. Continued networking and knowledge-sharing opportunities such as BuffelpalooSA

Several speakers highlighted the value of bringing practitioners, researchers and managers together.

Medium priority

13. Research priorities that directly support on-ground management

Strong support from researchers and practitioners, though generally viewed as supporting other priorities.

14. Recognition of Traditional Custodian knowledge and involvement

Widely supported and acknowledged as important, though discussed less frequently than funding, hygiene and mapping.

15. Ranger training, capacity building and support

Mentioned several times through Indigenous Ranger Program, NT Ranger Programs and workshop feedback.

16. New herbicide and chemical options

Generated interest, particularly following Dr Hanwen Wu's presentation, but discussion was more specialist in nature.

Emerging priorities

17. Better understanding of grazing impacts and economics

Raised mainly in relation to pastoral engagement and future research needs.

- Cost-benefit comparisons between buffel grass and native pastures.
- Differences in grazing impacts between sheep, cattle, kangaroos and other herbivores.

18. Reliable access to potable water in remote control areas

A very practical operational challenge, particularly relevant to remote regions but not broadly discussed across all participants.

19. Investigation of native alternatives to buffel grass

Mentioned as a future opportunity, but attracted relatively little discussion compared to immediate management priorities.

Discussion

A dominant theme was **weed hygiene and spread prevention**. Participants repeatedly highlighted the need for stronger hygiene practices, improved awareness and practical solutions such as public washdown facilities, designated hygiene stations and more coordinated approaches to preventing seed movement along transport corridors, innovation with innovative processes needed including potentially working in with wash down

facilities in Pt Augusta and Coober Pedy. Roads, railways, contractors, heavy machinery and travellers were all identified as important vectors that require greater attention.

Collaboration and coordinated landscape-scale management emerged as another major priority.

Participants stressed that buffel grass does not recognise administrative boundaries and that successful management requires collaboration between landscape boards, government agencies, industry, Aboriginal organisations, councils, infrastructure providers and private landholders. Examples such as regional highway programs demonstrated the benefits of treating entire corridors rather than focusing on individual administrative sections.

There was also strong support for **improved mapping, monitoring and data sharing**. Participants recognised that many organisations are collecting valuable information but are often doing so using different systems and databases. Greater alignment and consolidation of mapping efforts was identified as an important opportunity to improve strategic decision-making and resource allocation.

Funding and resourcing remained a major concern throughout the discussion. Participants highlighted the need for long-term, consistent investment rather than short-term project funding, noting that buffel grass management requires ongoing commitment over many years. Coordination roles, strategic planning, ranger programs and follow-up control all rely on stable funding sources.

Attendees also emphasised the need to better identify and prioritise **high-value ecosystems, species and assets**. Questions were raised about which landscapes are most vulnerable, which species are at greatest risk and where limited resources can deliver the greatest conservation outcomes. This discussion linked closely with earlier presentations about protecting priority environmental assets and preventing buffel grass from entering relatively uninvaded regions.

The session concluded with a discussion about **stakeholder engagement** and the importance of maintaining constructive dialogue between groups that view buffel grass differently. Participants noted that while buffel grass is regarded by many as a significant environmental threat, others continue to see value in it as a pasture species. Several attendees stressed that future progress will depend on respectful conversations, building common ground and seeking shared outcomes rather than becoming entrenched in opposing positions. This was seen as particularly relevant to ongoing discussions around Weed of National Significance recognition and future policy development.

The collective message heading into Day Two was clear: success will require coordinated action, stronger partnerships, improved hygiene and monitoring, strategic prioritisation, and sustained investment backed by robust science and practical on-ground experience

Key themes emerging from all regions

Across all workshops, several common themes emerged:

Shared priorities

- Protect high-value ecological assets before buffel establishes.
- Focus effort on vectors and transport corridors.
- Maintain repeat control rather than one-off treatment.
- Improve hygiene and movement controls for machinery and soil.
- Strengthen data collection and reporting systems.

Shared challenges

- Rail corridors.
- Road networks.
- Remote and inaccessible infestations.
- Funding limitations.
- Cross-tenure management difficulties.
- Residential and industrial areas acting as reservoirs for reinfestation.

Areas consistently identified for protection

- Southern Flinders Ranges.
- Gawler Ranges.
- Yorke Peninsula coastal systems.
- Ngarkat and Murraylands conservation reserves.
- APY Lands and intact desert landscapes.
- Great Victoria Desert margins.

The mapping workshop highlighted strong statewide alignment around an asset-protection approach. Participants consistently identified roads, railways, transport hubs and machinery movement as the primary pathways driving buffel spread. Across all regions, repeat control, strategic containment, protection of high-value conservation assets and coordinated cross-agency action were viewed as the most effective path forward. Researchers reinforced that climate suitability for buffel is likely to increase under future conditions, making early intervention and protection of currently buffel-free landscapes increasingly important.

