Commissioner *for* Environmental Sustainability Victoria

Strategic Audit of the Implementation of

Melbourne Strategic Assessment Conservation Outcomes 2024 Report

VICTORIA State Government

Bunjil, the wedge-tailed eagle and ancestral spirit of the Kulin nation.
Australia's largest living bird of prey and one of the largest eagles in the world.
Credit: Paul Hitch. © Parks Victoria

Traditional Owners

We acknowledge and respect Victoria's Traditional Owners as the original custodians of Victoria's land and waters. We acknowledge their unique ability to care for Country and their deep spiritual connection to it.

We honour Elders past and present, whose knowledge and wisdom have ensured the continuation of culture and traditional practices.

Commissioner *for* Environmental Sustainability Victoria

COVER IMAGE: Growling grass frog

Commissioner's foreword

I am pleased to present this Strategic Audit of the Implementation of Melbourne Strategic Assessment Conservation Outcomes 2024 Report.

Delivering Melbourne's Newest Sustainable Communities is the Victorian Government's plan for four growth areas of Melbourne covering approximately 60,000 hectares.[1] The growth areas are designed to accommodate Melbourne's future population growth and urban expansion.

The Melbourne Strategic Assessment program (MSA program) was established in 2008 to support ecologically sustainable development (ESD). It is an intrinsic part of the Government's plan for urban development in growth areas while also planning for the care and protection of biodiversity, consistent with Victorian and Australian environmental laws protecting Matters of National Environmental Significance (MNES). *The Melbourne Strategic Assessment (Environment Protection Mitigation Levy) Act 2020* requires that a biennial strategic audit of the implementation of the Melbourne Strategic Assessment Conservation Outcomes be completed by the Victorian Commissioner for Environmental Sustainability.

Under the MSA program, as agreed between the Australian and Victorian governments, conservation areas were identified for the protection of MNES, including two large reserves containing some of the last remaining critically endangered grassland habitats on Melbourne's fringe. These two large reserves would contain natural assets that provide habitat for threatened species, protect endangered ecological communities and are offsets for development in surrounding growth areas.

This strategic audit assesses the conservation outcomes for 12 MNES values, including three ecological communities, five plant species and four animal species. It provides an update on the scientific baseline — status, trend and data confidence assessments — that was established in the inaugural strategic audit that was tabled in the Parliament of Victoria in May 2023.

The science presented applies to the existing Melbourne Strategic Audit Monitoring and Reporting Framework (MSA MRF) of the Victorian Department of Energy, Environment and Climate Action (DEECA), to assess the ecological status and trend of the 12 MNES values against objectives formally defined in the Notice of the Conservation Outcomes published in the Victorian Government Gazette on 27 January 2022.

Specifically, this strategic audit aims to:

- assess the extent to which conservation outcomes are being achieved through the MSA program
- evaluate whether the processes and activities established to achieve outcomes are adequate
- inform adaptive management and improvements.

The condition of the protected conservation areas is assessed through the 26 conservation outcomes and 29 key performance indicators. The table below provides a summary of the status, trend and data confidence of the conservation outcomes for the 12 MNES values assessed in this report.

Proportion of status assessments (%)		Proportion of trend assessments (%)		Proportion of confidence assessments (%)	
Good	16.7	Improving	20.0	High	26.7
Fair	23.3	Stable	40.0	Moderate	40.0
Poor	33.3	Deteriorating	16.7	Low	33.3
Unknown	26.7	Unclear	23.3	Insufficient	0

1. Department of Transport and Planning 2009, 'Delivering Melbourne's newest sustainable communities, East Melbourne, Victoria.

In August 2024, DEECA publicly released the response to the 16 recommendations from the Strategic Audit of the Implementation of Melbourne Strategic Assessment Conservation Outcomes 2022 Report on the MSA program webpage.[2] The response provides an update on action undertaken by the Victorian Government to address each recommendation. While the implementation of most recommendations is in progress, this strategic audit reiterates the importance of delivering the reforms proposed in the previous strategic audit.

This 2024 strategic audit also presents six additional recommendations.

Recommendations 1 to 3 address the primacy of land acquisition, biomass (weed) control and managing illegal waste dumping. The ongoing challenge of progressing these issues suggests that the natural value of the Western Grassland Reserve, grassy eucalypt woodland and the 36 conservation areas is not yet fully appreciated by local communities. ESD that addresses the supply of housing into growing urban areas and provides open green areas with high MNES values will likely be more valued by people over time as urban development continues.

Recommendations 4 to 6 are important, scientifically specific issues that have the potential to significantly advance the conservation outcomes and are focused on the limitations of the current MSA MRF and two threatened species that are protected by the MSA program, the growling grass frog and the matted flax-lily.

Sincere thanks to everyone who has contributed, in small and large part, to the preparation of this report.

Helen Vaughan PSM

Interim Commissioner
for Environmental Sustainability, Victoria

2. Department of Energy, Environment and Climate Action 2024, 'Reports', East Melbourne, Victoria. https://www.msa.vic.gov.au/our-progress/reports Accessed 22 October 2024.

Acknowledgements

Thank you to my dedicated team of science writers and contributing authors who, under the skilful guidance of Dr Scott Rawlings, Director of Science and Reporting, and Michael Reid, Director of Office, have worked with me to prepare this Strategic Audit of the Implementation of Melbourne Strategic Assessment Conservation Outcomes 2024 Report. I am extremely grateful for your commitment and expertise.

I am deeply grateful to those individuals and organisations who have generously volunteered their time and expertise for this report, including:

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Amelia Young	Wilderness Society Australia
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Brendan Tatham	Victorian Farmers Federation
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About this Report

The *Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020* (MSA Act) and *Commissioner for Environmental Sustainability Act 2003* (CES Act) include a statutory requirement for the Victorian Commissioner for Environmental Sustainability (the Commissioner herein) to 'submit a report on the implementation of MSA conservation outcomes to the Minister' every two years (Section 18A(1)).[3]

The conservation outcomes were formally defined by notice in the Victorian Government Gazette (Part 6, Section 93 of the MSA Act) in January 2022 and set out a range of measures to limit and offset the impacts of urban development on threatened species and ecological communities listed as Matters of National Environmental Significance (MNES) in the urban growth areas of Melbourne.[4]

This report builds on the scientific baseline presented in the Strategic Audit of the Implementation of Melbourne Strategic Assessment Conservation Outcomes 2022 Report (MSA 2022 Report) to provide a considered analysis of the implementation to date, and the pressures and challenges ahead. The approach to reporting is authorised through the Framework for the Victorian State of the Environment 2023 Report – Science for Sustainable Development (the Framework), tabled in the Parliament of Victoria in June 2020, as required by the CES Act and exercising the authority under the Act.

This report proposes six recommendations to influence and inform the focus, effort and investment of the Victorian Government to improve the MSA conservation outcomes. These six recommendations are in addition to the MSA 2022 recommendations that are in progress.

Report structure

Part 1 – Report in Summary

Part 1 begins with a summary of findings for key land management issues and each of the 12 MNES and their respective conservation outcomes (26 in total). This is followed by the assessment dashboard that presents a synopsis of the assessments for the conservation outcomes as a whole and a traffic-light summary for each conservation outcome.

It includes the six recommendations that are informed by the analyses presented in Part 2 of this report and an overview of progress made by the Victorian Government against the MSA 2022 recommendations.

Part 1 concludes with background information, including the policy and legislative settings, and provides context for the scientific analyses of Part 2.

Part 2 – Scientific Assessments

Part 2 presents the detailed scientific assessments for each of the 12 MNES and respective conservation outcomes. Three conservation outcomes had multiple assessments due to different assessment results for multiple areas, including the WGR and 36 conservation areas. In total, 30 assessments were undertaken for the 26 conservation outcomes.

The assessments rely principally on data provided by DEECA's Arthur Rylah Institute (ARI) and evidence from other government agencies (including Parks Victoria), local governments and non-government stakeholders. The data are assessed and synthesised by the CES science team, and this is followed by a rigorous peer review process by subject-area experts. The assessments provide a scientific, evidence-based evaluation of the environmental condition of the MNES within the geographical scope of the MSA program and progress regarding the 26 conservation outcomes.

3. State Government of Victoria 2022, '*Commissioner for Environmental Sustainability Act 2003*', https://www.legislation.vic.gov.au/in-force/acts/commissioner-environmental-sustainability-act-2003/016 Accessed 17 October 2024.
4. State Government of Victoria 2022, 'Victorian Government Gazette, Issue G4, Melbourne Strategic Assessment (*Environment Mitigation Levy*) Act 2020 - Notice of the Conservation Outcomes', http://www.gazette.vic.gov.au/gazette/Gazettes2022/GG2022G004.pdf Accessed 17 October 2024.

Commissioner *for* Environmental Sustainability Victoria

Part 1. Report in Summary

Image depicting natural temperate grassland in the Western Grassland Reserve.
© DEECA

Key findings

Land management to protect MNES

The Melbourne Strategic Assessment program (MSA program) was established to protect the 12 MNES listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Figure 1) that occur within Melbourne's Urban Growth Boundary (UGB) and deliver gazetted conservation outcomes for these matters while simultaneously allowing urban development to occur. Protection and management of more than 20,000 hectares of the highest quality remnant natural habitat that supports the 12 MNES around Melbourne's urban fringe, including the Western Grassland Reserve (WGR) and 36 conservation areas, aim to comply with the environmental obligations of the EPBC Act, while simultaneously addressing the housing demand due to the increasing population of Melbourne.

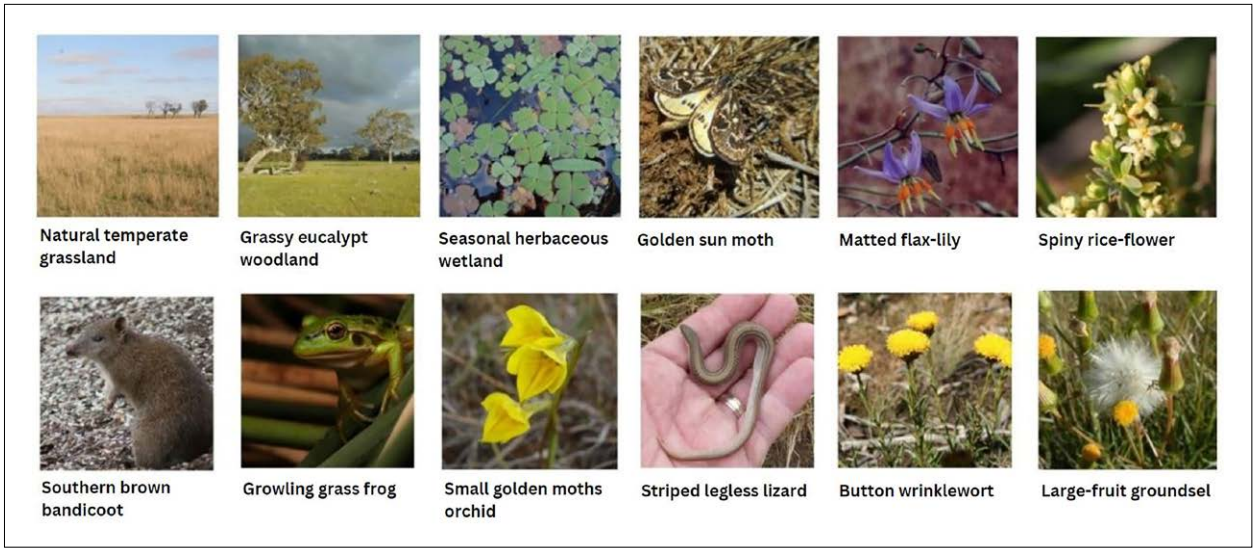

Figure 1: The 12 Matters of National Environmental Significance monitored under the Melbourne Strategic Assessment Program. Source: DEECA.

Land acquisition to establish the reserves

This report found that, as of October 2024, 25.4% of the WGR has been secured while 0% of the Grassy Eucalypt Woodland Protected Area (GEWPA) has been secured. In conservation areas, 15.4% of the overall extent of 36 conservation areas has been protected in perpetuity.

DEECA did not fulfill the Victorian Government's 2013 commitment to the Australian Government to establish the WGR and GEWPA by 2020. The Victorian Government advised the Australian Government in 2012 that this deadline for land acquisition would not be achieved.[5] DEECA advised that the timeline for delivery of establishing both reserves will be based on the current levy review (unpublished as of October 2024).[6]

When a parcel of land is acquired, DEECA conducts a survey to develop a vegetation inventory report. This report is used to develop a vegetation management plan with delivery partners that provides management actions and strategies (with targets) in the contracted time (10 years) to protect the identified MNES.

5. Victorian Auditor-General's Office 2020, 'Protecting Critically Endangered Grasslands', Independent assurance report to Parliament 2019–20: 16, Melbourne, Victoria.
6. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 23 September 2024.

Management response and management effectiveness

The Melbourne Strategic Audit Monitoring and Reporting Framework (MSA MRF) aims to:

- provide consistency in reporting on the conservation outcomes and
- apply an adaptive management approach to enable improvements to program implementation, outputs and outcomes.

This report has identified a decline in some MNES values by analysing the MRF KPI results in this reporting period. When there is a clear decline in ecological function and/or condition, it is unclear how this evidence is applied to improve implementation and outcomes of the MSA program. Parks Victoria (PV) and DEECA collect information during on-ground management activities, but the correlation between each activity and the changes detected has not been assessed. Therefore, this report describes the on-ground activities delivered by area but is unable to establish whether these activities result in improvements for relevant KPIs.

Western Grassland Reserve

In the WGR, PV is responsible for direct land management. Land management works occurred on approximately 2,000 hectares in 2018, but the area of works decreased significantly to 185 hectares in 2023. However, in the same period, PV's area of land management responsibility was increasing. This suggests that not all land management responsibilities were delivered for the period 2018-2023. PV has advised that this is principally because available funds only allowed for essential works on assigned land parcels.[7] Financial certainty to enable commitment to medium-term works contracts was lacking.

Meanwhile, the ecological condition of natural temperate grassland in the WGR degraded between 2013 and 2023. Consequently, this degradation could negatively impact on the habit condition of species such as the striped legless lizard, spiny rice-flower and matted flax-lily.

Another cause of delay in fulfilling land management responsibilities is the administrative process of land transfer to the PV land record after a land parcel is acquired by the Crown. In the 2014–2015 financial year, there were no properties on PV's land record even though five properties were acquired between 2009–2010 and 2014–2015. In the 2023–2024 financial year, 12 properties were under PV management and/or added to the PV land record. As of 3 July 2024, 30 properties (3,815 hectares) have been acquired and are now Crown land within the WGR.

In 2024–2025, it is anticipated that there will be 14 land parcels added to the PV land record for direct management. Some of these parcels (~1,099 hectares) are managed by private landholders (in partnership with Wyndham City Council) who conduct on-ground activities, including weed control, until the parcels are transferred to PV's land record.

As part of the land transfer process from DEECA to the PV Land Record, PV prepares a Property Assessment Report (PAR) that highlights any risks that are recognised in each acquired parcel. The PAR also provides an assessment of what is an acceptable risk and what is an unacceptable risk (e.g. unexploded ordnance contamination, contaminated soil and extensive rubbish dump sites). The outcome of the PAR determines if DEECA needs to resolve any issues prior to the transfer or PV undertaking any management activity.

Furthermore, revenue from the levy is only transferred to PV when the land acquired is in a state ready for PV to undertake on-ground works. There is a financial risk for PV associated with this approach given the depreciation of revenue over time. That is, when transferred, the revenue may fund fewer on-ground activities than it potentially could have if released earlier.

DEECA advised that, in the future, the aim is for PV to implement works as soon as practical following the transfer of freehold land to the Crown within reasonable condition parameters, or status on PV land record, to avoid this financial risk.[8] Implementation of this amendment will be achieved through DEECA's funding agreement with PV prior to the transfer of acquisitions to the PV land record.[9]

7. Parks Victoria (PV), 'Personal communication', 24 May 2024.
8. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 17 June 2024.
9. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 17 September 2024.

The interim management arrangements partnership delivered by DEECA and the Wyndham City Council (WCC) has focused on providing weed control grants and incentives to private landowners and lessees to prevent, reduce and contain the invasion and spread of *Catchment and Land Protection* (*CaLP*) *Act 1994* (CALP Act) listed serious environmental weeds across the reserve, including serrated tussock (*Nassella trichotoma*). This resulted in a 375% increase of grant participation compared to other interim management programs delivered under the MSA program. Additionally, WCC delivered almost twice the amount of weed control in the WGR area (2,421 ha compared to 1,238 ha) in less than half the time (3 years rather than 7 years) compared to other interim management programs (i.e. BushBroker auctions, serrated tussock mapping and control project and MSA Program weed control grant applications). The WCC partnership project covers 37 land parcels (15 properties, 4,814 ha) and this area is collectively greater than the size of land currently acquired in the WGR. The strong partnership between DEECA, WCC and private landholders, and the land management activities delivered, indicates the critical importance of the project for maintaining current high ecological values and preventing potential degradation of these lands. DEECA evaluates that this funding program is considered the most effective approach to deliver targeted and cost-effective weed control on private land in the WGR.[10]

This partnership demonstrates the potential to address high weed cover on newly acquired parcels where no, or limited, ecological effort was previously applied. The prevalence of weeds is the cause for why some KPIs are not meeting the baseline target in this report (e.g. KPI 7 for natural temperate grassland). Agriculture Victoria (DEECA) is responsible for administering weed management under the CaLP Act. There is an opportunity for improved conservation outcomes in the MSA program if the CaLP Act obligations are applied to private landholders in maintaining high ecological values and preventing degradation of the land they manage.

Serrated tussock. Credit: TassieKarin © DEECA

10. Department of Energy, Environment and Climate Action 2023, 'Western Grassland Reserve interim (private land) management partnership: effectiveness evaluation', Melbourne, Victoria.

Conservation areas

The 2013 Biodiversity Conservation Strategy (BCS) states that 36 conservation areas are to be established within the UGB to protect the highest quality biodiversity in the new urban growth corridors (Figure 2).[11] These conservation areas are set aside to protect and manage threatened species and ecological communities in perpetuity. This is a condition of Commonwealth approvals under the EPBC Act) for the urban development of Melbourne's growth corridors.

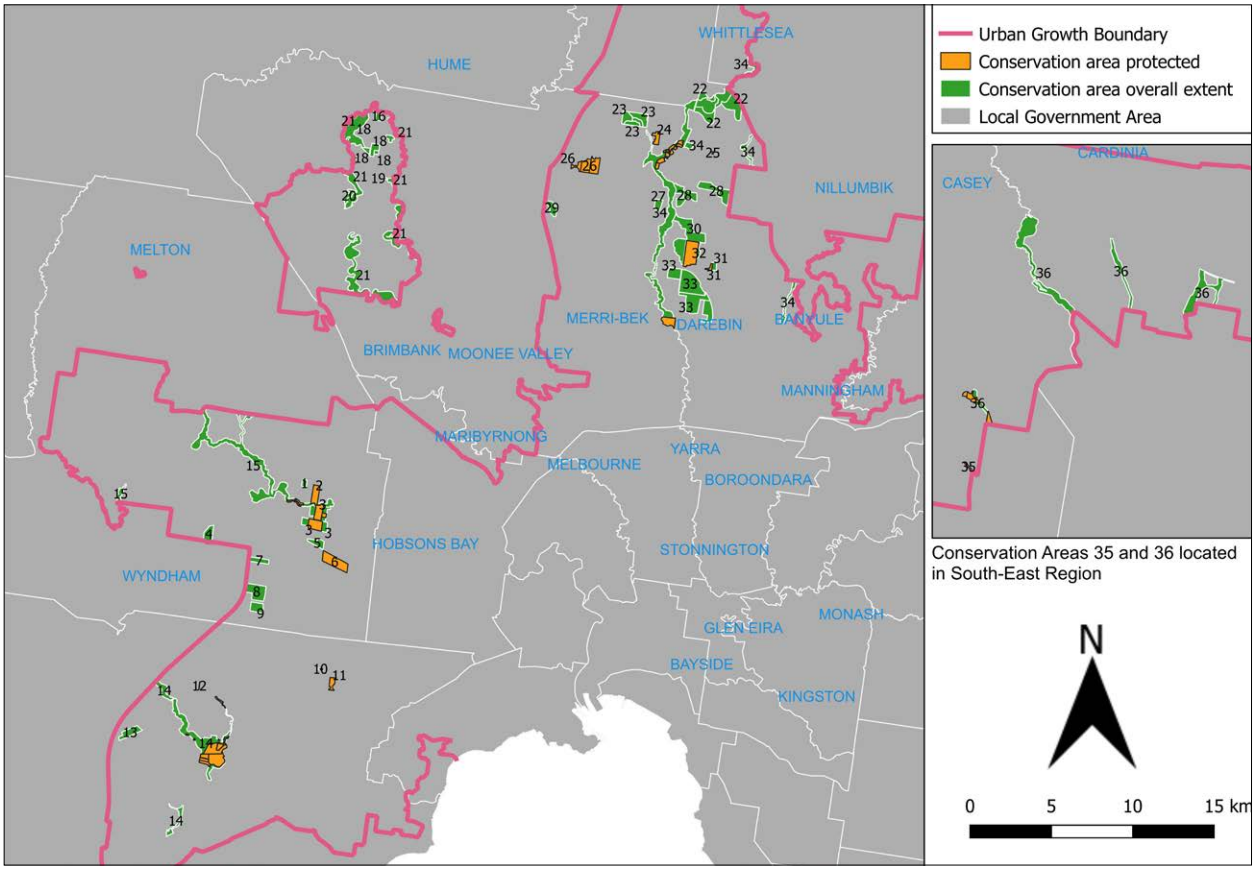

Figure 2. Extent of 36 conservation areas and areas secured as of June 2024. Source: DEECA.

Securing conservation areas in practice is achieved through the transfer or vesting of conservation area land (and associated management requirements) to the Minister for Environment. The land is subsequently surrendered to the Crown where it is reserved and managed for conservation purposes in perpetuity by the nominated Crown land manager. If a landowner decides to enter into an agreement with the Secretary (DEECA) under Section 69 of the *Conservation, Forests and Lands Act 1987* (CFL Act) as an alternative that retains their ownership of the land, the owner must conduct the conservation and management of the conservation area by or on behalf of the owner in perpetuity. The terms of the agreement must include that the owner pays the reasonable costs the Secretary incurred for the preparation, execution and registration of the agreement.

Areas secured by either method are considered 'secured' to protect threatened species and ecological communities, and land management plans are developed based on flora and fauna survey results when acquired. If the survey occurs after acquisition, the conditions may have degraded due to lack of conservation management works since acquisition.

11. Department of Environment and Primary Industries 2013, 'Biodiversity Conservation Strategy for Melbourne's Growth Corridors', East Melbourne, Victoria.

Extent

This report found that there have been changes in the extent of the conservation areas since the BCS was published in 2013. In total, there has been an approximate 400-hectare decrease (7.4% of total conservation area) in the current extent of conservation areas compared to the original extent described in the BCS in 2013. There was no area that has increased its boundary; all changes have resulted in a reduction of the conservation area.

DEECA advised that the difference in extent is past boundary adjustments for the conservation areas.[12] The adjustment to the boundaries is a process that had been acknowledged under the Commonwealth approvals (refer to Conditions 3 and 4 of the 2013 approval and Condition 3 of the 2014 approval).[13,14] The BCS also identifies the need for the boundaries of some conservation areas to be reviewed and revised. All the boundary adjustments have occurred consistent with the Australian Government endorsed approach outlined in Section 2 of the BCS Guidance Note.[15]

The conservation area boundaries adopted for this report are based on data provided by DEECA that have been updated with each boundary adjustment as opposed to the BCS boundaries that represent the extent in 2013.

Progress of land acquisition in conservation areas

As of June 2024, 817 hectares were secured for protection in perpetuity. This is approximately 16.2% of the overall extent of the 36 conservation areas (5,039.7 ha) (Table 1).

The largest conservation area secured is Conservation Area 14 that has a presence of growling grass frog. Conservation areas that have completed acquisitions are Conservation Areas 2, 6, 11, 12, 24, 25, 26 and 35. A completed acquisition is one in which 100% of the conservation area has been acquired for conservation management. Some MNES were found to have a limited presence within the secured conservation areas. For example, seasonal herbaceous wetlands have a single location of presence.[16]

Table 1: Overall extent of each conservation area and areas secured as of June 2024. Source: DEECA.

Conservation area	Overall area (ha)	Secured area (ha)
1	13.3	0.0
2	41.5	41.5
3	175.8	94.5
4	46.3	0.0
5	35.4	0.0
6	94.3	94.3
7	31.8	0.0
8	94.8	0.0
9	43.4	0.0
10	3.3	1.3
11	21.1	21.1
12	1.0	1.0
13	51.7	0.0
14	496.8	185.3
15	518.3	23.5
16	18.3	0.0
17	14.4	0.0
18	203.0	0.0
19	2.4	0.0
20	26.1	0.0
21	666.9	0.0
22	182.5	0.0
23	108.9	0.0
24	25.0	25.0
25	1.4	1.4
26	110.1	110.1
27	26.5	0.0
28	189.9	0.0
29	37.7	0.0
30	215.9	0.0
31	21.0	6.5
32	123.4	112.0
33	404.8	0.0
34	990.4	97.2
35	2.2	2.2
36	269.5	17.6
Total	**5,309.2**	**817.0**

12. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 27 March 2024.
13. Australian Government Department of Sustainability, Environment, Water, Population and Communities 2013 'Approval decision for the taking of actions in accordance with an endorsed program under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – Final approval for urban development in three growth corridors under the Melbourne urban growth program strategic assessment', Canberra, Australia.
14. Australian Government Department of Sustainability, Environment, Water, Population and Communities 2014 'Approval decision for the taking of actions in accordance with an endorsed program under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – Final approval for urban developments in south-eastern growth corridor under the Melbourne urban growth program strategic assessment', Canberra, Australia.
15. Department of Environment, Land, Water and Planning 2015, 'Guidance note: implementing the Biodiversity Conservation Strategy for Melbourne's growth corridors – working document', Melbourne, Victoria.
16. A secured area also includes lands where a landowner retains ownership and applies a section 69 of the Conservation, Forests and Lands Act 1987 agreement on the title.

Protection of conservation areas

This MSA report has found that illegal waste dumping is increasing within the conservation areas. One example is Conservation Area 9 for which earthworks were undertaken on approximately 35 hectares of the area, resulting in fill being spread to a depth of up to one-and-a-half metres across the conservation area.[17] EPA Victoria and the Australian Government are investigating this issue regarding potential breaches under the *Environment Protection Act 2017* (EP Act) and potential breaches under the EPBC Act. Melton City Council (MCC) is leading the prosecution against the landowner. In addition, MCC has successfully prosecuted the truck driver who was involved in this incident.[18]

Across the WGR, the type of illegal waste dumping was principally large household and building waste. Frequency has increased significantly in 2023 and 2024, particularly in the Mount Cottrell area.[19] While there is no data to quantify increased occurrence, anecdotally it would appear that the increase in illegal waste dumping is associated with increased housing demolitions.[20] In addition, a new report co-published by three Victorian environmental groups claimed that approximately half (15) of the conservation areas have had illegal waste dumping compliance issues, eight of which are regarded as severe.[21] The report from the volunteer groups is based upon field inspections of each conservation area. However, this evidence would require verification to confirm the findings.

The stakeholder report proposes active surveillance through partnership with various relevant agencies, including EPA Victoria and local government, and stronger compliance of protected areas to monitor activities by private landholders and land managers.

Land management by private landholders in conservation areas

In conservation areas, private landholders and appointed land managers are required to monitor and regularly report to DEECA on land management outcomes, including maintaining the habitat and preventing degradation.[22] This is to ensure the ongoing protection of the species and habitat that is present on the land. However, there is limited information reported to DEECA by private landholders.

This report includes data on areas of direct land management by private landholders that have been provided by DEECA. The aggregated area of management by private landholders was approximately 220 hectares in 2022. This is equivalent to approximately a quarter of secure conservation areas. Most of these private landholders (except for one land parcel transferred to Crown land in mid-2024) have agreements that specify operational works that need to be delivered and reported on annually. However, DEECA advised that these managers have not reported on on-ground works.[23]

An example is Conservation Area 11. The entire area is managed by a private landholder, and it has a known presence of golden sun moth and spiny rice-flower populations. After it was secured in 2020, there has been no information shared with DEECA regarding what management work has been undertaken.

Although the conservation areas are classified as secured, it is unclear what protection and management of threatened species and ecological communities are being undertaken as DEECA's requests for information have not provided details.[24] DEECA advised that landholders can voluntarily choose to exercise their option to manage the land themselves under the land management plan — maintaining their ownership through Section 69 of the CFL Act.[25] Under Section 69, DEECA does not provide funding for land management.

Another issue associated with land management by private landholders is that responsible private landholders would need to conserve secured areas in perpetuity after 10 years. After this first decade of intensive land management, minimal on-ground activities are expected. Therefore, it is critical to assess the condition of these areas periodically, and especially when the first 10-year intensive land management plan is approaching its conclusion.

17. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 21 June 2024.
18. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 19 September 2024.
19. Parks Victoria officer, personal communication, 16 September 2024.
20. Parks Victoria officer, personal communication, 16 September 2024.
21. Victorian National Parks Association, Grassy Plains Network and Merri Creek Management Committee 2024, 'A people's audit of the 36 MSA Conservation Areas', Carlton, Victoria.
22. These landholders have land management arrangements in place as per either Section 173 of the *Planning and Environment Act 1987* or Section 69 of the *Conservation, Forests and Lands Act 1987*.
23. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 12 June 2024.
24. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 12 June 2024.
25. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 23 August 2024.

Matters of National Environmental Significance

The following key findings will summarise key assessment results for gazetted conservation outcomes for each species and ecological community that are listed as MNES protected under the EPBC Act.[26] Twenty-six conservation outcomes are assessed for 12 MNES in this report.

Natural temperate grassland

The MSA program has achieved approximately 25% protection of land in perpetuity within the WGR (3,815 ha of 15,000 ha) and 36 conservation areas (359.8 ha of 1267.7 ha) as of June 2024 (Conservation Outcomes 1 and 2). This report also found that there is an overall decline in the condition of natural temperate grassland (Conservation Outcome 3) due to:

- increased weed cover
- gradual decline in herb richness
- slight decline in native grass cover in marginal grasslands (but stable cover in higher quality grasslands)
- slight decline in native forb cover in the higher quality grasslands and slight increase or stable elsewhere.

On-ground land management is critical to address the evident decline in natural temperate grassland, especially in the WGR, however, current management responses do not provide sufficient intervention. For example, areas of weed management declined significantly since 2019, from approximately 1,200 hectares to 100 hectares in 2023. This trend is concerning as there was an increase in land acquired during that period. The quality score of natural temperate grassland that represents ecological community quality also demonstrated the declining trend in many grassland states.[27]

Despite the deteriorating trend, the Victorian Government progressed a series of collaborations that resulted in:

- developing tools and approaches to characterise Victorian grassland communities and target invasive weed species at landscape and paddock scales using remotely sensed spatial information and
- a partnership with WCC to manage private land in the WGR of approximately 6,000 hectares. This partnership has not been incorporated into the current KPI data that could potentially improve KPIs in the future when measured and included.

Currently, Conservation Areas 2, 3, 6, 10, 11, 12, 24 and 32 are protected in perpetuity. DEECA also includes Conservation Areas 10 and 24 in the annual monitoring program and have stated that, in the future, at least one natural temperate grassland plot will be positioned in every conservation area to ensure there are longitudinal monitoring data across all protected areas.[28]

Grassy eucalypt woodland

Land has not been acquired to establish the 1,200 hectares of GEWPA outside the UGB (Conservation Outcome 1). The Victorian Government had committed, in the agreement between the Victorian and Australian governments signed in 2010, to deliver the GEWPA by 2020.[29] No progress has been made for this conservation outcome as of October 2024. Several programs have been progressed as part of the initial acquisition process, including phase 1 of the Community Engagement Program. The program will provide an understanding of the landowners' interest in securing and protecting their land and priority acquisition locations.

26. State Government of Victoria 2022, 'Victorian Government Gazette, Issue G4, Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020 – Notice of the Conservation Outcomes', http://www.gazette.vic.gov.au/gazette/Gazettes2022/GG2022G004.pdf Accessed 17 September 2024.
27. The quality algorithm combines eight measurable on-ground variables into a single value. These eight variables correspond closely with the KPI variables. The algorithm interprets changes among the multiple KPIs, by providing a single quality score between 100 (a 'pristine' site) and zero (where no value remains). The score is calculated from all permanent and re-allocated point-intercept plots in each year and reported by state.
28. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 10 July 2024.
29. Department of the Environment, Water, Heritage and the Arts 2010 'Draft approval for 28 existing precincts under the endorsed program for Melbourne's urban expansion', Canberra, Australia. https://www.agriculture.gov.au/sites/default/files/documents/26598%20-%20Part%202.pdf Accessed 19 September 2024.

Currently, there is insufficient information on the ecological condition of grassy eucalypt woodland as the KPIs have only three years' worth of monitoring data (Conservation Outcome 3). However, KPIs 5 and 6 (cover of native perennial grasses and bare ground cover) could be assessed as there is a target matrix that enabled assessment of data from a single year. Neither KPIs were met for the targets that represent structural heterogeneity. However, this does not represent the condition of the whole grassy eucalypt woodland community that the MSA program will eventually include. Currently only a single area (Conservation Area 26) is being monitored.

The MRF KPI for grassy eucalypt woodland provides several key points of evidence currently identified in Conservation Area 26:

- weed cover increased for some states: C3-dominated thicket and C3 woodland
- forb richness fell significantly for nutrient-enriched woodland
- native grass cover was stable in higher quality woodlands
- excessive Eucalyptus regeneration is present.

Data (including the 'woodland quality' score) demonstrate that urgent management intervention is necessary as ecological conditions in Conservation Area 26 are deteriorating. Although the baseline for each KPI will not be set until 2025, immediate on-ground actions are critical to address this decline. Limited data are available to DEECA regarding historical records of management responses applied to Conservation Area 26. Most of the area (93.8 ha) is managed by private landholders. The balance of the area is managed by Traditional Owners (11.7 ha) and Hume City Council (HCC) (4.9 ha; western portion of Conservation Area 26). The private landholders have made a management agreement with DEECA for two parcels of land since 2014 (52 ha) and 2019 (41.8 ha). DEECA does not have information on land management works that have been undertaken in accordance with the land management agreement for these two parcels. The area managed by HCC has detailed information on annual achievements against management targets.

Seasonal herbaceous wetlands (freshwater) of the temperate lowland plains

Conservation Outcome 1 is progressing through land acquisitions both in the WGR and conservation areas. DEECA advised that approximately 45 hectares of seasonal herbaceous wetlands have been protected within the WGR. Since 2022, the seasonal herbaceous wetland, Target Range Swamp, has been added to the regular monitoring program.[30]

Within the 36 conservation areas, the BCS identifies no presence of seasonal herbaceous wetlands. However, DEECA advised that DEECA's preliminary vegetation assessment identified that Conservation Area 3 (Western Growth Corridor: Clarke's Road Grassland, Rockbank) has seasonal herbaceous wetland extent within the Kororoit Creek Regional Park.[31] PV is currently progressing the procurement of a lead design consultant to develop a masterplan for the park.[32] Under the Strategic Directions Plan, seasonal herbaceous wetlands will be actively managed, including releasing water into these areas to maintain the ecological community.[33] The process to acquire the land necessary to establish the new park has commenced, but it will take time for the park to be fully completed. DEECA advised that the seasonal herbaceous wetland extent in Conservation Area 3 is smaller than the minimum of three hectares to be included in the regular monitoring program, therefore, this area will not be monitored.[34]

Conservation Outcome 2 was achieved. All data were within the 95% confidence interval tolerance of the defined baseline. Notably, weeds in Cobbledicks Rise Wetland appear to have increased during the period between 2022 and 2024 period which will require active monitoring. Results for this wetland community in Cobbledicks Rise Wetland vary widely, as the appearance of vegetation within this system is often highly dynamic due to rapid wetting and drying cycles. Large fluctuations in vegetation cover occasionally occur annually.

30. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 15 March 2024.
31. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 20 March 2024.
32. Parks Victoria (PV) 2022, 'Kororoit Creek Regional Park: Strategic directions plan', Melbourne, Victoria.
33. Parks Victoria (PV) 2022, 'Kororoit Creek Regional Park: Strategic directions plan', Melbourne, Victoria.
34. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 11 July 2024.

Golden sun moth

DEECA secured approximately 1,250 hectares of the WGR that contain populations of the golden sun moth.[35] Within the 36 conservation areas in the UGB, 131.3 hectares of golden sun moth habitat have been permanently protected. This is approximately 16% (131.3 ha of 807.1 ha) of overall habitat identified by the BCS. DEECA has not secured any land to permanently protect 680 hectares of occupied habitat outside the UGB. DEECA aims to find suitable areas in the future.[36] This ambition includes survey work based on known distributions and subsequently an intention to either purchase land or secure land via Section 69 of the CFL Act.

Conservation Outcome 2 was not met as the golden sun moth population in the WGR was below the baseline target. Urgent management intervention is required to improve the current declining trend.

The geographical scope of annual monitoring conducted by DEECA is confined to the WGR and Truganina South Nature Conservation Reserve (NCR). There is no information on the status of the golden sun moth population within the UGB, including the 36 conservation areas (Conservation Outcome 3). DEECA anticipates that Conservation Areas 4, 13, 23, 26, 27 and 33 will be included in the annual monitoring program in the future.[37] Additionally, the BCS indicates there are two more conservation areas that have occupied habitat — Conservation Areas 11 and 29. Conservation Area 11 has been secured and managed by a private land holder since 2020, however, there has been no information of on-ground management activities or regular monitoring. A survey of Conservation Area 11 to understand the status of the golden sun moth population is required.

Conservation Outcome 4 was not achieved as the GEWPA has not been established.

Matted flax-lily

The permanent protection of occupied habitat for the matted flax-lily has been achieved in the conservation areas as recommended in the BCS. Furthermore, additional habitat was found through regular survey attempts after the conservation areas were secured (Conservation Outcome 1).

DEECA has not secured any land to permanently protect 529 hectares of occupied habitat for the matted flax-lily outside the UGB as a part of the commitment to Conservation Outcome 1. A KPI for the MRF program outcome demonstrates that all known populations in conservation areas (24, 26 and 32) are currently being monitored. Populations in Conservation Area 24 were assessed as sustained in 2023 (Conservation Outcome 2). However, a deteriorating trend from 2021 raises a concern for not meeting the baseline in coming years. The other areas (26 and 32) have not completed a five-year cycle to enable assessment against the baseline.

Conservation Area 24 is managed by two entities: the Department of Health (DoH) for the Donnybrook Cemetery Area and HCC for the remaining area. Many matted flax-lily populations are located within the Cemetery area but there is no evidence that the ecological values have been managed. A management response must be applied to the Cemetery area to address the declining trend.

The other conservation areas (26 and 32) have not completed a five-year cycle to assess against the baseline.

Conservation Outcome 3 was not achieved as the GEWPA has not been established.

Spiny rice-flower

Conservation Outcome 1 was partially achieved. In the WGR, approximately 830 hectares of land have been secured that have a presence of spiny rice-flower population. This area is calculated by combining areas secured with existing spiny rice-flower distribution areas. Within the six conservation areas secured (Conservation Areas 2, 3, 6, 10, 11 and 12), only Conservation Area 10 is included in the monitoring system. The other conservation areas will be included in the future if the population increases to over 10 plants.

35. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 15 March 2024.
36. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 17 July 2024.
37. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 10 July 2024

Additional conservation of 394 hectares of high quality and confirmed habitat for the spiny rice-flower outside the UGB has not been achieved.

Conservation Outcomes 2 and 3 cannot be assessed as there are four years' worth of monitoring data that are not sufficient to set the baseline. The 2024 data will enable the first assessment. Preliminary results indicate that the spiny rice-flower populations in the reserve are stable, with low mortality of adult plants despite a low level of recruitment. During the last four years, the highest recruitment rate was 2.26% in 2022. The 394 hectares of conservation areas outside the UGB cannot be assessed for at least five years as monitoring population count and recruits cannot commence until land protection has been achieved.

Southern brown bandicoot

Conservation Outcome 1 cannot be fully assessed at this time as the data collection cycle will be completed with the addition of the 2024 data. The Victorian Government has installed a habitat connectivity corridor between Royal Botanic Gardens Victoria (RBGV) and Cranbourne as specified in the Precinct Structure Plan.[38] The aim is to install another three corridors between the RBGV and Cranbourne.

Conservation Outcome 2 cannot be assessed as more monitoring is required to assess against the baseline that was established in 2019. DEECA has developed a new five-year implementation plan for the sub-regional species strategy for the management areas. This new plan details on-ground actions to deliver from 2024 which includes predator control, grant programs for private landholders, community education and research on genetic diversity. Completion of this next monitoring cycle will provide a foundation for an adaptive management approach to ensure that the species persists within the southern brown bandicoot management area and to assess effectiveness of on-ground actions. The impact of the habitat connectivity corridors will also be assessed.

Growling grass frog

Conservation Outcome 1 cannot be assessed as the data collection cycle has not been completed. The baselines for the occupancy rate for the North, North-west and West regions are established, and the South-east region will be set in the 2024-25 financial year.

There are five conservation areas that are listed for growling grass frog conservation: Conservation Areas 14, 15, 21, 34 and 36 (Conservation Outcome 2). This is approximately 3,651 hectares in total. As of October 2024, approximately 418 hectares have been secured, which is 11% of the overall area. Assessment of whether the populations within these conservation areas are improving cannot be conducted as the data collection cycle is not complete.

Detection results indicate that each surveyed region has confined creeks where growling grass frog were found within the conservation areas. This emphasises the importance of the conservation areas for the species. The species population has been declining within the UGB due to disturbances, including urban expansion and diseases. There are few remnant metapopulations (a regional group of genetically connected populations of the species) remaining within the UGB.

Conservation Outcomes 1 and 2 indicate that these important populations should be protected and enhanced, and connectivity should be considered between populations. However, the KPI only measures occupancy for each region and occupancy does not provide insight to develop intervention strategies. DEECA advised that this KPI is intended as a starting point to conduct comprehensive analysis in the future once more information about this species is gathered.[39] However, remaining populations may face extinctions in the interim. The Growling Grass Frog Masterplan has various on-ground activities planned for delivery (including the creation of wetlands) which will not be captured by the current scope of the KPI (occupancy). Furthermore, the MRF is a tool for adaptive management, but it is unclear how this KPI will be used to develop management responses and evaluate threats in response to the MSA 2022 recommendation for the growling grass frog (Recommendation 12).

38. Department of Environment, Land, Water and Planning 2016, 'Implementation Plan for the Southern Brown Bandicoot sub-regional species strategy', Melbourne, Victoria.
39. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 8 May 2024.

Small golden moths orchid

Conservation Outcome 1 was not achieved for the small golden moths orchid as the relevant area within Conservation Area 3 has not been protected in perpetuity. Currently, 54% of Conservation Area 3 has been acquired (94.5 ha of 175.8 ha), but the areas secured do not include the presence of small golden moths orchid. Therefore, no surveys have occurred.

Striped legless lizard

Conservation Outcome 1 is partially achieved. Monitoring data indicate that the population of striped legless lizard in the WGR is sustained in the long-term across the known distribution. The annual monitoring result demonstrates improvement but due to the large fluctuation of annual results between 2016 and 2023 (KPI 1), a 95% confidence interval for the five-year mean suggests uncertainty in the results.

The BCS identified Conservation Areas 5, 6, 30 and 33 as having striped legless lizard presence. While Conservation Area 6 is the only area that has been secured, DEECA does not monitor the area. DEECA advisedthat this is because the site is protected by Section 173 under the *Planning and Environment Act 1987* (P&E Act).[40] Ostensibly, Conservation Area 6 provides an offset for the Boral Quarry located on the Western Victoria Basalt Plain at Deer Park on the western fringe of Melbourne (EPBC approval number 2002/82). The BCS requires that urban development be excluded around the area. To this end, the Government used the information in the BCS to contribute to defining the boundaries of the Urban Growth Zone as part of the UGB Expansion and subsequent precinct structure planning.

The MRF specifies that permanent grids will be monitored in conservation areas larger than 10 hectares at any location where the lizard is detected during inventory surveys. As all relevant conservation areas are larger than the required size, the monitoring program will assess these areas once secured.

Button wrinklewort

Monitoring data indicate that button wrinklewort in Conservation Area 10 is declining since 2019, therefore, Conservation Outcome 1 is not achieved. This is a continuation of the trend assessed in 2022. The population in 2023 (n = 452) is well below the baseline that is approximately 73% of the baseline population count (452 of 617). Using historical monitoring data from La Trobe University from 2004 to 2012 in Conservation Area 10, the population declined from 1,072 in 2004 to 472 in 2012.[41] The population count recorded at the same location increased slightly from 2015 to 2018 (from 591 to 638) but declined to 2023. As the MSA 2022 report identified that the decline is not from a sampling error or an issue of detectability, this result represents a real decline based on the frequent recording of dead plants at locations where they have previously been recorded alive.

DEECA asserts that rabbits are responsible for much of the decline observed in the 2022 and 2023 results.[42] A long-term management plan is currently being discussed with DEECA's biodiversity research institute (ARI) and La Trobe University in collaboration with Bunurong Land Council Aboriginal Corporation. This plan will include actions to support populations of button wrinklewort at Conservation Area 10 and within the adjacent expansion area. In addition, the MSA program have a funding agreement in place with La Trobe University for the cultivation of button wrinklewort at La Trobe University Wildlife Sanctuary, which will go into Conservation Area 10 and the adjoining grassland expansion area. DEECA expects that this project will introduce more button wrinklewort plants, commencing in Spring 2024.[43]

Additionally, recruitment was very low. On average, approximately four recruitments occurred each year. DEECA observed that this is lower than required for population persistence and atypical, as another location monitored (a few kilometres away from Conservation Area 10) has many more recruits in a recently planted population of 620 plants.[44] Current research being undertaken to gain a clearer understanding of the reason behind the low recruitment rate is expected to be completed by the end of 2026 and aims to provide a method to address this issue.

40. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 8 August 2024.
41. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.
42. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 22 May 2024.
43. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 22 May 2024.
44. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.

Large-fruit groundsel

The large-fruit groundsel is the only MNES of the 12 in this report that was assessed as having an improving trend in ecological condition that is likely due to favourable weather conditions for the species. However, this assessment is based on a location outside the UGB (Little Raven) with no survey information on the ecological condition within the UGB monitored, including Conservation Area 5. Therefore, the conservation outcome for large-fruit groundsel was not achieved as this outcome is specific to locations within the UGB, including Conservation Area 5.

Large-fruit groundsel.
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Assessment dashboard

The conservation outcomes assessment dashboard provides a high-level overview of the status, trend and confidence assessments for the 26 gazetted conservation outcomes, and a summary of individual conservation outcome report cards. Three conservation outcomes had multiple assessments due to different assessment results for multiple areas, including the WGR and 36 conservation areas. In total, 30 assessments were undertaken for 26 conservation outcomes.

Two MNES had a status of unknown and trend of unclear due to the incomplete cycle of data collection: southern brown bandicoot and growling grass frog. It is anticipated that these species will have sufficient information to be assessed in the future. The absence of any land acquisition for the GEWPA has impacted the capacity to assess the six conservation outcomes.

Overall, more than half of the assessments had a poor or unknown status and only five assessments (17%) had a good status (Figure 3; Table 2). Twelve assessments (40%) were found to have a stable trend (Figure 4; Table 3), however, many of these were due to the continued absence of land protections or data. Six assessments (20%) had an improving trend. Approximately a third of the assessments (7) had an unclear trend, primarily related to the absence of Government's progress in establishing a GEWPA that also influenced the confidence (low confidence for 10 assessments). The moderate confidence for 12 assessments (40%) was predominantly due to a lack of clarity concerning the timeframe for achieving land protections or a lack of monitoring data for the targeted areas (Figure 5; Table 4).

Table 2: Summary of status assessments for conservation outcomes for Matters of National Environmental Significance for the Melbourne Strategic Assessment Monitoring and Reporting Framework.

Status	Matters of National Environmental Significance (MNES)												
	MNES 1	MNES 2	MNES 3	MNES 4	MNES 5	MNES 6	MNES 7	MNES 8	MNES 9	MNES 10	MNES 11	MNES 12	Total
Good	1	-	1	-	1	-	-	-	-	1	-	1	5
Fair	1	1	1	-	1	3	-	-	-	-	-	-	7
Poor	1	2	1	2	1	2	-	-	-	-	1	-	10
Unknown	-	-	-	2	1	-	2	2	1	-	-	-	8
Total	**3**	**3**	**3**	**4**	**4**	**5**	**2**	**2**	**1**	**1**	**1**	**1**	**30**

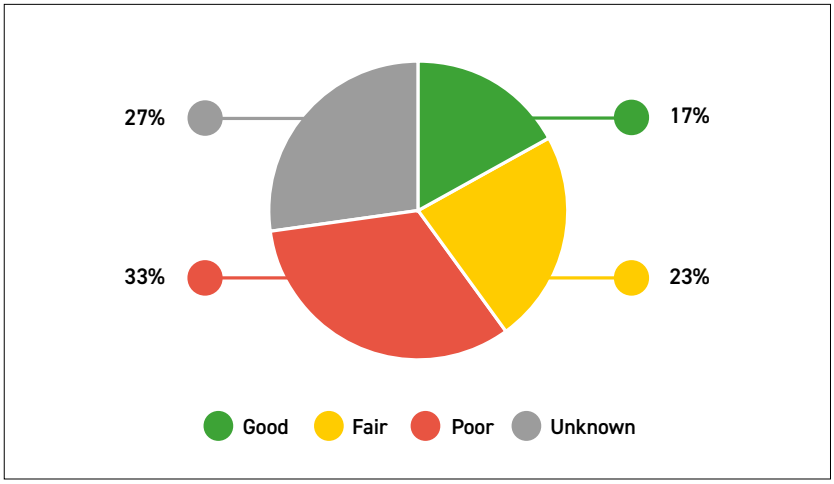

Figure 3: Proportional breakdown of status assessments for gazetted conservation outcomes.

Table 3: Summary of trend assessments for conservation outcomes for Matters of National Environmental Significance for the Melbourne Strategic Assessment Monitoring and Reporting Framework.

Trend	Matters of National Environmental Significance (MNES)												
	MNES 1	MNES 2	MNES 3	MNES 4	MNES 5	MNES 6	MNES 7	MNES 8	MNES 9	MNES 10	MNES 11	MNES 12	Total
Improving	1	-	1	-	-	2	-	1	-	-	-	1	6
Stable	1	2	2	1	2	3	-	-	-	1	-	-	12
Deteriorating	1	1	-	1	1	-	-	-	-	-	1	-	5
Unclear	-	-	-	2	1	-	2	1	1	-	-	-	7
Total	**3**	**3**	**3**	**4**	**4**	**5**	**2**	**2**	**1**	**1**	**1**	**1**	**30**

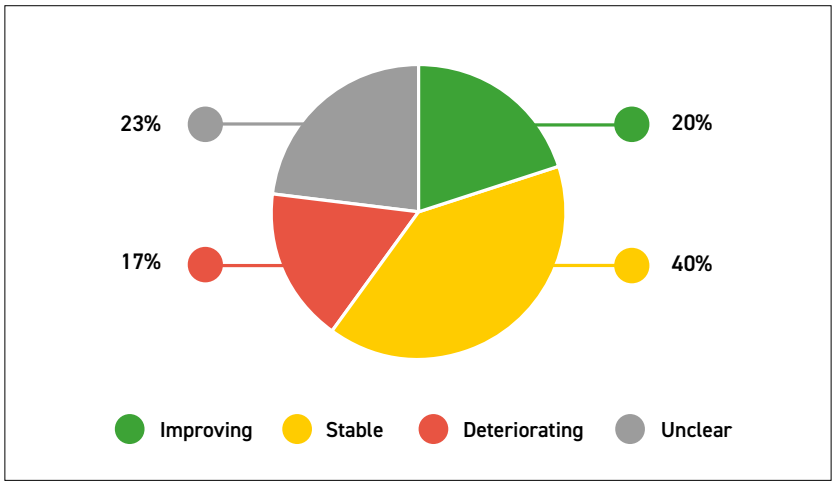

Figure 4: Proportional breakdown of trend assessments for gazetted conservation outcomes.

Table 4: Summary of confidence assessments for conservation outcomes for Matters of National Environmental Significance for the Melbourne Strategic Assessment Monitoring and Reporting Framework.

Confidence	Matters of National Environmental Significance (MNES)												
	MNES 1	MNES 2	MNES 3	MNES 4	MNES 5	MNES 6	MNES 7	MNES 8	MNES 9	MNES 10	MNES 11	MNES 12	Total
High	-	2	2	-	1	2	-	-	-	-	1	-	8
Moderate	3	1	1	2	1	2	-	-	-	1	-	1	12
Low	-	-	-	2	2	1	2	2	1	-	-	-	10
Total	**3**	**3**	**3**	**4**	**4**	**5**	**2**	**2**	**1**	**1**	**1**	**1**	**30**

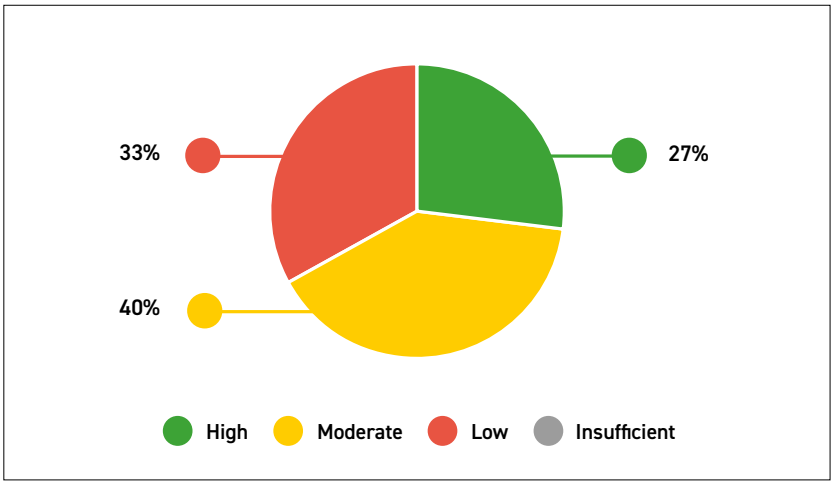

Figure 5: Proportional breakdown of confidence assessments for gazetted conservation outcomes.

Indicator assessment report card summaries

Key to indicator assessments

The colour and symbol keys for the indicator assessment report cards presented in Table 8 and Part 2 are as follows:

Key to status

Good | Fair | Poor | Unknown | Narrative but not assessed | Not applicable

Key to trend

Improving | Stable | Deteriorating | Unclear | Narrative but not assessed | Not applicable

Key to confidence

High | Moderate | Low | Insufficient | Narrative but not assessed | Not applicable

MNES 1 - Natural temperate grassland

Conservation Outcome 1

Establishment of the 15,000-hectare Western Grassland Reserve (nature conservation reserve or National Park protection) located outside the UGB west of Melbourne, protecting native grasslands

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor is due to 3,815 hectares of the 15,000-hectare Western Grassland Reserve target being secured in protections as of 3 July 2024.[45] Of the 10,000 hectares of natural temperate grassland of Victorian Volcanic Plains to acquire, 1,750 hectares have been acquired as of 2023.

More land acquisitions are occurring, therefore, the trend is rated as improving, although it is unclear as to when establishment of the 15,000-hectare reserve will be fully achieved.

The confidence in the status and trend assessment is rated as moderate due to the uncertainty regarding when establishment of the 15,000-hectare reserve will be fully achieved.

