Buffel grass (*Cenchrus ciliaris* L.), an early invader in Victoria

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Summary Buffel grass (*Cenchrus ciliaris*) is an invasive grass, with a long-lived deep root system, that can reproduce quickly and out-compete native vegetation. It poses a significant fire risk, having an ability to alter the intensity, frequency and extent of fires, changing vegetation structure and composition, and threatening the habitat of native fauna.

Buffel grass was first recorded in Victoria in 2014. A collaborative inter-agency approach has been implemented in north-west Victoria to tackle the threat it poses to some of the State's highest biodiversity assets. Key activities include undertaking delimiting surveys to determine the extent of infestations, recording and treatment of known infestations, and the promotion of awareness of buffel grass in Victoria.

The Weeds at the Early Stage of Invasion (WESI) project has used buffel grass as a pilot to test a number of the tools that have been developed for early invaders.

Keywords Buffel grass, early invader, delimiting survey.

History of buffel grass in Victoria Buffel grass was actively distributed for pasture from 1910, initially in Western Australia, then more widely (Reynolds and Shepherd 2012). Buffel grass was first recorded and reported in Victoria (excluding the cultivated specimen at Merbein in 1941), in April 2014 by Darren Schmitke from South Australia.

Shortly after, a Buffel Grass Teleconference Group was formed with participants from various groups within the Department of Environment, Land, Water and Planning (DELWP) to discuss the issue and plan how to manage the weed.

The Weeds at the Early Stage of Invasion (WESI) Project team became involved and undertook the first of many delimiting surveys that have been performed in the Mallee, starting with the largest of the buffel grass infestations along the Sturt Highway.

Ecology and distribution Buffel grass is an invasive deep-rooted perennial grass from Africa, Asia and India. It is widespread in central and northern Australia and is invading New South Wales and South Australia (Anon. 2008).

In Victoria the distribution of buffel grass is largely restricted to north west of the State in the Mallee. A distribution map has been developed; please contact the first author for a copy. The largest infestation can be found along the Sturt Highway between the South Australian border and the Mildura airport. The most southern recording is as far south as Bridgewater, which appears to be an outlier. The remaining infestations are largely located along the Murray Valley, Mallee and Calder Highways, in the north of the state.

Buffel grass is dispersed by wind, water and animals, aided by its fluffy bristles (Reynolds and Shepherd 2012). It spreads along drainage lines and roads and spread is assisted by slashers, vehicle draughts and the movement of soil.

Threats to the Victorian Mallee Buffel grass poses a significant threat to native Mallee habitats. South Australia's Buffel Grass Strategic Plan 2012–2017 (Reynolds and Shepherd 2012) indicates the *Environment and Protection and Biodiversity Conservation Act 1999* (EPBC) listed endangered Mallee emu-wren (*Stipiturus mallee*) and vulnerable Malleefowl (*Leiopoa ocellata*) as species that are considered to be threatened by the occurrence of buffel grass. Both species are found in the Victorian Mallee. In addition, food sources and habitat for other native fauna can also be altered by the occurrence of buffel grass (Anon. 2008).

Buffel grass also has rapid regrowth and high biomass that can alter the intensity, frequency and extent of fires and can change vegetation structure and composition (Anon 2008).

A relatively continuous flammable ground layer can be formed with dry foliage that can carry extensive and intense fires in a landscape (Anon. 2008). When moisture is sufficient this grass can recover its biomass very rapidly and can burn partly green, therefore fire can be carried at much shorter intervals in native understorey (Anon. 2008). It can also

dominate the ground layer, displacing native grasses and other plants.

Interagency and interstate collaboration Since the discovery of the first known infestations of buffel grass in Victoria there has been a joint collaborative effort amongst all land management agencies within the Mallee to tackle buffel grass.

A Buffel Grass Strategic Action Plan 2015–2020 was been developed in conjunction with the DELWP, VicRoads, Parks Victoria, and other agencies to promote and facilitate actions to manage Buffel grass strategically within Victoria. It is currently in draft form, and is in the process of being formalised.

In addition to Victorian collaboration, there has been interstate collaboration with South Australian colleagues who are dealing with buffel grass, providing invaluable resources and advice on identification, treatment and control of this species.

Delimiting surveys Since the first buffel grass plant was formally recorded, a number of delimiting surveys have been conducted to determine the full extent of the spread of this invasive grass. The WESI project has developed a package of tools, including a set of six 'how to' guides to help public land managers work out the highest priority early invaders to eradicate locally. One of the guides described the process of 'how to conduct a delimiting survey' (James and Blood 2016).

The WESI project has used buffel grass as a pilot project to test and refine the delimiting survey process in the field.

DELWP, Parks Victoria and VicRoads staff have participated in a number of delimiting surveys across the Mallee. During these surveys specimens have also been collected and submitted to the National Herbarium of Victoria.

Treatment and control of buffel grass The infestations located to date are mainly restricted to roadsides. VicRoads have been vigilant in locating and recording infestations and have implemented a treatment plan to reduce the cover and spread of buffel grass along roadsides. In addition, areas surrounding the infestations, such as National Parks and State Forest, are being monitored by DELWP and Parks Victoria for any spreading buffel grass plants.

Plan for the future Moving into the future, continual searching for buffel grass in and around infested areas, particularly in high biodiversity areas such as Murray Sunset National Park and Hattah Kulkyne National Park is the highest priority.

There will be continued collaboration between agencies to manage the threat and impact of buffel grass in the Mallee. Further works will be dependent on resourcing and possible project funding submissions.

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