Conservation Outcome 2

The permanent protection of native grasslands in conservation areas identified in the BCS and the Conservation Areas Declaration

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status and trend assessments of good and stable, respectively, are based on the quality score of Conservation Areas 10 and 24. Both areas have high quality habitat and quality scores from annual monitoring data which indicate a stable trend in their condition.

Currently, data on Conservation Areas 2, 3, 11 and 12 are absent, which resulted in the confidence assessment of moderate. At least one plot will be positioned in every conservation area to ensure there are longitudinal monitoring data across all protected areas. Once all plots are ready to monitor annually, the confidence in the status and trend assessments will be improved.

45. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 15 March 2024.

Conservation Outcome 3

Improved composition, structure, quality, and ecological function of protected native grasslands

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of fair is based on the KPI results in the Western Grassland Reserve and Conservation Areas 10 and 24. KPIs indicate that many KPIs achieved the baseline but also identified an overall decline in Natural Temperate Grassland condition. Therefore, the trend assessment of deteriorating is based on the following findings:

- Weed cover increased
- Herb richness fell gradually
- Native grass cover was steady in better grasslands, falling slightly in marginal grasslands
- Cover of native forbs fell slightly in the better grasslands and increased slightly or was steady elsewhere.

The confidence in the status and trend assessment is rated as moderate as there is uncertainty regarding the condition of some secured conservation areas that have not been included in the monitoring program yet.

Natural temperate grassland, Silky Blue Grass.
Credit: Marcia Riederer
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MNES 2 - Grassy eucalypt woodland

Conservation Outcome 1

The creation of the 1,200-hectare Grassy Eucalypt Woodland Protected Area outside the UGB, south-west of Whittlesea, protecting grassy eucalypt woodland

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor is based on the absence of any land acquisition to create a Grassy Eucalypt Woodland Protected Area on the fringe of the Urban Growth Boundary.

The trend assessment of stable is because the continued absence of any land acquisition is consistent.

The confidence in the status and trend assessment is rated as high because no acquisition has occurred between 2022 and 2024.

Conservation Outcome 2

The permanent protection of 341 hectares of grassy eucalypt woodland: in conservation areas identified in the BCS and the Conservation Areas Declaration on land secured as part of the Grassy Eucalypt Woodland Protected Area that is in addition to the 1,200 ha

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor is due to no land being acquired for the Grassy Eucalypt Woodland Protected Area. Based on the BCS, Conservation Areas 16, 17, 18, 19, 22, 25, 26, 27, 28, 29, 30, 31 and 33 have presence of Grassy Eucalypt Woodland. Conservation Areas 25, 26 and 31 have been secured. So far, Conservation Area 26 is the only area that is included in the regular monitoring program.

The trend assessment of stable is based on the consistently limited acquisition of relevant conservation areas.

The confidence in the status and trend assessment is rated as high due to high confidence in monitoring acquisition progress of grassy eucalypt woodland within conservation areas.

Conservation Outcome 3

Improved composition, structure, quality, and ecological function of protected grassy eucalypt woodland

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of fair is based on the KPI results for Conservation Area 26, which is the only area being monitored. The KPIs for grassy eucalyptus woodland provide several key points identified in Conservation Area 26:

- Weed cover increased for some states: C3-dominated thicket and C3 woodland
- Forb richness fell significantly for nutrient-enriched Woodland
- Native grass cover was steady in better woodlands
- Too much *Eucalyptus* regeneration is present.

The quality score of grassy eucalypt woodland in Conservation Area 26 demonstrates that quality of grassy eucalypt woodland is deteriorating or stable for some woodland states. For example, C3 woodland state decreased in its score from 44.4 to 29.1, a deterioration of approximately a third. Meanwhile, *Themeda*-dominated thicket maintained its original score.

The trend assessment of deteriorating is based on a declining trend in some KPI results. While there is an absence of on-ground works information, it is likely that KPI results will not be met in the future once the baseline is set.

The confidence in the status and trend assessments is rated as moderate because the first five-year data collection is not complete. However, the first three years of data indicates a clear status and trend for this conservation outcome.

Grassy eucalypt woodland.
Credit: Marcia Riederer
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MNES 3 - Seasonal herbaceous wetlands

Conservation Outcome 1

The permanent protection of seasonal herbaceous wetlands (freshwater) in:
1. the Western Grassland Reserve
2. the conservation areas identified in the BCS and the Conservation Areas Declaration

2024 status		2024 trend		2024 confidence	
1. 	2. 	1. 	2. 	1. 	2. 

Why this assessment in 2024?

The status assessment of poor for Conservation Outcome 1.1 is based on the progress of land acquisition compared to the target of 339 hectares to be protected. The permanent protection of seasonal herbaceous wetland in the Western Grassland Reserve is 45 hectares (or 13.3% achieved). Of the 45-hectare protected, approximately 24 hectares is regularly monitored. The status assessment of fair for Conservation Outcome 1.2 is due to additional areas identified with seasonal herbaceous wetland extent in Conservation Area 3, which is intended to become a regional park. The process to acquire the land to establish the park has commenced, but it will take time for the park to be established.

The trend assessment of stable for Conservation Outcome 1.1 is based on little improvement in total areas protected compared to 2022. Conservation Outcome 1.2 is assessed as improving as a protected conservation area has been added.

The confidence in the status and trend assessment for Conservation Outcomes 1.1 and 1.2 is rated as high because there is information on acquisition sufficient to assess status and trend.

Conservation Outcome 2

Improved composition, structure, quality, and ecological function of protected seasonal herbaceous wetlands (freshwater) that are greater than three hectares in size.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of good is based on the KPI results monitored since 2015. All KPIs were met except for Target Range Swamp as this area has not completed the first five-year data collection cycle. Some KPIs had lack of drawdown events which prevented assessments.

The trend assessment of stable is based on the KPI data.

The confidence in the status and trend assessment is rated as moderate because the condition information is based only on the 13.3% of total area protected in perpetuity. More area should be protected and included in the monitoring program.

MNES 4 - Golden sun moth

Conservation Outcome 1

Permanent protection of occupied habitat for golden sun moth with viable populations, as defined by population viability analysis models. The amount of habitat required outside the UGB to meet this target, over and above the conservation areas within the UGB and the Western Grassland Reserve, is 680 hectares.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor is based on limited acquisition of targeted areas. In the Western Grassland Reserve, 1,250 hectares of potential habitat have been protected. Conservation Areas 4, 11, 13, 23, 26, 27, 29 and 33 have a presence of golden sun moth. Conservation Areas 11 and 26 have been secured in perpetuity. DEECA has not secured any land to permanently protect 680 hectares of occupied habitat outside the UGB.

The trend assessment is stable as the permanently protected area remains unchanged from 2022.

The confidence in the status and trend assessment is rated as moderate even though there was sufficient information on progress in land protections for the species. This is because of the absence of identified areas to acquire the 680 hectares outside the Urban Growth Boundary.

Conservation Outcome 2

Golden sun moth populations in the Western Grassland Reserve are sustained in the long-term. Sustained means that the five-year mean proportion of sites occupied remains above the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor is based on the KPI result which indicates that the five-year mean proportion of sites occupied between 2019 and 2023 is below the baseline. Except for Truganina South NCR, all surveyed locations are in the Western Grassland Reserve. The result demonstrates that Conservation Outcome 2 has not been achieved. Urgent management intervention is required to improve the status of golden sun moth.

The trend assessment of deteriorating is based on the declining trend of detection rate since 2018.

The confidence in the status and trend assessment is rated as moderate because there is no data on golden sun moth in conservation areas. When Conservation Areas 4, 13, 23, 26, 27 and 33 are included in the annual monitoring program, a more confident assessment of this conservation outcome will be possible.

Conservation Outcome 3

Golden sun moth populations in the conservation areas identified in the BCS and the Conservation Areas Declaration, and those outside the UGB are sustained in the long-term. Sustained means that the five-year mean proportion of sites occupied remains above the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of unknown is based on the absence of golden sun moth ecological condition data within conservation areas. The geographical scope of annual monitoring conducted by DEECA is confined to the Western Grassland Reserve and South Truganina NCR. Conservation Areas 4, 13, 23, 26, 27 and 33 will be included in the annual monitoring program in the future. Additionally, the BCS indicates there are two more Conservation Areas that have occupied habitat: Conservation Areas 11 and 29. Conservation Area 11 has been secured and managed by a private land holder since 2020. However, there has been no information of on-ground management activities or regular monitoring. It is important to conduct a survey of Conservation Area 11 to assess the status of the golden sun moth population.

The trend assessment of unclear is based on the absence of information on golden sun moth within the conservation areas.

The confidence in the status and trend assessment is rated as low because there is no data on golden sun moth in the conservation areas.

Conservation Outcome 4

Golden sun moth populations in the Grassy Eucalypt Woodland Protected Area are sustained in the long-term. Sustained means that the five-year mean proportion of sites occupied remains above the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of unknown is based on the absence of golden sun moth population information in the Grassy Eucalypt Woodland Protected Area as no protection has been achieved.

The trend assessment of unclear is based on the absence of golden sun moth information within the Grassy Eucalypt Woodland Protected Area.

The confidence in the status and trend assessment is rated as low because there is no data on the golden sun moth in the Grassy Eucalypt Woodland Protected Area.

MNES 5 - Matted flax-lily

Conservation Outcome 1

The permanent protection of occupied habitat for matted flax-lily in:

1. the conservation areas identified in the BCS and the Conservation Areas Declaration

2. 529 hectares of conservation areas identified outside the UGB that can include land within the Grassy Eucalypt Woodland Protected Area (where occupied habitat is found).

2024 status		2024 trend		2024 confidence	
1. 	2. 	1. 	2. 	1. 	2. 

Why this assessment in 2024?

The status assessment of fair for Conservation Outcome 1.1 is based on the progress of protection in perpetuity for Conservation Areas 24, 26 and 32. Conservation Area 32 was not identified in the BCS, but survey efforts found occupied habitat and included it in the regular monitoring program. The status assessment of poor for Conservation Outcome 1.2 is based on the limited land acquisitions.

The trend assessment of stable for Conservation Outcome 1.1 is because no further land acquisitions were made between 2018 and 2024. Conservation Outcome 1.2 was also assessed as stable as no land protections have occurred.

The confidence assessment of moderate for Conservation Outcome 1.1 is due to the established evidence that identifies five conservation areas to protect (based on the BCS). The introduction of a formal timeline to achieve this outcome would improve the assessment's confidence. Conservation Outcome 1.2 had low confidence as there was no clear information on which areas would be acquired, nor a definitive timeframe for acquisition.

Conservation Outcome 2

Matted flax-lily populations in the conservation areas identified in the BCS and the Conservation Areas Declaration, and those outside the UGB are sustained in the long-term. Sustained means that the five-year mean detection rate of previously known plants remains above the baseline

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of good is based on the KPI 1 data which demonstrates all populations in permanent protection areas (Conservation Areas 24, 26 and 32) are currently being monitored and populations in Conservation Area 24 were sustained until 2023. However, the deteriorating trend from 2021 is a concern. Conservation Areas 26 and 32 will be ready to assess in 2025 and 2027, respectively.

The confidence assessment of high is based on the availability of data to assess status and trend.

Conservation Outcome 3

Matted flax-lily populations in the Grassy Eucalypt Woodland Protected Area are sustained in the long-term. Sustained means that the five-year mean detection rate of previously known plants remains above the baseline

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of unknown, and trend assessment of unclear, is due to an absence of matted flax-lily population information in the Grassy Eucalypt Woodland Protected Area as no protection has been achieved.

The confidence in the status and trend assessment is rated as low because there are no data on matted flax-lily in the Grassy Eucalypt Woodland Protected Area.

MNES 6 - Spiny rice-flower

Conservation Outcome 1

The permanent protection of occupied habitat for spiny rice-flower in:

1. **the Western Grassland Reserve**
2. **the conservation areas identified in the BCS and the Conservation Areas Declaration**
3. **394 hectares of conservation areas identified outside the UGB that can include land within the Grassy Eucalypt Woodland Protected Area (where occupied habitat is found).**

2024 status			2024 trend			2024 confidence		
1. 	2. 	3. 	1. 	2. 	3. 	1. 	2. 	3. 

Why this assessment in 2024?

The status assessment of poor for Conservation Outcome 1.1 is based on the limited area protected. The MSA program commits to protecting 10,000 hectares of natural temperate grassland in the Victorian Volcanic Plains by 2020. As of 2023, 1,750 hectares have been acquired. Approximately 830 hectares of the land secured has a presence of spiny rice-flower population. This is very limited and slow progress in protecting the species. Conservation Outcome 1.2 is assessed as fair as five out of nine conservation areas have been secured so far. The status assessment of poor for Conservation Outcome 1.3 is because no land acquisitions have been made.

The trend assessment of improving for Conservation Outcomes 1.1 and 1.2 are based on the recent progress of land protections. However, greater progress needs to be achieved particularly in the Western Grassland Reserve. Conservation Outcome 1.3 was assessed as stable as no land protections have been progressed.

The confidence assessment of moderate for Conservation Outcomes 1.1 and 1.2 is based on the evidence of progress in land protections. An introduction of a formal timeline to achieve this outcome would improve the confidence in the assessment. Conservation Outcome 1.3 had low confidence as there was no clear information on which areas would be acquired.

Conservation Outcome 2

Spiny rice-flower populations in the Western Grassland Reserve are sustained in the long-term. Sustained means that the recruits forming more than 10% of the population in each location at least once in the previous 10 years and the five-year mean population count remain above the baseline

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of fair and trend assessment of stable are based on KPI 1 and 2 data that demonstrate that populations in the Western Grassland Reserve were stable between 2019 and 2023 but that the recruitment rate was much lower than 10%. Management should seek to create germination niches, through the judicious use of fire and weed control.

The confidence assessment of high is based on the availability of data to assess status and trend.

Conservation Outcome 3

Spiny rice-flower populations in the conservation areas identified in the BCS and the Conservation Areas Declaration, and those outside the UGB are sustained in the long-term. Sustained means that recruits forming more than 10% of the population in each conservation area at least once in the previous 10 years and the five-year mean population count remain above the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of fair and trend assessment of stable are based on KPI 1 and 2 data that demonstrate that populations in conservation areas were stable between 2019 and 2023, but the recruitment rate was consistently much lower than 10%.

The confidence assessment of high is based on the availability of data to assess status and trend.

MNES 7 - Southern brown bandicoot

Conservation Outcome 1

Functioning and sustainable southern brown bandicoot populations within the southern brown bandicoot management area with connectivity between populations. Sustainable populations means that the proportion of sites occupied (measured via camera trap surveys taken every five years) remains above the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of unknown is because there is no baseline established yet. Therefore, trend assessment is also assessed as unclear. The confidence in the status and trend assessment is rated as low due to incomplete KPI data.

Conservation Outcome 2

The protection and enhancement of all southern brown bandicoot populations within the southern brown bandicoot management area.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of unknown is because there is no baseline established yet. Therefore, trend is also assessed as unclear. The confidence in the status and trend assessment is rated as low due to incomplete KPI data.

MNES 8 - Growling grass frog

Conservation Outcome 1

Functioning and sustainable growling grass frog populations within the UGB with connectivity between populations. Sustainable populations means that there is a reduction in extinction risk to low in the long-term (using the modelling that supports DEECA's Growling Grass Frog Masterplan)

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of unknown is because there is no baseline established yet. Therefore, the trend assessment is also assessed as unclear Confidence in the status and trend assessments is rated as low due to incomplete KPI data.

Conservation Outcome 2

The protection and enhancement of important growling grass frog populations in the conservation areas identified in the BCS and the Conservation Areas Declaration.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of unknown is because there is no baseline established for KPI 1 yet. Furthermore, it is unclear if the health of the growling grass frog population in the conservation areas can be measured by the current KPI (occupancy).

Many land parcels within Conservation Areas 14, 15, 34 and 36 will commence implementing land management plans in 2024 and 2025. This is likely to enhance growling grass frog populations in the conservation areas. Therefore, trend is assessed as improving.

The confidence assessment of low is based on the incomplete information of the baseline for KPI 1.

MNES 9 - Small golden moths orchid

Conservation Outcome 1

No substantial negative change to the known population of small golden moths orchid within the UGB in Conservation Area 3. No substantial negative change means that the count of individuals emergent at least once over a five-year period remains above 90% of the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of unknown is because there is no information on the condition of Conservation Area 3. Therefore, trend is also assessed as unclear.

Confidence assessment of low is based on the absence of information for KPI 1 in Conservation Area 3.

MNES 10 - Striped legless lizard

Conservation Outcome 1

Striped legless lizard populations are sustained in the long-term across the known distribution of this species in the Western Grassland Reserve and the conservation areas identified in the BCS and the Conservation Areas Declaration. Sustained means that evidence of striped legless lizard is detected once in every five-year period at each of the permanent monitoring plots.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of good is based on the KPI 2 result as this conservation outcome specifies that the striped legless lizard population should be detected once in every five-year period at each of the permanent monitoring plots. All permanent plots have met the KPI for the first five years. The only plot that has had a second five-year assessment period is 'Plot 96_1' in the Western Grassland Reserve. This plot achieved KPI 2 in both periods.

The trend assessment of table is based on the permanent plots achieving KPI 2.

The confidence assessment of moderate is due to the absence of information from the conservation areas. Currently, assessment is based only on data collected in the Western Grassland Reserve.

MNES 11 - Button Wrinklewort

Conservation Outcome 1

No substantial negative change to the known population of button wrinklewort within the UGB in Conservation Area 10. No substantial negative change means that the count of individuals emergent at least once over a five-year period remains above 90% of the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor, and trend assessment of deteriorating, is based on the KPI 1 result that the button wrinklewort population in Conservation Area 10 is declining since 2018. The population in 2023 (n = 452) is approximately 73% of the baseline population count (617). Therefore, the KPI was not achieved. This decline is evidenced by the frequent recording of dead plants at locations where they had previously been observed alive. DEECA indicated that this is a concerning issue to be urgently addressed.[46]

The confidence assessment of high is due to the availability of long-term data on the button wrinklewort population in Conservation Area 10.

MNES 12 - Large-fruit groundsel

Conservation Outcome 1

No substantial negative change to known populations of large-fruit groundsel within the UGB (including but not limited to Conservation Area 5). No substantial negative change means that the five-year mean population count remains above the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of good is based on the KPI 1 data. While the baseline of the large-fruit groundsel population is 30.4 (five-year average of population between 2017 and 2022), the population in 2023 dramatically increased to 243. As this increase between 2022 and 2023 is probably due to the wet season, different weather conditions may result in a fluctuating trend in the future.

As the population increased from 12 in 2021 to 243 in 2023, the trend is assessed as improving.

The confidence assessment is moderate based on the data of the large-fruit groundsel population in the Western Grassland Reserve. Data could be improved by expanding the collection within the Urban Growth Boundary, particularly in Conservation Area 5.

46. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 22 May 2024.

Recommendations

These recommendations are informed by the science and analyses presented in 'Part 2 – Scientific Assessments' and the 'Key findings' of this report. They are intended to support the design, improvement and implementation of the Melbourne Strategic Assessment program (MSA program) in relation to the gazetted conservation outcomes. Engagement of stakeholders and government organisations, including local government, was also critical for framing the recommendations in this report.

These six recommendations:

- are in addition to the 12 recommendations of the Strategic Audit of the Implementation of Melbourne Strategic Assessment Conservation Outcomes 2022 Report (MSA 2022 Report)
- propose closer alignment of the current key performance indicator (KPI) suite with gazetted conservation outcomes
- focus on specific areas for improvement for the protection of Matters of National Environmental Significance (MNES)
- propose more efficient coordination between responsible agencies to deliver environmental outcomes.

Recommendations 1 to 3 are critical recommendations that address overarching management issues (land acquisition, biomass (weed) control, illegal dumping) that if not resolved threaten the delivery and sustainability of the conservation outcomes. Recommendations 4 to 6 are important, scientifically specific issues that have the potential to significantly advance the conservation outcomes if implemented.

Table 5 provides a summary of the recommendations and challenges they propose to overcome.

Recommendations from the MSA 2022 Report

In August 2024, the Department of Energy, Environment and Climate Action (DEECA) publicly released the response to the 16 recommendations from the MSA 2022 Report on the MSA program webpage.[47] The response provides an update on action undertaken by the Victorian Government to address each recommendation but does not comment on the level of support for each recommendation. The Victorian Government provided a description of each recommendation in the response that is aligned to the intent of the MSA 2022 Report recommendations (Table 6).

Table 6 provides all this information as it appears on the MSA program webpage as of October 2024 and the text of the recommendations in the issued MSA 2022 Report. Where specific progress actions against the MSA recommendations have produced scientific evidence, these new data have been analysed for this 2024 report. Currently no recommendation from the MSA 2022 Report has been assessed as 'fully delivered', while the only recommendation that has demonstrated no or very limited progress is Recommendation 11 (southern brown bandicoot).

DEECA's response does not detail how and when the Victorian Government will complete delivery of each recommendation from the MSA 2022 Report.

The six recommendations presented in this report are additional to the 16 MSA 2022 recommendations that continue to be important, relevant and requiring implementation.

47. Department of Energy, Environment and Climate Action, 'Reports', Melbourne, Victoria. https://www.msa.vic.gov.au/our-progress/reports?anchor=Recommendation_1-715221-1 Accessed 11 September 2024.

Land acquisition

Recommendation 1: That DEECA investigates the applicability of public acquisition overlays to acquire prioritised land for the Grassy Eucalypt Woodland Protected Area and 36 conservation areas.

Challenges this recommendation addresses

To fulfill the Government's legislative requirements under the *Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020* (MSA Act) and commitments of the Government Gazette, the conservation outcomes require the acquisition of sufficient land with adequate environmental values to achieve the targets.

DEECA confirmed they have prepared a 'risk-based land acquisition strategy for the Western Grassland Reserve' (Table 6) in response to Recommendation 4 of the MSA 2022 Report, however, a similar program logic has not been prepared for the Grassy Eucalypt Woodland Protected Area (GEWPA) or 36 conservation areas.

Context

Natural temperate grassland and grassy eucalypt woodland used to be widespread across the Victorian Volcanic Plain in south-west Victoria. While these ecological communities once covered over a third of the state, they are now small and fragmented. They are considered two of Victoria's most important and biodiverse ecological communities.

In June 2008 and June 2009, the Australian Government listed natural temperate grassland and grassy eucalypt woodland, respectively, as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Under Section 1(2) of the *Commissioner for Environmental Sustainability Act 2003* (CES Act) and MSA Act (Section 137(b)), the Commissioner for Environmental Sustainability (the Commissioner) is required to audit progress on the MSA conservation outcomes as these appear in the Government Gazette.[48]

Two of the conservation outcomes relate specifically to acquiring land to establish the Western Grassland Reserve (WGR) and GEWPA:

- The creation of the 15,000-hectare WGR (nature conservation reserve or National Park protection) located outside the Urban Growth Boundary (UGB) west of Melbourne, protecting native grasslands.
- The creation of the 1,200-hectare GEWPA outside the UGB, south-west of Whittlesea, protecting grassy eucalypt woodland.

A further eight of the 26 conservation outcomes are directly related to land acquisitions, while another three are indirectly related (concerning the small golden moths orchid, button wrinklewort and large-fruit groundsel). These outcomes can only be achieved if land acquisitions are progressed.

The conservation outcomes for specific ecological conditions establish a baseline after the initial data collection cycle (five years) is complete. This baseline is subsequently used as a target to maintain an ecological state or monitor improvement. Progress on the conservation outcomes is dependent on regular additions to land acquisition.

Additionally, the 2013 Biodiversity Conservation Strategy (BCS) states that 36 conservation areas are to be established within the UGB to protect the highest quality biodiversity in the new urban growth corridors.[49] These conservation areas are set aside to protect and manage threatened species and ecological communities in perpetuity. This is a condition of Commonwealth approvals under the EPBC Act as an offset for the urban development of Melbourne's growth corridors.

Securing conservation areas in practice is achieved through the transfer or vesting of conservation area land (and associated management requirements) to the Minister for Environment. The land will then be surrendered to the Crown where it is reserved and managed for conservation purposes in perpetuity by the nominated Crown land manager. Areas are 'secured' to protect threatened species and ecological communities, and land management plans are developed based on flora and fauna survey results.

48. State Government of Victoria 2022, 'Victorian Government Gazette, Issue G4, Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020 – Notice of the Conservation Outcomes', Melbourne, Victoria.
49. Department of Environment and Primary Industries 2013, 'Biodiversity Conservation Strategy for Melbourne's Growth Corridors', East Melbourne, Victoria.

Recommendation 4 of the Melbourne Strategic Assessment Conservation Outcomes 2022 Report recommended:

> *'That DELWP actively implements a risk-based land acquisition strategy that prioritises MNES conservation outcomes. The land acquisition strategy must include the identification of interim management needs to support outcomes for MNES in priority areas where delays in acquisition have occurred and/or are likely to occur.'*

DEECA responded that they have prepared a risk-based land acquisition strategy for the WGR (refer to Recommendation 4 in Table 6).

This report proposes the next step in the evolution of the MSA land acquisition strategy by recommending that DEECA investigate the applicability of public acquisition overlays (PAO) to acquire prioritised land for the GEWPA and conservation areas. These areas are currently outside the existing PAO. One instrument that the Victorian government can apply to establish the WGR, GEWPA and conservation areas as offsets is a PAO. A PAO is a planning mechanism that is used by the government to identify areas for protection through planning scheme amendments.

A risk-based strategy to progress land acquisition for the GEWPA and conservation areas would need to investigate the applicability of PAOs and any potential advantage to the alternative instrument (i.e. a landholder entering into an agreement with the Secretary (DEECA) under Section 69 of the CFL Act that retains landholder ownership of the land, where the landholder must conduct the conservation and management of the conservation area in perpetuity).

Weed and biomass control

Recommendation 2: That the MSA program (DEECA) works with Agriculture Victoria (DEECA) to prevent, contain and reduce the invasion and spread of *Catchment and Land Protection Act 1994* listed serious environmental weeds within the Western Grassland Reserve and 36 conservation areas.

Challenges this recommendation addresses

This report identified a significant weed cover increase within the WGR and the 36 conservation areas. Some areas had 100% weed cover. This increase of weed cover led directly to some KPIs not achieving the baseline. The significant increase in weed cover is principally due to monitoring plots that were acquired and transferred to the Crown that did not have effective weed control prior to transfer.

Context

High weed cover was identified for many monitoring plots located within the WGR and the 36 conservation areas. This resulted in some KPIs not being achieved. This is predominantly because land parcels were not actively managed for weed control prior to acquisition, resulting in the status of several MNES including natural temperate grassland declining.

As land acquisition has only been achieved for a small percentage of the target areas, it is likely that this issue will continue to be an obstacle to meeting conservation outcomes as land is acquired. As the first five-yearly cycle of data collection sets the target baseline for future reporting, the condition of unacquired land parcels will significantly impact the potential of the Program to achieve the KPIs.

All three levels of government have different responsibilities for managing invasive weeds, with State Government primarily responsible for managing the risks of invasive species.

The Victorian Government is responsible for

- administrating Victoria's main legislation for invasive plants and animals, the Catchment and Land Protection Act 1994 (CaLP Act)
- setting statewide strategic policy for invasive species
- enforcing the provisions of the CaLP Act.

The Victorian Government's roles and responsibilities for invasive species compliance are primarily delivered by Agriculture Victoria, with the management of parks and reserves directed through PV.[50]

Under the CaLP Act, Section 20(d) and 20(e) outline the responsibilities that landowners must take all reasonable steps to:

- eradicate regionally prohibited weeds
- prevent the growth and spread of regionally controlled weeds.

If landowners do not take reasonable steps to comply with Section 20 of the CaLP Act, the Government can serve a Directions Notice or Land Management Notice on a landowner that outlines measures that must be taken for the control or eradication of noxious species on the land. It is an offence to not comply with the conditions of these notices.

In the WGR, the interim management partnership between the WCC and DEECA focused on providing weed control grants and incentives (Land Protection Grant Scheme) to private landowners and lessees to prevent, reduce and contain the invasion and spread of CaLP Act listed serious environmental weeds across the reserve, including serrated tussock. This partnership successfully managed weeds prior to acquisitions, demonstrating that the existing obligations for landowners to receive government funding provides a strong incentive for weed management. DEECA is planning to expand the current partnership with WCC to the City of Greater Geelong and City of Melton.[51]

As Agriculture Victoria is responsible for administering the CaLP Act, it is logical that the MSA program and Agriculture Victoria (both are functions of DEECA) partner to address high weed cover in the private land yet to be acquired to the full extent of available regulation and legislation.[52] The strategic application of compliance, grants and incentives will improve the condition of unacquired land parcels and, ultimately, conservation outcomes.

Illegal waste dumping

Recommendation 3: That the MSA program (DEECA) coordinates with EPA Victoria, Parks Victoria and local government to establish active surveillance of, and stronger compliance for, protected areas to address increasing illegal waste dumping activities.

Challenges this recommendation addresses

This report found that illegal waste dumping activities around the protected areas is increasing, particularly where development is occurring near the WGR and conservation areas. The dumping of hazardous materials in the protected area could negatively impact on conservation outcomes. More active and systematic collaboration between responsible agencies could address the illegal activities more appropriately. Illegal waste dumping is increasing in many urban and peri urban areas and this recommendation could be incorporated into a broader compliance strategy.

Context

This report has found that illegal waste dumping is increasing within the conservation areas. One example is Conservation Area 9 in which earthworks (~35 ha) were undertaken in late December 2021.[53] This work resulted in fill being spread to a depth of up to one-and-a-half metres across the conservation area. The EPA and Australian Government are investigating potential breaches under the EP Act and potential breaches under the EPBC Act.

Across the WGR, illegal waste dumping of large household and building waste has remained constant. The frequency of the dumping increased significantly in 2023 and 2024, especially in the Mount Cottrell area.[54] While there are no data to quantify the increased occurrence, anecdotal evidence suggests illegal waste dumping has been associated with housing demolitions.[55]

50. Agriculture Victoria, 'Legal responsibilities for managing invasive species', East Melbourne, Victoria. https://agriculture.vic.gov.au/biosecurity/protecting-victoria/legislation-policy-and-permits/legal-responsibilities-for-managing-invasive-species Accessed 17 September 2024.
51. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 17 June 2024.
52. Agriculture Victoria, 'Invasive species laws and the Catchment and Land Protection Act 1994', East Melbourne, Victoria. https://agriculture.vic.gov.au/biosecurity/protecting-victoria/legislation-policy-and-permits/invasive-species-laws-and-the-catchment-and-land-protection-act-1994 Accessed 17 September 2024.
53. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 21 June 2024.
54. Parks Victoria officer, personal communication, 16 September 2024.
55. Parks Victoria officer, personal communication, 16 September 2024.

Furthermore, a recent report, co-published by three Victorian environmental groups, claimed that approximately half (15) of the conservation areas have had compliance issues, eight of which are considered severe.[56] The report from the environmental groups is based on field inspections of the conservation areas and would require further validation.

The report proposed active surveillance through the partnership of responsible agencies and stronger compliance for protected areas. Addressing the issue of illegal waste dumping will require strong coordination between DEECA, Environment Protection Authority (EPA) Victoria, Parks Victoria (PV) and local government, however, there is great potential of reducing the overall costs of this challenge, and the burden on public resources, if the management focus shifts from response to prevention.

Management effectiveness

Recommendation 4: That DEECA updates the MSA Monitoring and Reporting Framework to include clear management responses and timelines to address program outcome KPIs that have not been achieved.

Challenges this recommendation addresses

The Melbourne Strategic Audit Monitoring and Reporting Framework (MSA MRF) provides a rigorous scientific method for applying an adaptive management approach for the MSA conservation outcomes. However, it is unclear what specific actions will be triggered when specific KPIs are not achieved.

This report has identified a decline of many MNES by analysing MRF KPI results in this reporting period. When there is a clear decline of ecological function and/or condition, it is unclear how this evidence is applied to improve MSA program implementation and outcomes.

Context

The MSA program MRF establishes data collection processes and reports on the Government's progress on program delivery.

The MSA MRF was established in 2015 and includes a Program Logic for the program's 'output' and 'outcomes' reporting.[57] The 'outputs' are principally concerned with land acquisitions, including establishing a 15,000-hectare grassland reserve. The 'outcomes' refer to conservation outcomes for MNES under MSA management. The MRF has not been formally updated since 2015, however, it is still referenced by DEECA as a document that:

> 'mandates [...] annual data collection [and] that ecological outcomes be reported every five years to provide the Australian Government and the public with the data required to judge whether Victoria is achieving its obligations under the MSA.' [58]

56. Victorian National Parks Association, Grassy Plains Network and Merri Creek Management Committee 2024, 'A people's audit of the 36 MSA Conservation Areas', Carlton, Victoria.
57. Department of Environment, Land, Water and Planning (DELWP) 2015, 'Monitoring and Reporting Framework – Melbourne Strategic Assessment', East Melbourne, Victoria.
58. Bruce M, Batpurev K, Bryant D, Sinclair S and Kohout M 2020, 'Melbourne Strategic Assessment: Ecological Outcomes Report 2014-15 to 2019-20.' Department of Environment, Land, Water and Planning, Heidelberg, Victoria.

Recommendation 1 of the Melbourne Strategic Assessment Conservation Outcomes 2022 Report recommended:

> *'That DELWP undertakes a review of the MSA ecological Monitoring and Reporting Framework (MRF), including a redesign of existing methods and KPI measures where required, to achieve landscape-scale, MNES conservation outcomes. This would include establishing a research strategy to address priority knowledge gaps and improve understanding of MNES and their management.'*

DEECA responded that they are: 1) reviewing and updating the MRF, and 2) developing a strategy to address knowledge gaps (to inform decision-making and management) (refer to Recommendation 1 in Table 6).

This report proposes the next step in the evolution of the MSA MRF by recommending that the MRF be updated to include clear management responses and timelines to address program outcome KPIs that have not been achieved.

The Commonwealth approved the 2015 MSA MRF formally defined outcomes for the MNES, structured as a simple two-tier 'objectives hierarchy', with a single overarching 'desired outcome' for each species and community, each with underlying KPIs.[59, 60]

The following single outcome statements, one for each species or community, form the basis of the MRF:

- The composition, structure and function of natural temperate grassland of the Victorian Volcanic Plain improves
- The composition, structure and function of grassy eucalypt woodland of the Victorian Volcanic Plain improves
- The composition, structure and function of seasonal herbaceous wetlands of the temperate lowland plains improves
- No substantial negative change to populations of button wrinklewort
- No substantial negative change to populations of large-fruit groundsel
- No substantial negative change to small golden moths orchid
- Matted flax-lily persists
- No substantial negative change to the population of spiny rice-flower, and the population is self-sustaining
- Golden sun moth persists
- Growling grass frog persists
- Southern brown bandicoot persists
- Striped legless lizard persists.

DEECA included these statements in the MRF as independent program outcomes, all of which must be achieved for the MSA program to fulfill its obligations. KPIs were developed based on these program outcomes for each MNES.

The current MRF has not been updated since 2015, including when the conservation outcomes were gazetted in 2020.

This report assessed that approximately a third of the KPIs (including sub-KPIs) were not achieved in this reporting period, while half of the MNES (6 of 12) were not assessed as the current five-year cycle of data collection was not completed. Most of the KPIs that were not met were the natural temperate grassland KPIs. This has important implications as many species that inhabit these grasslands are at risk of extinction, including the striped legless lizard, spiny rice-flower and matted flax-lily. Producing a logic for the MRF to establish what action will be triggered when specific KPIs are not achieved will provide transparency for stakeholders and land managers. This will be an important step to enable adaptive management for the MSA program and improve conservation outcomes.

59. Department of Environment, Land, Water and Planning (DELWP) 2015, 'Monitoring and Reporting Framework – Melbourne Strategic Assessment', East Melbourne, Victoria.
60. Biggs HC, and Rogers KH 2003, 'An adaptive system to link science, monitoring, and management in practice. In The Kruger Experience: Ecology and Management of Savanna Heterogeneity' J.T. du Toit, K.H. Rogers, and H.C. Biggs, eds. Washington, D.C.: Island Press, pp. 59–80

Growling grass frog

Recommendation 5: That DEECA reviews the key performance indicator suite for the growling grass frog to ensure it is comprehensive and contemporary to achieve the conservation outcomes.

Challenges this recommendation addresses

Currently, a single KPI (occupancy) is used to assess the conservation outcome for the growling grass frog. Occupancy alone does not adequately assess if the growling grass frog has sustainable and functioning populations with healthy connectivity between populations.

Context

Currently, the Monitoring and Reporting Framework has 'occupancy' as a single KPI for the growling grass frog in the north, north-west, west and south-east regions of the conservation areas. The conservation outcomes for this species are:

- Functioning and sustainable growling grass frog populations within the UGB with connectivity between populations. Sustainable populations means that there is a reduction in extinction risk to low in the long-term (using the modelling that supports DEECA's Growling Grass Frog Masterplan).
- The protection and enhancement of important growling grass frog populations in the conservation areas identified in the BCS and the Conservation Areas Declaration.[61]

Furthermore, there is a Growling Grass Frog Masterplan that outlines strategies for designing habitat and connectivity within the conservation areas, including the creation of wetlands for the species. In accordance with the Masterplan, Melbourne Water has been delivering on-ground activities, including land management, wetland creation, enhancement and maintenance. The Masterplan was completed in 2017, two years after the MRF; therefore, the current KPI predates the Masterplan.

The conservation outcomes are complex and require multiple indicators for assessment. Occupancy as a single KPI is an oversimplification. A review of key performance indicator suite for the growling grass frog will ensure the suite is comprehensive and contemporary and aligned with the Masterplan to achieve the conservation outcomes.

Matted flax-lily

Recommendation 6: That DEECA coordinates interim management works (including biomass control) for the Donnybrook Cemetery in Conservation Area 24 to protect the matted flax-lily population.

Challenges this recommendation addresses

The KPI assessment indicates that the matted flax-lily population in Conservation Area 24 is declining. Approximately half of the monitoring plots are located within the Donnybrook Cemetery. These plots will not be actively managed until the land custodian of the cemetery is transferred to the HCC. This delay in land management will potentially result in the KPI assessment for Conservation Area 24 declining below the baseline in the next audit (2026).

Context

The KPI for the matted flax-lily indicates that although known populations in Conservation Area 24 achieved the baseline detection rate, the detection rate has declined and is likely to decline below the baseline by 2026 unless action is taken. Given the habitat and observed history of this species, the key threat to the species is biomass (i.e. weeds).[62] The accumulation of biomass has two likely effects:

- Detection of the species is more difficult because of the overgrown grass and because the species can lose its foliage and retreat underground, leading to temporary non-detection of surviving plants
- Accumulation of biomass causes the species to weaken and eventually die off.

The intervention method to reduce this threat includes prescribed burning and other biomass control efforts. Fire removes the grass thatch which creates an open space for native species to thrive. Biomass control is also important as competition with weeds is regarded as a critical threat to recruitment for the matted flax-lily. Although there are approximately seven years' worth of survey results since 2016, DEECA did not provide information on on-ground management works delivered. Therefore, it is unclear how management responses impacted on the KPI result.

61. Victorian Government Gazette 2022 'Victoria Government Gazette: No. G 4 Thursday 27 January 2022', Richmond, Victoria.
62. The term 'biomass' in this context is referring to excessive cover of plant material which is controlled (reduced) using prescribed burning and/or grazing. The term 'weeds' is used when the management treatments involve mechanical and/or chemical treatments.

Recommendations in summary

Table 5: MSA 2024 recommendations and challenges addressed.

Recommendation 1 - Land acquisition	
Recommendation	That DEECA investigates the applicability of public acquisition overlays to acquire prioritised land for the Grassy Eucalypt Woodland Protected Area and 36 conservation areas.
Challenges this recommendation addresses	To fulfill the Government's legislative requirements under the *Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020* and the commitments of the Government Gazette, the conservation outcomes require the acquisition of sufficient land with adequate environmental values to achieve the targets. DEECA confirmed they have prepared a 'risk-based land acquisition strategy for the Western Grassland Reserve' (Table 6) in response to Recommendation 4 of the MSA 2022 Report, however, a similar program logic has not been prepared for the Grassy Eucalypt Woodland Protected Area or 36 conservation areas.
MNES that will be improved by the recommendation	All
Recommendation 2 - Weed and biomass control	
Recommendation	That the MSA program (DEECA) works with Agriculture Victoria (DEECA) to prevent, contain and reduce the invasion and spread of *Catchment and Land Protection Act 1994* listed serious environmental weeds within the Western Grassland Reserve and 36 conservation areas.
Challenges this recommendation addresses	This report identified a significant weed cover increase within the Western Grassland Reserve and the 36 conservation areas. Some areas had 100% weed cover. This increase of weed cover led directly to some key performance indicators not achieving the baseline. The significant increase in weed cover is principally due to monitoring plots that were acquired and transferred to the Crown that did not have effective weed control prior to transfer.
MNES that will be improved by the recommendation	All
Recommendation 3 - Illegal waste dumping	
Recommendation	That the MSA program (DEECA) coordinates with EPA Victoria, Parks Victoria and local government to establish active surveillance of, and stronger compliance for, protected areas to address increasing illegal waste dumping activities.
Challenges this recommendation addresses	This report found that illegal waste dumping activities around the protected areas is increasing, particularly where development is occurring near the Western Grassland Reserve and conservation areas. The dumping of hazardous materials in the protected area could negatively impact on conservation outcomes. More active and systematic collaboration between responsible agencies could better address the illegal activities. Illegal waste dumping is increasing in many urban and peri urban areas and this recommendation could be incorporated into a broader compliance strategy.
MNES that will be improved by the recommendation	All

Recommendation 4 - Management effectiveness	
Recommendation	That DEECA updates the MSA Monitoring and Reporting Framework to include clear management responses and timelines to address program outcome KPIs that have not been achieved.
Challenges this recommendation addresses	The MSA Monitoring and Reporting Framework provides a rigorous scientific method for applying an adaptive management approach for the Melbourne Strategic Assessment conservation outcomes. However, it is unclear what specific actions will be triggered when specific key performance indicators are not achieved. This report has identified a decline of many Matters of National Environmental Significance by analysing Monitoring and Reporting Framework key performance indicators results in this reporting period. When there is a clear decline of ecological function and/or condition, it is unclear how this evidence is applied to improve MSA program implementation and outcomes.
MNES that will be improved by the recommendation	All
Recommendation 5 - Growling grass frog	
Recommendation	That DEECA reviews the key performance indicator suite for the growling grass frog to ensure it is comprehensive and contemporary to achieve the conservation outcomes.
Challenges this recommendation addresses	Currently, a single key performance indicator (occupancy) is used to assess the conservation outcome for the growling grass frog. Occupancy alone does not adequately assess if the growling grass frog has sustainable and functioning populations with healthy connectivity between populations.
MNES that will be improved by the recommendation	MNES 8 - Growling grass frog
Recommendation 6 - Matted flax-lily	
Recommendation	That DEECA coordinates interim management works (including biomass control) for the Donnybrook Cemetery in Conservation Area 24 to protect the matted flax-lily population.
Challenges this recommendation addresses	The key performance indicator assessment indicates that the matted flax-lily population in Conservation Area 24 is declining. Approximately half of the monitoring plots are located within the Donnybrook Cemetery. These plots will not be actively managed until the land custodian of the cemetery is transferred to the Hume City Council. This delay in land management will potentially result in the key performance indicator assessment for Conservation Area 24 declining below the baseline in the next audit (2026).
MNES(s) that will be improved by the recommendation	MNES 5 - Matted flax-lily

Victorian Government progress on recommendations made in the Strategic Audit of the Implementation of Melbourne Strategic Assessment Conservation Outcomes 2022 Report

Table 6: Recommendations that are proposed in the Melbourne Assessment Conservation Outcomes 2022 Report and their associated Government responses as presented on the DEECA webpage.

Theme	Recommendation	MSA 2022 Recommendation[1]	DEECA's webpage	DEECA's Response
Monitoring, evaluation and reporting on the conservation outcomes	1	That DELWP undertakes a review of the MSA ecological monitoring and reporting framework (MRF), including a redesign of existing methods and KPI measures where required, to achieve landscape-scale, MNES conservation outcomes. This would include establishing a research strategy to address priority knowledge gaps and improve understanding of MNES and their management.	DEECA should review the MSA Program's ecological monitoring and reporting framework. This should include redesigning existing methods and measures where required to achieve landscape-scale conservation outcomes. DEECA should address knowledge gaps through a research strategy.	We are: • Reviewing and updating the monitoring and reporting framework. • Developing a strategy to address knowledge gaps (to inform decision-making and management).
Traditional Owner rights, knowledge, values and participation	2	That DELWP implements a strategy to embed Traditional Owner rights, knowledge, values and participation in the MSA program design and implementation. This includes mechanisms for the inclusion of cultural heritage and Traditional Owner values into the MSA program logic and Monitoring and Reporting Framework (MRF).	DEECA should produce a strategy to embed Traditional Owner rights and knowledge into the MSA Program. This includes their values, cultural heritage, and participation in its design and implementation.	We are: • Creating a strategy to include Traditional Owners' rights, knowledge, values, and participation in the program. • Additionally, we are funding activities to build capacity in Registered Aboriginal Parties.
Program design, governance and coordination (Program logic)	3	That DELWP: • Undertakes a contemporary redesign of the MSA program logic in consultation with Traditional Owners, scientists, land managers and community, and • establishes a governance framework that supports clearer decision-making and risk management practices at all levels of MSA planning and implementation	DEECA should: • Redesign the MSA program logic. Consult Traditional Owners, scientists, land managers, and other stakeholders. • Create a governance framework to improve program decision-making and risk management.	We are: • Updating the program logic and consulting with key stakeholders. • Reviewing and updating the governance arrangements for the program, including all decision-making processes.

Theme	Recommendation	MSA 2022 Recommendation[1]	DEECA's webpage	DEECA's Response
Program design, governance and coordination (Land acquisition)	4	That DELWP actively implements a risk-based land acquisition strategy that prioritises MNES conservation outcomes. The land acquisition strategy must include the identification of interim management needs to support outcomes for MNES in priority areas where delays in acquisition have occurred and/or are likely to occur.	DEECA should: • Adopt a risk-based land acquisition strategy. It should prioritise conservation and include interim management.	We have: • Prepared a risk-based land acquisition strategy for the WGR.
Natural temperate grassland	5	That DELWP: • Modifies the monitoring methods for natural temperate grassland to organise by management unit as well as by state, and include 'time since acquisition' as a parameter • enhances interpretation of results by adding an overall 'grassland quality' metric to the KPI reporting suite, and • addresses areas where measures indicate grassland condition is deteriorating	DEECA should: • Modify the natural temperate grassland monitoring methods. Organise by management unit and state. Include 'time since acquisition' as a parameter. • Add a 'grassland quality' metric to the reports to improve interpretation of results • Address areas where measures show that grassland condition is deteriorating.	We are: • Reviewing and updating the monitoring and reporting framework.
Grassy eucalypt woodland	6	That DELWP: • delivers the grassy eucalypt woodland baseline by 2026 as planned and immediately adopts interim management arrangements to prevent deterioration in the condition of the areas most at risk • changes the monitoring methods for the grassy eucalypt woodland to be organised by management unit and by state, measure 'time since acquisition', and • adds an overarching 'grassland quality' metric to the KPI reporting suite	DEECA should: • Deliver the grassy eucalypt woodland baseline by 2026, as planned. Adopt interim measures now to prevent deterioration in at-risk areas. • Change the monitoring methods for the grassy eucalypt woodland. Organise them by management unit and by state. Also, measure 'time since acquisition'. • Add an overarching 'grassland quality' metric to the key performance indicator reporting suite.	We are: • Reviewing and updating the monitoring and reporting framework.

Theme	Recommendation	MSA 2022 Recommendation[1]	DEECA's webpage	DEECA's Response
Seasonal herbaceous wetland	7	That DELWP: • increases weed control efforts and funding for land managers to protect seasonal herbaceous wetland • undertakes further research on the impacts of grazing, hydrological modification, and supplementary plantings of other native species, and • broadens the KPI suite for future monitoring and reporting on wetland condition	DEECA should: • Increase weed control and funding for land managers to protect seasonal herbaceous wetland. • Do more research into grazing effects, hydrological changes, and planting other native species. • Broaden the KPI suite for future monitoring and reporting on wetland conditions.	We are: • Improving weed management in the WGR with our partners. • Reviewing key performance indicators. • Identifying information needs and priorities by developinga knowledge strategy.
Golden sun moth	8	That DELWP: • considers changes to the monitoring regime of the golden sun moth, and • undertakes research into biomass control impacts.	DEECA should: • Consider changes to how the golden sun moth is monitored. • Undertake research into the impacts of biomass control.	We are: • Changing the existing occupancy measure to an abundance measure. • Looking into relationships between golden sun moth and grassland biomass and composition.
Matted flax-lily	9	That DELWP schedules periodic genetic sampling of future populations of the matted flax-lily to ensure viability and develop a biomass control plan for the species.	DEECA should: Periodically sample the genetics of future matted flax-lily populations. This will ensure their viability. It will also help develop a biomass control plan for the species.	We are: • Using a population viability analysis to make a decision tree. This should address when and how to control biomass. • We accept the critical importance of genetic sampling for all larger populations.
Spiny rice-flower	10	That DELWP: • clarifies the monitoring design • assesses the adequacy of the current 10-year monitoring and reporting threshold, and • develop a biomass control plan for the spiny rice-flower	DEECA should: • Clarify the monitoring design. • Assess the adequacy of the current 10-year monitoring and reporting threshold. • Develop a biomass control plan for the spiny rice-flower.	We are: • Incorporating the updated monitoring design into the new monitoring and reporting framework. • Reviewing the 10-year monitoring and reporting thresholds. • Using existing Population Viability Analyses to create a decision tree. This should address when and how to control biomass.

Theme	Recommendation	MSA 2022 Recommendation[1]	DEECA's webpage	DEECA's Response
Southern brown bandicoot	11	That DELWP undertakes research into habitat preferences and species responses to pressures and management regimes for the southern brown bandicoot. This would include designing a protocol for leveraging citizen science and empowering partner organisations to contribute to reporting on the KPIs	DEECA should: • Research the southern brown bandicoot's habitat preferences. Study its responses to pressures and management. • Design a protocol for using citizen science. Empower partners to contribute to reporting on KPIs.	We will: • Review compatible data from other organisations on population trends. We will supplement this with a literature review. • Work with the Royal Botanic Gardens Cranbourne to boost community engagement and citizen science.
Growling grass frog	12	That DELWP establishes baseline monitoring for new corridors for the growling grass frog, evaluate threats and management responses, and encourage citizen science to supplement conventional monitoring.	DEECA should: • Monitor new corridors for the growling grass frog. Assess threats and management responses. • Encourage citizen science to supplement conventional monitoring.	We are: • Monitoring corridors under a five-year rolling program. This includes the Merri, Darebin, and Moonee Ponds Creek catchments, and the Emu and Jacksons Creek catchments. • Working with growling grass frog land managers to support community engagement and citizen science.
Small golden moths orchid	13	That DELWP urgently assesses the impacts of biomass and pests on the small golden moths orchid.	DEECA should: • Urgently assess the impacts of biomass and pests on the small golden moths orchid.	We are: • Reviewing and prioritising this knowledge gap and looking at establishing a monitoring regime.
Stripped legless lizard	14	That DELWP: • redesigns the KPI and monitoring protocol for the striped legless lizard, such that the measure for persistence is a randomly sampled measure for occupancy across all sites and accounts for new locations, and • undertakes research to assess habitat preferences and population dynamics for the striped legless lizard	DEECA should: Redesign the KPI and monitoring protocol for the striped legless lizard. The measure for persistence should be a randomly sampled occupancy measure across all sites. It should also account for new locations. Undertake research to assess habitat preferences and population dynamics for the striped legless lizard.	We are: • Reviewing and updating the monitoring and reporting framework. • We will assess habitat preferences using existing (and future) data.

Theme	Recommendation	MSA 2022 Recommendation[1]	DEECA's webpage	DEECA's Response
Button wrinklewort	15	That DELWP assesses the causes of recruitment failure for the button wrinklewort population, including research into germination, and develop a management plan for the species based on the findings	DEECA should: • Assess the causes of recruitment failure for the button wrinklewort population, including research into germination. • Develop a management plan for the species based on the findings.	We are: • Working on this recommendation with La Trobe University. • Future work will be refined through the new knowledge strategy and a review of the monitoring and reporting framework.
Large-fruit groundsel	16	That DELWP undertakes research into the benefits of population augmentation of the large-fruit groundsel via the planting of tube stock.	DEECA should: • Investigate the benefits of boosting populations of large-fruit groundsel by planting tube stock.	We are: • Reviewing, refining, prioritising, and implementing by preparing the knowledge strategy.

[1] The publication of the MSA 2022 Report occurred prior to the machinery of government changes, thus, the recommendations refer to DELWP as opposed to DEECA.

Small golden moths orchid.
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Background

The Commissioner has been tasked with preparing biennial reports on the implementation of MSA conservation outcomes. The Commissioner's function is stipulated under Section 8(b) of the CES Act as:

> 'to conduct, once every two years, strategic audits of, and prepare reports on, the implementation of – (ii) the MSA conservation outcomes by the Secretary to the Department of Energy, Environment and Climate Action (DEECA).' [63]

The organisational structure of DEECA includes ARI and the MSA program team, both within the Biodiversity Division, as well as Agriculture Victoria (AgVic). AgVic was transferred from the Department of Jobs, Precincts and Regions to DEECA following the machinery of government changes that took effect on 1 January 2023. However, as each government business area differs in their responsibilities in the delivery of the MSA program, they are referred to separately throughout this report.

MSA program

To accommodate Melbourne's future population growth and urban expansion, four growth areas were planned to cover 60,000 hectares under the Victorian government MSA program Delivering Melbourne's Newest Sustainable Communities.[64] These growth areas included several nationally listed biodiversity values that triggered requirements to address potential impacts on listed species and communities under proposed plans.

DEECA opted to undertake a strategic assessment, based on the assumption that it would provide biodiversity gains and cost efficiency over time.[65] A strategic assessment would enable a consolidated approach to impact assessment, preventing multiple smaller impacts from 'falling through the cracks'.[66]

This involved a streamlined regulatory assessment and approvals process under Commonwealth law, involving:

- a strategic assessment of all biodiversity values within a set area
- the creation of a set of requirements that defined which areas were to be avoided (those that are too important to be lost), and which areas could be removed or offset, through combining Commonwealth EPBC Act requirements and Victorian Native Vegetation Clearing requirements.

DEECA is obligated to fulfill the requirements of the Australian Government-approved MSA program and BCS.[67, 68] These requirements are based on timestamped native vegetation datasets and values assessments performed in the original 2010 strategic assessment, and include:

- defined areas (as defined by the BCS) of high biodiversity value to which environmental impacts must be avoided (where development should not take place)
- defined areas in which environmental impacts are minimised through close regulation during precinct structure planning, including within a buffer region around all conservation areas
- defined areas of low biodiversity value that can be cleared within the UGB that that are consolidated and offset
- the application of consolidated levy fees that developers pay the Victorian Government. The Government uses this revenue to buy land for new conservation areas and organised land management for biodiversity offsets on developers' behalf.

The MSA program's strategic biodiversity offsetting program was established to ensure no net loss was achieved for biodiversity throughout the implementation of Growth Area Framework Plans. This offset program compensates for biodiversity losses arising from native vegetation removal.

63. State Government of Victoria 2003, '*Commissioner for Environmental Sustainability Act 2003*', Melbourne, Victoria.
64. Department of Environment and Primary Industries 2009, 'Delivering Melbourne's Newest Sustainable Communities: Program Report', East Melbourne, Victoria.
65. Department of Environment and Primary Industries 2009, 'Delivering Melbourne's Newest Sustainable Communities: Strategic Impact Assessment Report', East Melbourne, Victoria.
66. Department of Environment and Primary Industries 2013, 'Biodiversity Conservation Strategy for Melbourne's Growth Corridors', East Melbourne, Victoria.
67. Department of Environment and Primary Industries 2009, 'Delivering Melbourne's Newest Sustainable Communities: Program Report', East Melbourne, Victoria.
68. Department of Environment and Primary Industries 2013, 'Biodiversity Conservation Strategy for Melbourne's Growth Corridors', East Melbourne, Victoria.

Major offsets under the MSA program include the establishment of:

- a 15,000-hectare WGR west of Melbourne across council areas
- a 1,200-hectare GEWPA near Whittlesea outside the UGB
- 4,000 hectares of reserves within new suburbs inside the UGB
- sustainable populations of the growling grass frog and the southern brown bandicoot moving in and out of the suburbs
- locations of these areas can be found in Figure 6. This protection and management of more than 20,000 hectares of the highest quality remnant natural habitat around Melbourne's fringe is aimed at complying with the environmental obligations of the EPBC Act, while also addressing the housing demand due to the increasing population of Melbourne.

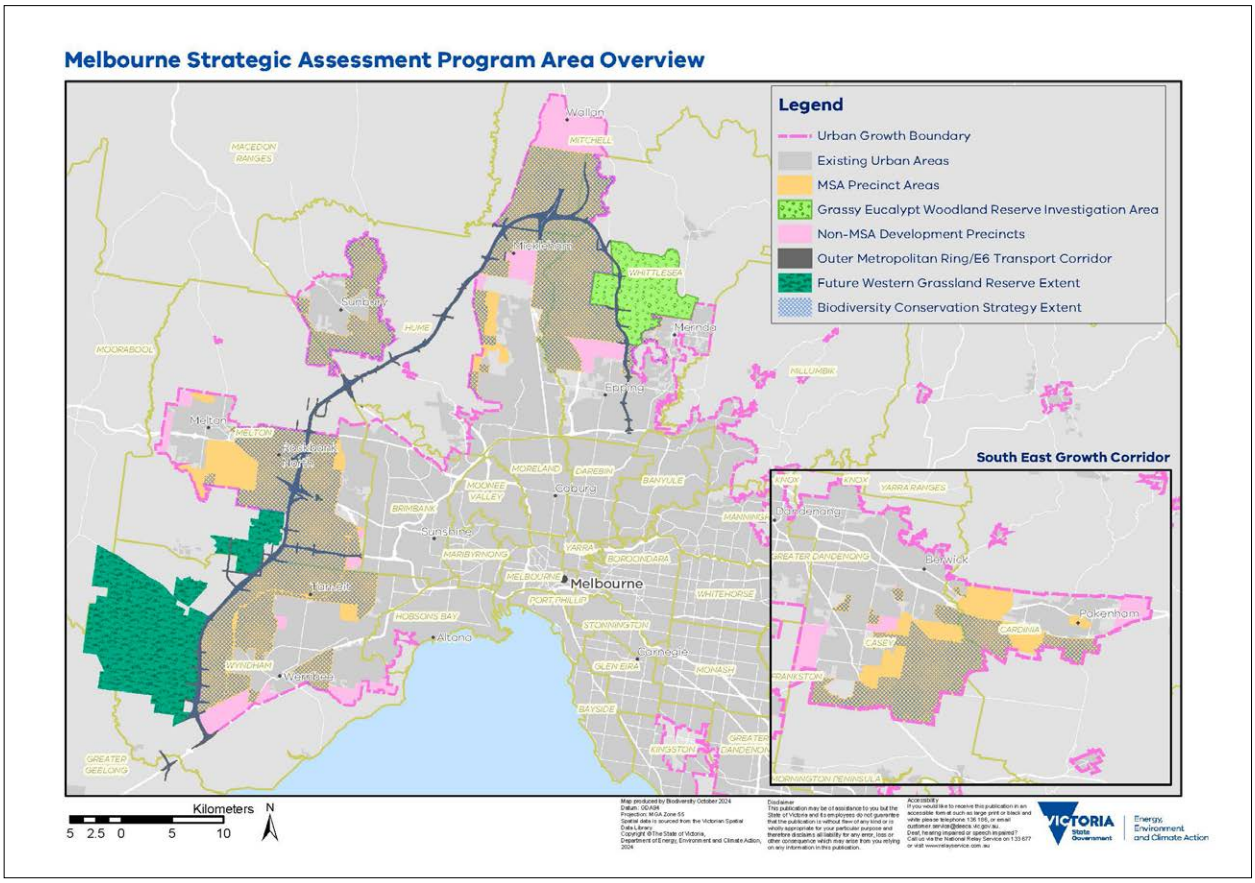


Figure 6: Overview of the Melbourne Strategic Assessment program area that describes locations of major program areas, including Western Grassland Reserve, Biodiversity Conservation Strategy extent and Grassy Eucalypt Woodland Reserve Investigation Area. Source: DEECA.

The MSA program's conservation commitments

DEECA's MSA BCS and Sub Regional Species Strategies were the initial documents, approved by the Australian Government, in which conservation objectives for the MNES under MSA management were defined.[69] The BCS identifies management strategies for areas of biodiversity value.

The requirement to prepare the BCS arose from the Program Report that committed to: 'An overarching BCS [...] for each of the expanded growth corridors.' [70]

These strategies were intended to inform preparation of the Growth Area Framework Plans and to provide high level guidance for practitioners. They outline how the areas of biodiversity value (State and Australian) within the growth areas will be managed and spatially identify how outcomes for MNES will be delivered.

69. Department of Environment and Primary Industries 2013, 'Biodiversity Conservation Strategy for Melbourne's Growth Corridors', East Melbourne, Victoria.
70. Department of Environment and Primary Industries 2009, 'Delivering Melbourne's Newest Sustainable Communities: Program Report', East Melbourne, Victoria.

According to DEECA, the purpose of the BCS is to:

- inform and guide the preparation of the Growth Corridor Plans
- outline how the conservation outcomes for MNES in the program report will be achieved spatially within the growth corridors and how impacts on these matters will be mitigated
- identify the land within the growth corridors that is required to be protected due to the sub-regional species strategies and prescriptions for MNES
- identify how areas set aside for conservation will be managed
- outline how mitigation measures will be implemented across the MSA program area.[71]

These conservation measures are meant to comprise:

- the protection and management of land of high biodiversity value within defined conservation areas and areas outside the UGB
- requirements to provide offsets for removal of native vegetation and threatened species habitat on land not required for conservation and suitable for urban development
- requirements to salvage and translocate certain threatened species prior to removal of habitat on land not required for conservation and suitable for urban development.

The BCS aims to apply the requirements of the MNES prescriptions and the Native Vegetation Management Framework, at a growth corridor level, to identify conservation areas, and remove the need to protect additional land resulting from these requirements at the precinct structure planning stage, or other development approval stages.[72, 73]

71. Department of Environment, Land, Water and Planning (DELWP), 'Personal communication', 23 August 2021.
72. Department of Sustainability and Environment 2011, 'Native Vegetation Management – A Framework for Action', Melbourne, Victoria.
73. Department of Environment and Primary Industries 2013, 'Biodiversity Conservation Strategy for Melbourne's Growth Corridors', East Melbourne, Victoria.
74. State Government of Victoria 2022, Victorian Government Gazette, Issue G4, 'Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020 - Notice of the Conservation Outcomes', http://www.gazette.vic.gov.au/gazette/Gazettes2022/GG2022G004.pdf Accessed 27 January 2022.
75. Department of Environment, Land, Water and Planning (DELWP) 2015, 'Monitoring and Reporting Framework – Melbourne Strategic Assessment', East Melbourne, Victoria.
76. Biggs HC, and Rogers KH 2003, 'An adaptive system to link science, monitoring, and management in practice. In The Kruger Experience: Ecology and Management of Savanna Heterogeneity' J.T. du Toit, K.H. Rogers, and H.C. Biggs, eds. Washington, D.C.: Island Press, pp. 59–80.

MSA conservation outcomes for MNES under Victorian legislation

The MSA program's implementation of the conservation outcomes has been brought under Victorian regulation through the introduction of the MSA Act. The conservation outcomes were formally defined by notice in the Victorian Government Gazette (Part 6, Section 93 of the MSA Act) in January 2022 and set out a range of measures to limit and offset the impacts of urban development on threatened species and ecological communities listed as MNES in the growth areas of Melbourne.[74]

The Commonwealth-approved 2015 MSA MRF formally defined outcomes for MNES and DEECA has subsequently structured these using as a simple two-tier 'objectives hierarchy' with a single overarching 'desired outcome' for each species and community, each with underlying KPIs.[75, 76]

The following single outcome statements, one for each species or community, form the basis of the 2015 MRF document:

- The composition, structure and function of natural temperate grassland of the Victorian Volcanic Plain improves
- The composition, structure and function of grassy eucalypt woodland of the Victorian Volcanic Plain improves
- The composition, structure and function of seasonal herbaceous wetlands of the temperate lowland plains improves
- No substantial negative change to populations of button wrinklewort
- No substantial negative change to populations of large-fruit groundsel
- No substantial negative change to small golden moths orchid
- Matted flax-lily persists
- No substantial negative change to the population of spiny rice-flower, and the population is self-sustaining
- Golden sun moth persists
- Growling grass frog persists
- Southern brown bandicoot persists
- Striped legless lizard persists

DEECA treats each of these as independent program outcomes, all of which must be achieved for the MSA to be fulfilling its obligations.

Regulatory environment

The MSA program aligns State and Commonwealth biodiversity regulation under one program, aiming to ensure that urban development within Melbourne's growth areas complies with all biodiversity requirements in a streamlined way.

Many historical planning and regulatory changes have enabled the current MSA program, as outlined in Table 7.[77]

Table 7: Timeline of regulatory changes enabling the MSA program.

Urban planning and regulation	Biodiversity planning and regulation
1987 Regulation of development standardised • P&E Act introduced	1988–1989 broadscale clearing ended • Planning permit required under the P&E Act to clear native vegetation
2002 Urban expansion coordinated • UGB introduced under the P&E Act • Melbourne 2030 – planning for sustainable growth (2002) released	1999–2002 offsetting rules introduced • EPBC Act introduced • Victorian Native Vegetation Management Framework introduced under the P&E Act
2005–2008 urban demand and supply planned • Population growth was projected until 2030 • First urban boundary expansion • Growth Areas Authority created (now Victorian Planning Authority)	2004–2006 Measuring losses and gains • Ecological Vegetation Classes (EVCs) are benchmarked for assessments • EVC extent and quality is projected with computer modelling • Mathematical methods for measuring losses and gains are set • Victorian offset market opens for trading
2009 Victorian Government's urban development program plan, Delivering Melbourne's Newest Sustainable Communities, released 2010 MSA Program Report approved 2013–2014 all urban development actions associated with MSA growth corridor plans approved 2017 Plan Melbourne released	2008–present MSA program delivery 2008 natural temperate grasslands listed as critically endangered MNES under the EPBC Act 2009 grassy eucalypt woodland listed as critically endangered MNES under EPBC Act 2013 BCS approved by the Minister for Environment 2013 seasonal herbaceous wetlands listed as critically endangered MNES under EPBC Act 2015 MSA formal ecological monitoring program commences
	2020 MSA Act introduced into Victorian legislation

The role of the Australian Government

The Australian Government has overall responsibility for ensuring that only actions that have been approved by the Federal Minister for the Environment are undertaken under the MSA program, and that all actions are consistent with the program. The Australian Government, represented by the Federal Minister for the Environment, has had an approval role at various stages of the program planning. During the implementation stage of the program the Australian Government's role has reduced.[78]

Strategic reforms

This Report is likely to contain interlinkages with other environmental legislative, policy and process reviews with potential to inform this work at a strategic level, including:

- The 2014 Senate Inquiry Environmental Offsets[79]
- The 2019 VAGO audit: Protecting Critically Endangered Grasslands[80]
- Parliamentary Review of the EPBC Act 2020[81]
- Parliamentary Inquiry into Ecosystem Decline in Victoria 2021[82]
- The 2021 VAGO audit: Protecting Victoria's Biodiversity[83]

VAGO audit: Protecting Critically Endangered Grasslands

In 2019, the Victorian Auditor-General's Office (VAGO) undertook an audit — Protecting Critically Endangered Grasslands — focusing on the MSA program's implementation with respect to its commitments to protect natural temperate grasslands and grassy eucalypt woodlands. VAGO's objective was to determine whether the management of native vegetation clearing was protecting state and nationally significant native vegetation in the extended UGB areas.

Under the MSA program, the Victorian government committed to establishing natural temperate grassland and GEWPA as offsets by 2020, via acquisition through use of a public acquisition overlay (PAO). A PAO is a planning mechanism that is used by the government to identify areas for protection through planning scheme amendments on Crown land. Currently, no land has been acquired for the GEWPA that is intended to be established outside, on the fringe, of the UGB. The Approximately 25% of the 15,000-hectare area of the WGR, established mainly to protect natural temperate grassland, has been protected.

Natural temperate grassland and grassy eucalypt woodland used to be widespread across the Victorian Volcanic Plain, in the state's south-west. While these once covered over a third of the state, these communities are now small and fragmented, and considered two of Victoria's most important and biodiverse ecological communities.

In June 2008 and June 2009, the Commonwealth listed natural temperate grassland and grassy eucalypt woodland, respectively, as critically endangered under the EPBC Act.

As part of the 2019 audit, VAGO assessed:

- progress made toward establishing the natural temperate grassland and GEWPA
- monitoring, evaluation and reporting processes by DEECA and its predecessors to support the delivery of these commitments
- program governance and risk management practices.

VAGO made seven recommendations to DEECA, and DEECA responded to each recommendation with agreed actions toward improvements to the MSA program. The Commissioner acknowledges the significant research and analysis undertaken by VAGO and others in recent years and references this work where relevant.

77. Department of Environment, Land, Water and Planning (DELWP), 'Personal communication', 23 August 2021.
78. Department of Environment, Land, Water and Planning (DELWP), 'Personal communication', 8 September 2021.
79. Commonwealth Government of Australia, The Senate, Environment and Communications References Committee, 2014, 'Inquiry into Environmental offsets: Report', Canberra, Australia.
80. Victorian Auditor-General's Office 2020, 'Protecting Critically Endangered Grasslands', Independent assurance report to Parliament 2019–20: 16, Melbourne, Victoria.
81. Commonwealth Government of Australia, Department of Environment 2020, 'Final Report of the Independent Review of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)', Canberra, Australia.
82. Parliament of Victoria, Legislative Council, Environment and Planning Committee 2021, 'Inquiry into ecosystem decline in Victoria', Melbourne, Australia.
83. Victorian Auditor-General's Office 2021, 'Protecting Victoria's Biodiversity', Independent assurance report to Parliament 2021–22:07, Melbourne, Victoria.

The MSA Act and the role of the Commissioner for Environmental Sustainability

The MSA Act took effect in July 2020 and establishes a new Victorian legislative framework for the existing MSA program.[84] The Act imposes a levy to fund regulatory measures designed to mitigate impacts on biodiversity caused by the development of land in Melbourne's growth corridors. The MSA Act also defines a role for the Commissioner to report on the MSA conservation outcomes every two years.

The MSA conservation outcomes set out a range of measures to limit and offset the impacts of urban development on threatened species and ecological communities listed as MNES in the growth areas of Melbourne. These conservation outcomes were formally defined by the Victorian Minister for Energy, Environment and Climate Change, by notice in the Government Gazette (Part 6, Section 93 of the MSA Act) in January 2022.

A key role of the Commissioner is to provide independent and objective scientific reporting to inform and provide assurance to policymakers, scientists, and the wider Victorian public on the implementation of the MSA program's conservation outcomes, which is supported by the MSA Act and CES Act. Reporting on the implementation of the MSA conservation outcomes is a deliverable of the Commissioner's broader program to make environmental reporting more impactful and lead to improved environmental outcomes.

As stated in the Commissioner's Framework for the Victorian State of the Environment 2023 Report - Science for Sustainable Development, the long-term goal of environmental reporting is to maintain a healthy environment.[85] Building a stronger scientific evidence base and developing recommendations to improve environmental outcomes has been a key focus of the Commissioner's work with partners and collaborators across the community, government and industry. The Commissioner has advocated for the important role of science, and investment by government, in developing the tools and capabilities that we need to adequately protect, manage and restore Victoria's environment.[86]

The Commissioner produces a suite of reports, including the State of the Environment, State of the Marine and Coastal Environment, State of Great Ocean Road Coast and Parks and State of the Yarra and Its Parklands reports. These reports provide independent and evidence-based assessments of the condition of Victoria's natural environment, with recommendations focusing on developing solutions and achieving improvements for ESD in Victoria.

84. State Government of Victoria 2020, 'Melbourne Strategic Assessment (Environment Levy Mitigation) Act 2020', Melbourne, Victoria.
85. Commissioner for Environmental Sustainability Victoria 2020, 'Framework for the Victorian State of the Environment 2023 Report Science for Sustainable Development', Melbourne, Victoria.
86. Commissioner for Environmental Sustainability Victoria 2020, 'Framework for the Victorian State of the Environment 2023 Report Science for Sustainable Development', Melbourne, Victoria.

Commissioner *for* Environmental Sustainability Victoria

Part 2. Scientific Assessments

Grassland looking towards the You Yangs.
© DEECA

Assessing the conservation outcomes

Part 2 of this report contains the detailed key performance indicator (KPI) results for all Matters of National Environmental Significance (MNES). Data are supplied by the Department of Energy, Environment and Climate Action (DEECA) in relation to status and trend information against conservation outcomes for MNES defined in the 2015 Melbourne Strategic Assessment Monitoring and Reporting Framework (MSA MRF) and published in the Victorian Government Gazette, with the data acquisition period for this report having ended on 21 June 2024.[87] To assess the gazetted conservation outcomes, a three-tier approach was applied:

- DEECA collects ecological condition data according to the MRF report against a set of KPIs for program outcomes for each MNES. These data were used to assess the gazetted conservation outcomes that are related to ecological conditions.
- DEECA's progress in land acquisitions was used to assess the conservation outcomes that are related to permanent land protections. The MRF has KPIs for program outputs for land protection through acquisitions. Conservation outcomes for some species (e.g. spiny rice-flower) explicitly have land protection written into the gazetted outcomes.
- Evidence from other government agencies, including Parks Victoria (PV), local governments and stakeholders.

DEECA's MSA Monitoring and Reporting Framework

The 2015 MSA MRF contains the most current approved Program Logic for the program's 'output' and 'outcomes' reporting.[88] 'Outputs' are mainly related to land acquisitions, including the Western Grassland Reserve (WGR) which is a 15,000-hectare grassland reserve establishment. The 'outcomes' refer to conservation outcomes for MNES under MSA management. The official MRF document has not been updated since 2015, however, this is still referenced by DEECA as a document that:

> 'mandates [...] annual data collection [and] that ecological outcomes be reported every five years to provide the Australian Government and public with the data required to determine whether Victoria is fulfilling obligations under the MSA.' [89]

The MSA MRF program has eight program outputs with relevant KPIs:

- Urban and infrastructure development occurs in accordance with Commonwealth approvals.
- Program cost recovery and expenditure is transparent and efficient.
- A 15,000-hectare grassland reserve is established and managed.
- A network of 4,000 hectares of conservation areas within the Urban Growth Boundary (UGB) is protected and managed for MNES species and ecological communities.
- A 1,200-hectare Grassy Eucalypt Woodland Protected Area (GEWPA) is established and managed outside the UGB.
- Eighty percent of grassy eucalypt woodland within the UGB is protected and managed.
- Eighty percent of confirmed highest priority habitat for golden sun moth, spiny rice-flower and matted flax-lily is protected and managed.
- Important landscape and habitat areas for southern brown bandicoot are protected and managed.

87. State Government of Victoria 2022, 'Victorian Government Gazette, Issue G4, *Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020* – Notice of the conservation outcomes', http://www.gazette.vic.gov.au/gazette/Gazettes2022/GG2022G004.pdf Accessed 17 September 2024.
88. Department of Environment, Land, Water and Planning (DELWP) 2015, 'Monitoring and Reporting Framework – Melbourne Strategic Assessment', East Melbourne, Victoria.
89. Bruce M, Batpurev K, Bryant D, Sinclair S and Kohout M 2020, 'Melbourne Strategic Assessment: Ecological Outcomes Report 2014-15 to 2019-20', Department of Environment, Land, Water and Planning, Heidelberg, Victoria.

This protection and management of more than 20,000 hectares of the highest quality remnant natural habitat around Melbourne's fringe aims to comply with the environmental obligations of the EPBC Act. The development of the MRF was also aimed at meeting these obligations.

The Commonwealth-approved 2015 MSA MRF formally defined outcomes for MNES for program outcomes.[90] This was structured as a simple two-tier 'objectives hierarchy' with a single overarching 'desired outcome' for each species and community, each with underlying KPIs.[91]

The following single outcome statements, one for each species or community, form the basis of the 2015 MSA MRF document:

- The composition, structure and function of natural temperate grassland of the Victorian Volcanic Plain improves
- The composition, structure and function of grassy eucalypt woodland of the Victorian Volcanic Plain improves
- The composition, structure and function of seasonal herbaceous wetlands of the temperate lowland plains improves
- No substantial negative change to populations of button wrinklewort
- No substantial negative change to populations of large-fruit groundsel
- No substantial negative change to small golden moths orchid
- Matted flax-lily persists
- No substantial negative change to the population of spiny rice-flower and the population is self-sustaining
- Golden sun moth persists
- Growling grass frog persists
- Southern brown bandicoot persists
- Striped legless lizard persists.

DEECA treats each of these as independent program outcomes, all of which must be achieved for the MSA to be fulfilling obligations. Based on this program outcome for each MNES, KPIs for program outcomes were developed.

The current MSA MRF was released in 2015, and DEECA has been updating the MRF to reflect the conservation outcomes defined in the Government Gazette and ensuring that these reflect the manner in which the MSA program is currently being delivered. Key changes include:

- Updated conservation outcomes for consistency with the notice in the January 2022 Government Gazette that includes adjustments to KPIs, data sources and data collection methods to provide clarity and reflect current practices
- Minor adjustments such as outdated or unnecessary information, terminology and references
- Updated program logic to reflect the abovementioned adjustments and current delivery arrangements.

These changes have yet to be reflected in an updated version of DEECA's official MSA MRF document. No formal external review or consultation process has occurred to inform changes to the monitoring framework, as DEECA has relied largely on internal expertise.

DEECA is the primary custodian of the data collected through the Arthur Rylah Institute's (ARI) annual MSA ecological monitoring program. The ARI has been undertaking annual data collection for the MSA ecological monitoring program since 2013, involving field surveys tailored to the characteristics of each species and ecological community (Figure 7). These are used to measure progress towards the conservation outcomes, as described in the 2015 MRF and summarised in the MSA Outcome Reports 2014 to 2020. KPIs for species include measures relating to population counts, detection rates, recruitment and occupancy. KPIs for communities include measures relating to plant species richness and cover of weed and native species, and state change for woodland, grassland and spatial heterogeneity. The MSA outcome reports spanning from 2014 to 2020 have notably not presented detailed analyses or interpretation of the monitoring results. Instead, a statement of whether each KPI was met, and some brief qualitative discussions of distinct trends have been offered.

90. Department of Environment, Land, Water and Planning (DELWP) 2015, 'Monitoring and Reporting Framework – Melbourne Strategic Assessment', East Melbourne, Victoria.
91. Biggs HC and Rogers KH 2003, 'An adaptive system to link science, monitoring, and management in practice. In The Kruger Experience: Ecology and Management of Savanna Heterogeneity' J.T. du Toit, K.H. Rogers, and H.C. Biggs, eds. Washington, D.C.: Island Press, pp. 59–80.

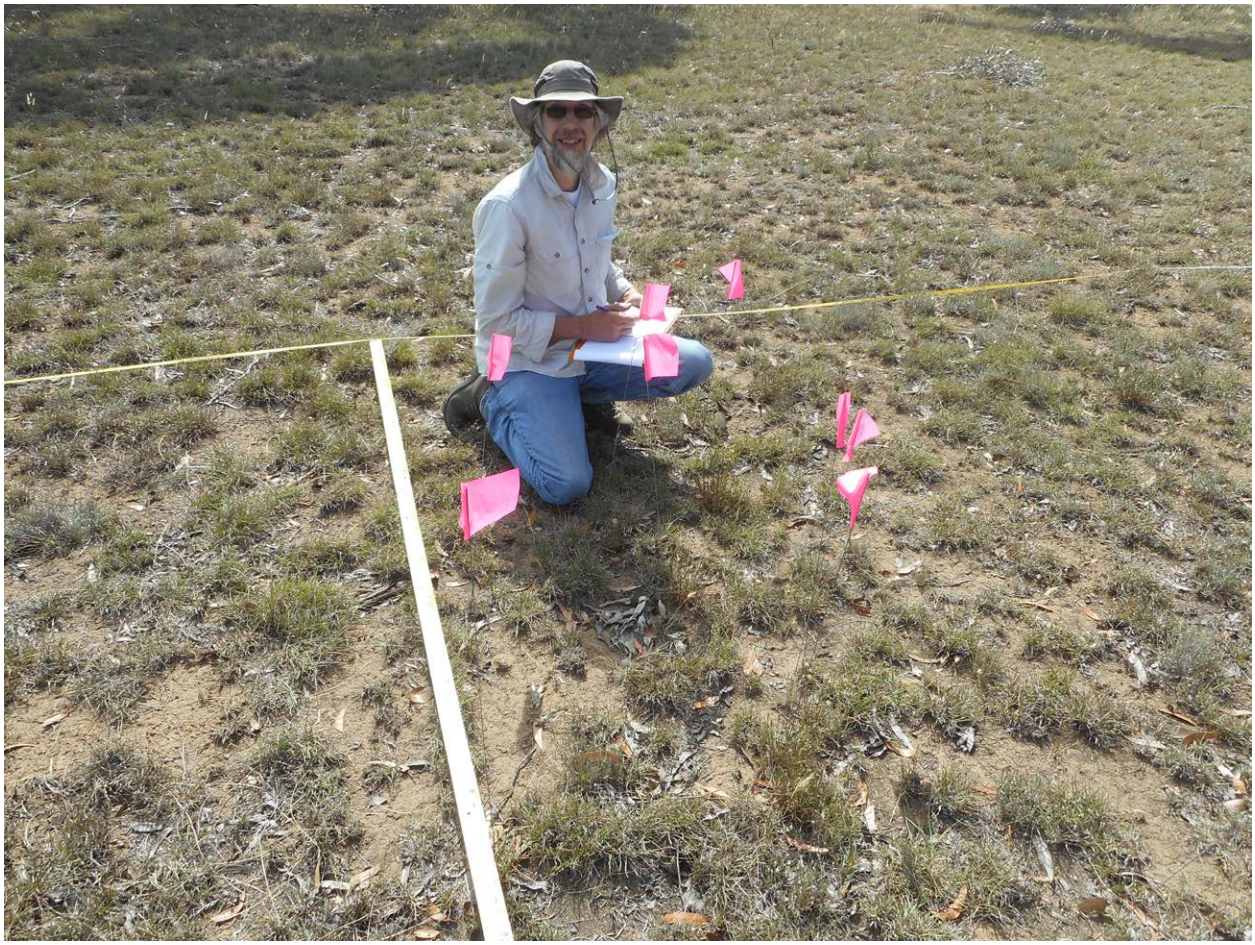


Figure 7: Annual monitoring of natural temperate grassland being undertaken by DEECA staff in the Truganina Cemetery to measure ecological characteristics. Source: DEECA.

DEECA's progress in land protections

DEECA's land protections is a critical component for many gazetted conservation outcomes. DEECA provided their most current progress in land acquisitions to evaluate the conservation outcomes. Internal analysis was conducted by the Victorian Commissioner for Environmental Sustainability in consultation with DEECA for conservation areas to achieve this outcome. More details of the analysis can be found in 'Progress in land protections in conservation areas.' Land protection status in the WGR was provided by DEECA.

Evidence from the other Government agencies and stakeholders

In addition to DEECA, various agencies and stakeholders are directly or indirectly involved in the MSA program who also have valuable information related to conservation outcomes. For example, DEECA has limited information on the growling grass frog as the data collection cycle has not been completed, therefore, KPI assessment is not feasible. RMIT University and passionate community stakeholders have long-term or critical data that indicate the trend and status of the species.

How to read KPI results in Part 2 of this report

Results in Part 2 of this report are separated into themes by MNES (i.e. by communities and species).

These MNES are:

- **Ecological communities:** Natural temperate grassland, grassy eucalypt woodland and seasonal herbaceous wetlands.
- **Threatened species:** Golden sun moth, matted flax-lily, spiny rice-flower, southern brown bandicoot, growling grass frog, small golden moths orchid, striped legless lizard, button wrinklewort and large-fruit groundsel.

For each of the 12 MNES, information will be provided on:

- **Background:** Brief information on the ecological characteristics of the species/ecological community, including status of *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listing.
- **DEECA's conservation commitments and relevant KPIs:** The DEECA 2015 MSA MRF considers the gazetted conservation outcomes. The framework specifies that implementation of MSA program activities and processes is expected to lead to the delivery of program outputs. These outputs are generally related to the protection of MNES through land acquisitions and are expected to lead to program outcomes that are generally related to ecological conditions. Each MNES section in this report will specify which conservation outcome is related to which program output and outcome.
- **Conservation outcomes assessed:** Conservation outcomes that are related to KPIs for program outputs will provide the current progress in land acquisitions/protections. KPIs for program outputs are outdated as these were developed in 2015 prior to the conservation outcomes being gazetted in 2022, seven years later. In addition, these KPIs do not align appropriately with the conservation outcomes. Therefore, any conservation outcomes that are related to land acquisitions/protections will be reported as areas acquired/protected. Once the MRF has been updated (currently in progress), reporting against KPIs will be available.

  Conservation outcomes that are related to KPIs for program outcomes (ecological conditions/functions) will have a summary of findings section based on KPI assessments.

  - Monitored areas for program outcomes: This section will provide information on areas surveyed for ecological conditions/functions.
  - KPIs assessed for conservation outcomes: For each MNES, there are one or more KPIs for program outcomes. Most MNES have a single conservation outcome that is aligned with MRF program outcomes except for the spiny rice-flower (Conservation Outcomes 2 and 3). There is a summary table at the beginning of the relevant section for each KPI for program outcomes. This table is a quick guide to the status of a KPI for the current reporting period. It shows the relevant reporting unit (location, population or state for woodland and grassland) and indicates whether the KPI was achieved, not achieved or not assessed. Reasons for this to not have been assessed include that the MNES is not currently protected (or too few locations are protected), too few years have elapsed for the KPI to be assessed (i.e. the baseline is not set) or the KPI is only assessed after a particular event that has not occurred in the relevant period (e.g. wetland flooding).
  - Data: Underlying raw data exist that contribute significantly to the evidence base and understanding regardless of the KPIs, the baseline and/or the target. However, assessment of these data is undertaken with an awareness of potential links to the KPIs.
- **Results:** Progress (status, trend and data confidence) against existing KPIs and delivery targets defined under the MSA program's MRF).
- **Key insights and management implications**.

Charts or tables that show annual data relevant to the KPI for program outcomes are also included. The most common of these is a chart which depicts a baseline (represented by a horizontal dashed line), the temporal trend in the indicator (represented by a green line) and the relevant mean used for assessing performance against the KPIs (typically a five-year rolling mean) with 95% confidence intervals (represented by a red line) (Figure 8). The KPI results in 2022 and 2023 may appear to be below the baseline but the 95% confidence interval is still within the baseline, meaning that this KPI has met the baseline.

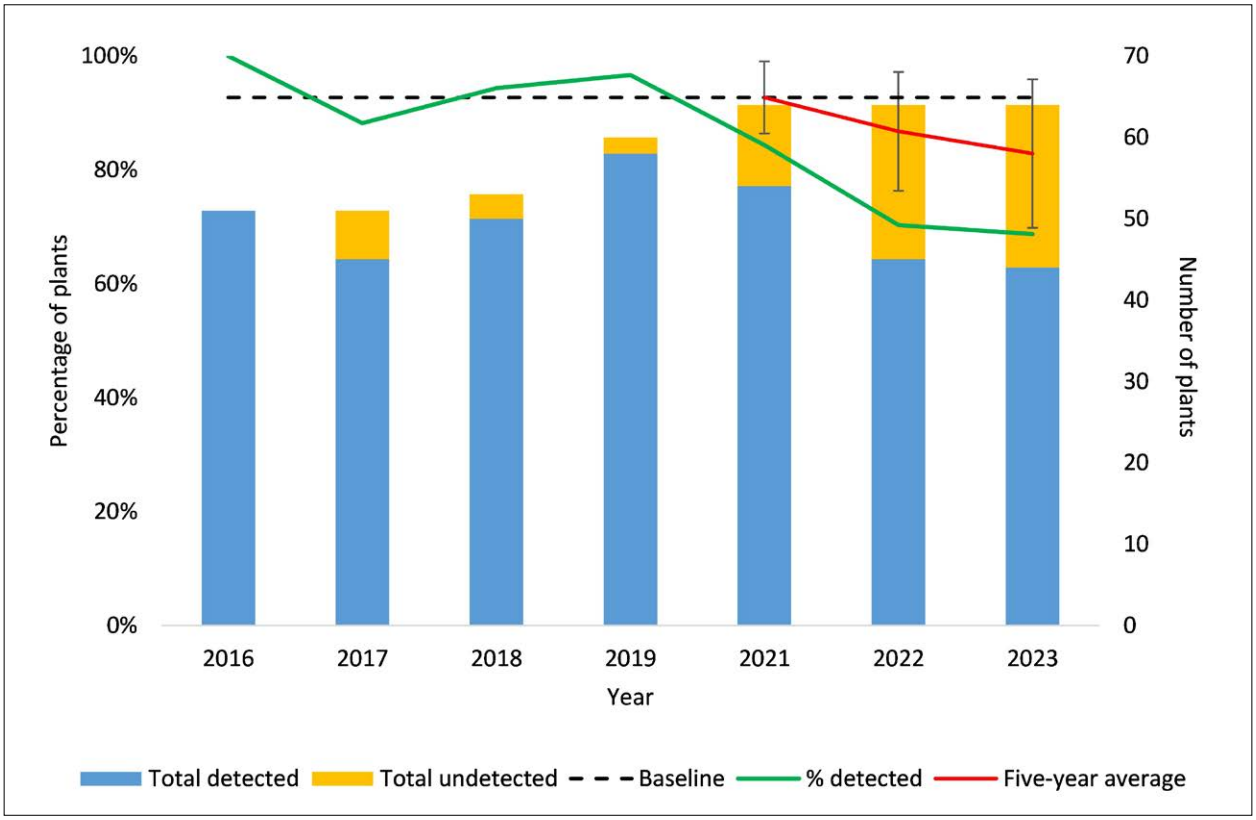


Figure 8: Example of a KPI indicator chart for which the KPI was recorded as achieved. The bar chart shows the total number of detected and undetected matted flax-lily plants in Conservation Area 24 between 2016 and 2023. Dashed line indicates the baseline value (93%). Green line indicates the annual detection rate. Red line indicates the five-yearly moving average with a 95% confidence interval. Source: DEECA.

Data source

This report presents data that are mainly supplied by DEECA in relation to status and trend information against conservation outcomes for MNES defined in the MRF and published in the Victorian Government Gazette, with the data acquisition period for this report having ended on 21 June 2024.[92] Some additional data were supplied by PV, local councils, RMIT University and Trust for Nature.

Status 2022–2024

The status of each MNES conservation outcome's KPI for the program outcome is assessed as either 'met', 'not met', 'partially met' or 'not assessed' according to the objective defined by the KPI. DEECA has created performance targets that determine these statuses for each MNES under MSA management.

92. State Government of Victoria 2022, '*Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020* – Notice of the conservation outcomes', http://www.gazette.vic.gov.au/gazette/Gazettes2022/GG2022G004.pdf Accessed 24 September 2024.

Targets vary according to the characteristics of the species or ecological community, however, there are several consistent themes:

- Most KPIs are assessed against a baseline that sets the measure above which the relevant attribute must remain (for desirable attributes such as populations of threatened species) or below (for undesirable attributes such as weeds). In all such cases, the KPI is considered not met once the 95% confidence interval on the measure does not meet the baseline.
- In most cases, baselines are set by the conditions at the commencement of monitoring. This means that the target is to maintain or improve on what was present when MSA management commenced. In addition, there is a need to meet offset obligations overall that adds another layer to this. In these cases, the baseline is calculated not from the first survey, but from the mean of the first five years' monitoring data. This approach is intended to dampen fluctuations between monitoring periods that are not related to management or long-term success (e.g. fluctuations in vegetation cover due to recent fires or animals' responses to weather conditions).
- A continuous improvement approach applies to some KPIs that DEECA has designed to encourage positive outcomes ('maintain gains') for MNES. In these cases, if the measured mean in a five-yearly reporting cycle is an improvement from the baseline, the measured mean sets a new target for the next five-year reporting period. DEECA states that this approach is beneficial for measures for which the most desirable outcome is always 'complete removal' (e.g. weeds) or 'as high as possible' (e.g. abundance of a listed species). The baseline is set and does not change regardless of the results for other KPIs. Such set baselines are considered appropriate in cases in which the attribute is desired at moderate levels. For example, it is desirable for the cover of kangaroo grass *(Themeda triandra)* in natural temperate grassland to be maintained within a range, therefore, a continuous improvement model is not appropriate.

There are exceptions to these general approaches that are based on considerations of the ecology and survey techniques applicable to the measure in question. These are described and explained in the MRF.

Reason for non-assessment of MSA monitoring and reporting framework key performance indicators

For some KPIs, an assessment could not be made, with reasons for this varying with each KPI. Reasons for non-assessments are defined below.

- N/A (not applicable).
- Baseline not yet set: For many of the KPIs, not enough time has elapsed for the baseline to have been set — as this occurs after the fifth year of monitoring once enough data have been collected. This means the baseline is set as the mean measure of five years of data for that KPI from the commencement of monitoring.
- Change in monitoring method: DEECA indicates that some changes to the monitoring methods have been necessary over time as new information comes in and knowledge of the species and systems improve. This has impacted the ability for an assessment to be made for some KPIs, as previous data collected according to outdated methodologies are no longer valid.
- Lack of drawdown event: For some of the seasonal herbaceous wetland KPIs, data may only be collected after a drawdown event has occurred.[93] An assessment has not been made due to this event not having occurred during the defined reporting period.

Trend

The trend summary presents an overall analysis of the trend assessments for each KPI. The trend identifies whether the status of the indicator is deteriorating, improving or remaining stable. The legend for trend in the report card reads as follows:

- Unclear
- Deteriorating
- Stable
- Improving.

93. This is the phase that evaporation begins to exceed rainfall. As a result, the water levels begin to drawdown, and the shallow Seasonal Herbaceous Wetland can dry out quickly.

Data confidence

Data confidence reflects the knowledge gaps and data limitations when assessing the status and trend of each KPI. The legend for data quality in the report card is:

- N/A: A KPI data confidence assessment has not been made because status and trend assessments have not been made for this indicator.
- Insufficient evidence: There is negligible evidence (that is, suitable data and/or thresholds) and no status or trend assessments can be made.
- Low: An assessment can be made but there is minimal evidence to guide the assessment.
- Moderate: Limited evidence or limited consensus.
- High: Adequate high-quality evidence and high level of consensus.

Broad findings and issues

Land acquisition to establish the reserves

This report found that the assessment of the conservation outcomes that are related to land acquisitions was difficult as no current timeframe for acquisition has been committed to by the Victorian Government. The report found that, as of October 2024, 25% of the WGR has been secured.

DEECA did not meet the Victorian Government's 2013 commitment to the Australian Government to establish the WGR and GEWPA by 2020. No land has yet been acquired for the GEWPA, and no target date has been identified. The Victorian Government advised the Australian Government in 2012 that the 2020 deadline for land acquisition would not be achieved.[94] The Australian Government formally noted this advice but a formal extension with timelines did not occur. DEECA advised that the timeline for delivery of establishing both reserves is 2060 based on the current levy review.[95]

When a parcel of land is acquired, DEECA conducts a survey to develop a vegetation and fauna inventory reports. These reports are used to develop a vegetation management plan with delivery partners that provides management actions and strategies (with targets) in the contracted time (10 years) to protect the identified MNES.

Management response and management effectiveness

The MSA MRF aims to:

- provide consistency to reporting on conservation outcomes
- apply an adaptive management approach to enable improvements to program implementation, outputs and outcomes.

This report has identified a decline in some MNES values through analysis of MRF KPI results during the reporting period (2022–2024). When there is a clear decline in ecological function and/or condition, how this evidence is applied to improve implementation and outcomes of the MSA program is unclear. PV and DEECA collect information during on-ground management activities but the correlation between each activity and the changes detected has not been assessed. Therefore, this report describes the on-ground activities delivered by area but is unable to establish whether these activities result in improvements for relevant KPIs.

On-ground land management

When a parcel of land is acquired, DEECA conducts a survey to:

- Identify and map any EPBC-listed plant species or ecological communities that are the targets of conservation measures under the MSA.
- Provide enough information regarding the distribution of vegetation on the land to allow management planning to proceed. This information includes the distribution of native vegetation types, significant species and exotic species that threaten natural values.
- Provide a qualitative baseline describing the vegetation when the survey area is protected.
- This report is used to develop a vegetation management plan that provides management actions and strategies (with targets) with delivery partners in the contracted time. The contracted time is 10 years.

94. Victorian Auditor-General's Office 2020, 'Protecting critically endangered grasslands', Melbourne, Victoria. https://www.audit.vic.gov.au/report/protecting-critically-endangered-grasslands?section= Accessed 11 October 2024.
95. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 23 September 2024.

Western Grassland Reserve

In the 2014–2015 financial year, there was no property on PV's land record, though five properties were acquired between 2009–2010 and 2014–2015. In the 2023-2024 financial year, 12 properties were under PV management and/or PV land record (Table 8). As of 3 July 2024, 30 properties (3,815 ha) have been acquired to Crown land within the WGR. This is approximately 12.7% of the overall land parcels (236) in the WGR.

The discrepancies between the number of land parcels acquired and the number of land parcels on the PV land record increased as of 2023–2024 (Table 8), particularly during the period of the COVID-19 pandemic. In 2024–2025, there will be 14 additional land parcels on the PV land record for direct management. These parcels (~1,099 ha) were managed by private landholders in partnership with the Wyndham City Council (WCC) to conduct on-ground activities, including weed control. These parcels will continue to be managed through the partnership with WCC until being transferred to PV's land record.

Table 8: Areas under direct management for Parks Victoria and DEECA's interim management in the Western Grassland Reserve. Source: DEECA.

Financial year	Land parcels acquired	Parcels on Parks Victoria land record	Parcels managed interim to Parks Victoria	Parcels managed by Local Government Authority/ DEECA partnership
2009-10	1	0	1	0
2010-11	1	0	1	0
2011-12	3	0	3	0
2012-13	3	0	3	0
2013-14	3	0	3	0
2014-15	5	0	5	0
2015-16	5	2	3	0
2016-17	7	5	2	0
2017-18	8	5	3	0
2018-19	14	8	6	0
2019-20	18	8	10	0
2020-21	20	11	9	0
2021-22	23	11	12	0
2022-23	24	12	12	0
2023-24	27	12	14	1
2024-25	30	27	0	2

Interim management in the Western Grassland Reserve

PV is the main delivery partner with DEECA in the WGR for the direct management of acquired land. Prior to land being acquired, there are two different types of land: 1) land that is in progress of a transition to Crown land, and 2) private land in the Public Acquisition Overlay (PAO) area to maintain biodiversity values before land acquisition through interim management.

Land that is in progress of transitioning to Crown land

As part of the land transfer process from DEECA to the PV Land Record, PV prepares a Property Assessment Report (PAR) that highlights any risks that are recognised in each acquired parcel. The PAR also provides an assessment of what is an acceptable risk and what is an unacceptable risk (e.g. UXO contamination, contaminated soil and extensive rubbish dump sites). The outcome of the PAR determines if PV is prepared to accept a land parcel on the PV land record or if there are matters that DEECA needs to resolve prior to the transfer or undertaking of any management activity.

Under the *Parks Victoria Act 2018*, advice must be sought from PV in relation to any land proposed to be added to the PV Land Record and through this process PV can determine if land is suitable to be added to the PV Land Record. This can result in significant delays in transferring acquired land to the PV land record. Furthermore, revenue from the levy is only transferred to PV when the land acquired is in a state appropriate for PV to undertake on-ground works. There is a financial risk associated with this approach given the depreciation of revenue over time. This means that, when eventually transferred, the revenue may fund fewer on-ground activities than it potentially could have if released earlier.

DEECA advised that, in the future, the aim is for PV to implement works as soon as practicable following the transfer of freehold land to the Crown regardless of the condition (within reasonable parameters) or the status on PV land record to avoid this financial risk.[96] Implementation of this amendment will be achieved through DEECA's funding agreement with PV prior to the transfer of acquisitions to the PV land record.[97]

Private land in the Public Acquisition Overlay area

For private land that has not been acquired, private landowners were supported to manage the threats posed by noxious and environmental weeds to natural temperate grassland, remnant vegetation and other ecological values on their land within the WGR PAO area. This was mostly delivered by the partnership with the WCC as approximately two thirds of the WGR are located within council's jurisdiction. This resulted in a $1.6 million funding agreement between May 2020 and June 2024. DEECA has been discussing involvement in a partnership (similarly to that established with the WCC) with the City of Greater Geelong and City of Melton.

The interim management through this partnership delivered to date has focused on providing weed control grants and incentives to private landowners and lessees in efforts to prevent, reduce and contain the invasion and spread of CaLP Act listed serious environmental weeds across the reserve, including serrated tussock *(Nassella trichotoma*). Weeds, both noxious and emerging, are likely the most important management issue immediately confronting the WGR, relevant to virtually all private land parcels, and likely to worsen if land management and weed control practices do not improve. Confounding this is the risk that private landowners, confronted with compulsory acquisition, may lose the incentive to responsibly manage their land and adopt agricultural practices harmful to the ecological values that the reserve seeks to protect.

In 2020, the Victorian Auditor-General's Office (VAGO) undertook a performance audit of the MSA program. Recommendation 4 of the audit report Protecting Critically Endangered Grasslands June 2020 requires DEECA to evaluate the effectiveness of its interim land management agreement with WCC and share learnings with relevant councils and/or land management groups.

The effectiveness evaluation report produced in November 2023 demonstrates that the partnership resulted in a 375% increase in grant participation compared to other interim management programs delivered under the MSA program.[98]

96. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 17 June 2024.
97. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 17 September 2024.
98. Department of Energy, Environment and Climate Action 2023, 'Western Grassland Reserve interim (private land) management partnership: effectiveness evaluation', Melbourne, Victoria.

Additionally, the WCC delivered almost twice the quantity of weed control in the WGR area (2,421 ha versus 1,238 ha) in less than half time (three years rather than seven years) comparted to other interim management programs (BushBroker auctions, serrated tussock mapping and control project and MSA Program weed control grant applications). This project covers 37 land parcels (15 properties, 4,814 ha) and this is collectively greater than the size of land acquired in the WGR. The partnership with private landholders and land management activities delivered indicates the critical importance of the project for maintaining current high ecological values and prevent potential degradation of these lands. DEECA evaluates that this funding program is considered the most effective approach for delivering targeted and cost-effective weed control on private land in the WGR.

This partnership demonstrates the potential to address high weed cover on newly acquired parcels where no ecological effort was previously applied. The prevalence of weeds is the cause for some KPIs not meeting the baseline target in this report (e.g. KPI 7 for natural temperate grassland). Agriculture Victoria (DEECA) are responsible for administering weed management under the CaLP Act. There is an opportunity for improved conservation outcomes in the MSA program if CaLP Act obligations are applied to private landholders in maintaining high ecological values and preventing degradation of the land they manage.

Direct land management in the WGR

PV is the sole delivery agent for direct land management strategies for the WGR. On average, on-ground activities have been undertaken on approximately 764 hectares of the WGR per year since 2013 (Figure 9).[99] The activities include animal control, weed control, fire management, grazing, harvest/cropping and restoration. In 2018, land management works were undertaken on nearly 2,000 hectares of the WGR (Figure 9). The area of works decreased significantly to 185 hectares in 2023, while PV's land management area was increasing. This indicates that management had not been undertaken for over 10 years (2013-2023). This is the responsibility of PV and DEECA in partnership.

This suggests that not all land management responsibilities were delivered for the period between 2018 and 2023. PV have advised that this is principally because funds that were available only allowed for essential works on assigned land parcels.[100] There was not the financial certainty to commit to medium-term works contracts. This would mean that there are unused funds for management and limited time would be left for PV to complete the contracted works in 10 years.

99. Please note that this is an area-based information. This means that the area-based information for some activities may be inaccurate such as weed control within a land parcel as whole property might be counted as weed control applied even a portion of the extent was treated.
100. Parks Victoria (PV), 'Personal communication', 24 May 2024.

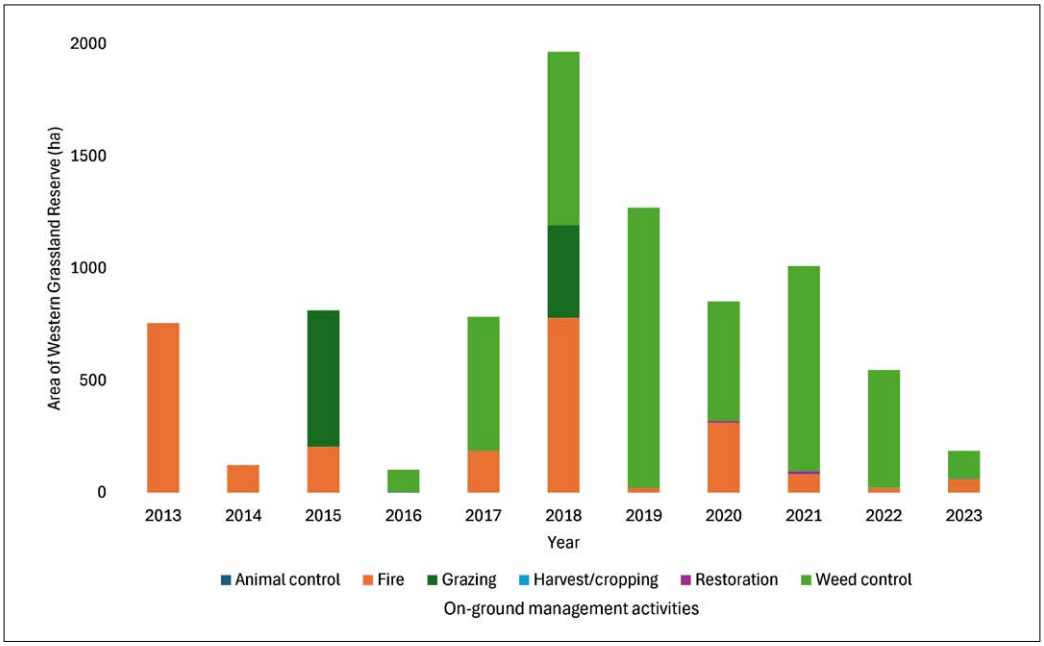


Figure 9: Extents of areas on which on-ground management activities were undertaken within the Western Grassland Reserve by Parks Victoria from 2013 to 2023. Source: PV.

The financial uncertainty also impacted on PV's human resource capacity. PV currently has six FTE positions for 2023–2024 and plans to increase that number to eight FTE for the 2024–2025 financial year due to the additional land expected to be managed by PV next year. There are two supervisory roles, one planning role and five operational delivery roles.

- Area Chief Ranger: Responsible for the overall planning and operational delivery of the MSA program for both the WGR and Biodiversity Conservation Strategy (BCS) for Melbourne's growth corridor reserves that are assigned to PV.
- Planning Officer: Responsible for budget management, procurement and strategic planning for WGR and BCS reserves.
- Team Leader: Coordinates and supervises the day-to-day operational delivery staff.
- Grassland Ecologist: Specialised role developing a biomass management strategy and collecting grassland values data working with ARI.
- Project Officer: Delivery of functional projects, including development of rehabilitation programs, fencing, road management and strategic fire break establishment.
- Ranger roles (x3): Planning and implementing weed control program, including supervision of contractors, compliance and assisting with environmental monitoring.

PV also has corporate operational support for the asset demolition and site rehabilitation. This includes the removal of houses, sheds and associated infrastructure when new properties are acquired.

A five-year funding agreement was approved in December 2022 for the financial years between 2021–2022 and 2025–2026 up to a value of $14.2 million. The forecast budget for the agreement was difficult to determine as the future land acquisition rate was unknown. To assist this, there is a provision in the agreement to increase the total value in the instance that large acquisitions take place that were not anticipated. This agreement has allowed PV to establish a Panel of Providers to undertake weed control for the next five years. PV expects a significant increase in the operational works program from May 2024 onwards.

One of the primary challenges that PV faces in delivering operational requirements in WGR is planned burning. DEECA's Forests and Fire Operations Division (FFOD) is the responsible authority on public land. Through the Forest Fire Management Victoria partnership with PV, they have several accredited fire delivery staff that lead and assist planned burning in the WGR alongside FFOD accredited personnel. This includes two DEECA-appointed planning roles created to assist the Metro Fire District in ensuring the grassland planned burn program is fully planned for and implemented. PV also has significant input into planning that land parcels and reserved are

nominated in the Joint Fuel Management Plan that will be included in the planned burning program.

PV advised that the challenge faced in delivering burning requirements of the grassland reserves is the exponential increase in area that requires burning when conditions are favourable for burning. Historically, approximately 400 hectares of grassland was burned annually west of Melbourne. As the MSA program grows, PV anticipates that approximately 3,000 hectares to 4,000 hectares will need to be burned annually to maintain ecological values and objectives. Fewer than 100 hectares of burning had been delivered since 2019 (except for 2020 during which approximately 300 hectares were delivered) (Figure 9). This amplifies that delivery of management outcomes, and weed and pest management, have not occurred.

Conservation areas

The 2013 Biodiversity Conservation Strategy (BCS) states that 36 conservation areas are to be established within the UGB to protect the highest quality biodiversity values in the new urban growth corridors to achieve conservation outcomes for MNES (Figure 10).[101] The BCS outlines how these conservation areas need to be protected in perpetuity and mandatory biodiversity protection requirements for developing land within or adjacent to a conservation area within the UGB. It demonstrates all relevant MNES, including matters covered in the EPBC Act. Conservation decisions in the document were made using biodiversity data collected by the Victorian Government through various biodiversity mapping projects and other data collected by DEECA.

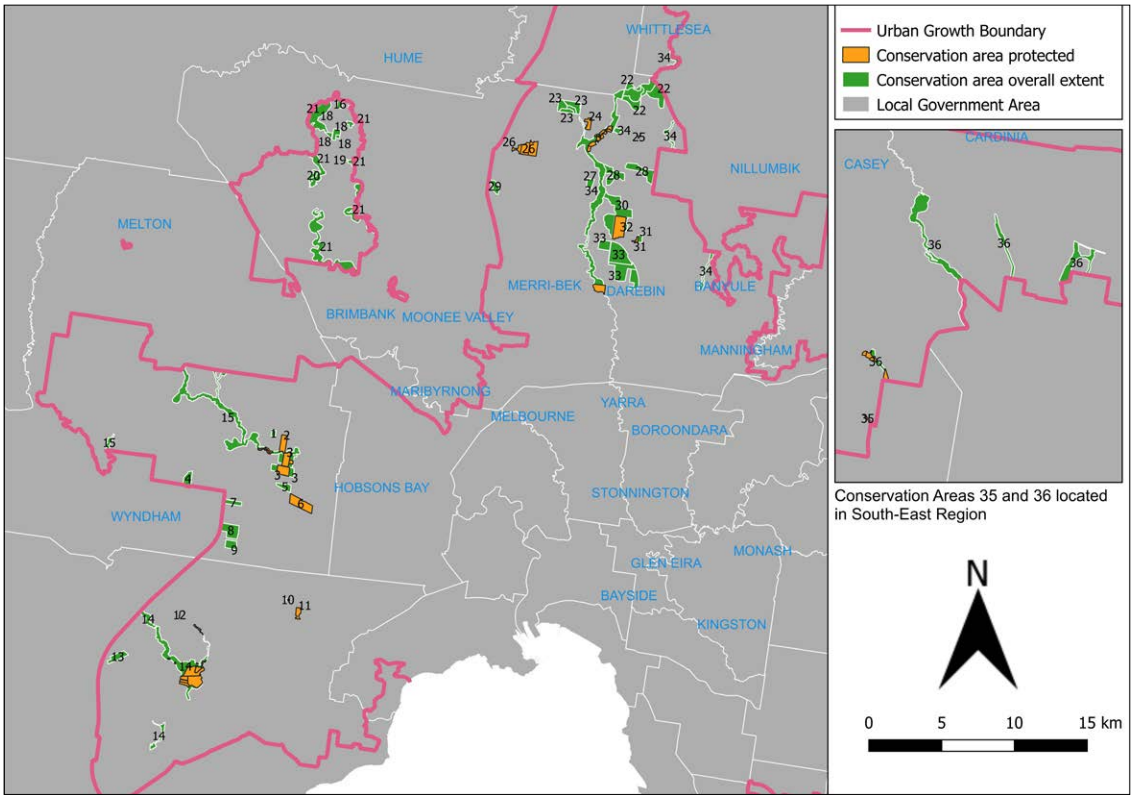


Figure 10: Extents and locations of the 36 conservation areas and areas secured as of June 2024 based on the Biodiversity Conservation Strategy. Conservation areas are numbered, orange areas indicate areas protected in perpetuity and green areas indicate overall areas earmarked for protection. Source: DEECA.

101. Department of Environment and Primary Industries 2013, 'Biodiversity Conservation Strategy for Melbourne's Growth Corridors', East Melbourne, Victoria.

Securing conservation areas in practice is achieved through the transfer or vesting of conservation area land (and associated management requirements) to the Minster for Environment. The land will subsequently be surrendered to the Crown where it is reserved and managed for conservation purposes in perpetuity by the nominated Crown land manager. If a landowner decides to enter into an agreement with the Secretary (DEECA) under Section 69 of the *Conservation, Forests and Lands Act 1987* (CFL Act) as an alternative that retains their ownership of the land, the owner must conduct the conservation and management of the conservation area by, or on behalf of, the owner in perpetuity. The terms of the agreement must include that the owner pays reasonable costs that the Secretary incurred for the preparation, execution and registration of the agreement.

Areas secured by either method are considered 'secured' to protect threatened species and ecological communities, and land management plans are developed based on flora and fauna survey results when acquired. If the survey occurs after acquisition, the conditions may have degraded due to lack of conservation management works since acquisition.

Extent of conservation area

Changes have occurred in the extent of the conservation areas since publication of the BCS (Table 9). The current extent of conservation areas has decreased by approximately 400 hectares from the original extent described in the BCS in 2013. Area boundaries have not increased, rather all changes have resulted in a reduction in area.

DEECA advised that the differences are due to past boundary adjustments for the conservation areas.[102] Adjustment to the boundaries is a process that had been acknowledged under Commonwealth approvals (refer to Conditions 3 and 4 of the 2013 approval and Condition 3 of the 2014 approval).[103, 104] The BCS also identified the need for the boundaries of some conservation areas to be reviewed and revised. All boundary adjustments have occurred consistently with the Commonwealth-endorsed approach outlined in the BCS Guidance Note (refer to Section 2).[105]

The conservation area boundaries adopted for this report are based on data provided by DEECA that have been updated with each boundary adjustment as opposed to the BCS boundaries that only represent the extent in 2013.

102. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 27 March 2024.
103. Australian Government Department of Sustainability, Environment, Water, Population and Communities 2013 'Approval decision for the taking of actions in accordance with an endorsed program under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – Final approval for urban development in three growth corridors under the Melbourne urban growth program strategic assessment', Canberra, Australia.
104. Australian Government Department of Sustainability, Environment, Water, Population and Communities 2014 'Approval decision for the taking of actions in accordance with an endorsed program under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – Final approval for urban developments in south-eastern growth corridor under the Melbourne urban growth program strategic assessment', Canberra, Australia.
105. Department of Environment, Land, Water and Planning 2015, 'Guidance note: implementing the Biodiversity Conservation Strategy for Melbourne's growth corridors – working document', Melbourne, Victoria.

Table 9: Area in the current Melbourne Strategic Assessment database and Biodiversity Conservation Strategy by conservation area. Source: DEECA.

Conservation area	Comparison in extent between the Melbourne Strategic Assessment spatial layer and that described in the Biodiversity Conservation Strategy document	Area in the current database (ha)	Area in the BCS (ha)
1	Same	13.3	13.3
2	Different	41.5	45.0
3	Different	175.8	235.0
4	Same	46.3	46.3
5	Same	35.4	35.4
6	Different	94.3	110.9
7	Same	31.8	31.8
8	Different	94.8	112.6
9	Same	43.4	43.4
10	Different	3.3	15.1
11	Different	21.1	22.0
12	Different	1.0	1.5
13	Different	51.7	59.4
14	Different	496.8	372.0
15	Different	518.3	539.7
16	Same	18.3	18.2
17	Same	14.4	14.5
18	Different	203.0	252.9
19	Same	2.4	2.4
20	Different	26.1	42.1
21	Same	666.9	666.9
22	Different	182.5	207.2
23	Different	108.9	103.7
24	Same	25.0	25.0
25	Same	1.4	1.4
26	Different	110.1	111.8
27	Same	26.5	26.5
28	Different	189.9	331.1
29	Same	37.7	37.7
30	Same	215.9	215.9
31	Different	21.0	29.8
32	Different	123.4	154.6
33	Different	404.8	468.3
34	Different	990.4	1,009.7
35	Same	2.2	2.2
36	Different	269.5	329.8
Total	**Different**	**5,309.2**	**5,735.1**

Progress in land acquisition

As of June 2024, 817 hectares were secured for protection in perpetuity, representing approximately 15.3% of the overall extent of the 36 conservation areas (5,039.7 ha; Table 10). Within the 817 hectares, 292 hectares (36%) will be managed for nature conservation. These areas will be protected and managed primarily for national and state environmental significance. The management categories of some conservation areas are yet to be determined since 2013 when the BCS was developed (Conservation Areas 7, 8, 9 and 13). These areas have not been acquired, indicating that no surveys have been conducted to determine the category.

In addition, Truganina South Nature Conservation Reserve (NCR) is reserved to protect the golden sun moth and striped legless lizard.

The largest conservation area secured is Conservation Area 14, in which growling grass frog is present. Conservation areas that have completed acquisitions are Conservation Areas 2, 6, 11, 12, 24, 25, 26 and 35. A completed acquisition is one in which 100% of the conservation area has been acquired for conservation management. Some MNES were found to have limited presence within the secured conservation areas.[106] For example, the seasonal herbaceous wetland ecological community has a single location of presence (Table 10).

Table 10: Overall extent of each conservation area and area secured as of June 2024 and Matters of National Environmental Significance that are identified as present in the Biodiversity Conservation Strategy. The management category indicates how each conservation area will be managed. Source: DEECA.

Conservation area	Area (ha)	Secured (ha)	Management category	Presence of Matters of National Environmental Significance
1	13.3	0.0	Nature conservation	Natural temperate grassland, spiny rice-flower
2	41.5	41.5	Nature conservation	Natural temperate grassland, spiny rice-flower
3	175.8	94.5	Regional park (park only)	Natural temperate grassland, seasonal herbaceous wetland (added based on field survey), spiny rice-flower, growling grass frog, small golden moths orchid
4	46.3	0.0	Nature conservation	Natural temperate grassland, golden sun moth, spiny rice-flower
5	35.4	0.0	Nature conservation	Natural temperate grassland, spiny rice-flower, striped legless lizard, large-fruit groundsel
6	94.3	94.3	Existing offset	Natural temperate grassland, spiny rice-flower, striped legless lizard
7	31.8	0.0	To be determined following surveys	Natural temperate grassland
8	94.8	0.0	To be determined following surveys	Natural temperate grassland
9	43.4	0.0	To be determined following surveys	Natural temperate grassland
10	3.3	1.3	Existing public land (cemetery) Open space (most of buffer)	Natural temperate grassland, spiny rice-flower, button wrinklewort
11	21.1	21.1	Nature conservation	Natural temperate grassland, golden sun moth, spiny rice-flower

106. Secured area also includes lands for which the landowner retains ownership and places a section 69 of the *Conservation, Forests and Lands Act 1987* agreement on title.

Conservation area	Area (ha)	Secured (ha)	Management category	Presence of Matters of National Environmental Significance
12	1.0	1.0	Existing public land	Natural temperate grassland, spiny rice-flower
13	51.7	0.0	To be determined following surveys	Natural temperate grassland, golden sun moth
14	496.8	185.3	Growling grass frog conservation, floodplain and open space (part only) Regional park (Werribee Township Regional Park)	Growling grass frog
15	518.3	23.5	Growling grass frog conservation, floodplain and open space (part only) Regional park (Werribee Township Regional Park)	Growling grass frog
16	18.3	0.0	Nature conservation	Grassy eucalypt woodland
17	14.4	0.0	Nature conservation	Grassy eucalypt woodland
18	203.0	0.0	Nature Conservation (part only, primarily between Lancefield Road and railway line) Open space (most of site)	Grassy eucalypt woodland
19	2.4	0.0	Nature conservation	Grassy eucalypt woodland
20	26.1	0.0	Open space	
21	666.9	0.0	Growling grass frog conservation, floodplain and open space	Growling grass frog
22	182.5	0.0	Nature conservation (most of site) Open space (eastern section containing predominantly scattered trees)	Natural temperate grassland, grassy eucalypt woodland, matted flax-lily, growling grass frog
23	108.9	0.0	Nature conservation	Natural temperate grassland, golden sun moth, matted flax-lily, growling grass frog
24	25.0	25.0	Existing public land	Natural temperate grassland, matted flax-lily
25	1.4	1.4	Nature conservation	Grassy eucalypt woodland
26	110.1	110.1	Nature conservation	Grassy eucalypt woodland, golden sun moth, matted flax-lily
27	26.5	0.0	Nature conservation	Grassy eucalypt woodland, golden sun moth, growling grass frog
28	189.9	0.0	Open space	Natural temperate grassland, grassy eucalypt woodland

Conservation area	Area (ha)	Secured (ha)	Management category	Presence of Matters of National Environmental Significance
29	37.7	0.0	Nature conservation	Grassy eucalypt woodland, golden sun moth
30	215.9	0.0	Nature conservation	Natural temperate grassland, grassy eucalypt woodland, matted flax-lily, growling grass frog, striped legless lizard
31	21.0	6.5	Nature conservation	Grassy eucalypt woodland
32	123.4	112.0	Nature conservation	Natural temperate grassland
33	404.8	0.0	Nature conservation (part) Open space (most of site)	Natural temperate grassland, grassy eucalypt woodland, golden sun moth, striped legless lizard
34	990.4	97.2	Growling grass frog conservation, floodplain and open space	Growling grass frog
35	2.2	2.2	Existing public land	
36	269.5	17.6	Growling grass frog conservation, floodplain and open space (part only) Regional park (Cranbourne Regional Park)	Growling grass frog
Total	**5,309.2**	**817.0**		

Protection of conservation areas

Conservation areas are established to protect areas with the highest biodiversity value identified in the expanded UGB, as stated in the BCS for Melbourne's growth corridors.[107] The BCS is the overarching strategy for the protection of biodiversity in the growth corridors. It sets out all the conservation measures required for MNES to satisfy the commitments to the Australian Government and to meet state requirements, including Victoria's Native Vegetation Management: A Framework for Action.

These conservation measures comprise:

- The protection and management of land of high biodiversity value within defined conservation areas and areas outside the UGB.
- Requirements to provide offsets for removal of native vegetation and threatened species habitat on land not required for conservation and suitable for urban development.
- Requirements to salvage and translocate certain threatened species prior to removal of habitat on land not required for conservation and suitable for urban development.

The BCS identifies 36 conservation areas within the growth corridors that will be protected and managed in perpetuity. It outlines how these conservation areas need to be protected and explains the Victorian and Australian governments' mandatory biodiversity protection requirements for anyone developing land within or next to a conservation area.

107. Department of Environment and Primary Industries 2013, 'Biodiversity Conservation Strategy for Melbourne's growth corridors', Melbourne, Victoria.

The mandatory conditions include securing and protecting the conservation area, developing a construction environmental management plan, developing a fencing plan, developing a land management plan and salvaging and relocating native vegetation if required.

These conservation areas must be protected by appointed managers, including PV, Melbourne Water, local government, Traditional Owners and private landholders.

A new report co-published by three Victorian environmental groups claimed that approximately half (15) of the conservation areas have had compliance issues, eight of which are regarded as severe.[108] The report from the stakeholder groups is based upon field inspections of each conservation areas. However, this evidence requires a validation process to be undertaken by the Victorian Government to investigate further the conflicting findings and communicate with the groups future steps to resolve the issues raised. The Victorian Government has not provided a formal response to these claims.

This report has found that illegal waste dumping is increasing within the conservation areas. One example is Conservation Area 9 in which approximately 35 hectares had earthworks undertaken that have resulted in fill being spread to a depth of up to one-and-a-half metres across the conservation area.[109] The Environment Protection Authority (EPA) Victoria and Australian Government are investigating this issue regarding potential breaches under the *Environmental Protection Act 2017* and potential breaches under the EPBC Act. Melton City Council (MCC) is leading the prosecution against the landowner who did not fulfill land protection agreements. In addition, the Council has successfully prosecuted the truck driver who was involved in this incident. [110]

Across the WGR, the type of dumping was generally consistent, being large household and building waste dumping. Frequency has increased significantly in 2023 and 2024 particularly in the Mount Cottrell area.[111] While there are no data to quantify increased occurrence, anecdotally it is accepted that the increase in illegal waste dumping is associated with increased housing demolitions.[112] In addition, a new report co-published by three Victorian environmental groups claimed that approximately half (15) of the conservation areas have had illegal waste dumping compliance issues, eight of which are regarded as severe.[113] The report from the volunteer groups is based upon field inspections of each conservation areas. However, this evidence would require validation to confirm the findings.

The stakeholder report proposes active surveillance through partnership with various relevant agencies, including EPA Victoria and local government, and stronger compliance of protected areas to monitor activities by private landholders and land managers.

Land management by private landholders in conservation areas

Interim management in conservation areas

Interim management is required under land management plans and the Section 173 agreements that include land management clauses that are required because of VC213 since July 2022 the holder of the planning permit, whether it is the landowner or a developer, must manage the land until they transfer conservation area land to the Minister. Prior to this, there was no interim management applied to conservation areas.

Direct land management in conservation areas

In conservation areas, private landholders and appointed land managers are required to monitor and regularly report to DEECA on land management outcomes, including maintaining the habitat and preventing degradation.[114] This is to ensure the ongoing protection of the species and habitat that is present on the land. However, there is limited information reported to DEECA by private landholders. This report includes data on areas of direct land management by private landholders that have been provided by DEECA. The aggregated area of management by private landholders was approximately 220 hectares in 2022 (Figure 11).

108. Victorian National Parks Association, Grassy Plains Network and Merri Creek Management Committee 2024, 'A people's audit of the 36 MSA conservation areas', Carlton, Victoria.
109. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 21 June 2024.
110. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 19 September 2024.
111. Parks Victoria (PV), 'Personal communication', 16 September 2024.
112. Parks Victoria (PV), 'Personal communication', 16 September 2024.
113. Victorian National Parks Association, Grassy Plains Network and Merri Creek Management Committee 2024, 'A people's audit of the 36 MSA conservation areas', Carlton, Victoria.
114. These landholders are who have land management arrangements that are in place under either section 173 of the *Planning and Environment Act 1987* or section 69 of the *Conservation, Forests and Lands Act 1987.*

This is equivalent to approximately a quarter of secure conservation areas. Most of these private landholders (except for one land parcel transferred to Crown land in mid-2024) have agreements that specify operational works that need to be delivered and reported on annually. However, DEECA advised that these managers have not reported on on-ground works.[115]

An example is Conservation Area 11. The entire area is managed by a private landholder and has a presence of golden sun moth and spiny rice-flower population. After the area was secured in 2020, information has not been shared with DEECA regarding the nature of the management work that has been undertaken. Although these areas are classified as secured areas, it is unclear whether protection and management of threatened species and ecological communities are being undertaken despite requests for information by DEECA.[116]

DEECA advised that landholders can voluntarily choose to exercise their option to manage the land themselves under the land management plan, maintaining their ownership through Section 69 of the CFL Act.[117] Under Section 69, DEECA does not provide funding to deliver land management.

Another issue associated with land management by private landholders is that responsible private landholders would need to conserve secured areas in perpetuity after 10 years. After this first decade of intensive land management, minimal on-ground activities are expected. Therefore, it is critical to assess the condition of these areas periodically, and especially when the first 10-year intensive land management plan is approaching the end.

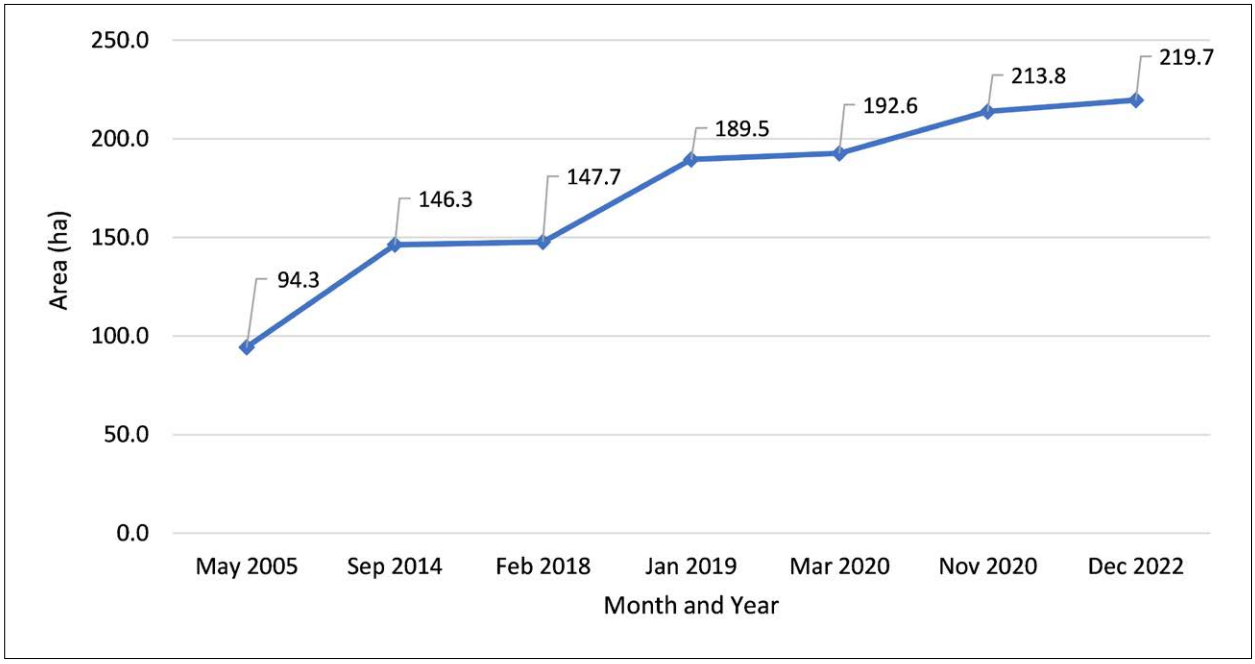
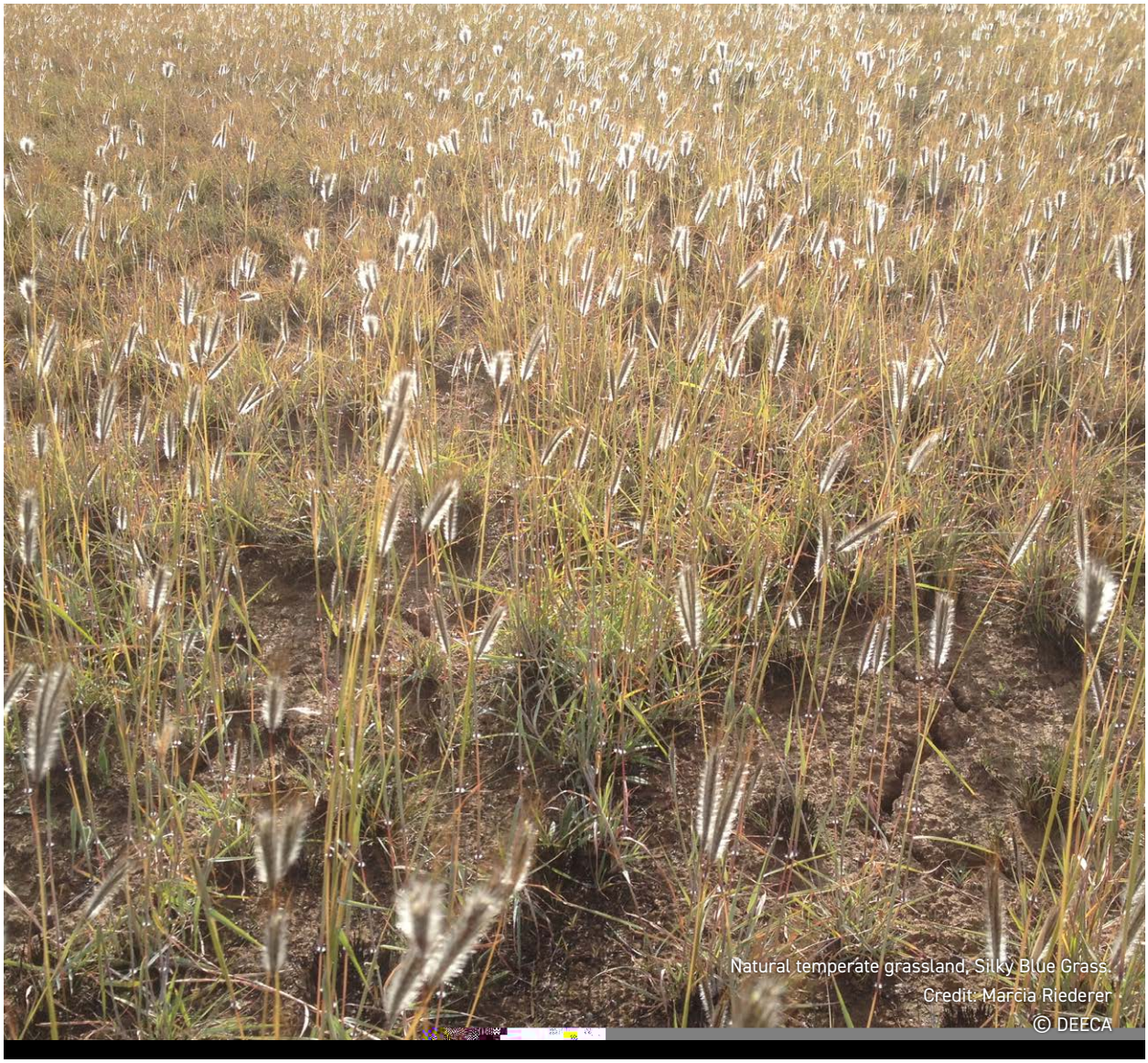


Figure 11: Aggregated area of land managed by private landholders in the conservation areas from May 2005 to December 2022. Source: DEECA.

115. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 12 June 2024.
116. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 12 June 2024.
117. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 23 August 2024.

MNES 1: Natural temperate grassland



Natural temperate grassland, Silky Blue Grass.
Credit: Marcia Riederer
© DEECA

'Natural temperate grassland of the Victorian Volcanic Plain' (natural temperate grassland herein) is an ecological community listed as critically endangered under the EPBC Act and occurs on heavy soils on basalt terrain where it is dominated by one or more native tussock-forming grasses (Figure 12). This community also contains a variety of native herbs (notably daisies of the Asteraceae family) that may occasionally be dominant. Sparse or absent tree cover is also characteristic of this community.[118]

This ecological community formerly covered a large extent of the Victorian Volcanic Plain (apart from forested areas in the far west and south, and isolated woodlands and wetlands elsewhere). Natural temperate grassland is currently restricted to small, scattered remnants throughout the former range with a concentration of remnants immediately west of Melbourne.[119]

118. Department of Sustainability, Environment, Water, Population and Communities 2011, 'Nationally Threatened Ecological Communities of the Victorian Volcanic Plain: Natural Temperate Grassland & Grassy Eucalypt Woodland. A guide to the identification, assessment and management of nationally threatened ecological communities *Environment Protection and Biodiversity Conservation Act 1999*.' Department of Sustainability, Environment, Water, Population and Communities. Canberra, Australian Capital Territory.
119. Department of Sustainability, Environment, Water, Population and Communities 2011, 'Nationally Threatened Ecological Communities of the Victorian Volcanic Plain: Natural Temperate Grassland & Grassy Eucalypt Woodland. A guide to the identification, assessment and management of nationally threatened ecological communities *Environment Protection and Biodiversity Conservation Act 1999*.' Department of Sustainability, Environment, Water, Population and Communities. Canberra, Australian Capital Territory.

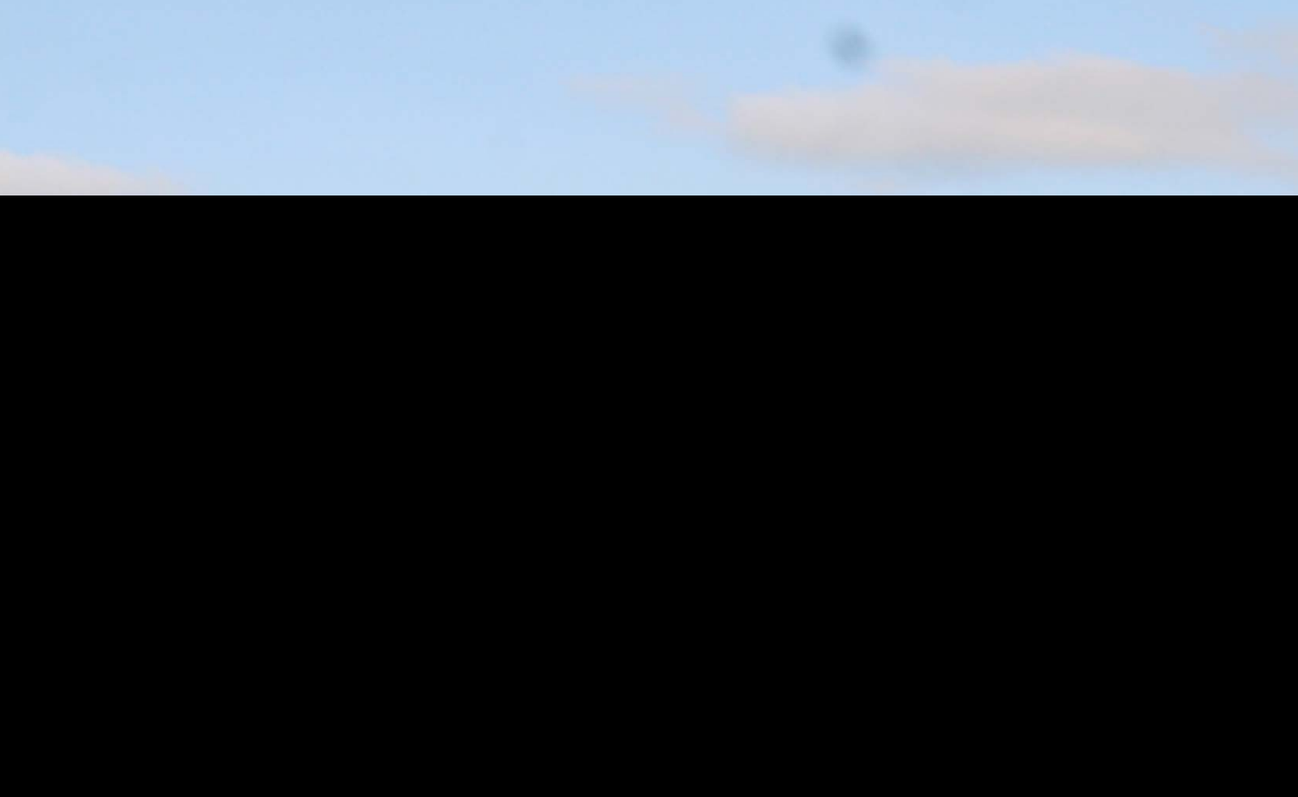


Figure 12: Image depicting natural temperate grassland in the Western Grassland Reserve. Source: DEECA.

DEECA's conservation commitment and relevance to MRF

DEECA published the following statements as conservation outcomes for natural temperate grassland (Table 11) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with which KPIs are provided in Table 11.

Table 11: Conservation outcomes for natural temperate grassland and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcome	Alignment with Monitoring and Reporting Framework
The creation of the 15,000-hectare Western Grassland Reserve (nature conservation reserve or National Park protection) located outside the Urban Growth Boundary (UGB) west of Melbourne, protecting native grasslands.	Program output: A 15,000-hectare grassland reserve is established and managed.
The permanent protection of native grasslands in conservation areas identified in the Biodiversity Conservation Strategy and the Conservation Areas Declaration.	Program output: A network of conservation areas within the UGB is protected and managed for [plant and animal] species and vegetation communities considered to be Matters of National Environmental Significance.
Improved composition, structure, quality and ecological function of protected native grasslands.	Program outcome: The composition, structure and function of natural temperate grassland improves.

Conservation outcomes assessed

Conservation Outcome 1

Establishment of the 15,000-hectare Western Grassland Reserve (nature conservation reserve or National Park protection) located outside the UGB west of Melbourne, protecting native grasslands

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor is due to 3,815 hectares of the 15,000-hectare Western Grassland Reserve target is secured in protections as of 3 July 2024.[120] Of the 10,000 hectares of natural temperate grassland of Victorian Volcanic Plains to acquire, 1,750 hectares have been acquired as of 2023.

More land acquisitions are occurring, therefore, the trend is rated as improving, although it is unclear as to when establishment of the 15,000-hectare reserve will be fully achieved.

The confidence in the status and trend assessment is rated as moderate due to the uncertainty regarding when establishment of the 15,000-hectare reserve will be fully achieved.

DEECA advised that 3,815 hectares were secured in protections on 3 July 2024.[121] DEECA also advised that more land parcels will be added to the WGR in the future.[122] A total of 10,000 hectares of the 15,000 hectares must be natural temperate grassland of the Victorian Volcanic Plain. While DEECA is finalising data for 2024, in 2023, 1,750 hectares of natural temperate grassland of the Victorian Volcanic Plain were secured within 2,847 hectares of land parcels secured. This represents approximately 17.5% of the overall target that needs to be achieved.[123]

Conservation Outcome 2

The permanent protection of native grasslands in conservation areas identified in the BCS and the Conservation Areas Declaration

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status and trend assessments of good and stable, respectively, are based on the quality score of Conservation Areas 10 and 24. Both areas have high quality habitat and quality scores from annual monitoring data which indicate a stable trend in their condition.

Currently, data on Conservation Areas 2, 3, 11 and 12 are absent, which resulted in the confidence assessment of moderate. At least one plot will be positioned in every conservation area to ensure there is longitudinal monitoring data across all protected areas. Once all plots are ready to monitor annually, the confidence in the status and trend assessment will be improved.

Among the conservation areas that contain natural temperate grassland, Conservation Areas 2, 3, 10, 11, 12 and 24 have been secured for the protection of natural temperate grassland (Table 12), but monitoring data exist only for Conservation Areas 10 and 24. At least one plot will be positioned in every conservation area in future to ensure the acquisition of longitudinal monitoring data across all protected areas.

120. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 15 March 2024.
121. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 15 March 2024.
122. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 17 April 2024.
123. Please note that these figures are a tally of data collected at the time of the inventories respectively. They are not a snapshot of all properties as of 2023.

Table 12: Conservation areas that have a presence of natural temperate grassland based on the Biodiversity Conservation Strategy secured as of June 2024. Source: DEECA.

Conservation area	Area (ha)	Secured (ha)
1	13.3	0.0
2	41.5	41.5
3	175.8	94.5
4	46.3	0.0
5	35.4	0.0
6	94.3	94.3
7	31.8	0.0
8	94.8	0.0
9	43.4	0.0
10	3.3	1.3
11	21.1	21.1
12	1.0	1.0
13	51.7	0.0
22	182.5	0.0
23	108.9	0.0
24	25.0	25.0
28	189.9	0.0
30	215.9	0.0
32	123.4	112.0
33	404.8	0.0

Conservation Outcome 3

Improved composition, structure, quality, and ecological function of protected native grasslands

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of fair is based on the KPI results in the Western Grassland Reserve and Conservation Areas 10 and 24. KPIs indicate that many KPIs achieved the baseline but also identified an overall decline in Natural Temperate Grassland condition. Therefore, the trend assessment of deteriorating is based on the following findings:

- Weed cover increased
- Herb richness fell gradually
- Native grass cover was steady in better grasslands, falling slightly in marginal grasslands
- Cover of native forbs fell slightly in the better grasslands and increased slightly or was steady elsewhere.

The confidence in the status and trend assessment is rated as moderate as there is uncertainty regarding the condition of some secured conservation areas that have not been included in the monitoring program yet.

In summary, based on the result of the seven KPIs, the ecological condition of natural temperate grassland in the WGR deteriorated between 2022 and 2024 while some specific grassland states improved in some conditions. Conservation Areas 10 and 24 had a stable condition between 2022 and 2024.

KPIs for program outcomes assessed

DEECA's MSA MRF summarises the conservation outcome related to program outcome for the natural temperate grassland as a single goal statement:

> 'the composition, structure and function of natural temperate grassland of the Victorian Volcanic Plain improves within the program area'.

DEECA developed seven KPIs to report against this single outcome statement:

- KPI 1: The area (ha) making an unfavourable transition between states must be zero (defined by a state-and-transition model (STM), currently unpublished).
- KPI 2: The cover of native perennial forbs must remain above a baseline. The baseline is different for each state. This is defined by the cover observed in the first five years of monitoring for each state and fixed at a new elevated level if exceeded.
- KPI 3: The richness of native perennial forbs must remain above a baseline. The baseline is different for each state. This is defined by the richness observed in the first five years of monitoring for each state and fixed at a new elevated level if exceeded.
- KPI 4: The cover of kangaroo grass must remain above a baseline. The baseline is different for each state. This is defined by the first five years of monitoring for each state and fixed at a new elevated level if exceeded, until it reaches 29% where it remains fixed.
- KPI 5: The cover of native perennial grass (excluding kangaroo grass) must remain above a baseline. The baseline is different for each state and permanently set by the cover observed in the first five years of monitoring for each state.
- KPI 6: Percentage of plots that have bare ground cover between 25% and 75%.
- KPI 7: The cover of perennial weeds must remain below a baseline. The baseline is different for each state. This is defined by the richness observed in the first five years of monitoring for each state and fixed at a new lowered level if weeds are reduced below the baseline.

KPIs are assessed in the following five grassland states: herb-rich grassland (HG), *Themeda* grassland (TG), C3 grassland (C3G), nutrient-enriched grassland (NG) and de-rocked grassland (DG). The Strategic Audit of the Implementation of Melbourne Strategic Assessment Conservation Outcomes 2022 Report (MSA 2022 Report) established a baseline for all states and the analyses of all KPIs are compared to this baseline in this report.[124]

Monitored areas

Natural temperate grassland is only monitored on properties protected under the MSA. Properties are protected each year to increase the area covered by the monitoring year-on-year. Over time, the number of plots will increase and the ability to detect changes and infer relationships between management and ecological outcomes will increase. Monitoring areas cover most protected areas within the WGR. Conservation Areas 10 and 24 within the conservation areas are the only areas among the secured conservation areas that apply to natural temperate grassland analysis (Figure 13).

124. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.

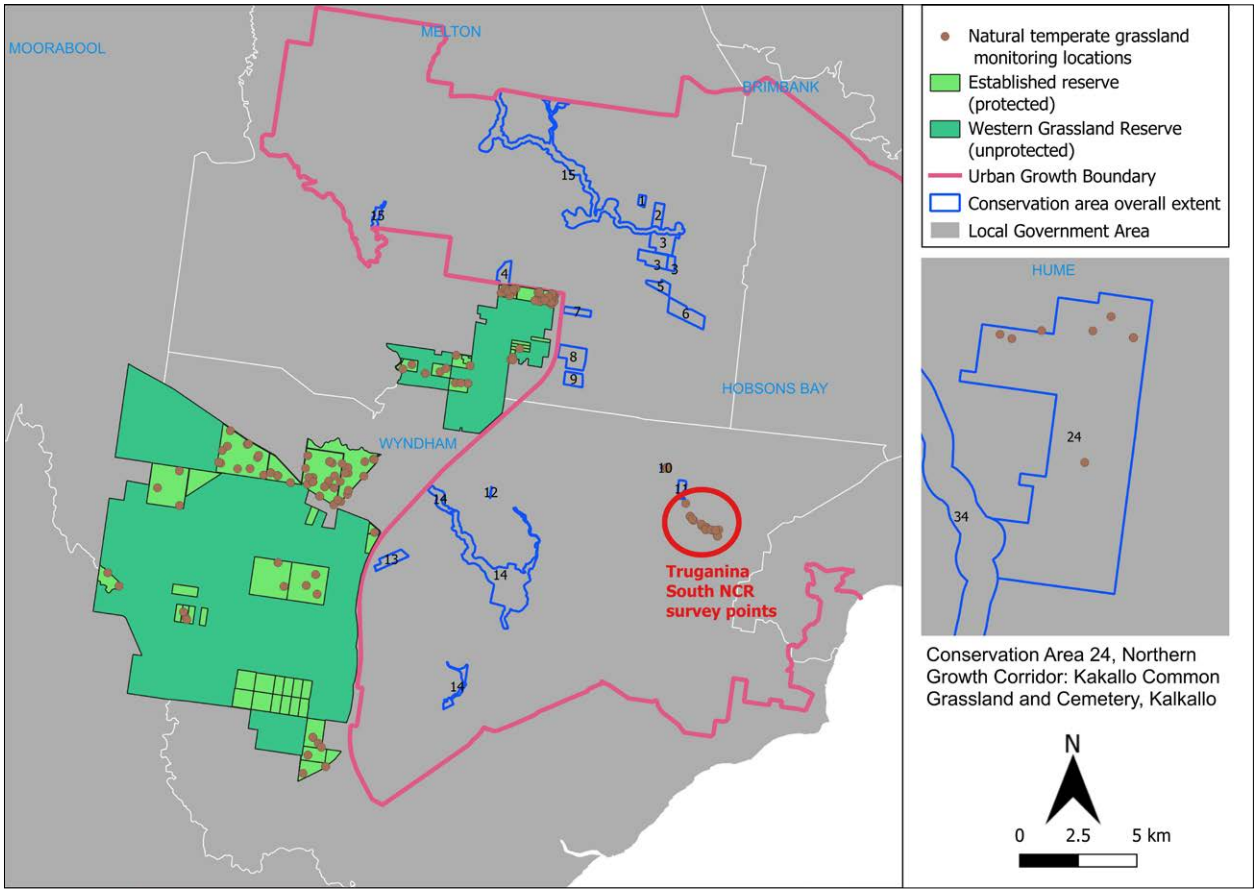


Figure 13: Map of natural temperate grassland monitoring locations.[125] Secured areas (light green polygons) within the Western Grassland Reserve (dark green polygons), Conservation Areas 10 and 24, and the Truganina South Nature Conservation Area (NCR) (south-east of Conservation Area 11) are included in the regular monitoring program. Source: DEECA.

KPI 1: Hectares transitioning between grassland states

Table 13: KPI 1 assessment results for natural temperate grassland by grassland state.

KPI 1: Hectares transitioning between states	Baseline (ha)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Herb-rich grassland	No negative change	Met	N/A	Stable	High	2015
Themeda grassland	No negative change	Met	N/A	Stable	High	2015
C3 grassland	No negative change	Not Met	N/A	Deteriorating	High	2015
Nutrient-enriched grassland	No negative change	Met	N/A	Stable	High	2015
De-rocked grassland	No negative change	Not Met	N/A	Deteriorating	High	2015

125. Please note that this figure includes DEECA's current permanent monitoring plots, as well as some older discontinued plots which were used when used to move location each year. This is why there are higher concentrations of plots in the parcels acquired earlier.

KPI 1 compares the results from vegetation mapping completed at five-yearly intervals (with the first interval having concluded in 2020, covering all areas protected and mapped by 2016 an arbitrary commencement date when several properties were protected). It refers to states defined by the natural temperate grassland STM in which some grassland state/s are more desirable than others.[126] The KPI is designed to ensure that any transitions between grassland state/s are positive and that negative transitions are avoided.

The data are uniquely complex in identifying grassland state changes. The initial assessment of grassland state is based on the subjective delineation of polygons, each representing an area of land in a given grassland state. This delineation occurs during the preparation of inventory reports.

Subsequent sampling is plot-based, utilising sampling that is designed to also assist managers track weed levels. Each point is a circle with a 10-metre radius, with many hundreds of such plots arranged on a regular grid (80 m). Multiple plots may fall within each mapped polygon. The data collected at each plot are raw estimates of the cover of plant species and species-groups.

Each plot can be assigned to a state post-sampling using a published key (Figure 14). The assignment of states is imprecise unless soil tests are undertaken at each location, but this is not feasible.

The clearest way to assess change is to determine whether the plot-based state matches the previous polygon-based state.

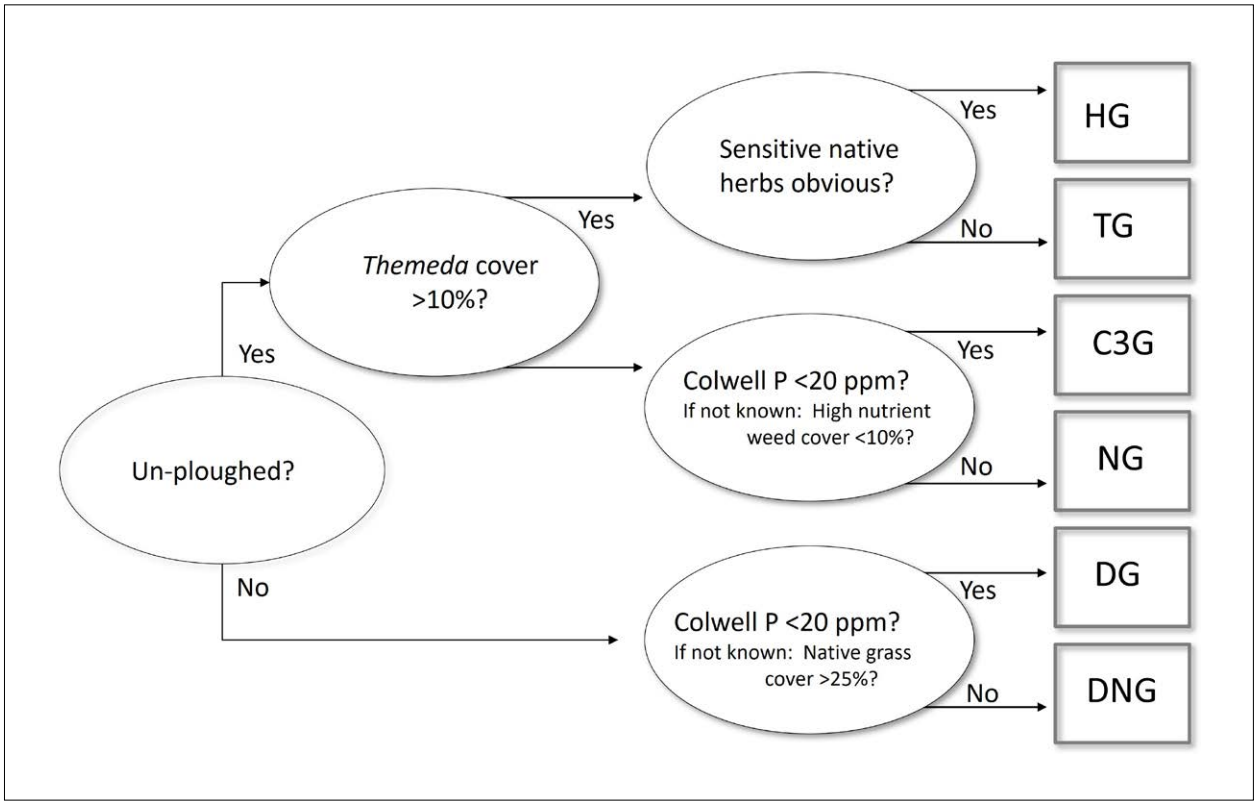


Figure 14: A decision tree used for identifying grassland states. Sensitive native herbs and high nutrient weeds are defined in Appendix 3 in Sinclair et al. (2019).[127] HG = herb-rich grassland, TG = *Themeda* grassland, C3G = C3 grassland, NG = nutrient-enriched grassland, DG = de-rocked grassland and DNP = de-rocked and nutrient-enriched pasture. Source: Sinclair et al. (2019).[128]

126. Sinclair SJ, Zamin T, Gibson-Roy P, Dorrough J, Wong N, Craigie V, Garrard GE and Moore JL 2019, 'A state-and-transition model to guide grassland management', *Australian Journal of Botany 67*, pp. 437-453.
127. Sinclair SJ, Zamin T, Gibson-Roy P, Dorrough J, Wong N, Craigie V, Garrard GE and Moore L 2019, 'A state-and-transition model to guide grassland management', *Australian Journal of Botany, 67*, pp. 437-453.
128. Sinclair SJ, Zamin T, Gibson-Roy P, Dorrough J, Wong N, Craigie V, Garrard GE and Moore L 2019, 'A state-and-transition model to guide grassland management', *Australian Journal of Botany, 67*, pp. 437-453.

Table 14 shows that approximately 2,000 hectares of monitored areas were unchanged regarding grassland state between 2015 and 2023 and this is approximately 80% of overall areas surveyed (2,002.9 ha of 2,509.1 ha). Approximately 116 hectares transitioned to a positive grassland state. The grassland state that had the largest areas in which positive changes were made was the nutrient-enriched state (100 ha of 116 ha). In contrast, approximately 400 hectares were assessed as having negative transitions within the same period. The year that had the largest area with a negative change was 2022 and this was 185 hectares.

Since 2017, the area of negative change increased until 2022. Although the area was decreased in 2023, almost all areas surveyed in that year were found to have a negative change (99.9%). The grassland state that had the largest area with a negative change occurring was C3 grassland (Table 15). It is alarming that the proportion of areas that made a negative change has been increasing. The state of over 80% of de-rocked grassland areas had changed negatively since 2020. Distinguishing the proportion of this apparent change that represents ecologically meaningful state change and that which is due to inconsistencies in the underlying data is not possible.

Table 14: Monitored areas (ha) that made positive change, no change and negative change by year. Source: DEECA.

Year	Positive change	No change	Negative change	Total
2015	26.3	943.4	5.4	975.0
2016	24.0	117.8	2.0	143.8
2017	1.1	13.2	1.2	15.6
2019	0.0	5.6	29.2	34.7
2020	14.8	74.4	62.0	151.2
2021	34.8	110.4	66.6	211.8
2022	15.0	737.7	185.0	937.6
2023	0.0	0.5	38.9	39.4
Total	**115.9**	**2,002.9**	**390.2**	**2,509.1**

Table 15: Area (ha) that had a negative change by year and grassland state. Proportion of the area that made negative change by year is indicated in brackets. Source: DEECA.

Year	HG	TG	C3G	NG	DG	Total
2015	4.3 (21%)	1.1 (15%)	0.0 (0%)	0.0 (0%)	No area surveyed	5.4 (<1%)
2016	0.0 (0%)	2.0 (69%)	No area surveyed	0.0 (0%)	No area surveyed	2.0 (1%)
2017	No area surveyed	No area surveyed	1.2 (100%)	0.0 (0%)	No area surveyed	1.2 (8%)
2019	No area surveyed	No area surveyed	29.2 (97%)	No area surveyed	No area surveyed	29.2 (84%)
2020	2.1 (38%)	1.7 (15%)	43.8 (96%)	0.0 (0%)	14.4 (81%)	62.0 (41%)
2021	No area surveyed	2.7 (61%)	33.5 (32%)	0.0 (0%)	30.4 (87%)	66.6 (31%)
2022	No area surveyed	No area surveyed	96.2 (13%)	0.0 (0%)	88.8 (100%)	185.0 (20%)
2023	No area surveyed	No area surveyed	22.1 (98%)	No area surveyed	16.8 (100%)	38.9 (99%)
Total	**6.4 (24%)**	**7.4 (29%)**	**225.9 (24%)**	**0.0 (0%)**	**150.4 (95%)**	**390.2 (16%)**

KPI 2: Cover of native perennial forbs

Table 16: KPI 2 assessment results for natural temperate grassland by grassland state.

KPI 2: Cover of native perennial forbs	Baseline (ha)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Herb-rich grassland	5.2	Not met	N/A	Stable	High	2017
Themeda grassland	1.4	Met	N/A	Stable	High	2018
C3 grassland	2.0	Met	N/A	Stable	High	2017
Nutrient-enriched grassland	2.2	Met	N/A	Improving	High	2017
De-rocked grassland	2.8	Met	N/A	Improving	Medium	2022

KPI 2 measures the cover of the valuable and diverse native perennial forb component that includes many rare species. KPI 2 is assessed using a continuous improvement approach, where any increase over the baseline in a five-year reporting period will lead to the calculation of a new baseline for subsequent reporting periods.

The permanent point intercept plots provide an estimate of the cover of native perennial herbs in each state in each year. Forb cover is relatively low across all states. This is the case in most grasslands across Victoria, even those that are considered very intact.

In relation to the maintenance of native forb cover, KPI 2 has been met for all states except herb-rich grassland, where it is most important, because many rare species are concentrated here (Figure 15). All states were found to have stable or improving trend. Nutrient-enriched grassland did not meet the baseline value in 2022 but recovered to be within the baseline between 2022 and 2023.

Meanwhile, herb-rich grassland deteriorated the native perennial forb cover from 5.2% to 3.9%. Five-year average values for 2022 and 2023 were below the baseline. The deterioration of native perennial forb cover in herb-rich grassland is partially due to the cover decreasing from 8.2% in 2017 to 2.7% in 2019, mainly due to the significant decrease in herb-rich grasslands in Conservation Areas 10 and 24. Conservation Area 10 has not assigned a land manager for direct land management. Currently PV is managing the area. Conservation Area 24 has Hume City Council (HCC) to manage the western part of area. There is no information provided by DEECA regarding management activities delivered since 2016, meaning that it is difficult to understand the cause of the decrease in the native perennial forb cover. The cover of the other grassland states either minimally increased or were stable between 2022 and 2024.

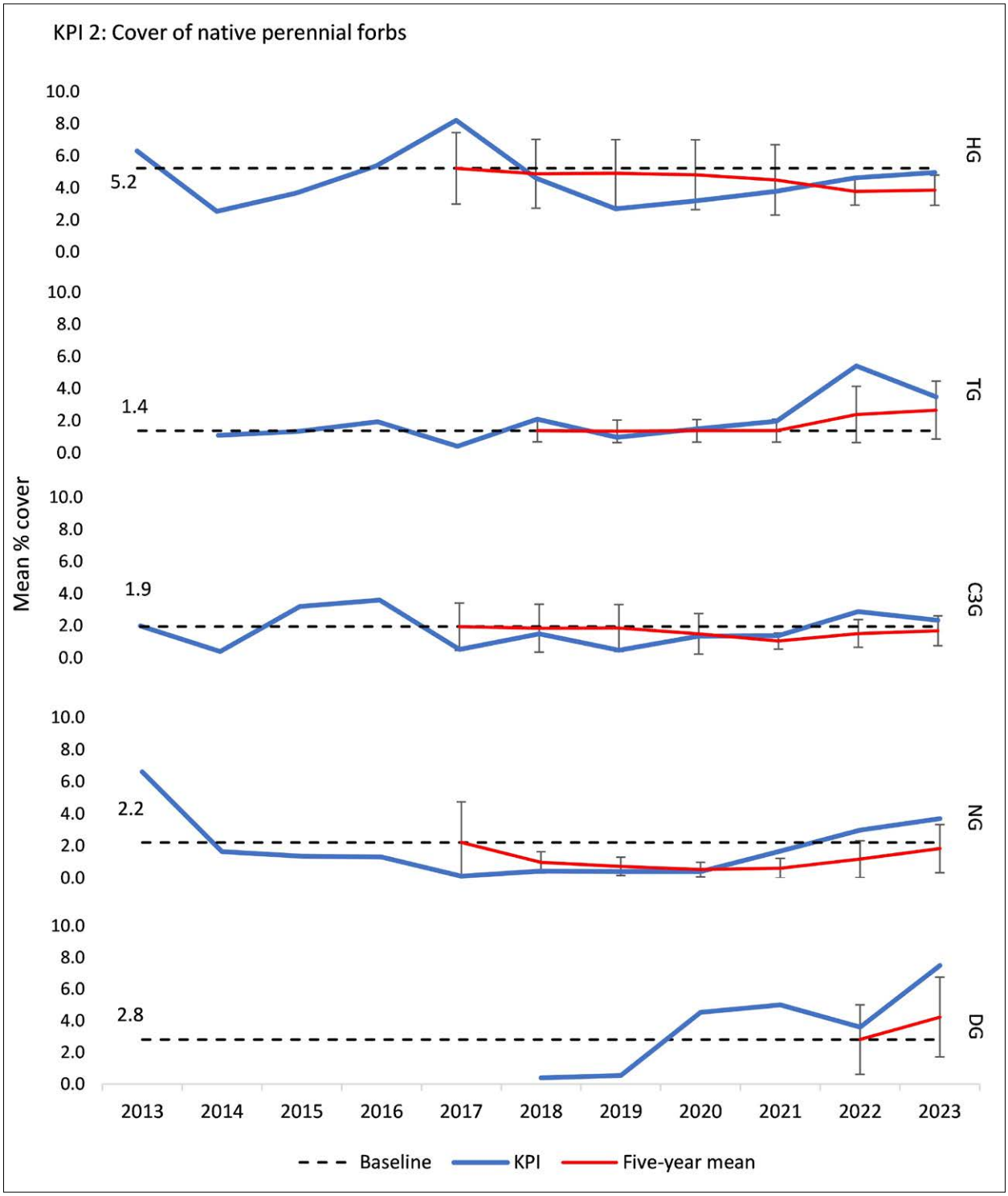


Figure 15: Cover of native perennial forbs in natural temperate grassland displayed by grassland state. Dashed lines show baselines. Blue lines show annual KPI data. Red lines show error bars representing 95% confidence intervals on five-year mean values. Source: DEECA.

KPI 3: Richness of native perennial forbs

Table 17: KPI 3 assessment results for natural temperate grassland by grassland state

KPI 3: Richness of native perennial forbs	Baseline (no. of species)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Herb-rich grassland	9	Not met	N/A	Deteriorating	High	2017
Themeda grassland	4	Met	N/A	Stable	High	2018
C3 grassland	5	Not met	N/A	Deteriorating	High	2017
Nutrient-enriched grassland	4	Not met	N/A	Stable	High	2017
De-rocked grassland	4	Met	N/A	Stable	Medium	2022

KPI 3 measures the richness of the native perennial forb component (explicitly at the scale of the 400 m^2 plot). The point intercept plots (permanent and reallocated) provide an estimate of the richness of native perennial herbs per plot, in each state, in each year. It is notable that imperfect detectability of sparse or cryptic species (due to seasonal conditions and human error) inevitably leads to fluctuations in the data. KPI 3 is assessed using a continuous improvement approach, where any increase over the baseline in a five-year reporting period will lead to the calculation of a new baseline for subsequent reporting periods.

KPI 3 was met in two states: *Themeda* grassland and de-rocked grassland. Nutrient-enriched grassland and C3 grassland states were consistently lower than the baseline since 2021. In 2023, the five-yearly mean value for herb-rich grassland was lower than the baseline for the first time in a decade of data collection (Figure 16).

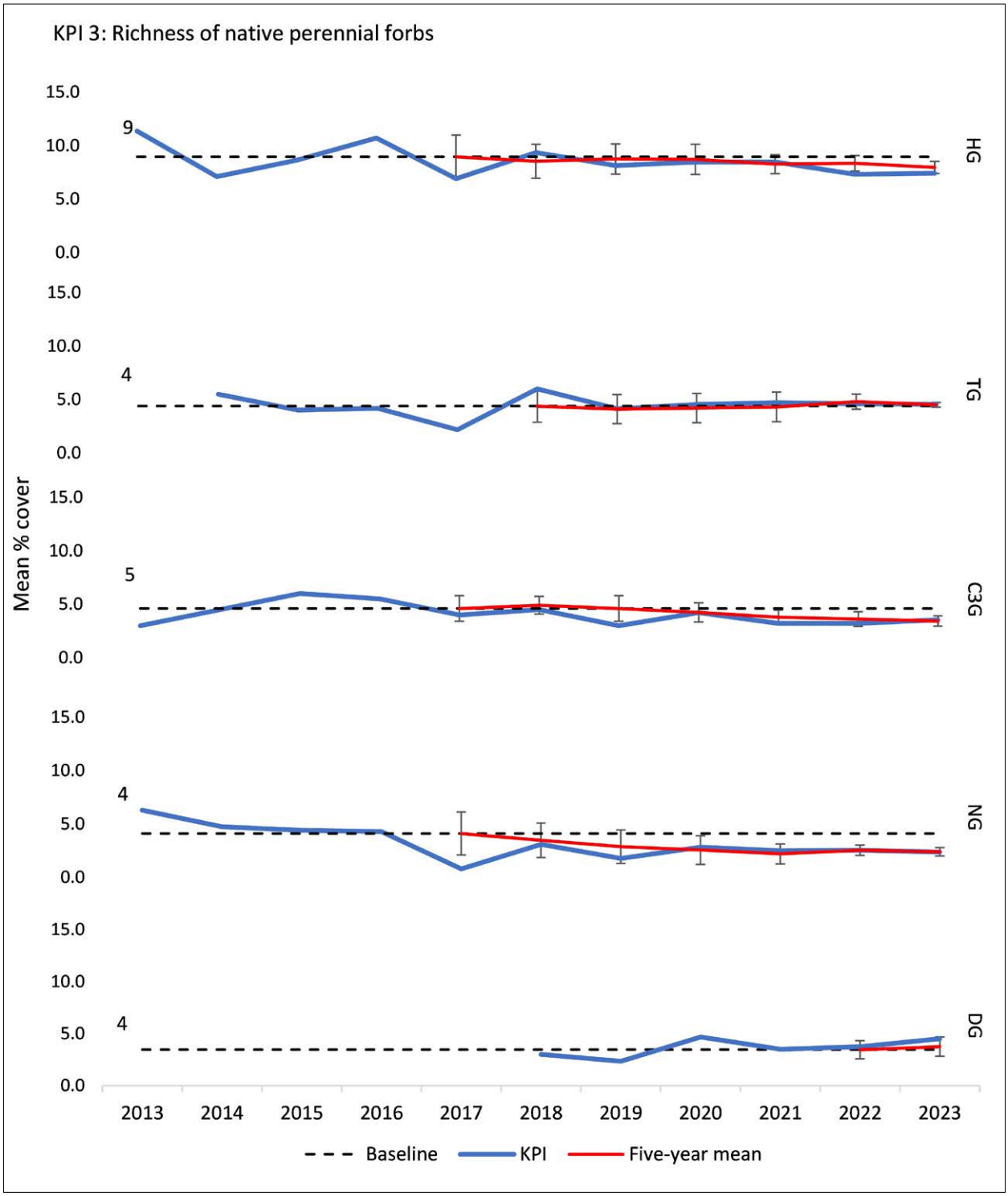


Figure 16: Richness of native perennial forbs in natural temperate grassland displayed by grassland state. Dashed lines show baselines. Blue lines show annual KPI data. Red lines show error bars representing 95% confidence intervals on five-year mean values. Source: DEECA.

KPI 4: Cover of kangaroo grass

Table 18: KPI 4 assessment results for natural temperate grassland by grassland state

KPI 4: Cover of kangaroo grass	Baseline (ha)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Herb-rich grassland	29.3	Met	N/A	Deteriorating	High	2017
Themeda grassland	17.5	Met	N/A	Improving	High	2018
C3 grassland	0.6	Met	N/A	Stable	High	2017
Nutrient-enriched grassland	0.0	Met	N/A	Stable	High	2017
De-rocked grassland	0.2	Met	N/A	Stable	Medium	2022

KPI 4 measures the cover of kangaroo grass, the naturally dominant species of natural temperate grassland that is considered a foundational species that regulates nutrient dynamics and species competition in the ecological community.[129] The point intercept plots (permanent and re-allocated) provide an estimate of the cover of this species in each state in each year.

For the most intact state (herb-rich grassland), KPI 4 is assessed using a set baseline approach (rather than a continuous improvement approach), where the baseline remains at 29.3% (set by the first five years of monitoring in the herb-rich grassland state). This reflects the fact that kangaroo grass is valuable but can become over-abundant.[130] The intact herb-rich grasslands are assumed to have an acceptable level of kangaroo grass cover.

For all other states, a continuous improvement approach will be taken, where any increase over the baseline in a five-year reporting period will lead to the calculation of a new baseline for subsequent reporting periods until a cover of 29.3% is reached, when the baseline will become fixed. As the *Themeda* grassland state reached this baseline in 2023, the baseline was amended to 29.3%.[131]

All states have set baselines that were established in 2017 except for *Themeda* grassland state and de-rocked grassland that were set in 2018 and 2022, respectively (Figure 17).

129. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.
130. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.
131. The five-yearly average was 34.5% but 95% confidence interval is between 23.0 and 46.1, meaning that this has not exceeded the baseline cover of kangaroo grass for herb-rich grassland state. Therefore, the baseline was amended to 29.3%.

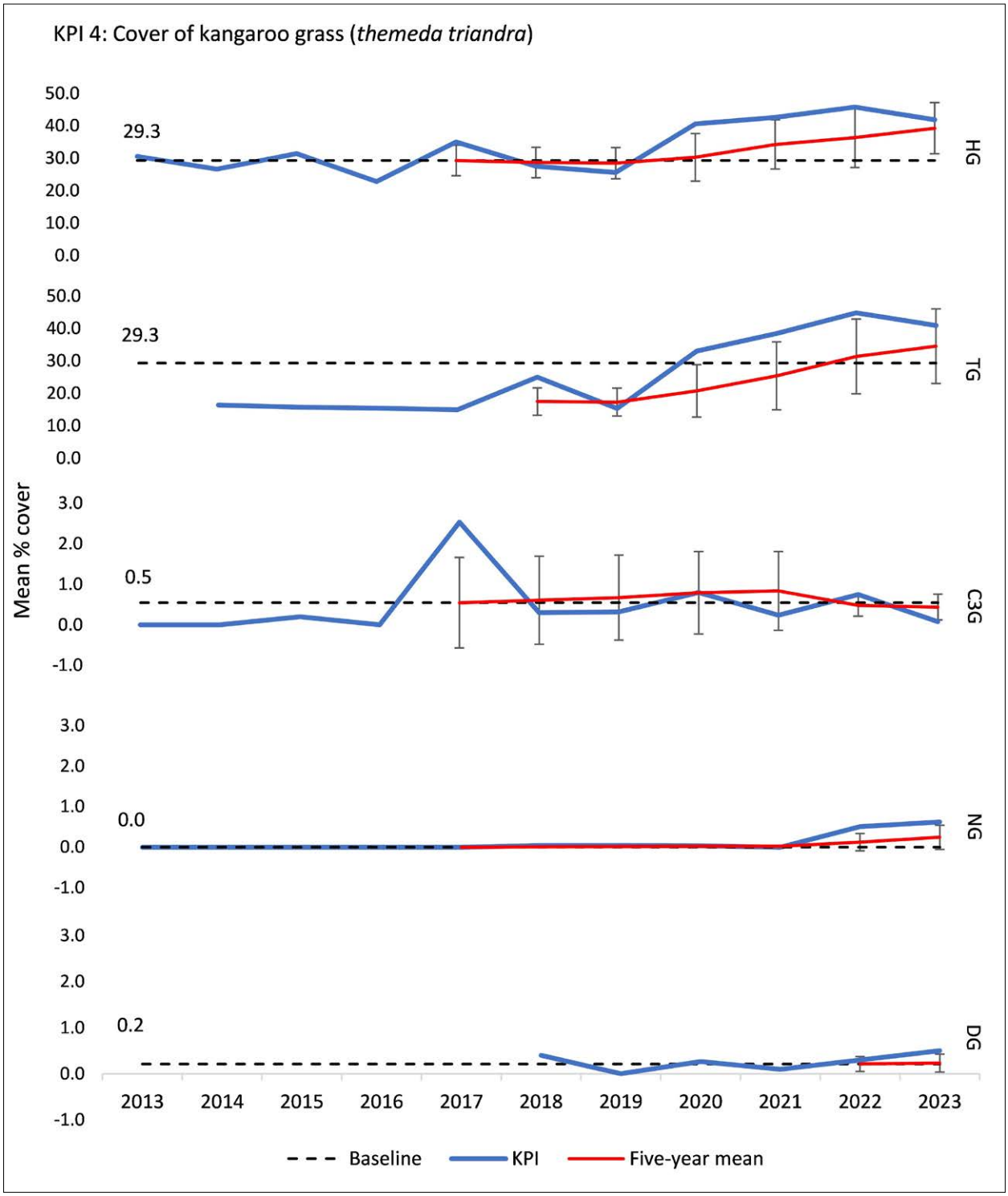


Figure 17: Cover of kangaroo grass in natural temperate grassland displayed by grassland state. Dashed lines show baselines. Blue lines show annual KPI data. Red lines show error bars representing 95% confidence intervals on five-year mean values. Source: DEECA.

KPI 5: Cover of any native perennial grasses (excluding kangaroo grass)

Table 19: KPI 5 assessment results for natural temperate grassland by grassland state.

KPI 5: Cover of any native perennial grasses (excluding kangaroo grass)	Baseline (ha)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Herb-rich grassland	38.7	Met	N/A	Stable	High	2017
Themeda grassland	31.3	Met	N/A	Stable	High	2018
C3 grassland	44.9	Met	N/A	Stable	High	2017
Nutrient-enriched grassland	30.5	Not met	N/A	Deteriorating	High	2017
De-rocked grassland	50.1	Met	N/A	Stable	Medium	2022

KPI 5 measures the cover of native perennial grasses (other than kangaroo grass that was addressed in the preceding KPI). The point intercept plots (permanent and re-allocated) provide an estimate of the cover of these species in each state in each year.

KPI 5 is assessed using a set baseline approach (rather than a continuous improvement approach), where the baseline remains at the value defined in the first monitoring period, reflecting the fact that moderate levels of native grass cover must be maintained, and that both loss of cover and over-growth may be problematic.

KPI 5 was met in all states except for nutrient-enriched grassland state, which had a 22.9% mean average in 2023.[132] This state was also found to have a deteriorating trend (Figure 18).

As anticipated in the MSA 2022 Report, the cover of native perennial grasses for nutrient-enriched grassland declined gradually, which led to the breach of the baseline in 2023 for the first time. The MSA 2022 Report demonstrated that the status of this grassland may be attributable to two sources:

- new properties being acquired which have lower native grass cover. When added to the dataset, they cause an overall decrease in the mean
- an actual decrease at managed sites resulting from weed invasion and lack of biomass management.

132. The nutrient-enriched grassland state had a 95% confidence interval between 16.4 and 29.4% with a five-year mean value of 22.9%.

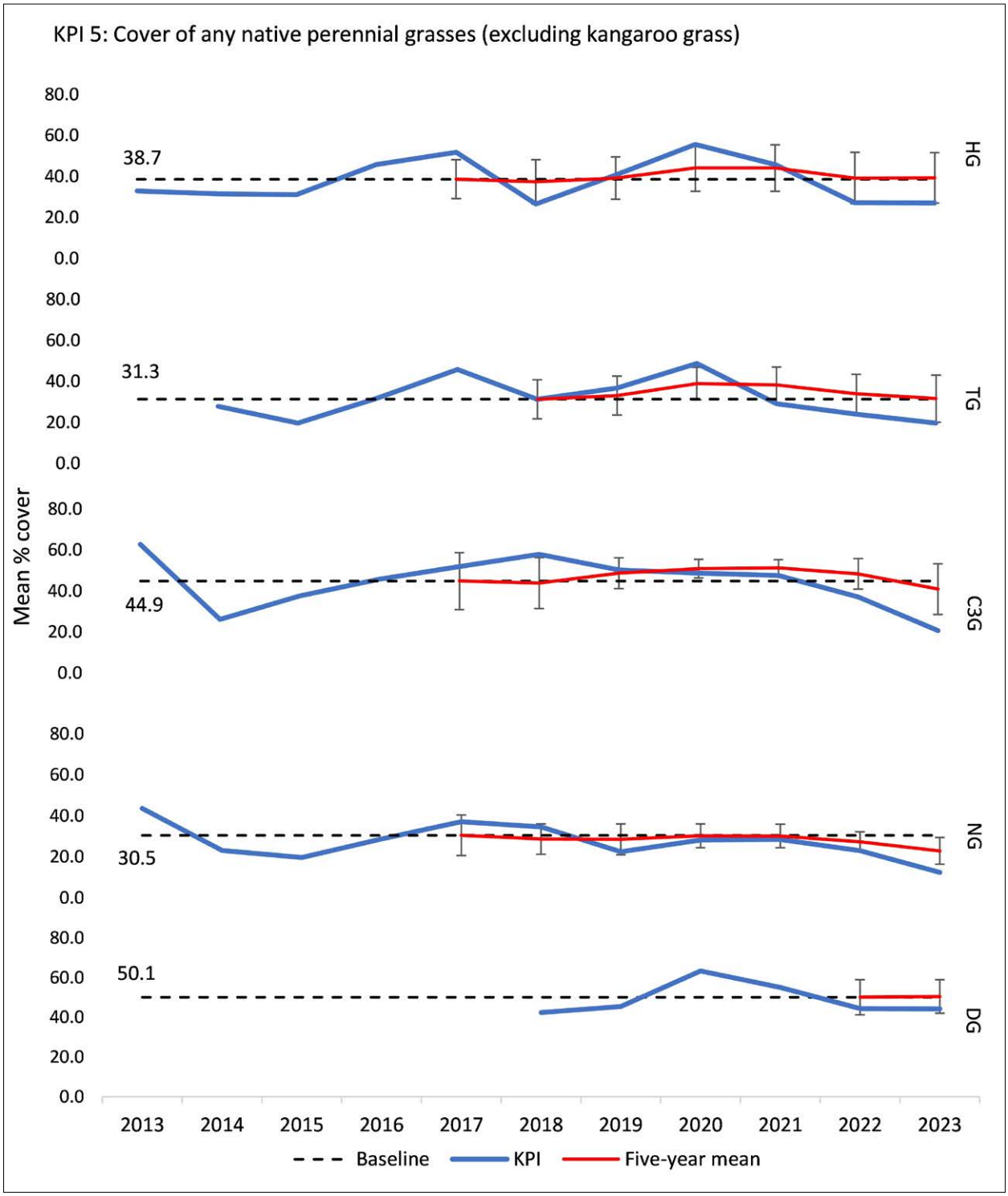


Figure 18: Percentage cover of native perennial grasses (excluding kangaroo grass) in natural temperate grassland displayed by state. Dashed lines show baselines. Blue lines show annual KPI data. Red lines show error bars representing 95% confidence intervals on five-year mean values. Source: DEECA.

KPI 6: Percentage of plots that have bare ground cover between 25% and 75%

Table 20: KPI 6 assessment results for natural temperate grassland by grassland state.

KPI 6: Percentage of plots that have bare ground between 25-75%	Baseline (%)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Herb-rich grassland	Bare ground between 25% and 75%	Not met	N/A	Stable	High	Assessment each monitoring year
Themeda grassland	Bare ground between 25% and 75%	Not met	N/A	Stable	High	Assessment each monitoring year
C3 grassland	Bare ground between 25% and 75%	Not met	N/A	Stable	High	Assessment each monitoring year
Nutrient-enriched grassland	Bare ground between 25% and 75%	Not met	N/A	Stable	High	Assessment each monitoring year
De-rocked grassland	Bare ground between 25% and 75%	Not met	N/A	Stable	High	Assessment each monitoring year

KPI 6 is a measure of habitat structural heterogeneity across the landscape (i.e. among plots). It requires that natural temperate grassland exists in a range of structural types each year (no single type is always preferred), to allow a range of animals to meet their habitat requirements. The KPI requires a certain proportion (5%–30%) of plots to fall within a bare ground cover category (25%–75% bare ground), and consequently requires a proportion to fall outside that category.

KPI 6 does not refer to a baseline. Rather, the KPI is met or not in each year.

In previous years, DEECA used a set of randomised small plots to assess the KPI 6 (as described in the MRF). This was necessary in the earlier years of the MSA because there were too few point-intercept plots within the relatively small area of protected land to service the KPI 6. Now that there are numerous point intercept plots over a larger protected area, the KPI 6 is assessed using the bare ground measure in the point intercept plots (as for KPIs 2, 3, 4, 5 and 7).

Table 21 shows proportion of plots that have 25% to 75% bare ground cover by state and year. The result indicates that all plots and state in 2023 had below 24% bare ground cover. The data indicate that biomass was too high in every area surveyed.

Table 21: Proportion of plots that had 0% to 24% bare ground cover by grassland state in 2023. Number of overall plots and plots that had less than 24% bare ground cover are indicated in brackets. Source: DEECA.

Grassland state	2023
Herb-rich grassland	100% (n = 19)
Themeda grassland	100% (n = 13)
C3 grassland	100% (n = 15)
Nutrient-enriched grassland	100% (n = 16)
De-rocked grassland	100% (n = 4)

KPI 7: Percentage cover of all perennial vegetation comprising weeds

Table 22: KPI 7 assessment results for natural temperate grassland by grassland state.

KPI 7: Percentage cover of all perennial vegetation comprising weeds	Baseline (%)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was sett
Herb-rich grassland	23.2	Met	N/A	Stable	High	2017
Themeda grassland	27.0	Met	N/A	Stable	High	2018
C3 grassland	30.5	Not met	N/A	Deteriorating	High	2017
Nutrient-enriched grassland	43.2	Not met	N/A	Deteriorating	High	2017
De-rocked grassland	44.2	Met	N/A	Stable	Medium	2022

KPI 7 measures the percentage of all perennial vegetation cover that comprises weeds (introduced species). Weeds are considered undesirable. The point intercept data from the permanent and re-randomised plots provide the relevant data in each state in each year. KPI 7 is assessed using a continuous improvement approach in which any increase over the baseline in a five-year reporting period will lead to the calculation of a new baseline for subsequent reporting periods.

KPI 7 was met in herb-rich grassland, *Themeda* grassland (TG) and de-rocked grassland — the other two states (C3 grassland and nutrient-enriched grassland) did not meet the baselines that were set in 2017 (Figure 19). These two states had an increasing trend in weed cover, resulting in a trend assessment of 'deteriorating'.

In general, weed cover increased and resulted in C3 grassland and nutrient-enriched grasslands breaching KPI 7. Both states showed perennial weed cover exceeding 70% in 2023. The five-year average was 53.8% for C3 grassland and 67.7% for nutrient-enriched grassland and these values are approximately 76% and 57% higher than the baseline values, respectively.

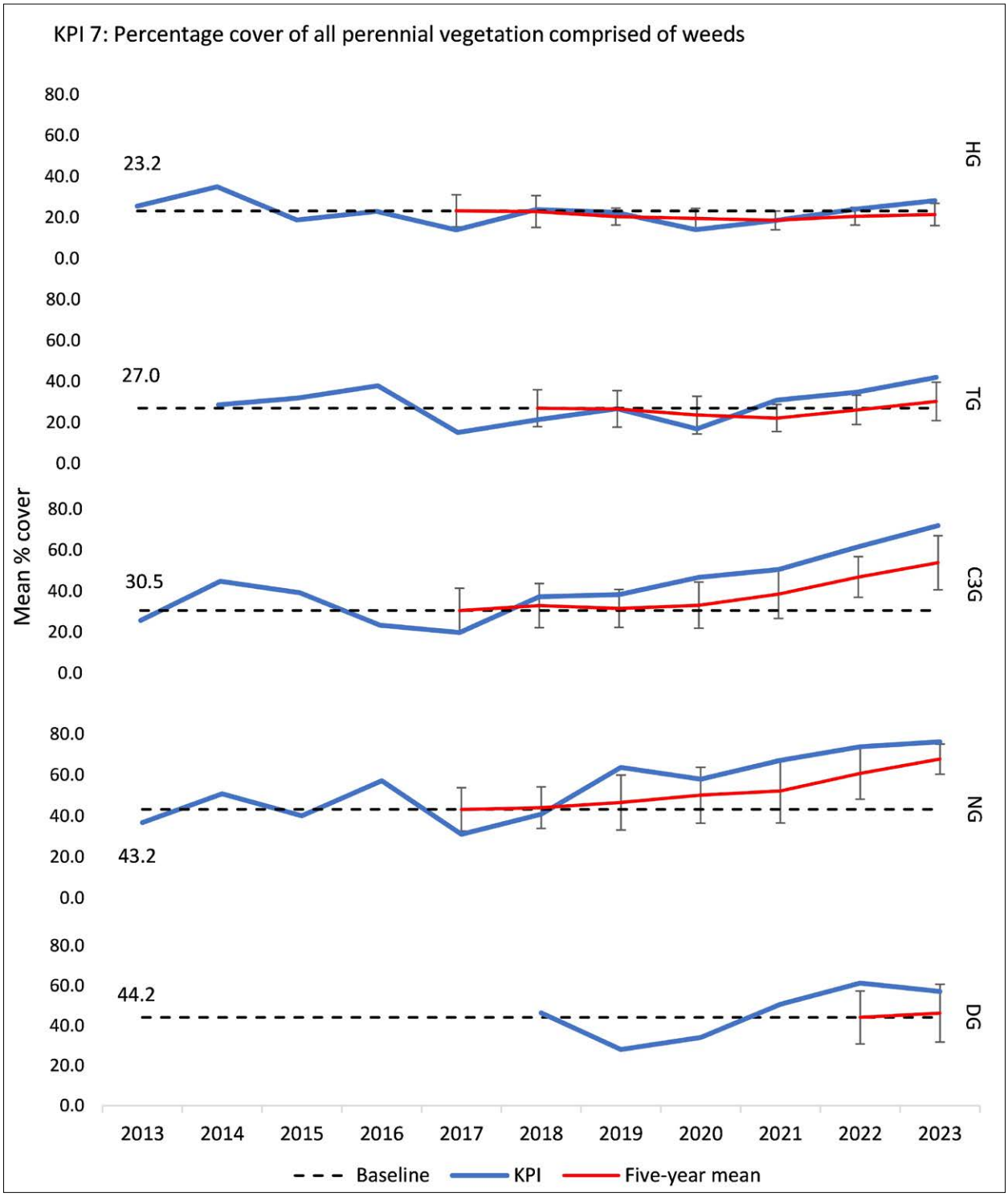


Figure 19: Percentage cover of all perennial vegetation comprising weeds in natural temperate grassland displayed by state. Dashed lines show baselines. Blue lines show annual KPI data. Red lines show error bars representing 95% confidence intervals on five-year mean values. Source: DEECA.

Key insights and management implications

Natural temperate grassland is a complex ecological community. The MRF KPI identify several key points that show an overall decline in natural temperate grassland:

- weed cover increased
- herb richness fell gradually
- native grass cover was steady in higher quality grasslands, falling slightly in marginal grasslands
- cover of native forbs fell slightly in the higher quality grasslands and increased slightly or was steady elsewhere.

To address this negative trend regarding increasing weed cover, on-ground management responses are critical. However, weed management activity has been insufficient. Weed control was administered to the WGR at a rate of approximately 672 hectares on average per year (Figure 20) from 2016. The largest area that was treated for weeds was 1,323 hectares in 2019, from when the area decreased significantly to 164.8 hectares in 2023. This has important implications for the degradation of natural temperate grassland. More on-ground works should be delivered as almost all plots surveyed had excessive biomass levels (refer to KPI 6) and many had increasing weed levels.

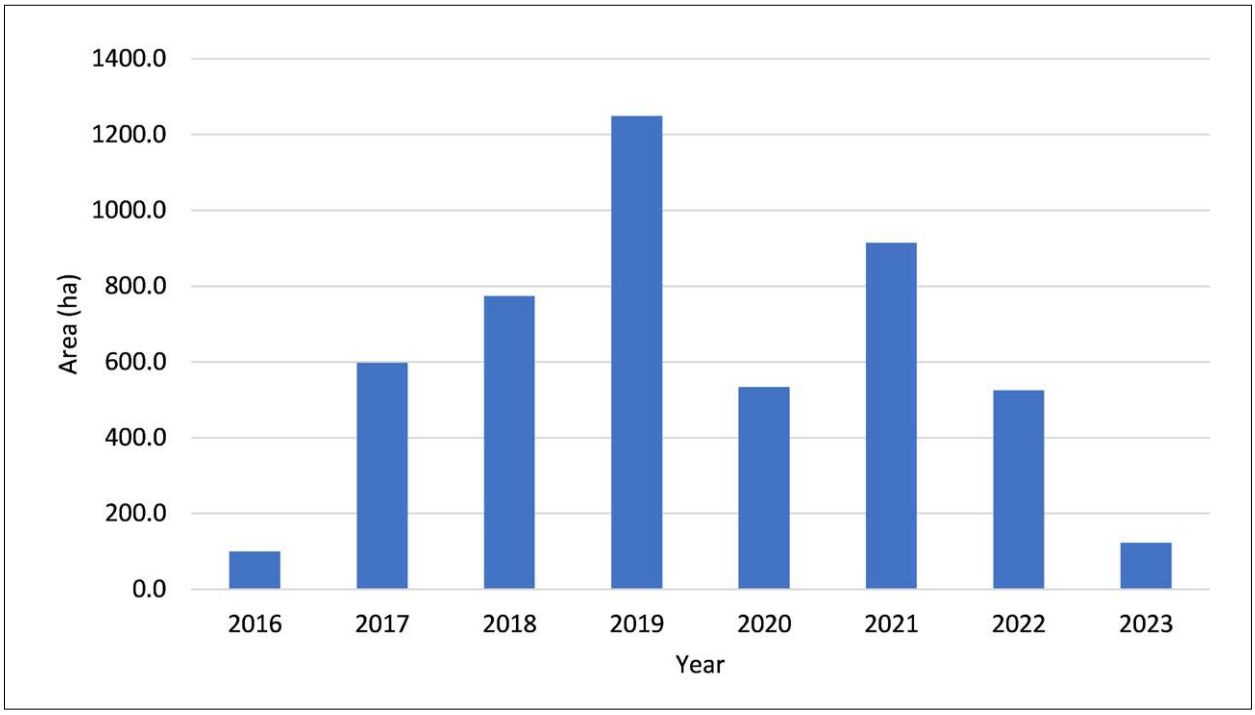


Figure 20: Extent of area in which weed control was undertaken in the Western Grassland Reserve between 2016 and 2023. Source: DEECA.

DEECA also advised, based on internal expert advice, that they are planning to change the target range for KPI 6 from '5%-30% of plots to fall within the bare ground cover category (25%-75% bare ground)' to '5%-30% of plots to fall within a bare ground cover category (10%-50% bare ground)' in the future.[133] If the target is modified in the future, more grassland states will meet the target. Nevertheless, the modified target range for each category will still result in most grassland states not meeting the KPI 6.

The MRF KPIs provide reliable indications of natural temperate grassland change but address separate aspects of the community. No single KPI is a direct, all-encompassing measure of the composition, structure and function for the community, which is the way improvement is framed in DEECA's conservation outcome statement.

133. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 3 June 2024.

To address this, a recommendation was made in the MSA 2022 Report to report 'grassland quality' scores to the KPI reporting suite (Recommendation 5 (ii)).[134] This metric uses an algorithm described in Sinclair et al.[135]

The quality algorithm combines eight measurable on-ground variables into a single value. These eight variables correspond closely with the KPI variables. The algorithm clarifies changes among the multiple KPIs by providing a single quality score between 100 (a 'pristine' site) and zero (where no value remains). The score is calculated from all permanent and re-allocated point-intercept plots in each year and reported by state.

Figure 21 demonstrates that quality of natural temperate grassland is decreasing for higher quality grassland states. For example, the score for herb-rich grassland decreased from 56.9 to 45.6 within a decade. The condition of *Themeda* grassland also deteriorated between 2018 and 2023, coinciding with the decreasing amount of on-ground works undertaken by PV (Figure 21). This decrease was mainly reported from the WGR whereas that type of grassland was found to have a stable trend in Conservation Areas 10 and 24.

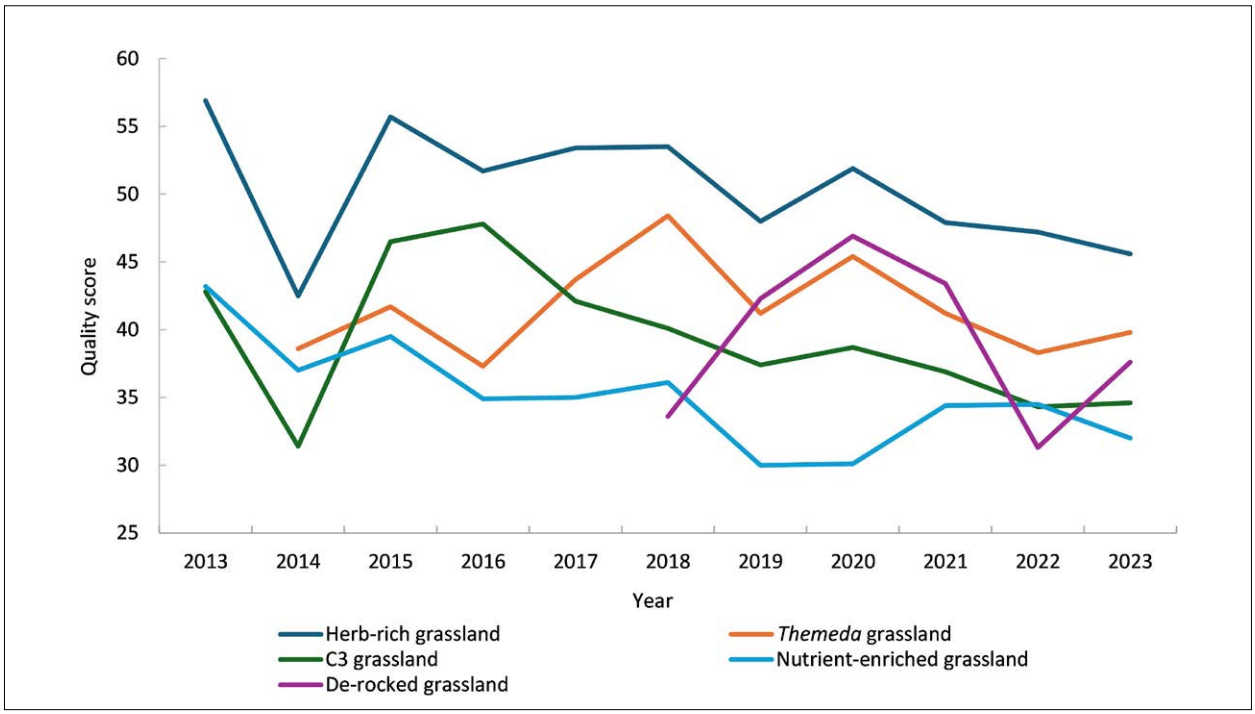


Figure 21: Quality score of natural temperate grassland within monitored plots (Western Grassland Reserve, Conservation Areas 10 and 24 and Truganina South Nature Conservation Reserve) by grassland state between 2013 and 2023. Source: DEECA.

The MSA 2022 Report also indicated issues in interpretating the results for natural temperate grassland under the current framework as KPIs are aggregated by states. This was subsequently assessed to be reported as 'met', 'not met' or 'partially met' against the baseline for each state. While condition of the ecological community by state is helpful, this does not indicate the impact of management responses. As a result, in the MSA 2022 Report, a recommendation was made to report the monitoring results by management unit and include 'time since acquisition' (Recommendation 5 (i)). DEECA responded that they are 'reviewing and updating the monitoring and reporting framework'.[136] This report identified that the aggregation of data only by state did not provide a comprehensive

134. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.
135. Sinclair SJ, Griffioen P, Duncan DH, Millett-Riley JE and White MD 2015, 'Quantifying ecosystem quality by modelling multi-attribute expert opinion', *Ecological Applications*, 25, pp. 1463-1477.
136. Department of Energy, Environment and Climate Action 2024, 'MSA conservation outcomes Report 2022 Recommendations and responses', Melbourne, Victoria.

understanding of natural temperate grassland. For example, Conservation Areas 10 and 24 contain high quality herb-rich grasslands and have different conditions from this type of grassland in the WGR, hence this could result in a 95% confidence interval of five-year average data becoming wider due to high variation. On average, since 2015 the quality score for herb-rich grassland in the conservation areas was higher than that of the grassland in the WGR by approximately one-third.

Weed management begins with understanding the current state and degree of weed exposure in both private and public land. Land managers cannot access private land without the landowner's consent. As a result, DEECA and PV often receive a land parcel that has been degraded. Many survey locations within newly acquired land in the WGR were heavily degraded. Some parcels had close to 100% weed cover. There were 16 survey plots that had no weed control applied and had higher weed coverage than the other survey plots. This potentially resulted in the weed cover increase for some grassland states.

To address this, a suite of readily available remote sensing data has been used to develop tools and approaches to characterise Victorian grassland communities and target invasive weed species at landscape and paddock scales.[137] This effort is aimed to achieve the following objectives:

- develop a remote sensing tool to monitor serrated tussock at paddock and landscape scales
- determine drivers of successful serrated tussock management utilising long-term management and imagery data
- develop a remote sensing tool to provide landscape scale measurement of desirable grassland communities that the WGR seeks to protect
- develop a range of spatially explicit outputs to support weed monitoring and management programs across the WGR.

This work has been producing maps of serrated tussock across the WGR in 2021 and 2022. These maps were produced using a combination of remotely sensed data and rapid plots (n =~12,000) in the acquired lands. The work will provide important information for assessing the current state of weed cover in natural temperate grassland prior to land acquisitions and improve effectiveness of management responses by applying weed control works where relevant. Combination with the current partnership with the WCC for applying intensive landcare activities would help target high weed cover locations to address this weed issues in the WGR.

This research has a critical importance for natural temperate grassland management as more areas within the WGR and conservation areas will be under MSA management and MRF. A more practical assessment of weed cover will provide a tool for the Government to identify areas to address negative impacts from weeds. DEECA also advised that they are looking at ways to use remotely-sensed information for KPI 1 but their progress is not published.[138] In addition, it allows DEECA and PV to gain a consistent overview of natural temperate grassland composition over acquired (WGR) land and private land under interim management.

Another approach in practical land management prior to land acquisitions is the partnership with the WCC in the WGR. As indicated in the 'on-ground land management' theme above, DEECA has a partnership with the WCC to manage private land in the WGR. Significant effort has been invested into the project which resulted in covering close to 6,000 hectares of private land to deliver land management activities. Continuation of this project has a critical importance prior to acquisition and transition to PV for direct management as it will help maintain high vegetation values and prevent potential degradation of the freehold land. This will also result in an improvement of KPI results in the future.

Conservation outcome statements indicate that BCS identified conservation areas where there is a presence of natural temperate grassland should be permanently protected and improve ecological function of the ecological community. Currently Conservation Areas 2, 3, 6, 10, 11, 12, 24 and 32 are protected in perpetuity. DEECA has Conservation Areas 10 and 24 are in the annual monitoring program and clarified that at least one natural temperate grassland plot will be positioned in every conservation area, to ensure there is longitudinal monitoring data across all protected areas. Larger areas will have larger numbers of plots.

137. Sheffiend K, Dugdale T and Abuzar M 2023 'Remote sensing tools for serrated tussock and desirable grassland communities in the Western Grassland Reserve: Milestone Report No:1', Department of Energy, Environment and Climate Action.
138. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 3 June 2024.

MNES 2: Grassy eucalypt woodland

Grassy eucalypt woodland.
Credit: Marcia Riederer
© DEECA

'Grassy eucalypt woodland of the Victorian Volcanic Plain' (grassy eucalypt woodland herein) is an ecological community listed as critically endangered under the EPBC Act (Figure 22).[139] This community is characterised by eucalypt woodlands with a grassy understorey, described in detail in the Commonwealth listing advice.[140] The community occurs south of the Great Dividing Range, and is specifically limited to Quaternary basalt plains.[141]

139. Department of the Environment 2022. 'Grassy Eucalypt Woodland of the Victorian Volcanic Plain in Community and Species Profile and Threats Database', Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat Accessed 10 February 2022.
140. Threatened Species Scientific Committee 2008, 'Advice to the Minister for the Environment, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act): Natural Temperate Grassland of the Victorian Volcanic Plain.' Threatened Species Scientific Committee. Canberra, Australian Capital Territory.
141. Threatened Species Scientific Committee 2008, 'Advice to the Minister for the Environment, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Ecological Communities under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act): Natural Temperate Grassland of the Victorian Volcanic Plain.' Threatened Species Scientific Committee. Canberra, Australian Capital Territory.

Figure 22: Image depicting the grassy eucalypt woodland of the Victorian Volcanic Plain. Source: DEECA.

DEECA's conservation commitment and relevance to MRF

DEECA published the statements below as conservation outcomes for grassy eucalypt woodland (Table 23) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with which KPIs can be found in Table 23.

Table 23: Conservation outcomes for natural temperate grassland and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcome	Alignment with Monitoring and Reporting Framework
Creation of the 1,200-hectare Grassy Eucalypt Woodland Protected Area (GEWPA) outside the Urban Growth Boundary, south-west of Whittlesea, protecting grassy eucalypt woodland.	Program output: A 1,200-hectare GEWPA protected and managed
The permanent protection of 341 hectares of grassy eucalypt woodland: in conservation areas identified in the Biodiversity Conservation Strategy and the Conservation Areas Declaration on land secured as part of the Grassy Eucalypt Woodland Protected Area that is additional to the 1,200 hectares.	Program output: A network of conservation areas within the Urban Growth Boundary (UGB) is protected and managed for Matters of National Environmental Significance species and vegetation communities Program output: 80% of grassy eucalypt woodland within the UGB is protected
Improved composition, structure, quality and ecological function of protected grassy eucalypt woodland.	Program outcome: The composition, structure and function of grassy eucalypt woodland of the Victorian Volcanic Plain improves in all areas in which it is protected

Conservation outcomes assessed

Conservation Outcome 1

The creation of the 1,200-hectare Grassy Eucalypt Woodland Protected Area outside the UGB, south-west of Whittlesea, protecting grassy eucalypt woodland

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor is based on the absence of any land acquisition to create a Grassy Eucalypt Woodland Protected Area on the fringe of the Urban Growth Boundary.

The trend assessment of stable is because the continued absence of any land acquisition is consistent.

The confidence in the status and trend assessment is rated as high because no acquisition has occurred between 2022 and 2024.

Conservation Outcome 1 was not achieved. The Victorian Government had originally been committed to achieving this outcome by 2020. As of October 2024, no land has been acquired and no progress has been made towards this conservation outcome.

DEECA is currently implementing this conservation outcome. In 2021, DEECA developed a strategy for establishing a GEWPA.[142] In July 2021, Trust for Nature was assigned to implement a landholder engagement program across the grassy eucalypt woodland investigation area for the MSA program. The two-year program ended in December 2023. The engagement program also employed staff from the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation.

The program also included a small incentive package to encourage engagement with landowners. The purpose of this phase of the engagement program was to make connections with landowners in the area and understand their interests and drivers regarding securing/protecting their land via the Trust for Nature conservation covenant program or voluntary sale to the Victorian Government.

Trust for Nature produced a final report for phase 1 of the Community Engagement Program and made recommendations based on their engagement, analysis and conversations with landowners on possible means of moving forward with land security. Their engagement was focused on the areas where patches of higher quality vegetation retain a dense cover of large old trees. This area ('core protection area') also includes important connectivity elements such as Darebin Creek, Barbers Creek and Plenty River.

The significant delay of land acquisition means that the environmental condition of the area may have been degraded.

142. Department of Environment, Land, Water and Planning 2021, 'Strategy for establishing a Grassy Eucalypt Woodland Protected Area', Melbourne, Victoria.

Conservation Outcome 2

The permanent protection of 341 hectares of grassy eucalypt woodland: in conservation areas identified in the BCS and the Conservation Areas Declaration on land secured as part of the Grassy Eucalypt Woodland Protected Area that is in addition to the 1,200 ha

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor is due to no land being acquired for the Grassy Eucalypt Woodland Protected Area. Based on the BCS, Conservation Areas 16, 17, 18, 19, 22, 25, 26, 27, 28, 29, 30, 31 and 33 have presence of Grassy Eucalypt Woodland. Conservation Areas 25, 26 and 31 have been secured. So far, Conservation Area 26 is the only area that is included in the regular monitoring program.

The trend assessment of stable is based on the consistently limited acquisition of relevant conservation areas.

The confidence in the status and trend assessment is rated as high due to high confidence in monitoring acquisition progress of grassy eucalypt woodland within conservation areas.

Among the conservation areas that are identified to have a presence of grassy eucalypt woodland, Conservation Areas 25, 26 and 31 have been secured (Table 24). Conservation Area 26 is the only area that has been included in the regular monitoring program to date.

Table 24: Conservation areas that have a presence of grassy eucalypt woodland based on the Biodiversity Conservation Strategy secured as of June 2024. Source: DEECA.

Conservation area	Overall area (ha)	Secured (ha)
16	18.3	0.0
17	14.4	0.0
18	203.0	0.0
19	2.4	0.0
22	182.5	0.0
25	1.4	1.4
26	110.1	110.1
27	26.5	0.0
28	189.9	0.0
29	37.7	0.0
30	215.9	0.0
31	21.0	6.5
33	404.8	0.0

Conservation Outcome 3

Improved composition, structure, quality, and ecological function of protected grassy eucalypt woodland

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of fair is based on the KPI results for Conservation Area 26, which is the only area being monitored. The KPIs for grassy eucalyptus woodland provide several key points identified in Conservation Area 26:

- Weed cover increased for some states: C3-dominated thicket and C3 woodland
- Forb richness fell significantly for nutrient-enriched Woodland
- Native grass cover was steady in better woodlands
- Too much Eucalyptus regeneration is present.

The quality score of grassy eucalypt woodland in Conservation Area 26 demonstrates that quality of grassy eucalypt woodland is deteriorating or stable for some woodland states. For example, C3 woodland state decreased in its score from 44.4 to 29.1, a deterioration of approximately a third. Meanwhile, *Themeda*-dominated thicket maintained its original score.

The trend assessment of deteriorating is based on a declining trend in some KPI results. While there is an absence of on-ground works information, it is likely that KPI results will not be met in the future once the baseline is set.

The confidence in the status and trend assessments is rated as moderate because the first five-year data collection is not complete. However, the first three years of data indicates a clear status and trend for this conservation outcome.

Results for grassy eucalypt woodland (KPI 1-7 for program outcomes) are not sufficient to assess as baseline values have not been established for all KPIs. The first year of data collection was 2021. Baselines for KPIs 1, 2, 3, 4 and 7 will be set in 2026 while the baseline for KPIs 5 and 6 was established using the measurements from 2021. KPIs 5 and 6 will, therefore, be assessed in the next survey, which occurs every 5 years. Excessive regeneration is occurring at most states with extensive weed cover. Meanwhile, the quality of monitoring sites degraded. Overall, the ecological condition of grassy eucalypt woodland in Conservation Area 26 deteriorated between 2022–2024 while some specific woodland states had a stable condition. However, Conservation Outcome 3 was not assessed as more data need to be collected to set the baseline.

KPIs assessed

DEECA's MSA MRF summarises the conservation outcome related to program outcomes for the grassy eucalypt woodland as a single goal statement:

> 'the composition, structure and function of grassy eucalypt woodland of the Victorian Volcanic Plain improves in all areas where it is protected'.[143]

DEECA developed seven KPIs to report against this single outcome statement:

- KPI 1: The area (ha) making an unfavourable transition between states must be zero (defined by a STM, currently unpublished).
- KPI 2: The cover of native perennial forbs must remain above a baseline. The baseline is different for each state. It is defined by the cover observed in the first five years of monitoring for each state and fixed at a new elevated level if exceeded.
- KPI 3: The richness of native perennial forbs must remain above a baseline. The baseline is different for each state. It is defined by the richness observed in the first five years of monitoring for each state and fixed at a new elevated level if exceeded.

143. Department of Environment, Land, Water and Planning (DELWP) 2015, 'Monitoring and Reporting Framework – Melbourne Strategic Assessment', East Melbourne, Victoria.

- KPI 4: The cover of 'target grass species' (kangaroo grass, common tussock grass (*Poa labillardierei*) and/or soft spear-grass (*Austrostipa mollis*)) must remain above a baseline. The baseline differs for each state. It is defined by the first five years of monitoring for each state and fixed at a new elevated level if it is exceeded, until it reaches 29% where it remains fixed.
- KPI 5: Every year, the relative abundance of four woodland structural types must be appropriately represented across the entire reserve network (Multi-layered vegetation, Open treeless vegetation, Park-like vegetation and Vigorous regeneration that must be in certain proportions by area).
- KPI 6: Every year, between 25% and 75% of all plots must support some *Eucalyptus* recruits.
- KPI 7: The cover of perennial weeds must remain below a baseline. The baseline is different for each state. It is defined by the richness observed in the first five years of monitoring for each state and fixed at a new lowered level if weeds are reduced below the baseline.

KPIs are assessed in the following five grassland states: herb-rich woodland, C3 woodland, *Themeda*-dominated thicket, C3-dominated thicket and nutrient-enriched woodland. Compared to the MSA 2022 Report, an additional metric was added to the report, regarding quality score.[144] This addition is due to Recommendation 6(iii) from the MSA 2022 Report. Similarly to natural temperate grassland, this will be discussed in the 'Key insights and management implications' section of this outcome assessment.

Monitored areas

Grassy eucalypt woodland is only monitored on properties protected under the MSA. Currently this only covers The Mount Ridley Woodland Reserve (Conservation Area 26) (Figure 23) that was first monitored in 2021. Twelve plots were implemented. In 2023, some private land did not permit access to DEECA for monitoring.

144. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.

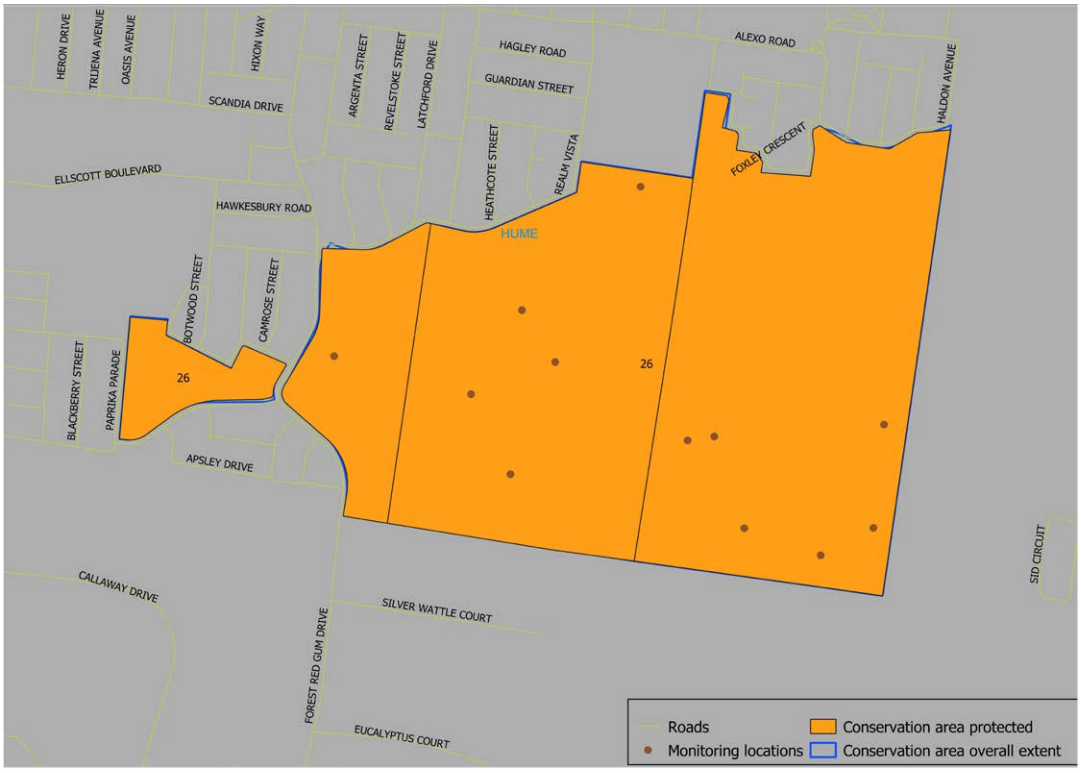


Figure 23: Map of 12 monitoring locations within Conservation Area 26 for monitoring grassy eucalypt woodland. Source: DEECA.

KPI 1: Hectares transitioning between states

Table 25: KPI 1 assessment results for grassy eucalypt woodland by woodland state.

KPI 1: Hectares transitioning between states	Baseline (ha)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Herb-rich woodland	No negative change	Not assessed yet	Assessed every five years	Unclear	N/A	N/A
C3 woodland	No negative change	Not assessed yet	Assessed every five years	Unclear	N/A	N/A
Themeda-dominated thicket	No negative change	Not assessed yet	Assessed every five years	Unclear	N/A	N/A
C3-dominated thicket	No negative change	Not assessed yet	Assessed every five years	Unclear	N/A	N/A
Nutrient-enriched woodland	No negative change	Not assessed yet	Assessed every five years	Unclear	N/A	N/A

KPI 1 compares the results from vegetation mapping completed at five-yearly intervals (with the first interval having concluded in 2020, covering all areas protected and mapped by 2016 — an arbitrary commencement date when several properties were protected). It refers to states defined by the grassy eucalypt woodland STM in which some states are more desirable than others.[145] The KPI is designed to ensure that any transitions between states are positive transitions, and that negative transitions are avoided.

KPI 2: Cover of native perennial forbs

Table 26: KPI 2 assessment results for grassy eucalypt woodland by woodland state.

KPI 2: Cover of native perennial forbs	Baseline (%)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline will be set
Herb-rich woodland	N/A	Not assessed	Assessed every five years	Unclear	N/A	2025
C3 woodland	N/A	Not assessed	Assessed every five years	Unclear	N/A	2025
Themeda-dominated thicket	N/A	Not assessed	Assessed every five years	Unclear	N/A	2025
C3-dominated thicket	N/A	Not assessed	Assessed every five years	Unclear	N/A	2025
Nutrient-enriched woodland	N/A	Not assessed	Assessed every five years	Unclear	N/A	2025

KPI 2 measures the cover of the valuable, diverse native perennial forb component that includes many rare species. The point intercept plots (permanent and re-allocated) provide an estimate of the cover of native perennial herbs in each state in each year. Forb cover is relatively low for many states except for herb-rich woodland (Table 27).

145. Sinclair SJ, Zamin T, Gibson-Roy P, Dorrough J, Wong N, Craigie V, Garrard GE and Moore JL 2019, 'A state-and-transition model to guide grassland management', Australian Journal of Botany, 67, pp. 437-453.

Table 27: Cover of native perennial forbs in grassy eucalypt woodland by woodland state between 2021 and 2023. Baselines, error bars and five-year mean values cannot be displayed due to insufficient data availability. Source: DEECA.

KPI 2: Cover of native perennial forbs	2021 (%)	2022 (%)	2023 (%)
Herb-rich woodland	8.4	10.2	14.8
C3 woodland	1.0	1.2	1.6
Themeda-dominated thicket	3.6	3.6	2.4
C3-dominated thicket	2.8	5.4	6.8
Nutrient-enriched woodland	19.6	17.9	3.3

KPI 3: Richness of native perennial forbs

Table 28: KPI 3 assessment results for grassy eucalypt woodland by woodland state.

KPI 3: Richness of native perennial forbs	Baseline (%)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline will be set
Herb-rich woodland	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
C3 woodland	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
Themeda-dominated thicket	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
C3-dominated thicket	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
Nutrient-enriched woodland	N/A	Not assessed	Insufficient data	Unclear	N/A	2025

KPI 3 measures the richness of the native perennial forb component (explicitly at the scale of the 400-m^2 plot). The point intercept plots (permanent and re-allocated) provide an estimate of the richness of native perennial herbs per plot, in each state, in each year. It is notable that imperfect detectability of sparse or cryptic species (due to seasonal conditions and human error) inevitably leads to fluctuations in the data (Table 29).

Table 29: Richness of native perennial forbs in grassy eucalypt woodland by woodland state between 2021 and 2023. Baselines, error bars and five-year mean values cannot be displayed due to insufficient data availability. Source: DEECA.

KPI 3: Richness of native perennial forbs	2021	2022	2023
Herb-rich woodland	17.0	16.5	10.0
C3 woodland	5.0	4.5	6.0
Themeda-dominated thicket	0.0	9.0	7.0
C3-dominated thicket	8.0	8.0	7.0
Nutrient-enriched woodland	6.0	6.0	5.0

KPI 4: Cover of native grass (*Themeda triandra* and *Poa spp.*)

Table 30: KPI 4 assessment results for grassy eucalypt woodland by woodland state.

KPI 4: Cover of native grass *(Themeda triandra* and *Poa)*	Baseline (%)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline will be set
Herb-rich woodland	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
C3 woodland	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
Themeda-dominated thicket	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
C3-dominated thicket	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
Nutrient-enriched woodland	N/A	Not assessed	Insufficient data	Unclear	N/A	2025

KPI 4 measures the cover of three main native grass species: kangaroo grass, *Poa* species and soft spear-grass. The point intercept plots (permanent and re-allocated) provide an estimate of the cover of this species in each state in each year. All plots were found to have no presence of soft spear-grass. *Poa* cover was very low for all states except for herb-rich woodland state (approximately 20%). *Themeda* woodland had approximately 3% cover of *Poa* species, whereas kangaroo grass had a cover of approximately 18% in 2023 for the same state. The other states had very low cover of kangaroo grass.

Table 31: Percentage cover of native grass (*Themeda triandra* and *Poa spp.*) in grassy eucalypt woodland by woodland state between 2021 and 2023. Baselines, error bars and five-year mean values cannot be displayed due to insufficient data availability. Source: DEECA.

KPI 4: Cover of native grass (Themeda triandra and Poa)	2021 (%)	2022 (%)	2023 (%)
Herb-rich woodland	23.4	16.6	23.2
C3 woodland	1.7	0.9	0.0
Themeda-dominated thicket	28.0	13.6	20.8
C3-dominated thicket	6.2	3.2	0.0
Nutrient-enriched woodland	1.6	0.1	0.4

KPI 5: Structural heterogeneity

Table 32: KPI 5 assessment results for grassy eucalypt woodland in Conservation Area 26.

KPI 5: Structural heterogeneity	Baseline (%)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Conservation Area 26	Meeting the targets for different vegetation types	N/A	Assessed every five years	Unclear	Medium	2021

KPI 5 is to capture structural heterogeneity of grassy eucalypt woodland. Balanced mixture of different type of vegetation is critical for an ideal condition for the grassy eucalypt woodland. DEECA has target ranges for structural types in different landscape units (Table 33). In summary, three years of monitoring demonstrates KPI 5 will not meet the target as most plots are vigorously regenerating, and if current conditions were not intervened by management responses, next monitoring data in 2026 will be deteriorated, leading to not meeting the KPI 5.

Table 33: Structural heterogeneity in grassy eucalypt woodland by landscape unit. Heterogeneity is surveyed only once every five years. Source: DEECA.

Target ranges for structural types, in different landscape units. Grassy eucalypt woodland vegetation type	Target range on 'undulating plains' (%)	Data in 2021 on 'undulating plains' (%)	Target range on 'Gilgai plains' (%)	Data in 2021 on 'Gilgai plains' (%)	Target range on 'stony rises' (%)	Data in 2021 on 'stony rises' (%)
Multi-layered vegetation	10 – 70	0	0 – 15	33.3	70 – 100	0
Open vegetation	0 – 15	0	5 – 30	0	0 – 15	0
Park-like vegetation	20 – 80	37.5	50 – 95	0	0 – 10	100
Vigorous regeneration	0 - 5	62.5	0 – 5	66.7	0 – 5	0

KPI 6: Percentage of plots between 25% and 75% containing *Eucalyptus* recruits

Table 34: KPI 6 assessment results for grassy eucalypt woodland in Conservation Area 26.

KPI 6: percentage of plots between 25% and 75% with *Eucalyptus* recruits	Baseline (%)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Conservation Area 26	Eucalypt recruit plots between 25% and 75%	Partially met	N/A	Unclear	Medium	2021

Table 35: Number of plots of overall number of plots surveyed in 2021 containing *Eucalyptus* recruits by woodland state. The count of *Eucalyptus* recruits indicates the average number of recruits per plot. Source: DEECA.

KPI 6: Percentage of plots between 25% and 75% with *Eucalyptus* recruits	Number of plots with *Eucalyptus* recruits	Overall number of plots	Percentage of plots with *Eucalyptus* recruits	Count of *Eucalyptus* recruits in 2021
Herb-rich woodland	2	2	100%	167.5
C3 woodland	3	4	75%	79.0
Themeda-dominated thicket	1	1	100%	774.0
C3-dominated thicket	2	2	100%	103.0
Nutrient-enriched woodland	3	3	100%	117.7

KPI 6 indicates that plots that have *Eucalyptus* recruits occurring need to be maintained between 25% and 75% of overall plots across all states. Monitoring in 2021 shows that most plots (11 out of 12 plots) have *Eucalyptus* recruits, indicating that too many plots are regenerating (Table 35). Count of *Eucalyptus* recruits is also alarming. One example is a *Themeda*-dominated woodland plot that has 774 *Eucalyptus* recruits occurring in a 0.25-hectare plot. This indicates more than 3,000 recruits per hectare.

KPI 7: Percentage cover of all perennial vegetation comprising weeds

Table 36: KPI 7 assessment results for grassy eucalypt woodland by woodland state.

KPI 7: Percentage cover of all perennial vegetation comprising weeds	Baseline (%)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline will be set
Herb-rich woodland	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
C3 woodland	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
Themeda-dominated thicket	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
C3-dominated thicket	N/A	Not assessed	Insufficient data	Unclear	N/A	2025
Nutrient-enriched woodland	N/A	Not assessed	Insufficient data	Unclear	N/A	2025

Table 37: Percentage cover of all perennial vegetation comprising weeds. Source: DEECA.

KPI 7: Percentage cover of all perennial vegetation comprising weeds	2021 (%)	2022 (%)	2023 (%)
Herb-rich woodland	59.0	38.8	42.8
C3 woodland	57.3	54.4	100.0
Themeda-dominated thicket	12.8	12.8	15.2
C3-dominated thicket	28.0	46.2	88.0
Nutrient-enriched woodland	31.2	50.0	35.1

KPI 7 measures the percentage of all perennial vegetation cover that comprises weeds (introduced species). Weeds are considered undesirable. The point intercept data from the permanent and re-randomised plots provide the relevant data in each state in each year. KPI 7 is assessed using a continuous improvement approach, where any increase over the baseline in a five-year reporting period will lead to the calculation of a new baseline for subsequent reporting periods.

Within the first three years of monitoring indicate that some states increased weed cover significantly (Table 37). C3 woodland and C3 thicket states reached over 88% of weed coverage in 2023. The C3 thicket state increased in cover from 28% to 88% that is more than a three-fold increase. The other states had a stable weed cover within the three years.

Key insights and management implications

Although monitoring has been only three years from 2021, KPIs 5 and 6 could be assessed as there is a target matrix that could be compared with a single year record. Both KPIs were not met for the targets that represent structural heterogeneity. However, this does not represent the condition of the whole grassy eucalypt woodland community that the MSA program should eventually cover. Currently only a single area (Conservation Area 26) is in the monitoring program.

The MRF KPI for grassy eucalypt woodland provides several key points identified so far in Conservation Area 26:

- weed cover increased for some states: C3-dominated thicket and C3 woodland
- forb richness fell significantly for nutrient-enriched woodland
- native grass cover was steady in higher quality woodlands
- excessive *Eucalyptus* regeneration is present.

The MRF KPIs provide good indications of grassy eucalypt woodland change, but these address separate aspects of the community. No single KPI is a direct and all-encompassing measure of the composition, structure and function for the community, which is the way improvement is framed in DEECA's conservation outcome statement. To address this, the MSA 2022 Report recommended to include 'grassland quality' scores in the KPI reporting suite (Recommendation 6 (ii)).[146]

This metric uses an algorithm described in Sinclair et al (2018).[147] This is now included as a KPI in response to the Recommendation.

The quality algorithm combines eight measurable on-ground variables into a single value. These eight variables correspond closely with the KPI variables. The algorithm makes sense of changes among the multiple KPIs, by providing a single quality score between zero (where no value remains) and 100 (a 'pristine' site). The score is calculated from all permanent and re-allocated point-intercept plots in each year and reported by state.

Table 38 demonstrates that quality of grassy eucalypt woodland is decreasing or stable for some woodland states. For example, C3 woodland state decreased its score from 44.4 to 29.1, a deterioration of approximately a third. Meanwhile, *Themeda*-dominated thicket maintained its original score.

Table 38: Quality score of grassy eucalypt woodlands by woodland state between 2021 and 2023. Source: DEECA.

Quality score	2021	2022	2023
Herb-rich woodland	62.2	60.6	65.3
C3 woodland	44.4	38.4	29.1
Themeda-dominated thicket	60.4	55.3	58.1
C3-dominated thicket	54.2	50.7	50.2
Nutrient-enriched woodland	47.2	45.6	48.4

Data, including the 'woodland quality' score, demonstrate that urgent management intervention is necessary as ecological conditions in Conservation Area 26 are deteriorating. Although the baseline for each KPI has not been set, it is apparent that on-ground actions are critical to address this. However, limited data were received by DEECA regarding historical records of management responses applied to Conservation Area 26. Most of the area (93.8 ha) is managed by private landholders, followed by Traditional Owners (11.7 ha, direct management will start mid-2024) and the HCC (4.9 ha, western portion of Conservation Area 26). There are two parcels of land for which private landholder management agreements were initiated in 2014 (52 ha) and 2019 (41.8 ha). DEECA does not have information on these two parcels regarding which land management works have been delivered against the land management agreement. The area managed by the HCC had detailed information on yearly achievements against management targets.

146. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.
147. Sinclair SJ, Bruce MJ, Griffioen P, Dodd A and White MD 2018, 'A condition metric for Eucalyptus woodland derived from expert evaluations', Conservation Biology, 32(1), pp. 195-204.

Thousands of young trees in a limited area (refer to KPI 5) could result in an increased risk of fire damage to old trees, since river red gum *(Eucalyptus camaldulensis* subsp. *camaldulensis)* is sensitive to fire. As *Eucalyptus* leaves are highly flammable, fire could result in a significant impact on the ecological community. However, an external ignition source from a collection of fine fuels (e.g. a grass fire or large collection of leaf matter) would be required as young trees may not increase the overall fire risk within a eucalypt woodland. Another issue is that as the young trees grow in the absence of management interventions, more areas will be shaded. This could result in a negative impact on other MNES, including the matted flax-lily. Currently, between 320 and 3,100 trees are regenerating at monitoring plots. DEECA advised that a few trees per hectare might be an ideal number of trees that would be sufficient to replace the large old trees in the future.[148] As a part of inserting fire breaks, DEECA undertook thinning of these young trees using a combination of mechanical crushing and painting the base of the crushed trees with herbicide. However, if the trees grow large enough it will be difficult to apply this method and it becomes costly as different treatments need to be applied. This also results in another issue as there will be more fuel on the ground that could increase fire risk to old trees. Therefore, timely application of on-ground activity is critical.

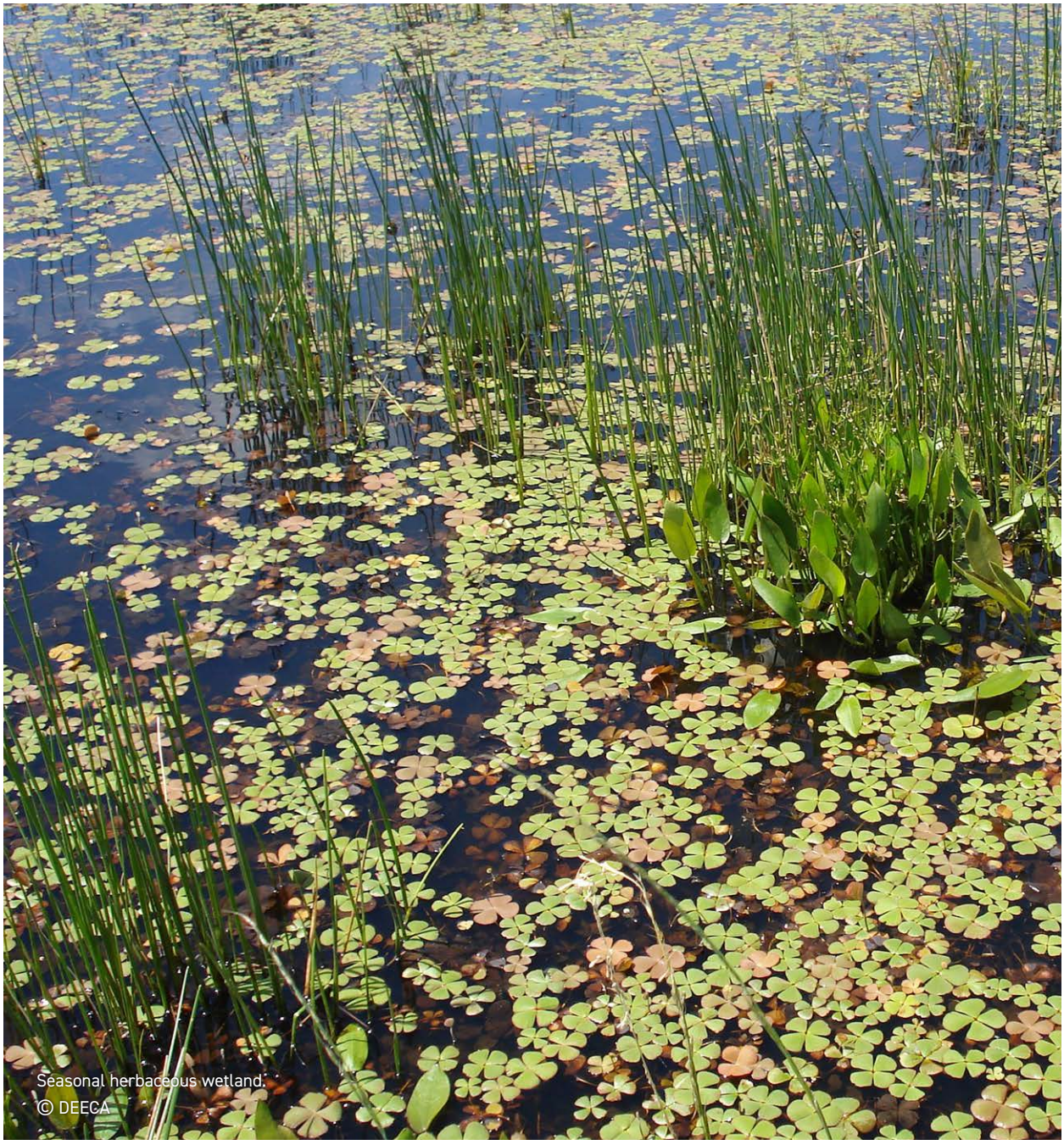
The BCS identified that Conservation Area 25 also has presence of a grassy eucalypt woodland community. This area is also protected in perpetuity. Currently information on this area is lacking as no monitoring has occurred.

Similarly to natural temperate grassland, the MSA 2022 Report also indicated issues in interpretating the results for this ecological community under the current framework as KPIs are aggregated only by woodland states. Each woodland state then assessed to report as 'met', 'not met' or 'partially met' against baseline that will be set using the first five years of annual monitoring data. This assessment framework excludes key factors that enable understanding the current status and effectiveness of management responses. Therefore, the MSA 2022 Report recommended to report the monitoring methods by management unit and include 'time since acquisition' (Recommendation 6 (i)).

River Red-gum
(*Eucalyptus camaldulensis* subsp. *Camaldulensis*)
Credit: Jesse Saofia
© iNaturalist Australia

148. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 22 May 2024.

MNES 3: Seasonal herbaceous wetlands



Seasonal herbaceous wetland.
© DEECA

'Seasonal herbaceous wetlands of the temperate lowland plains' (seasonal herbaceous wetlands) are listed as critically endangered under the EPBC Act (Figure 24).[149] These wetlands occur on fertile clay soils and are inundated after rains but may remain dry for long periods of time. Vegetation occurring in the wetlands is typically low and open, composed mostly of grasses, sedges, herbs and ferns. This ecological community was formerly scattered in large and small patches across the lowland plains of south-eastern Australia but is currently restricted to small, scattered remnants throughout the former range.[150]

149. Threatened Species Scientific Committee 2012, 'Advice to the Minister for the Environment, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act): Seasonal Herbaceous Wetlands of the Temperate Lowland Plains.' Threatened Species Scientific Committee. Canberra, Australian Capital Territory.
150. Threatened Species Scientific Committee 2012, 'Advice to the Minister for the Environment, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act): Seasonal Herbaceous Wetlands of the Temperate Lowland Plains.' Threatened Species Scientific Committee. Canberra, Australian Capital Territory.

Figure 24: Image depicting the seasonal herbaceous wetland in the Western Grassland Reserve after filling. Source: DEECA.

DEECA's conservation commitment and relevance to the MRF

DEECA published the following statements as conservation outcomes for seasonal herbaceous wetlands (Table 39) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with KPIs can be found in Table 39.

Table 39: Conservation outcomes for seasonal herbaceous wetlands and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcome	Alignment with the Monitoring and Reporting Framework
The permanent protection of seasonal herbaceous wetlands (freshwater) in: • the Western Grassland Reserve • the conservation areas identified in the Biodiversity Conservation Strategy and the Conservation Areas Declaration.	Program output: The 15,000-hectare grassland reserve is established and managed outside the Urban Growth Boundary (UGB) Program output: A network of conservation areas within the UGB is protected and managed for Matters of National Environmental Significance species and vegetation communities
Improved composition, structure, quality and ecological function of protected seasonal herbaceous wetlands (freshwater) that exceed three hectares in size.	Program outcome: The composition, structure and function of seasonal herbaceous wetlands of the temperate lowland plains improves in all areas in which it is protected

DEECA's MSA MRF also summarises the conservation outcomes for seasonal herbaceous wetlands as a single goal statement: 'the composition, structure and function of seasonal herbaceous wetlands of the temperate lowland plains improves in all areas where it is protected'.[151]

Conservation outcomes assessed

Conservation Outcome 1

The permanent protection of seasonal herbaceous wetlands (freshwater) in:
1. the Western Grassland Reserve
2. the conservation areas identified in the BCS and the Conservation Areas Declaration

2024 status		2024 trend		2024 confidence	
1. 	2. 	1. 	2. 	1. 	2. 

Why this assessment in 2024?

The status assessment of poor for Conservation Outcome 1.1 is based on the progress of land acquisition compared to the target of 339 hectares to be protected. The permanent protection of seasonal herbaceous wetland in the Western Grassland Reserve is 45 hectares (or 13.3% achieved). Of the 45-hectare protected, approximately 24 hectares is regularly monitored. The status assessment of fair for Conservation Outcome 1.2 is due to additional areas identified with seasonal herbaceous wetland extent in Conservation Area 3, which is intended to become a regional park. The process to acquire the land to establish the park has commenced, but it will take time for the park to be established.

The trend assessment of stable for Conservation Outcome 1.1 is based on little improvement in total areas protected compared to 2022. Conservation Outcome 1.2 is assessed as improving as a protected conservation area has been added.

The confidence in the status and trend assessment for Conservation Outcomes 1.1 and 1.2 is rated as high because there is information on acquisition sufficient to assess status and trend.

This outcome assesses the permanent protection of the seasonal herbaceous wetlands (freshwater) target areas within the WGR and 36 conservation areas. The statement of reasons for approval decision under Part 10 of the EPBC Act indicates that there are an estimated 533 hectares of larger patches (larger than three hectares and potentially having conservation value) of likely seasonal herbaceous wetlands in the growth corridors and the WGR. A total of 339 hectares (64%) of the 533 hectares would be protected. The condition for the approval was that most of the 339 hectares to be protected needed to be present within the WGR.

DEECA advised that approximately 45 hectares of seasonal herbaceous wetlands have been protected within the WGR.[152] This is approximately 13.3% of the total area to be protected. Since 2022, Target Range Swamp has been added to the regular monitoring program.[153]

BCS identified no extent of seasonal herbaceous wetlands within the 36 conservation areas. However, DEECA advised that a preliminary vegetation assessment identified that Conservation Area 3 (Western Growth Corridor: Clarke's Road Grassland, Rockbank) contains extent of seasonal herbaceous wetlands within Kororoit Creek Regional Park.[154] PV is currently progressing the procurement of a lead design consultant to develop a masterplan for the park.[155] Under the Strategic Directions Plan, seasonal herbaceous wetlands will be a part of active management, including releasing water into these areas to maintain the ecological community.[156]

151. Department of Environment, Land, Water and Planning (DELWP) 2015, 'Monitoring and Reporting Framework – Melbourne Strategic Assessment', East Melbourne, Victoria.
152. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 15 March 2024.
153. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 15 March 2024.
154. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 20 March 2024.
155. Parks Victoria (PV) 2022, 'Kororoit Creek Regional Park: Strategic directions plan', Melbourne, Victoria
156. Parks Victoria (PV) 2022, 'Kororoit Creek Regional Park: Strategic directions plan', Melbourne, Victoria.

PV is yet to commence a work plan in the new park. The process for acquiring the land necessary to establish the new park has commenced but it will take time for the park to be fully completed. DEECA advised that the extent of seasonal herbaceous wetlands in Conservation Area 3 to be included in the regular monitoring program is less than three hectares in size.[157] This is based on advice from experts within DEECA.

Conservation Outcome 2

Improved composition, structure, quality, and ecological function of protected seasonal herbaceous wetlands (freshwater) that are greater than three hectares in size.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of good is based on the KPI results monitored since 2015. All KPIs were met except for Target Range Swamp as this area has not completed the first five-year data collection cycle. Some KPIs had lack of drawdown events which prevented assessments.

The trend assessment of stable is based on the KPI data.

The confidence in the status and trend assessment is rated as moderate because the condition information is based only on the 13.3% of total area protected in perpetuity. More area should be protected and included in the monitoring program.

Conservation Outcome 2 is to ensure that the protected seasonal herbaceous wetland community improves in ecological functioning. All KPIs for seasonal herbaceous wetlands in the MRF are related to this outcome.

KPIs indicate that native forb richness remains stable across all wetland sites except for Target Range Swamp due to insufficient data (that are expected to be ready for assessment for KPI 1 and 3 in 2027). All data were within the 95% confidence interval tolerance of the defined baseline in each case, meaning that KPIs indicate that Conservation Outcome 2 has been met. However, weeds in Cobbledicks Rise Wetland would appear to be increasing during the 2022–2024 period.

Results for this community convey a wide degree of variation, as the appearance of vegetation within this system is often very dynamic due to the rapid wetting and drying cycles. Large fluctuations in vegetation cover occasionally occur from year to year.

Exotic perennial species have a presence at the monitoring sites. Some of these have increased over the last few years. Each wetland has experienced invasion from a different combination of weed species (Windmill: *Helminthotheca echioides, Galenia pubescens, Nassella trichotoma, Cynara cardunculus;* Cobbledicks Rise: *Hypochaeris radicata, H. echioides, C. cardunculus, N. trichotoma*; One Tree Rise: *Lolium rigidum, G. pubescens, Marsilea drummondii, Phalaris aquatica, H. echioides*).

Consistent with findings in the MSA 2022 Report, native perennial species remain stable.[158] However, weed cover fluctuated significantly over the last few years. For example, the proportion of weed cover increased from 7.6% in 2020 to 51.4% in 2022 at Cobbledicks Rise Wetland. On the other hand, Windmill Wetland experienced a significant reduction in weed cover from 42.4% in 2022 to 6.3% in 2023. The high variation in annual weed cover resulted in a wide 95% confidence interval for the five-year mean for weed cover. Due to the large variation, determining the current status of the ecological condition of seasonal herbaceous wetlands is difficult.

Based on results from the KPIs, the condition of the seasonal herbaceous wetland community in the WGR is stable. However, this wetland system is highly dynamic and variable by site, and assessing the overall trend trajectory is difficult.

157. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 11 July 2024.
158. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.

KPIs assessed

DEECA's MSA MRF also summarises the conservation outcomes for the seasonal herbaceous wetlands as a single goal statement: 'the composition, structure and function of seasonal herbaceous wetlands of the temperate lowland plains improves in all areas where it is protected'.[159] DEECA developed four KPIs to report against this single outcome statement:

- KPI 1: Richness of native perennial forbs during spring-summer must remain above the baseline, set as the mean of the first five years of monitoring.
- KPI 2: Richness of all native forbs during drawdown must remain above the baseline, set as the mean of the first five years of monitoring.
- KPI 3: Percentage of all perennial vegetation (during spring-summer) composed of weeds must remain below the baseline (set by the first year of monitoring for the wetland).
- KPI 4: Percentage of all perennial vegetation (during drawdown) composed of weeds must remain below the baseline (set by the first year of monitoring for the wetland).

KPIs 1 and 2 are assessed using a 'continuous improvement' approach, where any increase over the baseline in any wetland in a five-year reporting period will lead to the calculation of a new baseline for that wetland for subsequent reporting periods.

KPIs 3 and 4 are assessed using a 'continuous improvement' approach, where any decrease below the baseline in any wetland in a five-year reporting period will lead to the calculation of a new baseline for that wetland for subsequent reporting periods.

Drawdown event only occurred during the normal spring-summer monitoring period, therefore, KPIs 1 and 2, and KPIs 3 and 4 will be identical when drawdown event occurred.

Monitored areas

Seasonal herbaceous wetlands are monitored as a set of discrete wetlands. Each wetland is reported separately. All seasonal herbaceous wetlands sites exceeding three hectares in area are monitored (Figure 25).

The first parcels of land supporting seasonal herbaceous wetlands were acquired in 2012. These areas contained three wetlands larger than three hectares in size. These are:

- Cobbledicks Rise Wetland (5.1 ha, part of the Cobbledicks cluster noted in DEPI (2013b))[160]
- One Tree Rise Wetland (3.1 ha)
- Windmill Wetland (4.3 ha, part of the Cobbledicks cluster noted in DEPI (2013b))[161]

Monitoring commenced for all three sites in 2014. There is one new addition in the annual monitoring system since 2023, Target Range Swamp:

- Target Range Swamp (12 ha)

Target Range Swamp was sampled at a lower intensity in 2023–2024 compared to 2022–2023 season. DEECA advised that their unpublished power analysis shows that 50% of the plots was sufficient to characterise the relevant information.[162] DEECA's result shows that results from samples from every 20 metres were extremely similar to those from every 10 metres.

159. Department of Environment, Land, Water and Planning (DELWP) 2015, 'Monitoring and Reporting Framework – Melbourne Strategic Assessment', East Melbourne, Victoria.
160. Department of Environment and Primary Industries 2013, 'The impact of Melbourne's growth on 'seasonal herbaceous wetlands of the temperate lowland plains', East Melbourne, Victoria.
161. Department of Environment and Primary Industries 2013, 'The impact of Melbourne's growth on 'seasonal herbaceous wetlands of the temperate lowland plains', East Melbourne, Victoria.
162. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 24 June 2024.

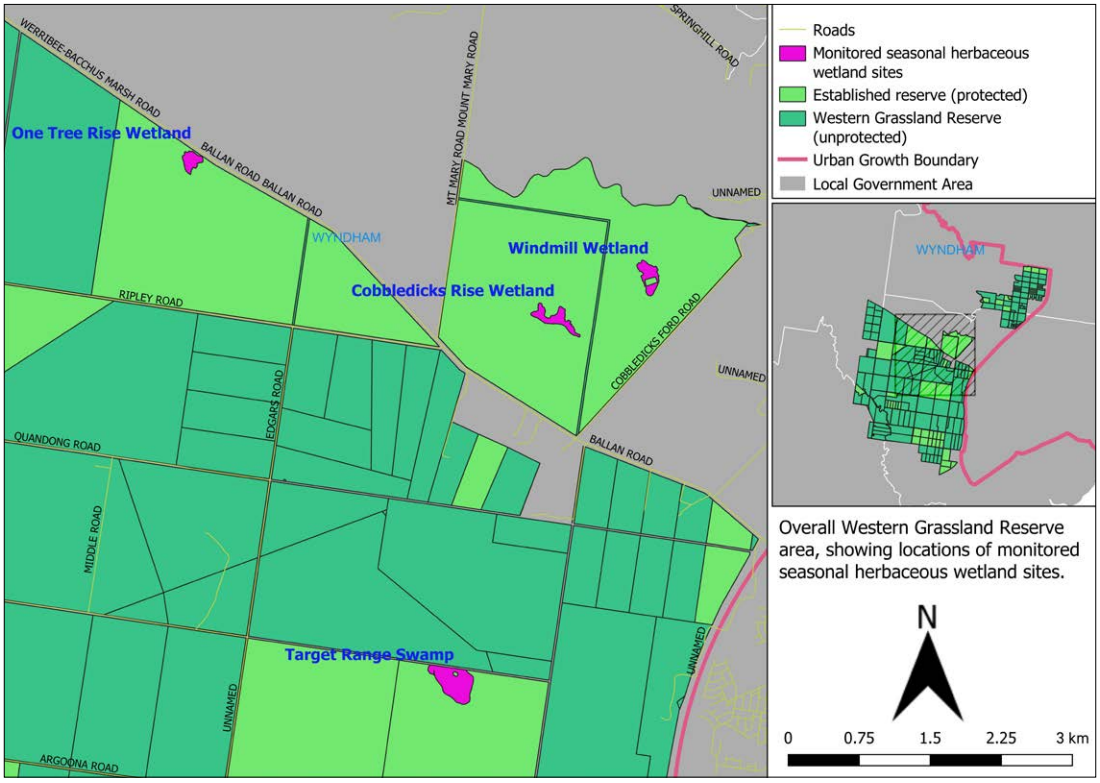


Figure 25: Map of the locations of the subject wetlands within the protected areas of the Western Grassland Reserve. Source: DEECA.

KPI 1: Richness of native perennial forbs during spring-summer

Table 40: KPI 1 assessment results for seasonal herbaceous wetland by the subject wetland within the protected areas of the Western Grassland Reserve.

KPI 1: Richness of native perennial forbs during spring-summer	Baseline (no. of species)	Status 2022-2024	Reason for non-assessment (if applicable)	Trend	Data confidence	Year that baseline was /will be set
Cobbledicks Rise	13	Met	N/A	Stable	High	2018
One Tree Rise	16	Partially met	N/A	Stable	High	2018
Windmill	16	Met	N/A	Stable	High	2018
Target Range	Not yet set	N/A	Baseline not yet set	N/A	N/A	2027

KPI 1 measures the richness of the valuable native perennial forb component (explicitly at the individual wetland scale). Baseline is an average of first five years of species count, leading to baseline having decimal points. KPI 1 measures forb richness in every year, regardless of hydrological phase. It reports the count of species surveyed on an annual basis. Given KPI 1 will include wet and dry years, this measure is expected to fluctuate over time.

KPI 1 was met for Cobbledicks Rise Wetland and Windmill Wetland in 2022–2024. In 2023, One Tree Rise wetland did not meet the baseline that was set in 2018 (16 species), but native perennial forb richness was higher than the baseline in 2022. As Target Range Swamp started its annual monitoring from 2023, no assessment was made due to insufficient data.

KPI 2: Richness of all native forbs during drawdown

Table 41: KPI 2 assessment results for seasonal herbaceous wetland by the subject wetland within the protected areas of the Western Grassland Reserve.

KPI 2: Richness of all native forbs during drawdown	Baseline (no. of species)	Status 2022-2024	Reason for non-assessment (if applicable)	Trend	Data confidence	Year that baseline was set
Cobbledicks Rise	12	Met	N/A	Stable	Low	2017
One Tree Rise	18	Not assessed	Lack of drawdown event	N/A	N/A	2023
Windmill	14	Met	N/A	Improving	Low	2017
Target Range	6	Met	N/A	Unclear	Low	2023

KPI 2 measures the richness of all native forbs, including both perennial and annual species (explicitly at the individual wetland scale). It is measured only at times when a given wetland is drawing down after filling, and the maximum expression of species richness is expected. This may only happen every few years, such that KPI 2 is not relevant in many years. The KPI 2 is assessed against a baseline, set by the first year of monitoring at drawdown, with a unique benchmark for each wetland. Since monitoring began, drawdown has occurred in 2017 for Cobbledicks Rise, and Windmill Wetlands (One Tree Rise has a smaller catchment and did not fill in 2017) and 2024 for Target Range Swamp (Figure 26). In 2023, all wetlands had a drawdown event. The drawdown events occurred during the normal spring-summer monitoring period, so a single monitoring event covered KPIs 1 and 2. One Tree Rise Wetland was not assessed as only a single event was recorded so far. The count of native forbs at drawdown for Cobbledicks Rise Wetland in 2017 was 11 species that increased to 15 species in 2023 (Figure 26).[163] All were perennial, so this value is identical to that measured for KPI 1 (that only assesses perennial forb species). For Windmill Wetland, the count of native forbs at drawdown in 2017 was 11 species.[164] In the next drawdown event occurred in 2023, the count of species was increased to 17 species. Target Range Swamp was found to have two drawdown events consecutively in 2023 and 2024 with 6 and 10 species found, respectively.

163. In the MSA 2022 Report, the count of native forbs in 2017 was recorded to 12 species but due to the rationalisation of the perennial / annual status of species in 2024, slight changes were made as inconsistencies were found.
164. In the MSA 2022 Report, the count of native forbs in 2017 was recorded to 12 species but due to the rationalisation of the perennial / annual status of species in 2024, slight changes were made as inconsistencies were found.

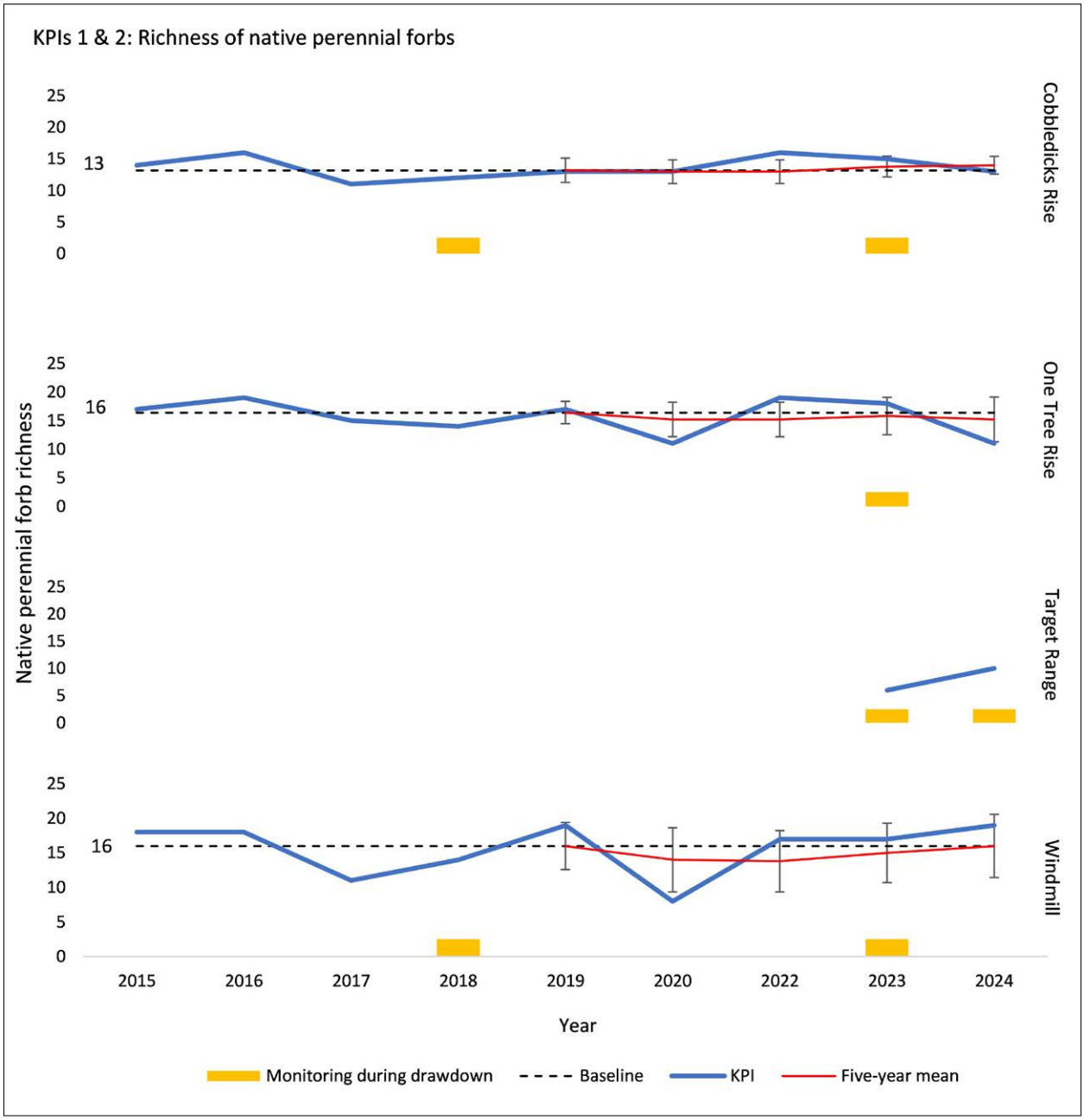


Figure 26: Richness of native forbs for monitored wetlands in the Western Grassland Reserve. Bar charts indicate years when the wetland was monitored during drawdown (September 1). Dashed lines show the baseline calculated after the first five years of monitoring. Blue lines show annual KPI data. Red lines show the five-year rolling mean (±95% confidence intervals). Source: DEECA.

KPI 3: Percentage cover of all perennial vegetation comprising weeds during spring-summer

Table 42: KPI 3 assessment results for seasonal herbaceous wetland by the subject wetland within the protected areas of the Western Grassland Reserve.

KPI 3: Percentage cover of all perennial vegetation comprising weeds during spring-summer	Baseline (%)	Status 2022-2024	Reason for non-assessment (if applicable)	Trend	Data confidence	Year that baseline was /will be set
Cobbledicks Rise	18.5	Met	N/A	Deteriorating	High	2018
One Tree Rise	30.7	Met	N/A	Improving	High	2018
Windmill	24.4	Met	N/A	Stable	High	2018
Target Range	Not yet set	N/A	Insufficient data	N/A	N/A	2027

KPI 3 measures the percentage of all perennial vegetation cover that comprises weeds (introduced species). Weeds are considered undesirable in grasslands. This means that the lower proportion of these introduced species contributes to higher health status of the wetlands.

KPI 3 is assessed against a baseline set by the first five years of monitoring (Figure 27). KPI 3 was met for One Tree Rise and Windmill Wetlands between 2022 to 2024. One Tree Rise wetland decreased weeds cover between 2022 and 2024 compared to previous years. On the other hand, Cobbledicks Rise Wetland increased the proportion of weeds cover to 45.5% in 2024, which is significantly more than the baseline: 18.5%. Due to a large fluctuation of weed cover, it is still within the 95% confidence interval tolerance of the defined baseline. The five-year mean value also indicates a gradual increase in proportion of weeds from 18.5% to 27.3%, leading to a deteriorating trend (Figure 27). Windmill was found to have a stable trend in weed cover during spring-summer. Target Range Swamp was protected more recently and has only been monitored for two years. The baseline is expected to be set in 2027.

Compared to the other monitored wetlands, this area has extremely low weed cover. This is probably related to its different hydrological regime to the other wetlands, with longer wet periods, harsh dry periods, and dominance by a strong competitor (cane grass), which collectively excludes weeds.

KPI 4: Percentage cover of all perennial vegetation comprises weeds during drawdown

Table 43: KPI 4 assessment results for seasonal herbaceous wetland by the subject wetland within the protected areas of the Western Grassland Reserve.

KPI 4: Percentage cover of all perennial vegetation comprising weeds during drawdown	Baseline (%)	Status 2022-2024	Reason for non-assessment (if applicable)	Trend	Data confidence	Year that baseline was set
Cobbledicks Rise	15.6	Met	N/A	Unclear	Low	2017
One Tree Rise	6.4	Not assessed	Lack of drawdown event	N/A	N/A	2023
Windmill	4.8	Met	N/A	Unclear	Low	2017
Target Range	0.3	Met	N/A	Unclear	Low	2023

As for KPI 3, KPI 4 measures the percentage of all perennial vegetation cover that comprises weeds (introduced species). In this case, the KPI only applies when a wetland is drawing down, having been filled. This KPI is assessed against a baseline, set by the first year of monitoring at drawdown, with a unique benchmark for each wetland.

Since monitoring began, drawdown has occurred in 2017 for Cobbledicks Rise, and Windmill Wetlands (One Tree Rise has a smaller catchment and did not fill in 2017) and 2024 for Target Range Swamp. In 2023, all wetlands had a drawdown event. This occurred during the normal spring-summer monitoring period, so a single monitoring event covered KPIs 1 and 2. As drawdown occurred during 2022 to 2024, assessment was conducted except for One Tree Rise Wetland as only single drawdown occurred in during monitoring period. The proportion of weed cover at drawdown for Cobbledicks Rise Wetland in 2017 was 27.9% that decreased to 23% in 2023.[165] All weeds were perennial, therefore, this value is identical to that measured for KPI 3 (which only assesses perennial vegetation). For Windmill Wetland, the percentage cover of all perennial vegetation comprising weeds at drawdown in 2017 was 36.6%.[166] The next drawdown event occurred in 2023, and the proportion was significantly decreased to 6.3 percent. Target Range Swamp was found to have two drawdown events consecutively in 2023 and 2024 with 0.26% and 0.30% found, respectively.

165. In MSA 2022 Report, the count of native forbs in 2017 was recorded to 12 species but due to the rationalisation of the perennial / annual status of species in 2024, slight changes were made as inconsistencies were found.
166. In MSA 2022 Report, the count of native forbs in 2017 was recorded to 12 species but due to the rationalisation of the perennial / annual status of species in 2024, slight changes were made as inconsistencies were found.

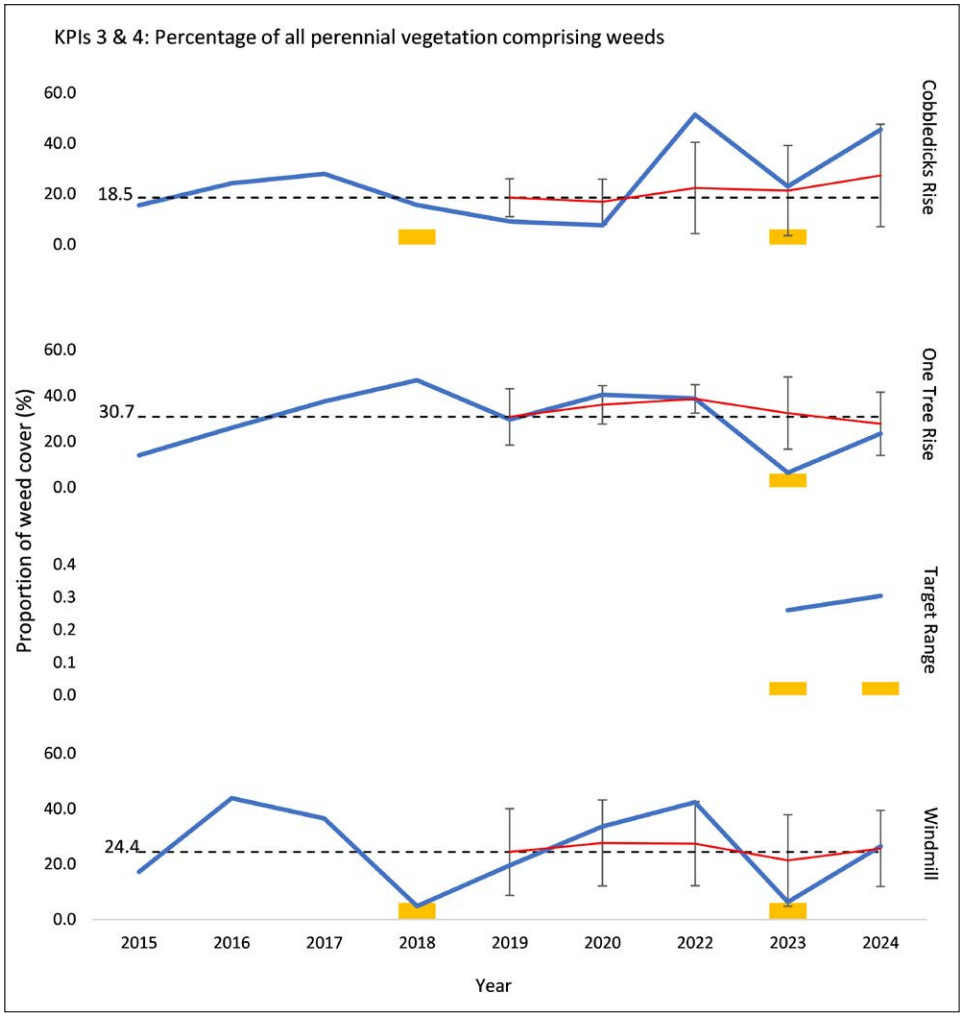


Figure 27: Percentage of all perennial vegetation comprising weeds for each monitored wetland from 2015 to 2024. Bar charts indicate years when the wetland was monitored during drawdown (September 1). Dashed lines show the baseline calculated after the first five years of monitoring. Blue lines show annual KPI data. Red lines show the five-year rolling mean (±95% confidence intervals). Note that Target Range Swamp has a different scale on the y-axis as the proportion was far lower than that of the other wetlands. Source: DEECA.

Key insights and management implications

DEECA's monitoring and reporting protocol for the seasonal herbaceous wetlands would appear scientifically robust and informed by available research. Due to seasonal variability and the ephemeral nature of the wetlands, assigning measures that indicate a change in wetland condition is difficult. Further, wetland species are highly resilient, with some having the ability to survive in dry periods for several years before re-emerging.[167]

The four KPIs for seasonal herbaceous wetlands are technically two KPIs measured across two scenarios. It is DEECA's intention to monitor the wetlands annually, however, sites can only be monitored at their full expression after they've been filled and they're in a state of drawing down — as it is at this point that most vegetation and flowering plants appear and are able to be detected. A drawdown event is rare. Until 2022, there was only a single year that occurred a drawdown event in 2017. As a result of a prolonged wet season in 2023, all four monitoring sites experienced drawdown events.

167. Commissioner for Environmental Sustainability 2022 'Strategic Audit of the implementation of Melbourne Strategic Assessment conservation outcomes 2022 Report', Melbourne, Victoria.

MNES 4: Golden sun moth

Golden sun moth.
Credit: Marcia Riederer.
© DEECA

Golden sun moth *(Synemon plana)* is a medium-sized day-flying moth with a wingspan of approximately 3 cm. The golden sun moth occurs in Victoria, South Australia, and New South Wales (Figure 28). In Victoria, it is found extensively on the Victorian Volcanic Plain, including the Werribee Keilor plains to the west of Melbourne.[168] It is listed in the vulnerable category of the threatened species list under the EPBC Act effective from 7 December 2021, which was changed from critically endangered status as a result of an improvement in understanding of the species distribution and habitat. The improved understanding of the species distribution was a result of an increase in survey effort in areas proposed for development and increased conservation interest in the species since its listing. This has led to the discovery of extant site localities, particularly in Victoria and the Australian Capital Territory, and to the north of the Australian Capital Territory in New South Wales.

168. Brown G, Tolsma A, and McNabb E 2012, 'Ecological aspects of new populations of the threatened Golden sun moth *Synemon plana* on the Victorian Volcanic Plains', *The Victorian Naturalist*, 129, pp. 77-85.

Figure 28: Image depicting a male golden sun moth in the Western Grassland Reserve. Source: DEECA.

DEECA's conservation commitment and relevance to MRF

DEECA published the following statements as conservation outcomes for the golden sun moth (Table 44) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with which KPIs can be found in Table 44.

Table 44: Conservation outcomes for golden sun moth and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcome	Alignment with Monitoring and Reporting Framework
The permanent protection of occupied habitat for golden sun moth in: • the Western Grassland Reserve (WGR) • the conservation areas identified in the Biodiversity Conservation Strategy (BCS) and the Conservation Areas Declaration (CAD) • 680 hectares of conservation areas identified outside the Urban Growth Boundary (UGB) that can include land within the Grassy Eucalypt Woodland Protected Area (GEWPA) (where occupied habitat occurs).	Program output: A network of conservation areas within the UGB is protected and managed for Matters of National Environmental Significance species and vegetation communities Program output: 80% of high priority habitat for golden sun moth protected and managed
Golden sun moth populations in the WGR are sustained in the long term. Sustained means that the five-year mean proportion of sites occupied remains above the baseline.	Program outcome: The golden sun moth persists
Golden sun moth populations in the conservation areas identified in the BCS and CAD, and those outside the UGB are sustained in the long term. Sustained means that the five-year mean proportion of sites occupied remains above the baseline.	Program outcome: The golden sun moth persists
Golden sun moth populations in the GEWPA are sustained in the long term. Sustained means that the five-year mean proportion of sites occupied remains above the baseline.	Program outcome: The golden sun moth persists

DEECA's MSA MRF also summarises the conservation outcomes for the golden sun moth as a single goal statement: 'the golden sun moth persists'.

Conservation outcomes assessed

Conservation Outcome 1

Permanent protection of occupied habitat for gol den sun moth with viable populations, as defined by population viability analysis models. The amount of habitat required outside the UGB to meet this target, over and above the conservation areas within the UGB and the Western Grassland Reserve, is 680 hectares.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor is based on limited acquisition of targeted areas. In the Western Grassland Reserve, 1,250 hectares of potential habitat have been protected. Conservation Areas 4, 11, 13, 23, 26, 27, 29 and 33 have a presence of golden sun moth. Conservation Areas 11 and 26 have been secured in perpetuity. DEECA has not secured any land to permanently protect 680 hectares of occupied habitat outside the UGB.

The trend assessment is stable as the permanently protected area remains unchanged from 2022.

The confidence in the status and trend assessment is rated as moderate even though there was sufficient information on progress in land protections for the species. This is because of the absence of identified areas to acquire the 680 hectares outside the Urban Growth Boundary.

There are three key land areas that are related to the conservation outcomes. The permanent protection of occupied habitat for golden sun moth in:

- WGR
- Conservation areas
- Outside the UGB area where golden sun moth habitat occurs

Among these areas, DEECA has advised that approximately 1,250 hectares of the WGR that contain occupied golden sun moth habitat have been secured.[169] Within 36 conservation areas in the UGB, Conservation Areas 4, 11, 13, 23, 26, 27, 29 and 33 have presence of golden sun moth. To date, Conservation Areas 11 and 26 have been secured in perpetuity. This is around 131.3 hectares of golden sun moth habitat, which is approximately 16% (131.3 ha of 807.1 ha) of overall habitat identified by the BCS. DEECA has not secured any land to permanently protect 680 hectares of occupied habitat outside the UGB but intends to find suitable areas in the future. This includes survey work based on known distributions and subsequently either purchasing the land or securing the land via Section 69 of the CFL Act. Methods for identifying suitable land should be employed to acquire areas that contain high quality habitat to meet this conservation target.

Conservation Outcome 2

Golden sun moth populations in the Western Grassland Reserve are sustained in the long-term. Sustained means that the five-year mean proportion of sites occupied remains above the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor is based on the KPI result which indicates that the five-year mean proportion of sites occupied between 2019 and 2023 is below the baseline. Except for Truganina South NCR, all surveyed locations are in the Western Grassland Reserve. The result demonstrates that Conservation Outcome 2 has not been achieved. Urgent management intervention is required to improve the status of golden sun moth.

The trend assessment of deteriorating is based on the declining trend of detection rate since 2018.

The confidence in the status and trend assessment is rated as moderate because there is no data on golden sun moth in conservation areas. When Conservation Areas 4, 13, 23, 26, 27, 33 are included in the annual monitoring program, a more confident assessment of this conservation outcome will be possible.

KPI 1 for the program outcome is directly related to Conservation Outcome 2. The KPI result indicates that the five-year mean proportion of sites occupied between 2019 and 2023 is below the baseline. All surveyed locations are situated within the WGR except for the Truganina South NCR. Data show that Conservation Outcome 2 has not been achieved. Urgent management intervention is required to improve the current status of the golden sun moth.

KPIs assessed

DEECA's MSA MRF summarises the conservation outcome related to program outcomes for the golden sun moth as a single goal statement: 'the golden sun moth persists'. DEECA measures progress towards the MRF goal statement for conservation outcomes using a single KPI:

- KPI 1: The five-year mean proportion of monitoring sites occupied must remain above a baseline set by the first five years of survey.

169. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 15 March 2024.

The baseline for this KPI is static at 89% of sites occupied, calculated as the mean of the first five years of data for all sites monitored within the first five years.

The MRF also has four other indicators:

- % cover of bare ground (point-intercept plots, report annually)
- % cover of weeds (point-intercept plots, report annually)
- weather conditions during survey (temperature, cloud cover, wind speed and direction) (Recorded at the time of survey, report annually)
- dominant grass in each plot (point-intercept plots, report annually).

These other indicators were not presented in this report.

Monitored areas

Monitoring currently occurs at nineteen permanent plots at 18 locations (Figure 29). Surveys were conducted annually under appropriate survey conditions. In 2022 and 2023, plots in Truganina South NCR and Mount Ridley NCR were not surveyed. DEECA indicated that Truganina South NCR was not surveyed under the correct conditions due to the weather, hence, this location was not included. As more land will be acquired for protections, more survey locations will be added into the regular monitoring system in the future. Between 2014 and 2023, the number of monitoring plots increased from nine to seventeen.

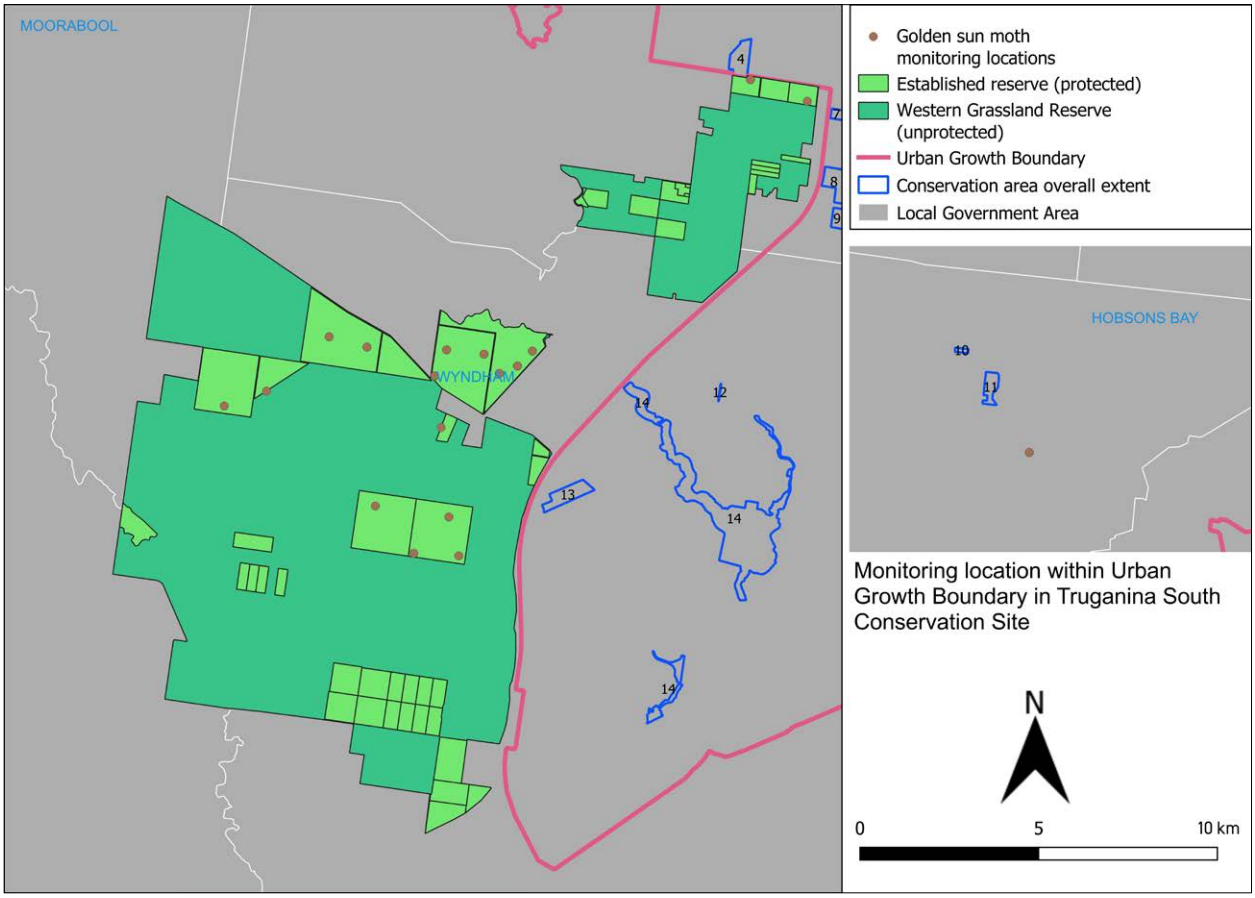


Figure 29: Monitoring locations for monitoring the golden sun moth in the Western Grassland Reserve and Truganina South Nature Conservation Reserve. Source: DEECA.

KPI 1: Proportion of monitoring sites that are occupied

The five-year mean proportion of monitoring sites occupied must remain above a baseline set by the first five years of survey.

Table 45: KPI 1 assessment results for golden sun moth for all monitoring locations

KPI 1: Proportion of monitoring sites that are occupied	Baseline (%)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
All locations	89%	Not met	N/A	Deteriorating	High	2018

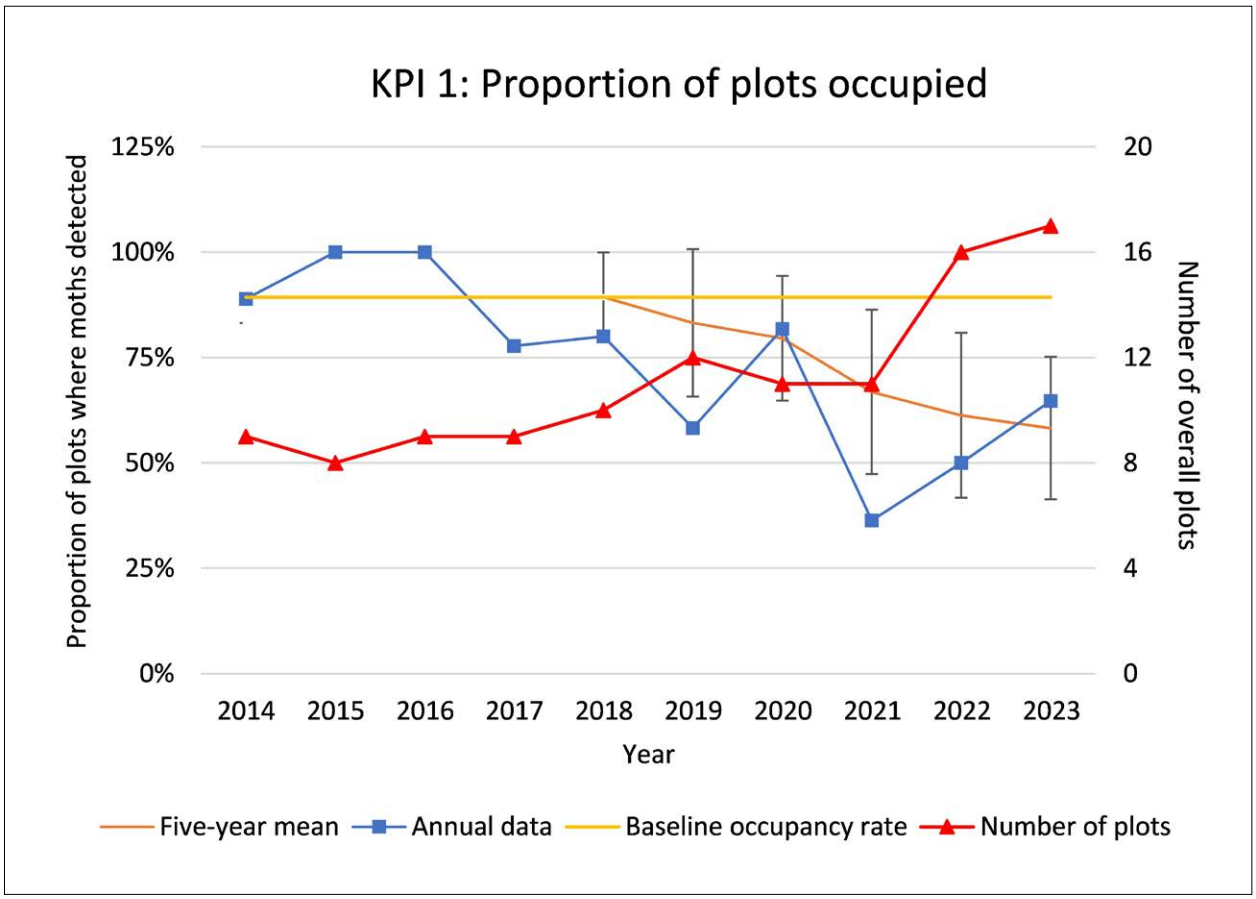


Figure 30: Proportion of plots in which golden sun moth was detected between 2014 and 2023. Dark orange line shows the five-year mean with error bars depicting 95% confidence intervals. Light orange line shows the baseline, set after first five years and red line shows number of plots surveyed each year. Source: DEECA.

The detection rate for the golden sun moth has been declining. In 2023, the golden sun moth was detected at eleven of seventeen plots (65%). Therefore, the mean average detection rate over the past five years (2019–2023) fell below the baseline of 89% (Figure 30). The average detection rate of the past five years is 58% (41%–75%, 95% confidence rate). Therefore, the KPI was in breach of the baseline for golden sun moth. This may suggest an overall decline in population numbers. Although the detection rate is recovering from the lowest annual record (36%) in 2021, annual detection rates pose a concern as annual detection rates from 2019 have been lower than the baseline.

DEECA suspects that the weather conditions over the last few years have impacted occupancy and/or detection — it has been colder and wetter.[170] However, DEECA cannot definitively attribute any specific factors to this apparent decline.

Conservation Outcome 3

Golden sun moth populations in the conservation areas identified in the BCS and the Conservation Areas Declaration, and those outside the UGB are sustained in the long-term. Sustained means that the five-year mean proportion of sites occupied remains above the baseline.

2024 status	2024 trend	2024 confidence
?	?	●

Why this assessment in 2024?

The status assessment of unknown is based on the absence of golden sun moth ecological condition data within conservation areas. The geographical scope of annual monitoring conducted by DEECA is confined to the Western Grassland Reserve and South Truganina NCR. Conservation Areas 4, 13, 23, 26, 27 and 33 will be included in the annual monitoring program in the future. Additionally, the BCS indicates there are two more Conservation Areas that have occupied habitat: Conservation Areas 11 and 29. Conservation Area 11 has been secured and managed by a private land holder since 2020. However, there has been no information of on-ground management activities or regular monitoring. It is important to conduct a survey of Conservation Area 11 to assess the status of the golden sun moth population.

The trend assessment of unclear is based on the absence of information on golden sun moth within the conservation areas.

The confidence in the status and trend assessment is rated as low because there is no data on golden sun moth in the conservation areas.

The geographical scope of annual monitoring conducted by DEECA is confined to the WGR and Truganina South NCR. Information for the current status of the golden sun moth population within the UGB, including the 36 conservation areas, is lacking. Conservation Areas 4, 13, 23, 26, 27 and 33 will be included in the annual monitoring program in the future. The BCS indicates that there are two additional conservation areas that contain occupied habitat: Conservation Areas 11 and 29. Conservation Area 11 has been secured and managed by a private land holder since 2020. However, there is no evidence that on-ground management activities or regular monitoring have taken place. Conducting a survey of Conservation Area 11 to understand the current status of the golden sun moth population will be important. Active community volunteers reported that Conservation Area 11 has approximately 80% weed cover and needle grass cover is increasing in abundance.[171]

170. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 3 May 2024.
171. Victorian National Parks Association, Grassy Plains Network and Merri Creek Management Committee 2024, 'A people's audit of the 36 MSA conservation areas', Carlton, Victoria.

Conservation Outcome 4

Golden sun moth populations in the Grassy Eucalypt Woodland Protected Area are sustained in the long-term. Sustained means that the five-year mean proportion of sites occupied remains above the baseline.

2024 status	2024 trend	2024 confidence
?	?	●

Why this assessment in 2024?

The status assessment of unknown is based on the absence of golden sun moth population information in the Grassy Eucalypt Woodland Protected Area as no protection has been achieved.

The trend assessment of unclear is based on the absence of golden sun moth information within the Grassy Eucalypt Woodland Protected Area.

The confidence in the status and trend assessment is rated as low because there is no data on the golden sun moth in the Grassy Eucalypt Woodland Protected Area.

This outcome has not been met as the GEWPA has not been established, with no area acquired to date. Therefore, information to assess golden sun moth populations in the GEWPA is not available and a baseline has not been set.

Key insights and management implications

Assessment result for KPI 1 indicates a clear trend of a decline in detection of golden sun moth in the WGR and Truganina South NCR. Currently, there is no evidence to explain the reason of the decline, but DEECA suspects it might be due to colder and wetter weather conditions over the past few years. However, other factors may also be responsible, including changes in grazing regime and changing grassland composition (as documented for natural temperate grassland). It is concerning that the golden sun moth detections are declining and that there is no clear cause. In addition, it is not clear whether declining detection means fewer moths emerging and flying (no decline in larvae, but fewer adults), or fewer moths overall (decline in both larvae and adults).

The small sample size could create a large fluctuation in the KPI result. Between 2014 and 2023, the sample size was almost doubled, and this will grow significantly when more land protections in the WGR, conservation areas and GEWPA are included in the MRF program. This will influence on the statistical confidence in the result as some years the number of new sites could be greater than established monitoring plots.

There is uncertainty in the status of golden sun moth populations within conservation areas. Due to a lack of information, it is unknown if the population is persisting. There is no access to many conservation areas as they are privately owned. This could potentially result in the degradation or extinction of the golden sun moth population for some conservation areas, impacting occupancy rates when the conservation areas are included in the regular monitoring program. The MSA 2022 Report recommended that DEECA considers changes to the monitoring regime of the golden sun moth due to the potential bias from the dataset (Recommendation 8).[172] So far, no changes have been made in response to the Recommendation.

Conservation Outcomes 2, 3 and 4 for the golden sun moth demonstrate that ecological condition assessment and monitoring should occur for all areas where permanent protections need to take place. Currently, it is limited to the WGR. Progress in land protections has been slow. Only approximately 16% of overall occupied habitat within the 36 conservation areas has been established to protect in perpetuity. Also, the GEWPA has not been established yet. Current data solely from the WGR are not sufficient to assess all conservation outcomes for golden sun moth.

Currently, management responses for the land parcels that have been secured for permanent protections are not available. Adaptive management intends to improve management practices incrementally by implementing responses in ways that maximise opportunities to learn from experience. However, the information is not available to assess the Government's effort to improve the declining occupancy rate of golden sun moth within the WGR.

172. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.

MNES 5: Matted flax-lily

Matted flax-lily.
© DEECA

Matted flax-lily *(Dianella amoena)* is listed as endangered under the EPBC Act. The species is a perennial lily that forms mats of up to approximately five metres wide (Figure 31). The plants have linear grey-green leaves and produce blue or violet star-shaped flowers, followed by purple berries.[173] The plants retreat underground during dry periods, causing detection to be problematic. Matted flax-lily is scattered across Victoria, with a few recently discovered populations in the Canberra region.

173. Carr GW and Horsfall PF 1995, 'Studies in *Phormiaceae (Liliaceae)* 1: New species and combinations in Dianella Lam', *Muelleria: An Australian Journal of Botany*, 8, pp. 365-378.

Figure 31: Image depicting tufts of the matted flax-lily in the foreground in Conservation Area 24 (Kalkallo Common Grassland and Cemetery, Kalkallo). Source: DEECA.

DEECA's conservation commitment and relevance to MRF

DEECA published the following statements as conservation outcomes for the matted flax-lily (Table 46) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with which KPIs are presented in Table 46.

Table 46: Conservation outcomes for matted flax-lily and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcome	Alignment with Monitoring and Reporting Framework
The permanent protection of occupied habitat for matted flax-lily in: • the conservation areas identified in the Biodiversity Conservation Strategy (BCS) and the Conservation Areas Declaration (CAD) • 529 hectares of conservation areas identified outside the Urban Growth Boundary (UGB) that can include land within the Grassy Eucalypt Woodland Protected Area (GEWPA) (in which occupied habitat occurs).	Program output: 80% of the highest priority habitats for matted flax-lily is protected and managed Program output: A network of conservation areas within the UGB is protected and managed for Matters of National Environmental Significance species and vegetation communities
Matted flax-lily populations in the conservation areas identified in the BCS and the CAD, and those outside the UGB are sustained in the long term. Sustained means that the five-year mean detection rate of previously known plants remains above the baseline.	Program outcome: No substantial negative change to the population of matted flax-lily within the program area
Matted flax-lily populations in the GEWPA are sustained in the long term. Sustained means that the five-year mean detection rate of previously known plants remains above the baseline.	Program outcome: No substantial negative change to the population of matted flax-lily within the program area

Conservation outcomes assessed

Conservation Outcome 1

The permanent protection of occupied habitat for matted flax-lily in:

1. the conservation areas identified in the BCS and the Conservation Areas Declaration

2. 529 hectares of conservation areas identified outside the UGB that can include land within the Grassy Eucalypt Woodland Protected Area (where occupied habitat is found).

2024 status		2024 trend		2024 confidence	
1. 	2. 	1. 	2. 	1. 	2. 

Why this assessment in 2024?

The status assessment of fair for Conservation Outcome 1.1 is based on the progress of protection in perpetuity for Conservation Areas 24, 26 and 32. Conservation Area 32 was not identified in the BCS, but survey efforts found occupied habitat and included it in the regular monitoring program. The status assessment of poor for Conservation Outcome 1.2 is based on the limited land acquisitions.

The trend assessment of stable for Conservation Outcome 1.1 is because no further land acquisitions were made between 2018 and 2024. Conservation Outcome 1.2 was also assessed as stable as no land protections have occurred.

The confidence assessment of moderate for Conservation Outcome 1.1 is due to the established evidence that identifies five conservation areas to protect (based on the BCS). The introduction of a formal timeline to achieve this outcome would improve the assessment's confidence. Conservation Outcome 1.2 had low confidence as there was no clear information on which areas would be acquired, nor a definitive timeframe for acquisition.

Permanent protection of occupied habitat for matted flax-lily has been achieved in conservation areas as identified in the BCS. Among conservation areas that contain matted flax-lily populations, Conservation Areas 24 and 26 have been protected in perpetuity (Table 47). Additional habitat was located through regular survey attempts when conservation areas were secured. As a result, Conservation Area 32 was found to have presence of the targeted species.

DEECA has not secured any land to permanently protect 529 hectares of occupied habitat outside the UGB but intends to find suitable areas in the future. This includes survey work based on known distributions followed by purchasing the land or securing the land via Section 69 of the CFL Act. Methods for identifying suitable land should be employed to acquire areas that contain high quality habitat to meet this conservation target.

Table 47: Conservation areas that have a presence of matted flax-lily based on the Biodiversity Conservation Strategy secured as of June 2024. Source: DEECA.

Conservation area	Area (ha)	Secured (ha)
22	182.5	0.0
23	108.9	0.0
24	25.0	25.0
26	110.1	110.1
30	215.9	0.0

Conservation Outcome 2

Matted flax-lily populations in the conservation areas identified in the BCS and the Conservation Areas Declaration, and those outside the UGB are sustained in the long-term. Sustained means that the five-year mean detection rate of previously known plants remains above the baseline

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of good is based on the KPI 1 data which demonstrates all populations in permanent protection areas (Conservation Areas 24, 26 and 32) are currently being monitored and populations in Conservation Area 24 were sustained until 2023. However, the deteriorating trend from 2021 is a concern. Conservation Areas 26 and 32 will be ready to assess in 2025 and 2027, respectively.

The confidence assessment of high is based on the availability of data to assess status and trend.

KPI 1 demonstrates that all known populations in Conservation Areas 24, 26 and 32 are currently being monitored and populations in Conservation Area 24 were sustained until 2023. However, the deteriorating trend from 2021 is a concern for future detection rates. Conservation Areas 26 and 32 will be ready for assessment in 2025 and 2027, respectively.

KPIs assessed

DEECA's MSA MRF summarises the conservation outcomes for the matted flax-lily as a single goal statement: 'no substantial negative change to the population of matted flax-lily within the program area'. DEECA developed a single KPI to report against this single outcome statement:

- KPI 1: Annual detection rate of known plants, which must remain above a baseline, set in the first five years of monitoring.

Note, this target is different from that included in the published MRF. The MRF will be updated as explained below.

The baseline detection rate will be set from the Kalkallo Common population in 2022, the fifth year of sampling. Currently, the mean detection rate is 0.92 (from the first four years of monitoring only).

Monitored areas

Matted flax-lily is known to occur in the northern growth corridor: five conservation areas (Conservation Areas 22, 23, 24, 26 and 30 based on BCS) and Grassy Woodland Reserve. Currently, Conservation Areas 24, 26 and 32 are under management within the MSA program (Figure 32). The monitoring program started regular survey in 2016 for Conservation Area 24 following a site inventory to locate known plants in 2015. It was not monitored in 2020 due to COVID-19. At Kalkallo Common Grassland, matted flax-lily plants have been translocated into the stony rises. These translocations pre-date the MSA, and these plants have been monitored under a different project, funded separately from the MSA. These plants are not included within MSA monitoring, although it is acknowledged that they form part of the matted flax-lily population in functional terms (i.e. they likely contribute pollen and seeds to the population).

Conservation Area 26 was included in the MRF from 2021. In 2021, 65 plants were searched and protected at Mount Ridley. The first survey of Conservation Area 32 was undertaken in 2023, during which 49 plants were located.

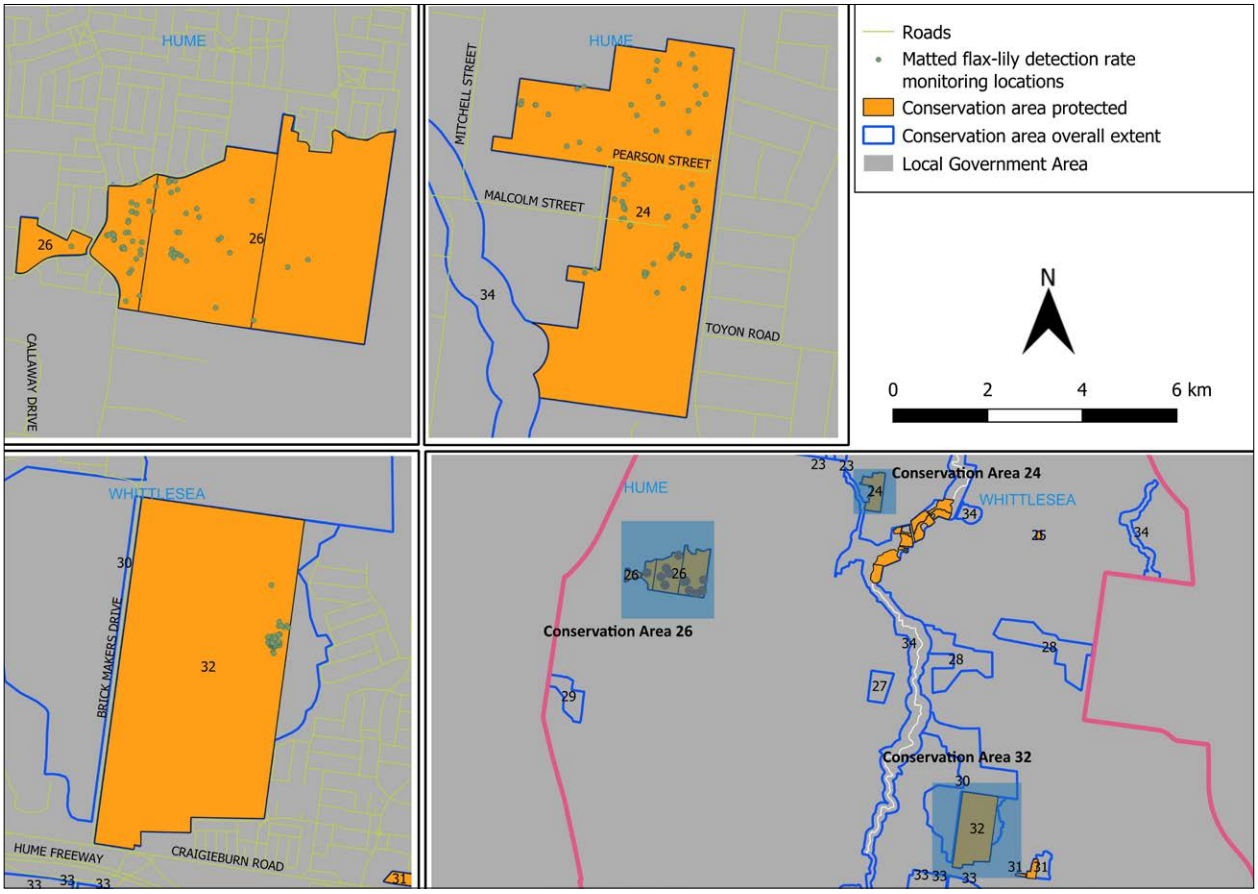


Figure 32: Monitoring locations for regular monitoring of detection rate of matted flax-lily in Conservation Areas 24, 26 and 32. Source: DEECA.

KPI 1: Proportion of monitoring sites that are occupied

Table 48: KPI 1 assessment results for matted flax-lily for Conservation Areas 24, 26 and 32.

KPI 1: Percentage of plants detected each year	Baseline (%)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was/ will be set
Conservation Area 24 (Kalkallo Common Grassland)	93%	Met	N/A	Deteriorating	High	2021
Conservation Area 26 (Mt Ridley West)	N/A	Not assessed	Baseline not yet set	Unclear	N/A	2025
Conservation Area 32 (Craigieburn Road (west))	N/A	Not assessed	Baseline not yet set	Unclear	N/A	2027

Conservation Area 24

In 2015, an initial database of known matted flax-lily plants (n = 51) was compiled from field searches and the compilation of existing data from the HCC, Merri Creek Management Committee and Abzeco at Conservation Area 24. Monitoring in these areas commenced in 2016. Each year during monitoring, new plants have been discovered, until by 2023 there are 78 plants included in the database.

Baseline value for the percentage of plants detected was set in 2021 as 93%. Although the five-yearly average gradually decreased by 2023, the 95% confidence interval range is within the baseline detection rate (Figure 33).

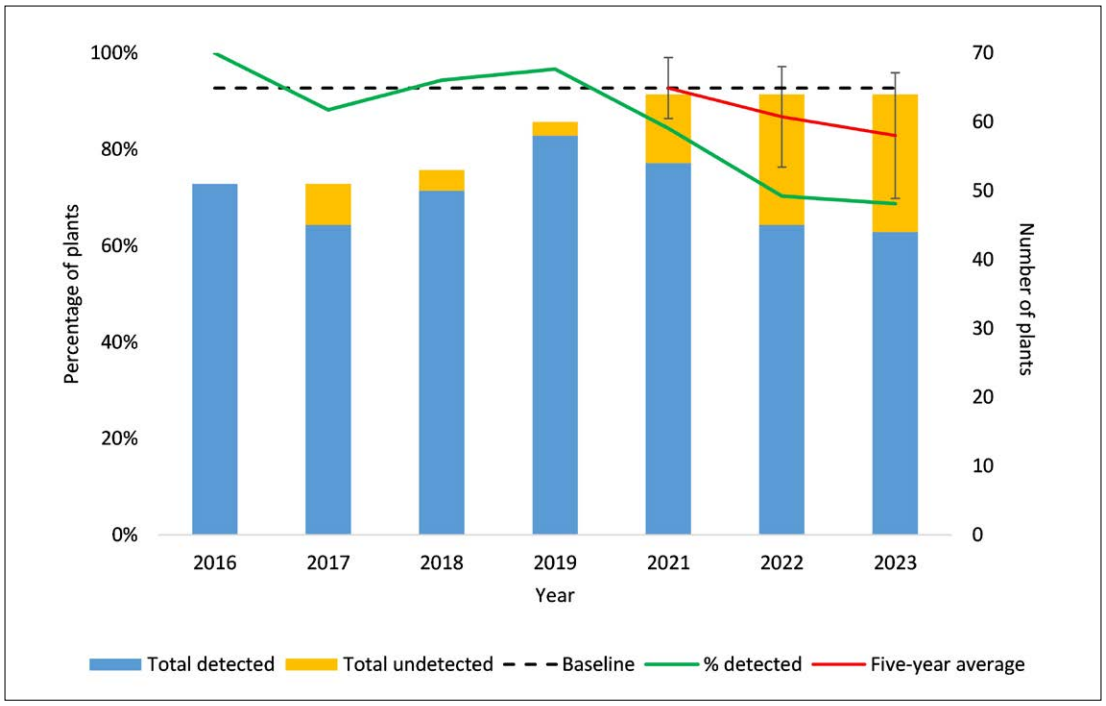


Figure 33: Total numbers of detected and undetected matted flax-lily plants in Conservation Area 24 between 2016 and 2023. Bar chart shows total number of detected and undetected plants. Dashed line indicates the baseline value (93%). Green line indicates the annual detection rate. Red line indicates the five-yearly moving average with a 95% confidence interval. Source: DEECA.

Conservation Areas 26 and 32

In 2015, an initial database of known matted flax-lily plants (n = 65) was compiled from field searches in Conservation Area 26. Due to access issues from private landowners who did not allow surveyors to their properties, detection rate was calculated only the ones that are accessible to survey (n = 38). In 2023, annual detection rate in 2023 was 87% (Figure 34). Due to its early stage of monitoring, assessment was not made yet and expected to be ready for assessment in 2025.

Conservation Area 32 was found to have a presence of matted flax-lily population through on-ground survey. This is a new discovery as BCS did not identify this species in Conservation Area 32. The survey in 2023 found 49 new plants and it is expected to have a baseline in 2027.

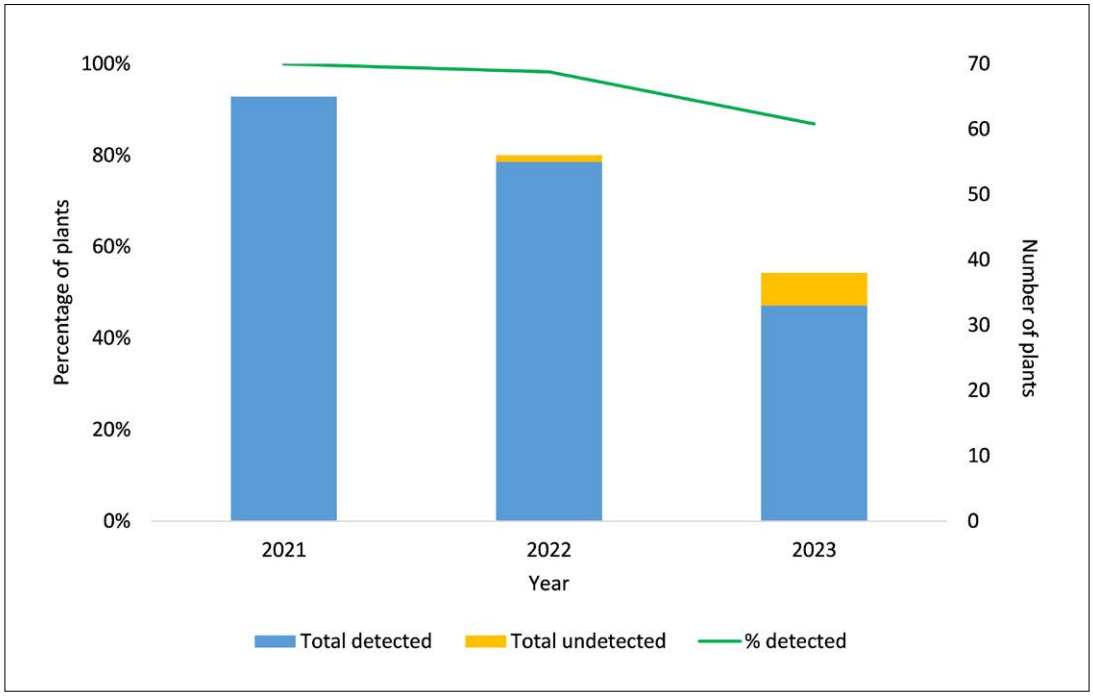


Figure 34: Total numbers of detected and undetected matted flax-lily plants in Conservation Area 26 between 2021 and 2023. Green line shows proportion of plants detected per year. Source: DEECA.

Conservation Outcome 3

Matted flax-lily populations in the Grassy Eucalypt Woodland Protected Area are sustained in the long-term. Sustained means that the five-year mean detection rate of previously known plants remains above the baseline

2024 status	2024 trend	2024 confidence
?	?	●

Why this assessment in 2024?

The status assessment of unknown, and trend assessment of unclear, is due to an absence of matted flax-lily population information in the Grassy Eucalypt Woodland Protected Area (GEWPA) as no protection has been achieved.

The confidence in the status and trend assessment is rated as low because there is no data on matted flax-lily in the GEWPA.

Information on matted flax-lily populations in the GEWPA is lacking as land acquisition has not been achieved and a baseline has not been set.

Key insights and management implications

KPI indicates that although known populations in Conservation Area 24 met the baseline detection rate, detection rate has declined and may not meet the baseline in the future. Given the habit and life history of this species, the key management intervention to address this trend is likely to be biomass management. Accumulation of biomass likely has two effects:

- It makes it much harder to find the species, because of overgrown grass and also because the species can lose its foliage and retreat underground, leading to temporary non-detection of surviving plants.
- Accumulation of biomass causes plants to weaken and eventually die off.

It is important to note that non-detection does not necessarily equate to a declining population.

The intervention method includes ecological fire and weed control efforts. In terms of fire, it removes the grass thatch which creates an open space for native species to thrive. In Darebin Creek, cultural burning resulted in approximately 20 shoots of matted flax-lily emerging.[174] Weed control is another important tool for removing biomass. Weed competition is regarded as a critical threat to recruitment. Although there are approximately seven years' worth of survey results since 2016, DEECA did not provide information on on-ground management works delivered. These areas are managed by two agencies: the HCC and DoH. Areas where DoH has been managing (near the Donnybrook Cemetery area) has not delivered any environmental works. The other areas have been managed by the HCC. Currently DEECA has been coordinating to transfer the custodian of the cemetery land to the HCC. Until this administrative process is complete, no management works will be delivered.

The MSA 2022 Report also found that genetic sampling research and development of biomass control plan are important factors for long-term sustainability of matted flax-lily.[175] As a result, Recommendation 7 was developed. To date, the MSA program supported an Honour's project that examined the population genetics of the species. The result of the project improved understanding how to count individuals and patches and translocations in the future. The MSA program requested the project that Conservation Area 24 be included as a prominent sampling site, and that some specific questions be answered.

In 2022, DEECA indicated that the species will persist in the medium-long term. DEECA indicates that if declines are detected, they would be relatively easy to rectify (but caution with erosion of genetic diversity), as there is ample tube stock for planting, and the plants can be grown from rhizomes. Response planning to manage potential species decline may be required given the current risk. Given the ease of intervention, supplementary planting may be undertaken to address any immediate declines, with opportunity to involve community.

174. La Trobe University 2021, 'Cultural burning brings back threatened species', https://www.latrobe.edu.au/news/announcements/2021/cultural-burning-brings-back-threatened-species Accessed 17 May 2024.
175. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.

MNES 6: Spiny rice-flower

Spiny rice-flower.
© DEECA

Spiny rice-flower *(Pimelea spinescens* subsp. *spinescens)* is listed as critically endangered under the EPBC Act. The species is a small shrub, growing up to 30 centimetres high (Figure 35) and endemic to Victoria, occurring on the Victorian Volcanic Plain, in the Wimmera and the Northern Plains regions.[176]

176. James EA and Jordan R 2014, 'Limited structure and widespread diversity suggest potential buffers to genetic erosion in a threatened grassland shrub *Pimelea spinescens (Thymelaeaceae)*', *Conservation Genetics*, 15, pp. 305-317.

Figure 35: Image depicting the spiny rice-flower. Source: DEECA.

DEECA's conservation commitment and relevance to MRF

DEECA published the following statements as conservation outcomes for the spiny rice-flower (Table 49) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with which KPIs can be found in Table 49.

Table 49: Conservation outcomes for spiny rice-flower and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcome	Alignment with Monitoring and Reporting Framework
The permanent protection of occupied habitat for spiny rice-flower in: • the Western Grassland Reserve (WGR) • the conservation areas identified in the Biodiversity Conservation Strategy (BCS) and the Conservation Areas Declaration (CAD) 394 hectares of conservation areas identified outside the Urban Growth Boundary (UGB) that can include land within the Grassy Eucalypt Woodland Protected Area (in which occupied habitat occurs).	Program output: A network of conservation areas within the UGB is protected and managed for species and vegetation communities considered to be Matters of National Environmental Significance Program output: 80% of the high priority habitats for spiny rice-flower protected and managed
Spiny rice-flower populations in the WGR are sustained in the long term. Sustained means that the recruits forming more than 10% of the population in each location at least once in the previous 10 years and the five-year mean population count remain above the baseline.	Program outcome: No substantial negative change to the population of spiny rice-flower and the population is self-sustaining within the program area
Spiny rice-flower populations in the conservation areas identified in the BCS and the CAD, and those outside the UGB are sustained in the long term. Sustained means that recruits forming more than 10% of the population in each conservation area at least once in the previous 10 years and the five-year mean population count remain above the baseline.	Program outcome: No substantial negative change to the population of spiny rice-flower and the population is self-sustaining within the program area

Conservation outcomes assessed

Conservation Outcome 1

The permanent protection of occupied habitat for spiny rice-flower in:

1. the Western Grassland Reserve

2. the conservation areas identified in the BCS and the Conservation Areas Declaration

3. 394 hectares of conservation areas identified outside the UGB that can include land within the Grassy Eucalypt Woodland Protected Area (where occupied habitat is found).

2024 status			2024 trend			2024 confidence		
1. 	2. 	3. 	1. 	2. 	3. 	1. 	2. 	3. 

Why this assessment in 2024?

The status assessment of poor for Conservation Outcome 1.1 is based on the limited area protected. The MSA program commits to protecting 10,000 hectares of natural temperate grassland in the Victorian Volcanic Plains by 2020. As of 2023, 1,750 hectares have been acquired. Approximately 830 hectares of the land secured has a presence of spiny rice-flower population. This is very limited and slow progress in protecting the species. Conservation Outcome 1.2 is assessed as fair as five out of nine conservation areas have been secured so far. The status assessment of poor for Conservation Outcome 1.3 is because no land acquisitions have been made.

The trend assessment of improving for Conservation Outcomes 1.1 and 1.2 are based on the recent progress of land protections. However, greater progress needs to be achieved particularly in the Western Grassland Reserve. Conservation Outcome 1.3 was assessed as stable as no land protections have been progressed.

The confidence assessment of moderate for Conservation Outcomes 1.1 and 1.2 is based on the evidence of progress in land protections. An introduction of a formal timeline to achieve this outcome would improve the confidence in the assessment. Conservation Outcome 1.3 had low confidence as there was no clear information on which areas would be acquired.

Conservation Outcome 1 is related to progress of land protections relevant to spiny rice-flower populations that are known to be present.

In the WGR, approximately 830 hectares of land that have a presence of spiny rice-flower population have been secured. This area is a calculation of an overlap between areas secured and existing/known spiny rice-flower distribution. Additional land will be acquired in the future. Thus, the area will expand and more land will be included in the monitoring regime. The MSA program commits the Victorian Government to permanently protect and manage 80% of the highest priority habitats for the spiny rice-flower in the Victorian Volcanic Plain bioregion. The highest priority habitat generally coincides with high quality listed natural temperate grassland or grassy eucalypt woodland.

Six conservation areas containing spiny rice-flower populations have been secured, namely Conservation Areas 2, 3, 6, 10, 11 and 12 (Table 50). Currently, only Conservation Area 10 is included in the monitoring system. The other areas will be included in the future if the population includes more than 10 plants. This criterion is based on advice from expert elicitation within DEECA. Similar to the golden sun moth, Conservation Area 11 has a presence of spiny rice-flower based on the BCS, but no information is available and DEECA has yet to survey the area even though it was secured in 2020.

Table 50: Conservation areas that have a presence of spiny rice-flower based on the Biodiversity Conservation Strategy secured as of June 2024. Source: DEECA.

Conservation area	Area (ha)	Secured (ha)
1	13.3	0.0
2	41.5	41.5
3	175.8	94.5
4	46.3	0.0
5	35.4	0.0
6	94.3	94.3
10	3.3	1.3
11	21.1	21.1
12	1.0	1.0

Additional conservation of 394 hectares of high quality and confirmed habitat for the spiny rice-flower outside the UGB has not been achieved. DEECA will work through to find suitable areas in the future. This includes survey work based on known distributions and then either purchase the land or secure the land via Section 69 of the CFL Act. Methods for identifying suitable land should be employed to acquire areas that contain high quality habitat to meet this conservation target.

Conservation Outcomes 2 and 3

Conservation Outcome 2

Spiny rice-flower populations in the Western Grassland Reserve are sustained in the long-term. Sustained means that the recruits forming more than 10% of the population in each location at least once in the previous 10 years and the five-year mean population count remain above the baseline

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of fair and trend assessment of stable are based on KPI 1 and 2 data that demonstrate that populations in the Western Grassland Reserve were stable between 2019 and 2023 but that the recruitment rate was much lower than 10%. Management should seek to create germination niches, through the judicious use of fire and weed control.

The confidence assessment of high is based on the availability of data to assess status and trend.

Monitoring data from 2024 will be used to set the baseline. The current four years' worth of monitoring data is insufficient for calculating the five-year mean spiny rice-flower population count in the WGR. Preliminary results indicate that the spiny rice-flower populations in the reserve are stable, with low mortality of adult plants despite a low level of recruitment. The highest recruitment rate was 2.26% in 2022 within the past four years.

Conservation Outcome 3

Spiny rice-flower populations in the conservation areas identified in the BCS and the Conservation Areas Declaration, and those outside the UGB are sustained in the long-term. Sustained means that recruits forming more than 10% of the population in each conservation area at least once in the previous 10 years and the five-year mean population count remain above the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of fair and trend assessment of stable are based on KPI 1 and 2 data that demonstrate that populations in conservation areas were stable between 2019 and 2023, but the recruitment rate was consistently much lower than 10%.

The confidence assessment of high is based on the availability of data to assess status and trend.

Similarly to Conservation Outcome 2, the assessment of Conservation Outcome 3 cannot be made as the five-year cycle of data collection has not been completed. The 2024 data from Conservation Area 10 will enable a partial assessment. Preliminary results indicate that the population in Conservation Area 10 is stable. The recruitment rate has been very low since 2019 and there is no indication of a significant increase in recruitment. The 394 hectares of conservation area outside the UGB cannot be assessed for at least five years because land protection has not been accomplished. Once this has occurred, monitoring of population counts and recruitment will be possible.

KPIs assessed

DEECA's MSA MRF summarises conservation outcomes for the spiny rice-flower as a single goal statement: 'no substantial negative change to the population of spiny rice-flower and the population is self-sustaining within the program area'. DEECA developed two KPIs to report against this single outcome statement:

- KPI 1: The five-year mean population density, measured in sample plots that must remain above a baseline set by the first five years of survey.
- KPI 2: The occurrence of recruits that must form over 10% of the MSA-wide population in at least one of the previous 10 years.

DEECA has recommended that KPI 1 is changed, so that 'density' is replaced with 'count' (as for button wrinklewort and large-fruit groundsel). The data presented here refer to the updated KPI.

KPI 1 is assessed using a 'continuous improvement' approach, where any increase over the baseline in a five-year reporting period will lead to the calculation of a new baseline for subsequent reporting periods. KPI 2 is assessed against a static baseline (10% of population, one in 10 years). The baseline has not yet been set for either KPI in any of the monitored areas and is due to be set in 2024.

Monitored areas

The spiny rice-flower occurs naturally in numerous conservation areas within the program area. Only four of these sites have so far come under management within the MSA program:

- Truganina Cemetery Grassland (Conservation Area 10).
- Mount Cottrell NCR (WGR)
- Magpie block (WGR)
- Radio block (WGR).

The spiny rice-flower is currently only monitored at two of these locations: Conservation Area 10 (Truganina Cemetery; monitored as one large cluster) and Radio property, WGR (monitored in four discrete clusters) (Figure 36).

A translocated population has been established on Mount Cottrell NCR, but it is monitored by another project and is not part of the MSA program.

It is anticipated that many more populations will be acquired and monitored in the future. Due to the restrictions of the COVID-19 pandemic, this species was not monitored in 2020.

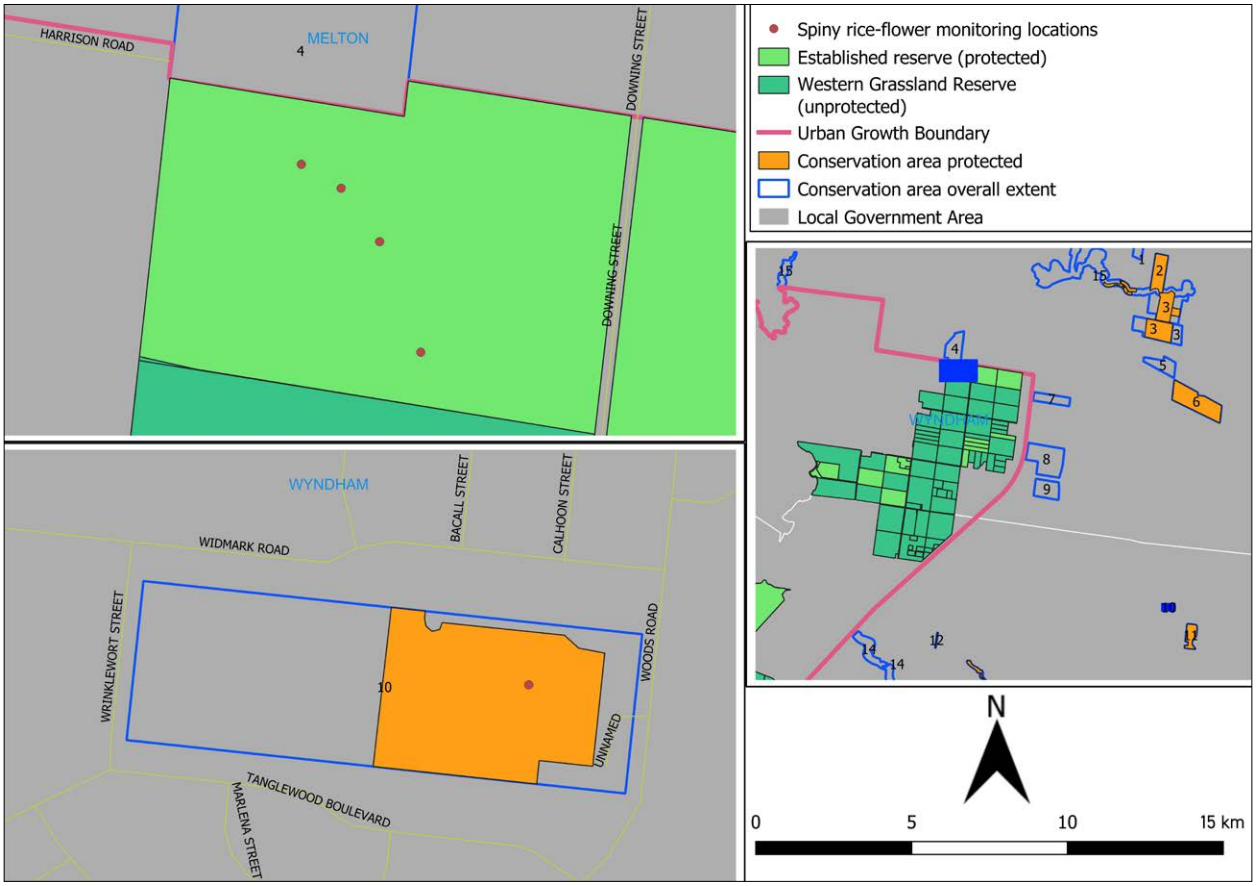


Figure 36: Five monitoring locations for spiny rice-flower in the Western Grassland Reserve and Conservation Area 10, measured since 2019. Source: DEECA.

KPI 1: Population count

Table 51: KPI 1 assessment results for spiny rice-flower for Radio in Western Grassland Reserve and Truganina Cemetery.

KPI 1: Population count	Baseline (Count of plants)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline will be set
Radio	N/A	Not assessed	Baseline not yet set	Unclear	N/A	2024
Truganina Cemetery	N/A	Not assessed	Baseline not yet set	Unclear	N/A	2024

The population counts (within clusters) in 2019 were 202 at Radio (in four clusters) and 965 at Truganina Cemetery (in one cluster). As 2019 was the first year of monitoring using this method the baseline cannot yet be set. Until 2023, both locations were stable (Figure 37).

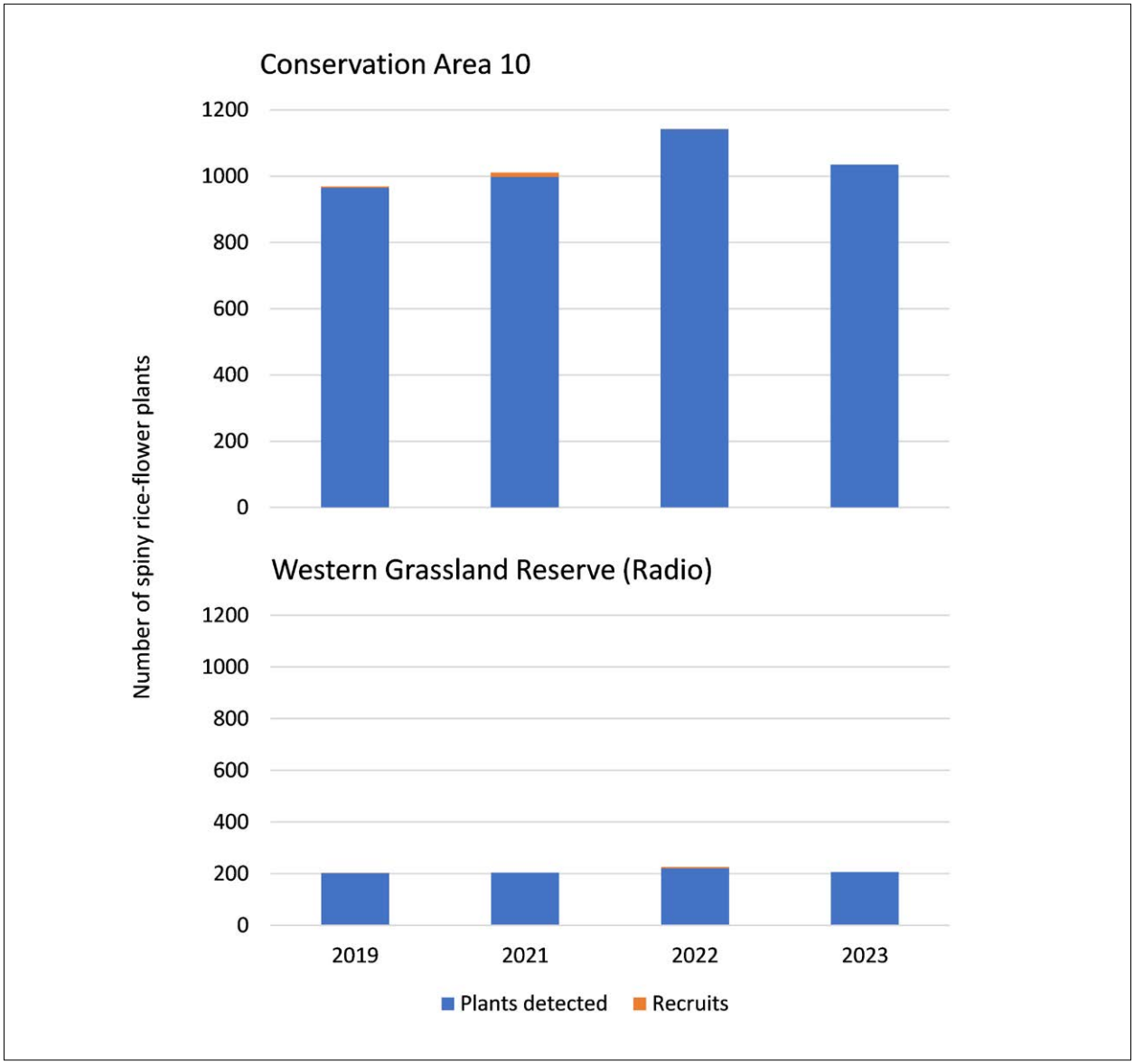


Figure 37: Population count of spiny rice-flower in the Western Grassland Reserve (Radio) and Conservation Area 10 (Truganina Cemetery) between 2019 and 2023. Surveys were not undertaken in 2020 due to COVID-19 restrictions. Source: DEECA.

KPI 2: Number of years that recruits form over 10% of the population over a 10-year period

Table 52: KPI 2 assessment results for spiny rice-flower for Radio in Western Grassland Reserve and Truganina Cemetery.

KPI 2: Number of recruits that form over 10% of the population over a 10-year period	Baseline (%)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline will be set
Radio	N/A	Not assessed	Baseline not yet set	Unclear	N/A	2024
Truganina Cemetery	N/A	Not assessed	Baseline not yet set	Unclear	N/A	2024

This KPI measures the proportion of plants that are new recruits to a population. It is expected that recruits form more than 10% of each population at least once every 10 years. This KPI is intended to measure rates of recruitment of the population, to ensure that conditions for recruitment occur with sufficient regularity, rather than measuring the fate of recruits, which is not specifically reported on (The overall population trajectory is intended to be covered by KPI 1).

Table 53 shows the percentage of recruits recorded across all currently monitored sites. The first year of monitoring using this method was 2019. The KPI will be assessed for the first time after 10 years of monitoring, in 2029.

Table 53: Percentage of population formed by recruits from overall population count each year between 2019 and 2023. Source: DEECA.

Area	2019 (%)	2021 (%)	2022 (%)	2023 (%)
Conservation Area 10 (Truganina Cemetery)	0.41%	1.30%	0.09%	0.00%
Western Grassland Reserve (Radio)	0.50%	0.00%	2.26%	0.00%

Key insights and management implications

Preliminary monitoring results for WGR and Conservation Area 10 indicate that populations are stable, but recruitment was very low despite a series of wet years, when recruitment may be expected. While it is too early to know if the KPI will be met after 10 years, the fact that recruitment has not occurred in several years with good conditions is cause for some concern. It may be that habitat management has not provided appropriate conditions to capitalise on rainfall. Management should seek to create germination niches, through the judicious use of fire and weed control.

Detection of this species was not always consistent as it is difficult to detect when the plant is covered by grasses. Some individual plants were not detected for one to two years and then 'reappeared' during the next monitoring attempts. In addition to variation in detectability due to tall grasses, it also creates shade, which the species is sensitive to. The most desirable way to address this issue is through regular burning in natural temperate grasslands as the species is typically associated with the ecological community. A planned burn occurred on the plots in the WGR recently but not the one in Conservation Area 10. This will be important to maintain efforts to control biomass and manage the risk of degradation to current and new populations.

Many conservation areas identified a presence of spiny rice-flower populations. To date, approximately 60% of conservation areas that BCS identified has been secured to protect in perpetuity. This includes Conservation Areas 2, 3, 6, 10, 11 and 12. Among those conservation areas, only Conservation Area 10 is included in the MRF monitoring program. DEECA advised that the other conservation areas will be surveyed to produce the Vegetation Inventory reports and monitored regularly.[177] The survey should start as soon as possible. However, if Vegetation Inventory reports identify that there is very small number of plants, DEECA will not include the area in the monitoring program.[178] These areas could be classified as an area to restore through management interventions, including translocations. DEECA advised that translocation of spiny-rice flower would be costly as the species requires approximately one metre of mechanical digging for the roots to settle.[179] Survey results may provide information on sites that are good candidates for population restoration.

177. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 22 May 2024.
178. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 22 May 2024.
179. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 22 May 2024.

MNES 7: Southern brown bandicoot

Southern Brown Bandicoot.
© DEECA

The southern brown bandicoot *(Isoodon obesulus* subsp. *obesulus)* is a marsupial in the family *Peramelidae* located in south-eastern mainland Australia (Figure 38) and listed as endangered under the EPBC Act. Males are generally larger than females.[180] The subspecies is found in Victoria, New South Wales and South Australia. In Victoria, it has a widespread, disjunct distribution primarily in coastal and foothill regions from East Gippsland to the Lower Glenelg in western Victoria.[181]

180. Menkhorst PWS 1990, 'Distribution and conservation status of bandicoots in Victoria.' In: JH Seebeck, PR Brown, RL Wallis and CM Kemper (eds.) Bandicoots and Bilbies, Surrey Beatty & Sons Pty Ltd, Chipping Norton, New South Wales, pp. 51-50.
181. Brown GW and Main ML 2010, 'Draft National Recovery Plan for the Southern Brown Bandicoot *Isoodon obesulus*', Department of Sustainability and Environment, Heidelberg, Victoria.

Figure 38: Image depicting the southern brown bandicoot. Source: Ozflash.

DEECA's conservation commitment and relevance to MRF

Victorian Government published the following statements as conservation outcomes for the southern brown bandicoot (Table 54). All conservation outcomes are aligned with program outcomes.

Table 54: Conservation outcomes for southern brown bandicoot and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcome	Alignment with Monitoring and Reporting Framework
Functioning and sustainable southern brown bandicoot populations within the southern brown bandicoot management area with connectivity between populations. Sustainable populations means that the proportion of sites occupied (measured via camera trap surveys taken every five years) remains above the baseline.	Program outcome: Southern brown bandicoot persists within the southern brown bandicoot management area
The protection and enhancement of all southern brown bandicoot populations within the southern brown bandicoot management area.	Program output: Important landscape and habitat areas for southern brown bandicoot are protected and managed

Persistence is assessed by the degree of occupancy of southern brown bandicoots as estimated by remote camera surveys, spread across 100 sites within the management area.

Conservation outcomes assessed

Conservation Outcome 1

Functioning and sustainable southern brown bandicoot populations within the southern brown bandicoot management area with connectivity between populations. Sustainable populations means that the proportion of sites occupied (measured via camera trap surveys taken every five years) remains above the baseline.

2024 status	2024 trend	2024 confidence
?	?	

Why this assessment in 2024?

The status assessment of unknown is because there is no baseline established yet. Therefore, trend assessment is also assessed as unclear. The confidence in the status and trend assessment is rated as low due to incomplete KPI data.

The data collection cycle has not been completed (KPI 1 for program outcome) therefore, Conservation Outcome 1 cannot be assessed. In terms of habitat connectivity, DEECA's sub-regional species strategy for the southern brown bandicoot demonstrates the importance of creating metapopulations within southern brown bandicoot management areas. Four proposed habitat connectivity corridors have been identified in the Precinct Structure Plans (PSP) located between the Royal Botanic Gardens Cranbourne and UGB (Figure 39) to achieve this.

The corridors provide structural connectivity to the management area. This includes the Botanic Ridge PSP and Deavon Meadows PSP. Habitat Connectivity Corridor 2 was established between 2022 and 2024 (Figure 39). The other three corridors have not been established as of July 2024. The City of Casey is currently working with DEECA to establish Habitat Connectivity Corridor 4 along the Botanic Ridge powerline easement. Restrictions exist around the easement that could impact the width of the corridor.

Figure 39: Southern brown bandicoot Habitat Connectivity Corridors 1 to 4, displaying Botanic Ridge Corridors.[182] Habitat Connectivity Corridor 2 is the only section to be fully delivered as of June 2024 that restored 6.338 hectares of land for southern brown bandicoot. Source: DEECA.

182. Department of Environment, Land, Water and Planning 2016, 'Implementation Plan for the Southern Brown Bandicoot sub-regional species strategy', Melbourne, Victoria.

KPIs assessed

DEECA's MSA MRF summarises the conservation outcomes for the southern brown bandicoot as a single goal statement: 'the southern brown bandicoot persists within the southern brown bandicoot management area'. DEECA developed a single KPI to report against this single outcome statement:

- KPI 1: The mean proportion of monitoring sites occupied must remain above a modelled baseline estimate of occupancy (calculated using data from the first survey).

183. Department of Environment and Primary Industry 2014, 'Sub-regional Species Strategy for the Southern Brown Bandicoot.' East Melbourne, Victoria.
184. Bryant D, Sinclair S, Geary W, Bruce M and Millen C 2018, 'The occurrence of the Southern Brown Bandicoot Isoodon obesulus and its habitat on Chinaman Island, Western Port, Victoria', *The Victorian Naturalist*, 135, pp. 128-138.
185. Maclagan SJ, Coates T and Ritchie EG 2018, 'Don't judge habitat on its novelty: Assessing the value of novel habitats for an endangered mammal in a peri-urban landscape', *Biological Conservation*, 223, pp. 11-18.

Monitored areas

Southern brown bandicoot is monitored on public land throughout the southern brown bandicoot Management Area.[183] The management area (Figure 40) covers 59,549 hectares situated south-east of Melbourne, primarily outside the UGB. Previous research has shown that despite this landscape being heavily modified, bandicoot populations persist.[184, 185] Monitoring is undertaken every five years. The first year of monitoring was 2019, the field work for the second round of monitoring was occurring during the compilation of this report (autumn 2024).

The baseline is the proportion of sites occupied as estimated by an occupancy model. It was set during the first monitoring period (2019), and it was split into three habitat types: canals (artificial waterways; 76% occupancy of sampled sites), reserves (39% occupancy) and roadsides (35% occupancy).

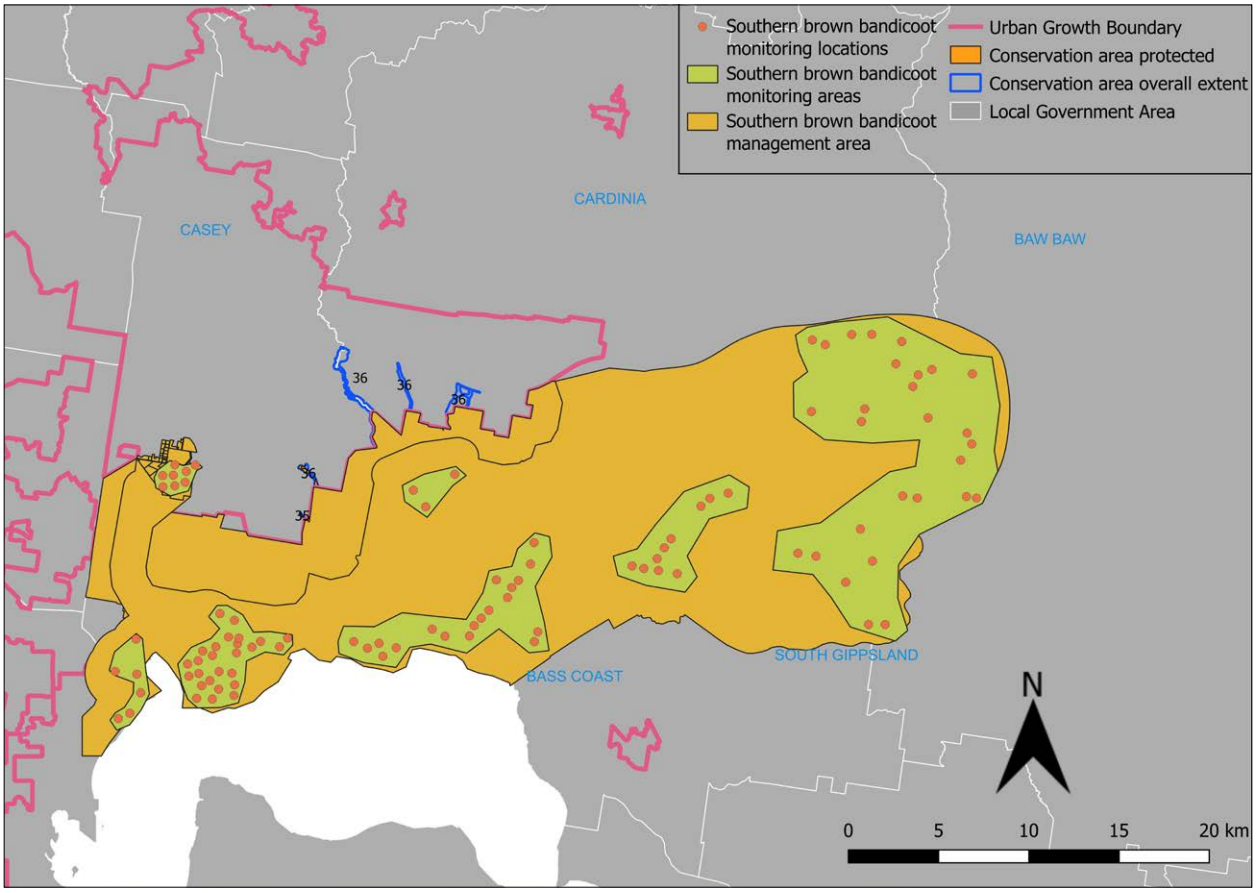


Figure 40: Map of southern brown bandicoot management area and 100 monitoring points (red dots) within the monitoring areas. Nine monitoring plots are located within the Urban Growth Boundary: eight in the Royal Botanic Gardens Cranbourne and one in the south-western part of the Bunyip area. Source: DEECA.

KPI 1: Proportion of monitoring sites that are occupied

Table 55: KPI 1 assessment results for southern brown bandicoot for within the southern brown bandicoot management area by habitat type.

KPI 1: Proportion of monitoring sites that are occupied	Baseline (%)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Canal	76	Not assessed	N/A	Unclear	N/A	2019
Reserve	39	Not assessed	N/A	Unclear	N/A	2019
Road	35	Not assessed	N/A	Unclear	N/A	2019

The baseline for southern brown bandicoot was calculated from the first survey, using the model to estimate occupancy from the data.[186] The best supported model had occupancy dependent on habitat type and detection dependent on survey month. There was no evidence that this model fitted poorly. The baseline for the southern brown bandicoot, therefore, varies by habitat type — 76% of canal of sites occupied, 39% of reserve sites and 35% of road sites occupied (Figure 41). DEECA advised that 2024 survey results will be ready for use in the next MSA report.[187] Bandicoot detections were spread out across the management area, with notable areas of non-detection in the south-western and north-eastern (north of the Princess Highway) corners of the management area.

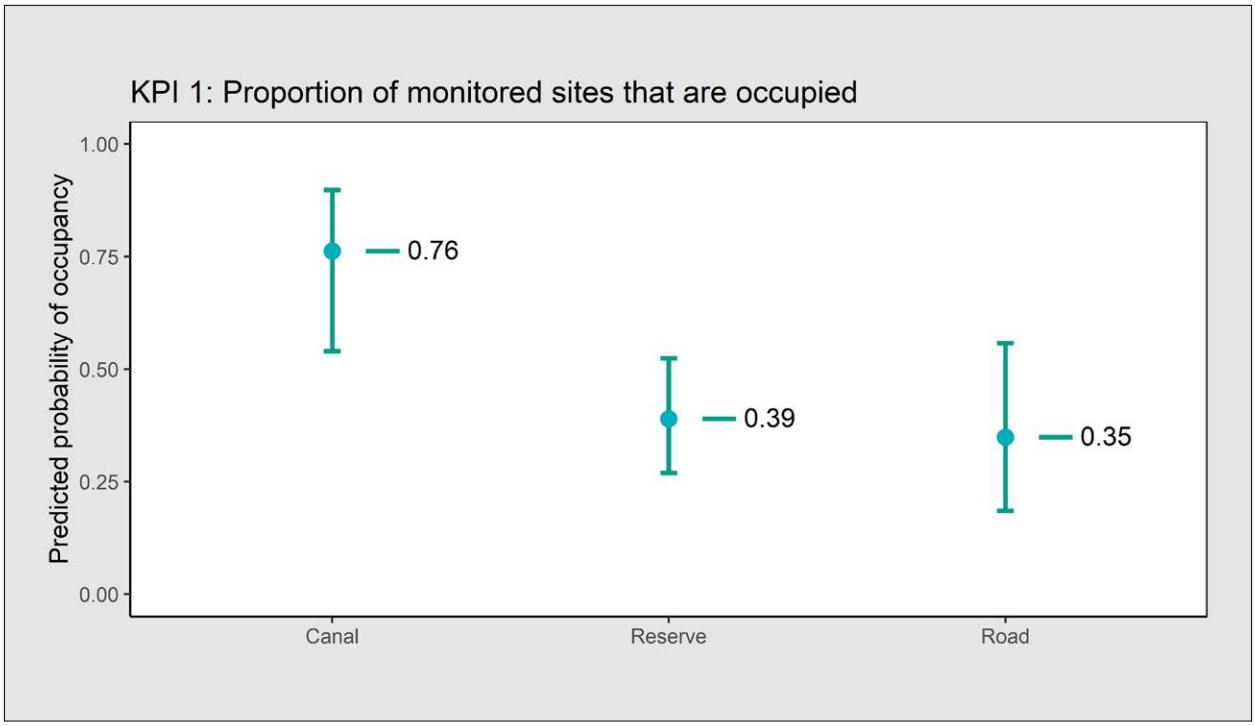


Figure 41: Modelled proportion of sites occupied by southern brown bandicoot and detection probability for southern brown bandicoot in the southern brown bandicoot management area for three different types of habitats: canal, reserve and road. Error bars show 95% confidence intervals. Horizontal lines show baselines for habitat types. Source: DEECA.

186. Bruce MJ, Bryant DB, Kohout M, Macak PV, Batpurev K and Sinclair SJ 2023, 'Southern brown bandicoots, *Isoodon obesulus obesulus*, occupy the margins of artificial waterways, in preference to bushland remnants or roadside vegetation', *Wildlife Research*, 50, pp. 68-75.
187. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', March 2024.

Conservation Outcome 2

The protection and enhancement of all southern brown bandicoot populations within the southern brown bandicoot management area.

2024 status	2024 trend	2024 confidence
?	?	

Why this assessment in 2024?

The status assessment of unknown is because there is no baseline established yet. Therefore, trend is also assessed as unclear. The confidence in the status and trend assessment is rated as low due to incomplete KPI data.

Due to the insufficient passage of time, Conservation Outcome 2 cannot be assessed. A baseline must be established to assess this conservation outcome.

Key insights and management implications

In this reporting period, data for KPI 1 was collected in Autumn 2024 but not reported in this report due to limited time to incorporate. Meanwhile, DEECA has developed a new five-year implementation plan for the sub-regional species strategy for the management areas. This new plan demonstrates details of on-ground actions to deliver from 2024, which includes predator control, grant programs for private landholders, community education and research on genetic diversity. DEECA advised that the next data for KPI 1 will be a foundation for an adaptive management approach to ensure that the species persists within the southern brown bandicoot management area and assess effectiveness of upcoming on-ground actions.[188]

The frequency of data collection for KPI 1 is five years while other MNES have an annual monitoring plan. This level of frequency is based on the expert advice that it was not necessary to monitor the species annually.[189] They considered the biology of the species and the likely population response to events, natural or otherwise.

Southern brown bandicoot does not have as much funding as the other species, principally due to the slow-down of land development within the south-eastern area of the UGB, leading to the reduction in levy allocated to the species. Leveraging data collected by citizen scientists and other organisations cannot be a potential method to overcome the restrictions as casual/incidental observations of the species are difficult to incorporate into an occupancy estimate. Instead, DEECA advised that all programs they fund should submit their survey data to the Victorian Biodiversity Atlas that will help update habitat distribution model and population viability analysis (PVA).[190]

DEECA considers that habitat connectivity is critical for southern brown bandicoot populations. The habitat connectivity corridors within the UGB may provide suitable shelter and foraging areas for the species and support movement to and from the Royal Botanic Gardens Cranbourne (the heart of the most important population of southern brown bandicoot in the sub-region). DEECA will conduct a follow up survey of Habitat Connectivity Corridor 2 to confirm the usage by the species. Also, DEECA will conduct on-ground delivery, creating new habitat standards, funding a habitat restoration plan and bushfire risk assessment to work in partnership with City of Casey to begin delivery of the Habitat Connectivity Corridor 4 (Figure 41).

188. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 27 May 2024.
189. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 19 July 2024.
190. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 27 May 2024.

Additionally, several key actions delivered from 2022 to mid-2024 include:

- DEECA MSA program funded southern brown bandicoot outreach officer position at the Royal Botanic Gardens Cranbourne to conduct community engagement. There is a monthly working group to discuss upcoming events and collaborate on future event ideas. In May 2024, the program had a webinar, Balancing Wildlife and Pests in your Garden, as a response to some media attention regarding rabbit baiting within the City of Casey.[191]
- Genetic rescue strategy: DEECA is implementing a state-wide genetic rescue program for the species. The program includes a PhD project at the University of Melbourne. Since 2022, this PhD project has collected samples from southern brown bandicoot populations across Victoria and South Australia to do a genetic risk assessment to identify the extent to which loss of genetic diversity is a key threat to the species and where in Victoria populations of the species are most likely to benefit from genetic supplementation.
- At the same time, DEECA has successfully sought permission and permits to establish a new, outbred population of southern brown bandicoots at the Briars Wildlife Sanctuary on Monington Peninsula. This is a fox-free safe haven of 230 hectares in the Mornington Shire. They are approximately half-way through sourcing the 20 founder animals for this population. The first eight individuals were translocated from East Gippsland to the Sanctuary in autumn 2024. Currently, DEECA is attempting to trap further animals from the Koo Wee Rup area and translocate them to the Briars. The Briars population is proposed to be a mix between distant populations and may provide offspring of high genetic diversity to supplement populations which are at risk of decline.
- New under-road transit infrastructure design: DEECA and Royal Botanic Gardens Victoria are collaborating to create standard engineering drawings for southern brown bandicoot to retrofit culverts across the southern brown bandicoot management area.

DEECA developed a new implementation plan with conservation actions that will be delivered from late 2024 onwards. DEECA advised that approximately $7 million in funding is available from the MSA levy to roll this plan out that will lead to the implementation of more intensive on-ground activities over the next few years.[192] These works should be used to assess the effectiveness of upcoming conservation activities for southern brown bandicoot populations that will help assess enhancement of southern brown bandicoot populations as specified in Conservation Outcome 2.

191. StarNews 2024, 'Rabit plague', https://cranbournenews.starcommunity.com.au/news/2024-02-16/rabbit-plague/ Accessed 31 May 2024.
192. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 27 May 2024.

MNES 8: Growling grass frog

Growling Grass Frog.
© DEECA

Growling grass frog *(Litoria raniformis)*, listed as vulnerable under the EPBC Act, is a large, semi-aquatic member of the 'bell frog group' (Figure 42).[193] This species was formerly distributed widely across lowland south-eastern Australia, including in most regions of Victoria (excluding the Mallee and alpine regions).[194]

193. Barker J, Grigg G and Tyler MJ 1995, 'A Field Guide to Australian Frogs.' Surrey Beatty, Chipping Norton, New South Wales.
194. Heard GW, McCarthy MA, Scroggie MP, Baumgartner JB and Parris KM 2013, 'A Bayesian model of metapopulation viability, with application to an endangered amphibian', *Diversity and Distribution*, 19, pp. 555–566.

Figure 42: Image depicting the growling grass frog. Source: DEECA.

DEECA's conservation commitment and relevance to MRF

DEECA published the following statements as conservation outcomes for the growling grass frog (Table 56) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with which KPIs can be found in Table 56.

Table 56: Conservation outcomes for growling grass frog and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcome	Alignment with Monitoring and Reporting Framework
Functioning and sustainable populations of growling grass frog within and adjacent to the Urban Growth Boundary (UGB) with connectivity between populations. Sustainable populations are defined as a reduction in extinction risk to low (using DEECA's Growling Grass Frog Masterplan model).	Program outcome: Growling grass frog persists within the MSA area
Protection and enhancement of important populations of growling grass frog, as identified in the Biodiversity Conservation Strategy and the Conservation Areas Declaration under Section 11 of the Melbourne Strategic Assessment (MSA) Act.	Program output: A network of conservation areas within the UGB is protected and managed for Matters of National Environmental Significance species and vegetation communities

Conservation outcomes assessed

Conservation Outcome 1

Functioning and sustainable growling grass frog populations within the UGB with connectivity between populations. Sustainable populations means that there is a reduction in extinction risk to low in the long-term (using the modelling that supports DEECA's Growling Grass Frog Masterplan)

2024 status	2024 trend	2024 confidence
?	?	

Why this assessment in 2024?

The status assessment of unknown is because there is no baseline established yet. Therefore, the trend assessment is also assessed as unclear Confidence in the status and trend assessments is rated as low due to incomplete KPI data.

Conservation Outcome 1 cannot be assessed because the data collection cycle has not been completed for the KPI 1 assessment.

KPIs assessed

DEECA's MSA MRF summarises the conservation outcomes for the growling grass frog as a single goal statement: 'growling grass frog persists within the MSA area'. DEECA developed a single KPI to report against this single outcome statement:

- KPI 1: Proportion of sites occupied.

The previous KPI 'Projected risk of extinction for each conservation area, estimated using a stochastic patch-occupancy model for growling grass frog metapopulations' has been replaced by a simpler measure that monitors the proportion of sites occupied by growling grass frog. DEECA indicates that the reason why they changed the KPI is because the previous KPI was very complex and used predicted analysis as a metric, whereas the current KPI uses raw data from field survey, which provides different insight. DEECA indicates that this KPI is a starting point to improve the understanding of this species as there is insufficient information to conduct comprehensive analysis of the species.

Monitored areas

Growling grass frog monitoring occurs in four separate areas consisting of on and off stream habitats:

- Western (Conservation Areas 14A, 14D, 14P, 15A and 15B): Werribee River, Toolern Creek, Koroit Creek and Lollipop Creek
- North-western (Conservation Areas 21A, 21B, 21C, 21D, 21E and 21F): Jacksons Creek and Emu Creek
- Northern (Conservation Areas 34A, 34D, 34E, 34F and 34G): Merri Creek and Darebin Creek
- South-eastern (Conservation Areas 36A, 36B, 36D and 36E): Clyde Creek, Cardidna Creek, Lower Gum Scrub Creek and Toomuc Creek.

Since monitoring started in 2021, a single year survey was completed for the northern (2021), north-western (2022) and western (2023) corridors. The survey for south-eastern area will commence in late 2024. Some survey locations are outside of the growling grass frog conservation area, but these locations are also important to identify habitat that the species uses (Figure 43).

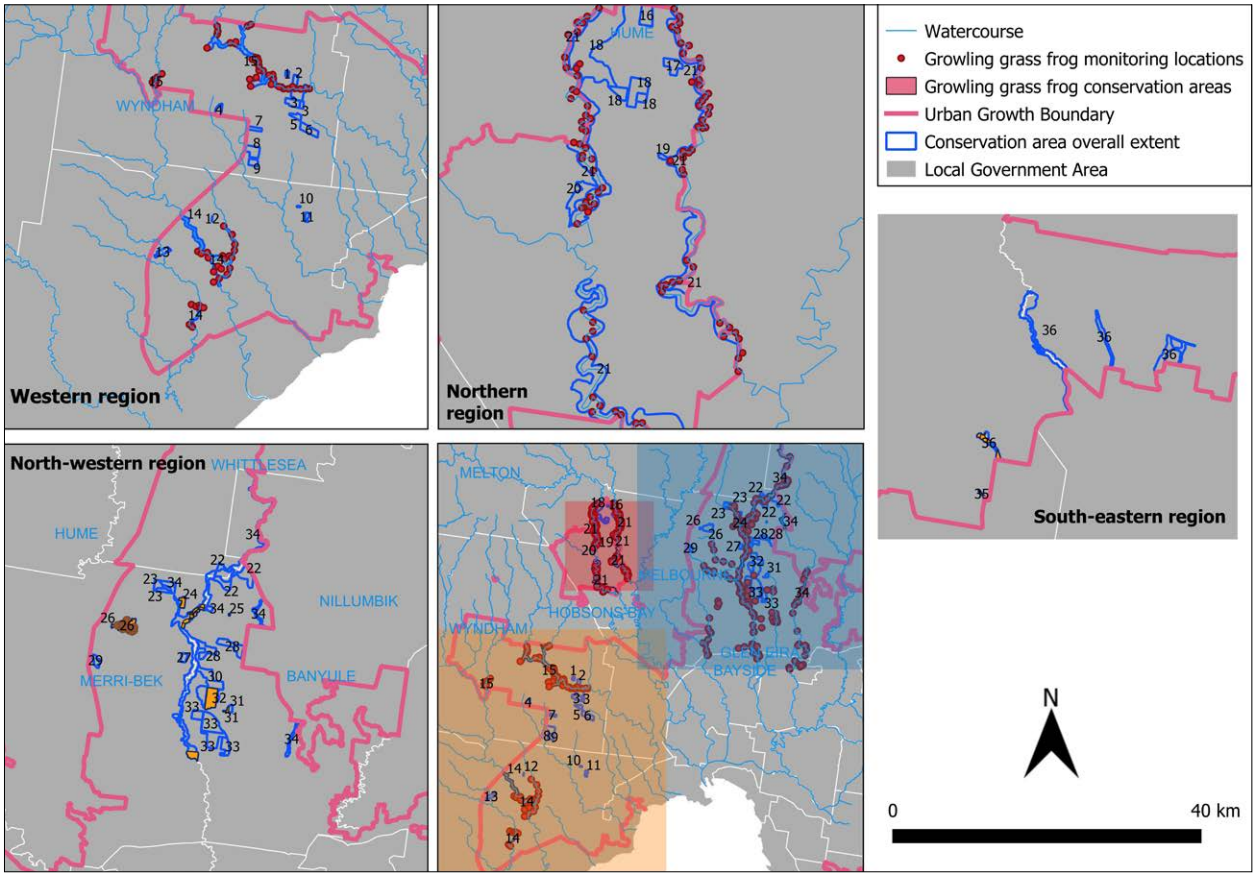


Figure 43: Map of growling grass frog survey locations in the northern, north-western, western and south-eastern regions within the Urban Growth Boundary. Source: DEECA.

KPI 1: Proportion of monitoring sites that are occupied

Monitoring commenced in 2021 for the north side along the Merri Creek corridor. In 2022, the north-west region completed the survey and then the western region was surveyed in 2024. In the 2024–25 financial year, the south-east region will be surveyed. This report can provide a baseline for each region, however, an assessment currently cannot be made but may be possible in future reports. Occupancy rate for each region can be found in Figure 44.

Table 57: KPI 1 assessment results for growling grass frog within conservation areas by region.

KPI 1: Proportion of monitoring sites that are occupied	Baseline (% of occupied plots)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was/ will be set
North region	0.25 (25%)	Not assessed	N/A	Unclear	N/A	2022
North-west region	0.29 (29%)	Not assessed	N/A	Unclear	N/A	2023
West region	0.12 (%)	Not assessed	N/A	Unclear	N/A	2024
South-east region	Not yet set	Not assessed	Baseline not yet set	Unclear	N/A	2024-2025

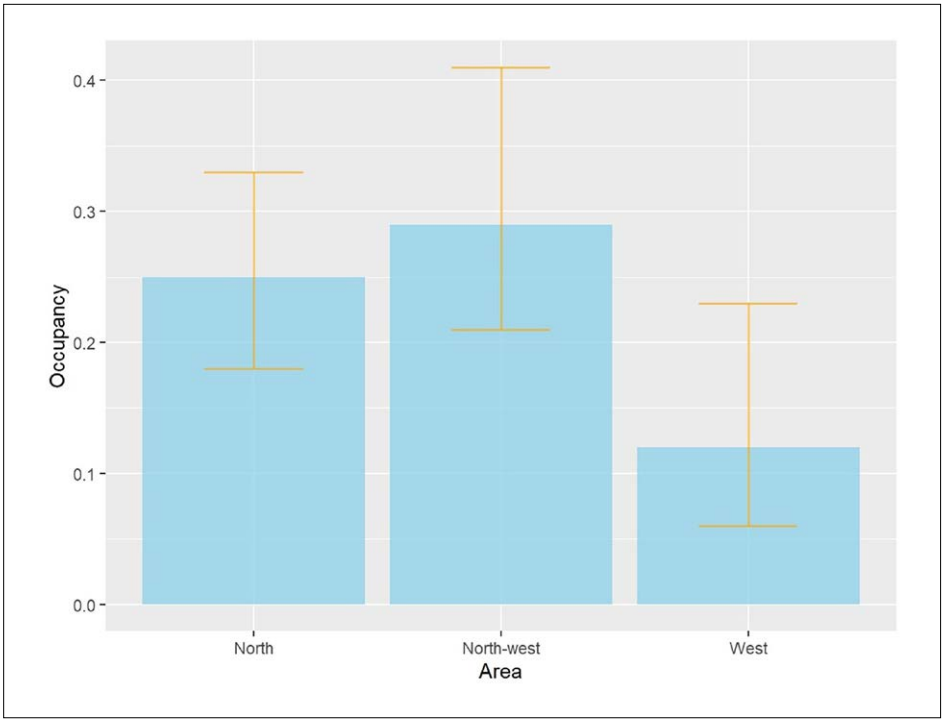


Figure 44: Occupancy rate of growling grass frog in the northern, north-western and western regions. Source: DEECA.

Conservation Outcome 2

The protection and enhancement of important growling grass frog populations in the conservation areas identified in the BCS and the Conservation Areas Declaration.

2024 status	2024 trend	2024 confidence
?	↗	

Why this assessment in 2024?

The status assessment of unknown is because there is no baseline established for KPI 1 yet. Furthermore, it is unclear if the health of the growling grass frog population in the conservation areas can be measured by the current KPI (occupancy).

Many land parcels within Conservation Areas 14, 15, 34 and 36 will commence implementing land management plans in 2024 and 2025. This is likely to enhance growling grass frog populations in the conservation areas. Therefore, trend is assessed as improving.

The confidence assessment of low is based on the incomplete information of the baseline for KPI 1.

Five conservation areas are listed as growling grass frog conservation area, including Conservation Areas 14, 15, 21, 34 and 36, with a total of approximately 3,651 hectares. Approximately 418 hectares have been secured (Table 10) to date, representing 11% of the overall area. An assessment of whether the populations within these conservation areas are enhanced cannot be conducted because the data collection cycle has not been completed as a part of the MRF.

Key insights and management implications

Detection results indicated that each surveyed region had confined creeks in which growling grass frog were found. In the western area, all detections occurred in the Koroit Creek. Werribee River, Toolern Creek and Lollipop Creek yielded no detections. In the North-western region, most detections occurred in Emu Creek. Only a single survey point in Jacksons

Creek had a detection of the species. The Northern area had detections at a range of locations in many watercourses: Merri Creek near Kalkallo Curly Sedge Creek, Bundoora Park near Darebin Creek, and Edgars Creek. Most of the detections were within the growling grass frog conservation areas, highlighting the importance of conservation areas for the species.

Due to an early phase of monitoring growling grass frog, the assessment of the KPI or conservation outcomes cannot be made. However, there is a long-standing growling grass frog research project focusing on the portion of the catchment from Moomba Park in Fawkner (the southern-most know current extent of the species), through to Somerton, just below Aitken Creek in the north. The MSA monitoring project also covers this area. The research project found that the population of the growling grass frog within the study site shows a long-term trend of decline.

Apart from urban expansion, chytrid fungus was evaluated to be mainly responsible for the long-term decline of growling grass frog. However, pesticides also could play a key role in declines. The research project conducted in 2023 found 25 pesticides that were commonly detected across urban wetlands in Melbourne.[195] Many of the pesticides detected in the study have been reported to occur at concentrations toxic to aquatic life, including the growling grass frog.[196, 197] Once the KPI 1 is ready for assessment, it is important to understand key factors impacted on the changes of the occupancy.

Melbourne Water is the main direct land manager of growling grass frog conservation areas. Melbourne Water has commenced delivery of management activities since 2022 in Conservation Area 36 and gradually increased extent of areas in their land record. They performed fencing, weed control, revegetation and rubbish removal in Conservation Area 34 (north-west of Donnybrook and west of Craigieburn Grassland Nature Conservation Reserve) and Conservation Area 36 (east of Clyde next to Foundation Avenue). The only area within the Kororoit Creek that has been secured is located north of Deanside (near Gray Court). Although this land was secured in 2020, no direct land management has commenced, and details of information were not provided to improve understanding of the current condition of the area.

The northern region had the largest and most extensive detections compared to the other regions. However, a long-term population decline has been progressing. A few remnant populations occur at the former Epping Tip, southern part of Craigieburn Grassland Nature Conservation Reserve along the Curly Sedge Creek, Edgard Creek in Epping and the Donnybrook area. There is uncertainty as to whether the population status and site condition will remain in the future due to several risks including water pollution and urban development. Conservation Outcomes 1 and 2 indicate that these important populations should be protected and enhanced, and connectivity should be considered between populations. However, the KPI only measures occupancy for each region and this does not provide insight that can be used to develop intervention strategies. DEECA advised that this is a starting point for conducting comprehensive analysis in the future once further information regarding this species has been acquired.[198] Meanwhile, remaining populations may face further extinctions. The MRF is a central tool for adaptive management, however, it is unclear how this KPI will be used as a part of developing management responses and evaluating threats in response to the MSA 2022 recommendation for growing grass frog (Recommendation 12).

There is a masterplan for growling grass frog that outlines strategies for designing habitat and connectivity within the conservation areas, including the creation of wetlands for the species.[199] DEECA developed a Memorandum of Understanding with the Melbourne Water Corporation in November 2018. The Melbourne Water Corporation agreed to deliver conservation works within the urban growth areas of Melbourne. These works include land management, wetland creation, enhancement and maintenance in accordance with the masterplan.

Melbourne Water Corporation produce milestone reports every six months. These reports describe progress in wetland design and construction and land management works. While more land will be acquired and applied to the masterplan program, the current effort by DEECA and Melbourne Water Corporation provides an opportunity to assess management effectiveness through KPIs.

195. Pettigrove V, Hassell K, Kellar C, Long S, MacMahon D, Myers J, Nguyen H, Walpitagama M 2023, 'Catchment sourcing urban pesticide pollution using constructed wetlands in Melbourne, Australia', *Science of the Total Environment*, 863, pp. 160556.
196. Ranatunga M, Kellar C, Pettigrove V 2023, 'Toxicological impacts of synthetic pyrethroids on non-target aquatic organisms: a review', *Environmental Advances*, 12, pp. 100388.
197. Ranatunga M 2024 'The toxicological effects of bifenthrin on urban aquatic fauna and its direct and indirect effects on threatened *Litoria raniformis* populations', School of Science RMIT University (under review).
198. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 8 May 2024.
199. Department of Environment, Land, Water and Planning (DELWP) 2017, 'Growling grass frog masterplan for Melbourne's growth corridors', East Melbourne, Victoria.

MNES 9: Small golden moths orchid

Small golden moths orchid.
© DEECA

Small golden moths orchid *(Diuris basaltica)*, listed as endangered under the EPBC Act, is a perennial orchid growing to 15 centimetres tall, with a single stem supporting one to two small yellow flowers (Figure 45). The species retreats to an underground tuber each year in summer and at other times when conditions are unfavourable. It is endemic to the Keilor and Werribee Plains.[200]

200. Barker J, Grigg G and Tyler MJ 1995, 'A Field Guide to Australian Frogs', Surrey Beatty, Chipping Norton, New South Wales.

Figure 45: Image depicting the small golden moths orchid. Source: DEECA.

DEECA's conservation commitment and relevance to the Monitoring and Reporting Framework

DEECA published the following statements as conservation outcomes for the small golden moths orchid (Table 58) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with KPIs can be found in Table 58.

Table 58: Conservation outcome for small golden moths orchid and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcomes	Alignment with Monitoring and Reporting Framework
No substantial negative change to the known population of small golden moths orchid within the Urban Growth Boundary (UGB) in Conservation Area 3. No substantial negative change means that the count of individuals emergent at least once over a five-year period remains above 90% of the baseline.	Program output: A network of conservation areas within the UGB is protected and managed for Matters of National Environmental Significance species and vegetation communities. Program outcome: No substantial negative change to the population of small golden moths orchid.

Conservation outcomes assessed

Conservation Outcome 1

No substantial negative change to the known population of small golden moths orchid within the UGB in Conservation Area 3. No substantial negative change means that the count of individuals emergent at least once over a five-year period remains above 90% of the baseline.

2024 status	2024 trend	2024 confidence
?	?	●

Why this assessment in 2024?

The status assessment of unknown is because there is no information on the condition of Conservation Area 3. Therefore, trend is also assessed as unclear.

Confidence assessment of low is based on the absence of information for KPI 1 in Conservation Area 3.

Conservation Outcome 1 cannot be assessed as the relevant area within Conservation Area 3 has not been protected in perpetuity. Currently, 54% of Conservation Area 3 has been acquired (94.5 ha of 175.8 ha) but the areas secured do not include the presence of small golden moths orchid. Therefore, no surveys have occurred.

KPIs assessed

DEECA's MSA MRF summarises the conservation outcomes for the small golden moths orchid as a single goal statement: 'no substantial negative change to the population of small golden moths orchid', DEECA developed a single KPI to report against this single outcome statement:

- KPI 1: Count of individuals emergent at least once over a five-year period.

Monitored areas

The small golden moths orchid is known from only one location in the MSA area, in Conservation Area 3 (Figure 46). This area has not yet been protected and no monitoring has occurred. The species is not dealt with further here.

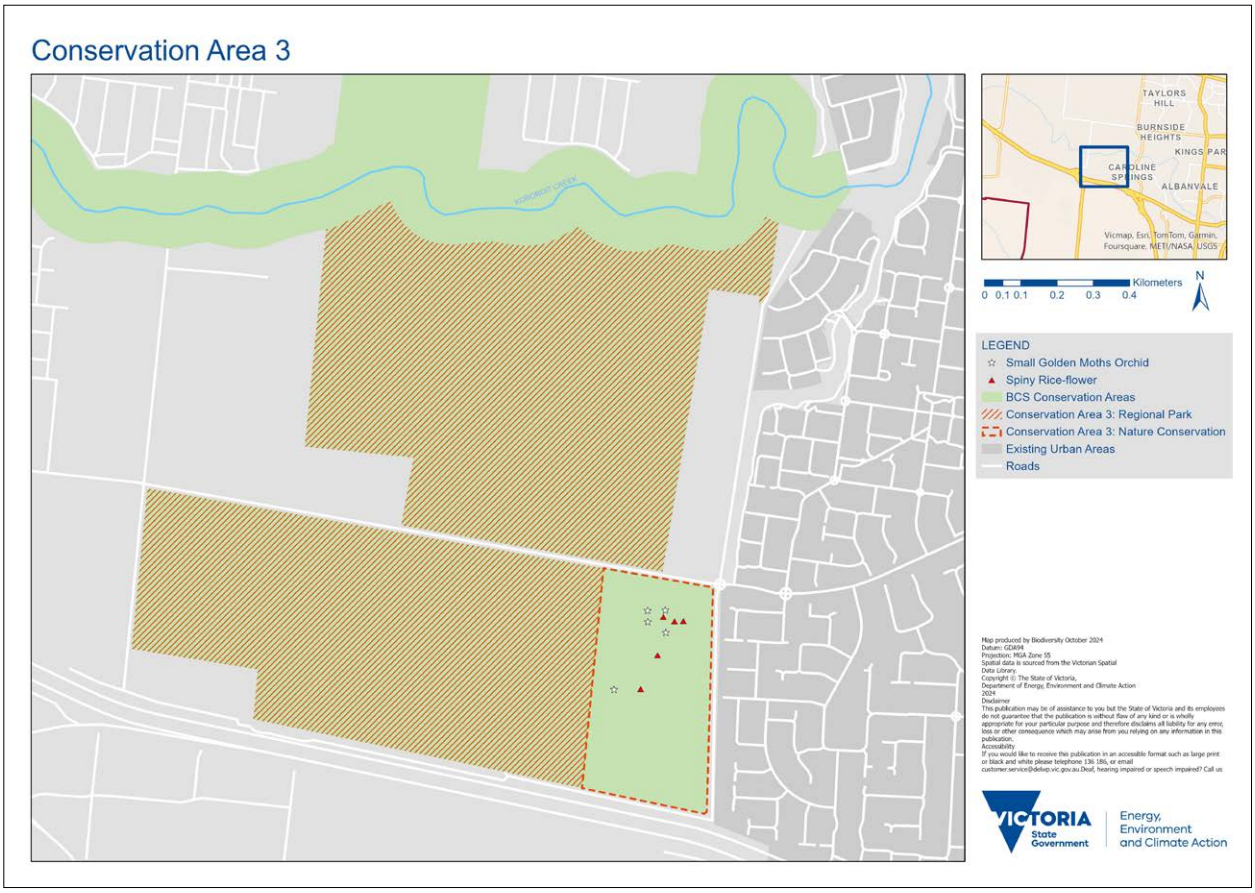


Figure 46: Area in which small golden moths orchid has a presence based on the Biodiversity Conservation Strategy, located in the south-eastern part of Conservation Area 3. Source: DEECA.

KPI 1: Count of individuals emergent at least once over a five-year period

Table 59: KPI 1 assessment results for small golden moths orchid in Conservation Area 3.

KPI 1: Count of individuals emergent at least once over a five-year period	Baseline (Count of plants)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline will be set
Conservation Area 3	Not yet set	Not assessed	Population not yet under MSA management	Unclear	N/A	Unclear

As results are currently unable to be assessed, an interpretation of results is not provided here.

Key insights and management implications

It is unclear if and how well the species is persisting. The MSA program has been unable to secure the area containing the remnant grassland habitat of small golden moths orchid and currently no interim management is being undertaken.[201]

This is the last known relatively large population of the small golden moths orchid.[202] The species is also reported to have experienced a 'catastrophic reduction in range and distribution'.[203] These factors cause the species to be considered extremely vulnerable to threats, resulting in pressures such as subtle changes in biomass and rabbits potentially being problematic for the persistence of the species.

Urgent action is required to understand potential threats to the population of the small golden moths orchid to halt potential species decline and extinction.

Small golden moths orchid.
Credit: Garry French
© iNaturalist Australia

201. Department of Environment, Land, Water and Planning (DELWP), 'Personal communication', 15 February 2022.
202. Department of Environment, Land, Water and Planning (DELWP), 'Personal communication', 15 February 2022.
203. Backhouse G and Lester K 2010, 'National Recovery Plan for the Small golden moths orchid *Diuris basaltica*'. Australian Government Department of the Environment. https://www.dcceew.gov.au/sites/default/files/documents/diuris-basaltica.pdf Accessed 18 October 2024.

MNES 10: Striped legless lizard

Striped legless lizard.
Credit: DEECA
© DEECA

The striped legless lizard *(Delma impar),* listed as vulnerable under the EPBC Act, is a flap-footed lizard lacking forelimbs with the hind limbs reduced to small flaps (Figure 47).[204] The species is found in the Australian Capital Territory, Victoria, New South Wales and South Australia. Genetic analysis shows that across the striped legless lizard's geographical range the species forms four distinct genetic lineages: the South Australia and Victorian Wimmera; south-western Victoria (including Melbourne); eastern Victoria and a lineage covering the Australian Capital Territory and Monaro Plains in New South Wales, with significant populations in the western suburbs of Melbourne.[205] Knowledge on the life history of the striped legless lizard is limited, though estimates of lifespan begin at approximately 10 years and age at first reproduction is considered to be two to three years for males and three to four years for females. Loss, modification, degradation and fragmentation of habitat that includes urban development, high intensity grazing and ploughing, and pasture improvement are threats to the striped legless lizard.

204. Wilson SK and Swan G 2010, 'A Complete Guide to the Reptiles of Australia.' New Holland Publishers (Australia) Pty Ltd, Chatswood, New South Wales.
205. O'Shea MB 2005, 'Methods for Assessment and Techniques for Management of Striped Legless Lizard Delma impar Populations in South-eastern Australia', Ph.D. thesis, Victoria University, St. Albans, Victoria.

Figure 47: Image depicting the striped legless lizard in the Western Grassland Reserve. Source: DEECA.

DEECA's conservation commitment and relevance to MRF

DEECA published the following statements as conservation outcomes for the striped legless lizard (Table 60) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with which KPIs can be found in Table 60.

Table 60: Conservation outcomes for striped legless lizard and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcome	Alignment with Monitoring and Reporting Framework
Striped legless lizard populations are sustained in the long term across the known distribution of this species: in the Western Grassland Reserve and the conservation areas identified in the Biodiversity Conservation Strategy and the Conservation Areas Declaration. Sustained means that evidence of striped legless lizard is detected once in every five-year period at each of the permanent monitoring plots.	Program output: A network of conservation areas within the Urban Growth Boundary is protected and managed for Matters of National Environmental Significance species and vegetation communities Program outcome: the striped legless lizard persists

Conservation outcomes assessed

Conservation Outcome 1

Striped legless lizard populations are sustained in the long-term across the known distribution of this species in the Western Grassland Reserve and the conservation areas identified in the BCS and the Conservation Areas Declaration. Sustained means that evidence of striped legless lizard is detected once in every five-year period at each of the permanent monitoring plots.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of good is based on the KPI 2 result as this conservation outcome specifies that the striped legless lizard population should be detected once in every five-year period at each of the permanent monitoring plots. All permanent plots have met the KPI for the first five years. The only plot that has had a second five-year assessment period is 'Plot 96_1' in the Western Grassland Reserve. This plot achieved KPI 2 in both periods.

The trend assessment of table is based on the permanent plots achieving KPI 2.

The confidence assessment of moderate is due to the absence of information from the conservation areas. Currently, assessment is based only on data collected in the Western Grassland Reserve.

Current monitoring undertakes a random selection of permanent monitoring plots annually in response to Recommendation 14 in the MSA 2022 Report. The data for KPIs 1 and 2 collected in the WGR show that the populations are sustained across the permanent monitoring sites as detection at these sites occurred at least within a five-year period. The annual result for KPI 1 indicates an improvement but due to the large fluctuation of annual results between 2016 and 2023, a 95% confidence interval for the five-year mean is large. This result indicates that whether there is a clear trend of improvement in occupancy rate within permanent monitoring sites remains unclear.

In terms of conservation areas, BCS identified Conservation Areas 5, 6, 30 and 33 that have a presence of striped legless lizard. While Conservation Area 6 has been secured, DEECA does not monitor the area. DEECA advised that this is because the site is protected by Section 173 under the *Planning and Environment Act 1987*.[206] Conservation Area 6 provides an offset for the Boral Quarry and the BCS requires urban development to be avoided around the area. This was achieved by ensuring the BCS was used to define what land became Urban Growth Zone as part of the UGB Expansion and subsequent precinct structure planning.

The updated MRF specifies that permanent grids will be monitored in conservation areas greater than 10 hectares at any location where the lizard is detected during inventory surveys. As all relevant conservation areas are greater than the required size, regular monitoring program will cover these areas. These survey grids within conservation areas will contribute to KPI 2 (which tracks known populations) but not KPI 1 (which depends on a random distribution of grids).

Restoration may be undertaken if the effort was dedicated to it but there are two main issues to achieve this if extinction has happened: 1) due to degraded condition, the species will be difficult to survive, and 2) there is nowhere to source the species to translocate. The most appropriate means of protecting the striped legless lizard is to protect conservation areas in which the species currently exists.

The MRF demonstrates that there are four other indicators: percentage cover of bare ground, percentage cover perennial weeds, percentage cover native grasses and the ambient air temperature, temperature under one tile per grid, cloud cover, wind direction and strength, survey date, start and finish time. These indicators may provide useful insight regarding detection rate.

206. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 8 August 2024.

KPIs assessed

DEECA's MSA MRF summarises the conservation outcome for the striped legless lizard as a single goal statement: 'the striped legless lizard persists'. DEECA developed two KPIs to report against this single outcome statement:

- KPI 1: Occupancy of striped legless lizard at randomly sampled locations.
- KPI 2: Evidence of striped legless lizard is detected at least once in every five-year period at 100% of permanent monitoring plots which have previously yielded detections.

These KPIs have been re-designed in response to the MSA 2022 Report Recommendation 14.[207] The main change is that the measure for persistence is a randomly sampled measure for occupancy across all sites and accounts for new locations. This means that more locations will be surveyed annually as the MSA program acquires more land in the future. For example, there were 30 survey points in 2023, which is four times higher than the number of survey points in 2018 (Table 61). To incorporate this, DEECA added one additional KPI. The current monitoring protocol shows that the geographical scope of the regular survey focuses on the WGR.

Table 61: Number of plots surveyed for striped legless lizard per year between 2016 and 2023. Source: DEECA.

Year	2016	2017	2018	2019	2021	2022	2023
Number of survey plots	16	13	8	6	11	11	30

DEECA suggests the average detection rate (number of plots detected / overall number of plots surveyed) between 2016–2021 as a five-year mean to compare with 2022 and 2023 survey results. In 2020, monitoring did not occur due to the COVID-19 pandemic.

For random sampling, monitoring of this species will be undertaken by annually surveying grids of roof tiles. Each grid is a rectangle of 10 metre x five metre ceramic or terracotta roof tiles spaced five metres apart, 50 tiles per grid in total. The tile grids will be established one months prior to the first survey. The location of the corner tiles on each grid will be recorded using GPS. There are conditions and season to conduct a survey such as time of day, tile temperature and air temperature.

At each tile grid the sheltered area underneath the tiles will be inspected for evidence of lizard presence, including sloughed skins. The number of live, dead and soughed skins should be recoded at each survey. The identity (to species where possible) and number of other vertebrate animals should also be recorded. Six repeat tile checks of each grid will be conducted at least one week apart. Should one of the checks fall outside the optimal conditions it is permitted to include a further check (i.e. at least five optimal and two outside the optimal conditions). Tile checks should not occur at the same time of day on each occasion for any given tile grid during the survey period.

The WGR will be divided into 250-hectare squares and up to two 10 x 5 tile grids allocated within each grid (random, excluding states 'de-rocked grassland', 'de-rocked nutrient-enriched pasture' and 'crop'). One permanent grid is to be located at Truganina South NCR. Up to 100 permanent monitoring grids will be established across the WGR.

Monitored areas

Monitoring efforts occurred mainly in the WGR and some in Truganina South NCR (Figure 48). As more areas will be protected in the WGR, more locations will be selected for conduction of annual survey.

207. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.

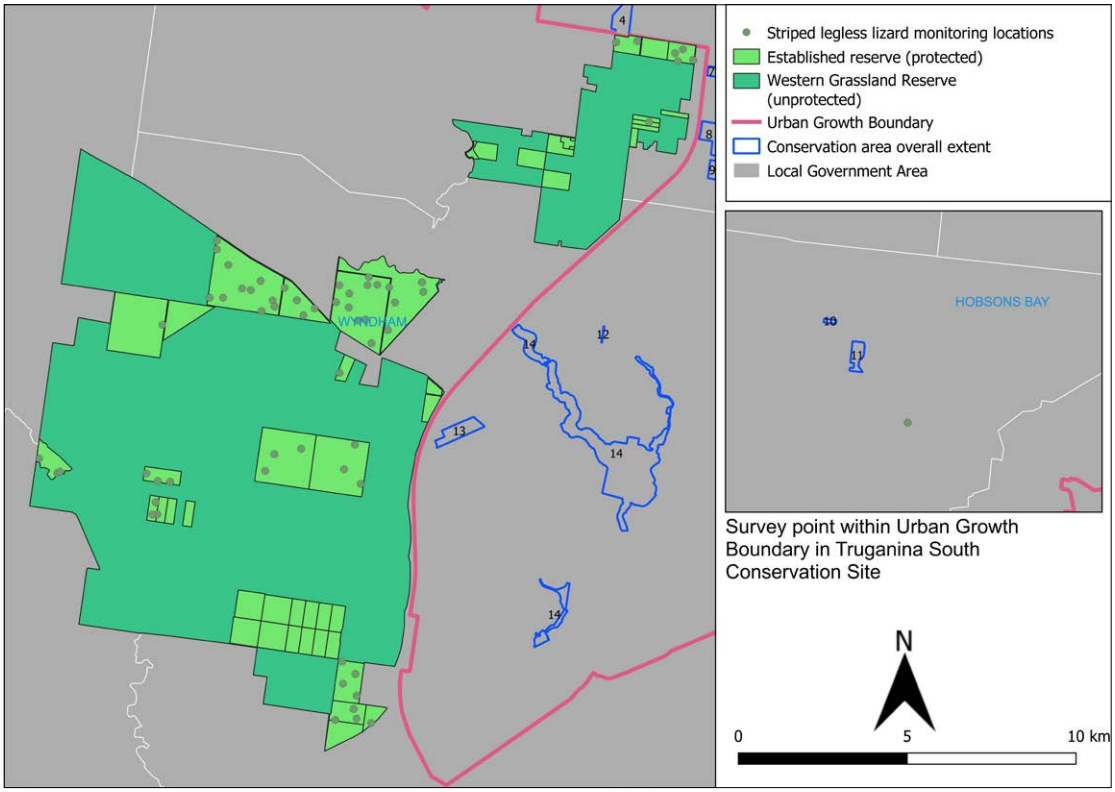


Figure 48: Locations of survey plots for striped legless lizard in the Western Grassland Reserve and Truganina South Nature Conservation Reserve. All survey plots are located in areas secured in perpetuity. Source: DEECA.

KPI 1: Proportion of monitoring sites that are occupied

Table 62: KPI 1 assessment results for striped legless lizard.

KPI 1: Proportion of monitoring sites that are occupied	Baseline (%)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
All locations	5.3%	Met	N/A	Unclear	High	2021

The average proportion of occupied monitoring sites within protected areas of the WGR and Truganina South NCR was approximately 5% for the first five annual survey results (2016–2021) (Figure 49). Between 2016 and 2018, the proportion was approximately 6% to 12% out of overall sites surveyed. In 2019 and 2021, the species was not occupied at any of the plots surveyed. This low rate of occupancy is due to the striped legless lizard being a cryptic species and may not be detected by surveys even when present at a site.[208] DEECA's survey technique accounts for this, meaning that it is likely that the KPI data indicate that occupancy is low rather than detection. Occupancy rate improved significantly in 2022 and 2023, resulting in an increase of the five-year mean of proportion of occupied sites from 5% to approximately 12%. However, due to the large fluctuation of annual results, the 95% confidence interval for the five-year mean is large. This result indicates that it is still unclear if there has been any change in occupancy within the permanent monitoring sites.

208. Australian Government Department of Sustainability, Environment, Water, Population and Communities 2011 '*Environment Protection and Biodiversity Conservation Act 1999* referral guidelines for the vulnerable striped legless lizard, *Delma impar*', Canberra, Australia. https://www.dcceew.gov.au/sites/default/files/documents/striped-legless-lizard-referral-guidelines.pdf Accessed 24 April 2024.

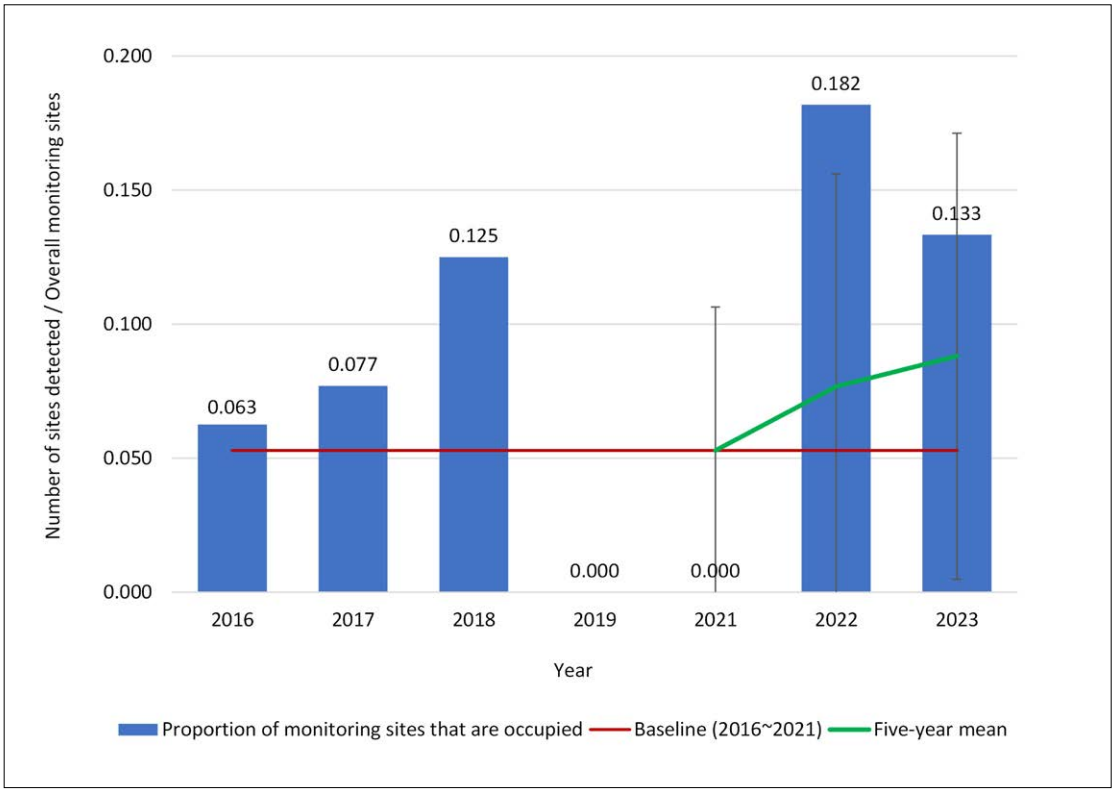


Figure 49: Proportion of monitoring sites occupied between 2016 and 2023. Red line shows baseline. Green line shows five-year mean with 95% confidence interval since 2021. Source: DEECA.

KPI 2: Detection at least once in every five-year period from the year that was found

Table 63: KPI 2 assessment results for striped legless lizard.

KPI 2: Detection at least once in every five-year period from the year that was found	Baseline	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
All locations	Detection at least once in every five-year period from the year that was found	Met	N/A	Stable	High	Various for each plot that was found previously

This KPI assesses whether monitoring plots where striped legless lizard was detected continue to support the species. Currently, all plots are situated within the WGR and Truganina South NCR. The species has been detected at six of all plots surveyed to date (Table 64). All six plots have met the KPI for the first five years. The only plot that has had a second iteration of the five-year assessment period is 'Plot 96_1' in the WGR, that had the first detection occurring in 2016. In the first (2016–2021) and second five-year period (2022–2027), this plot met the KPI 2.

Table 64: Plots with detection of striped legless lizard between 2016 and 2023. 'NA' indicates that a survey had not been undertaken. Source: DEECA.

Plot	Region	Year								First year of detection
		2016	2017	2018	2019	2020	2021	2022	2023	
32_1	WGR	NA	NA	NA	NA	NA	NA	Detected	Detected	2022
68_6	WGR	NA	NA	NA	NA	NA	NA	Not detected	Detected	2023
92_1	WGR	NA	NA	NA	NA	NA	NA	NA	Detected	2023
95_2	WGR	NA	NA	NA	NA	NA	NA	NA	Detected	2023
96_1	WGR	Detected	Detected	Detected	Not detected	NA	Not detected	Detected	Not detected	2016
TS_1	Truganina South NCR	NA	NA	NA	Not detected	NA	Not detected	Detected	Detected	2022

Key insights and management implications

Conservation outcomes for this species indicate populations need to be sustained in the long term across the known distribution of this species in the WGR and conservation areas. Currently, evidence demonstrates that the striped legless lizard populations in the WGR have met the target, but it is unclear in conservation areas as data are not being collected by DEECA. DEECA will conduct surveys in the conservation areas identified to have a presence of striped legless lizard.

Regarding the large fluctuation in occupancy rate (KPI 1), DEECA advised that there is a lack of evidence to explain the uncertainty.[209] One potential factor contributing to this is that the species is cryptic — initial MSA monitoring efforts struggled to consistently find the species and it remained unclear for some time exactly where search efforts should be located. One of the biggest challenges with threatened species monitoring is that it can be difficult to find the species. Often monitoring can be timed to when the species are most detectable, which is the case with the striped legless lizard. This species is most easily detected during early spring to summer, yet detection rates are still low and variable.

209. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 20 May 2024.

MNES 11: Button wrinklewort

Button wrinklewort.
Credit: Marcia Riederer
© DEECA

Button wrinklewort *(Rutidosis leptorrhynchoides)*, listed as endangered under the EPBC Act, is a small perennial daisy that produces multiple flowering stems with yellow flower heads (Figure 50). The species occurs in grasslands and grassy woodlands, in areas free from intense competition from other plants. It is distributed across south-western Victoria, around Melbourne and in the Canberra region.[210]

210. Office of Environment and Heritage 2012, 'National Recovery Plan for Button Wrinklewort Ru*tidosis leptorrhynchoides*.', Hurstville, New South Wales.

Figure 50: Image depicting the button wrinklewort. Source: DEECA.

DEECA's conservation commitment and relevance to the MRF

DEECA published the following statements as conservation outcomes for the button wrinklewort (Table 65) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with KPIs can be found in Table 65.

Table 65: Conservation outcomes for button wrinklewort and alignment with the Monitoring and Reporting Framework program outputs and program outcomes.

Conservation outcome	Alignment with Monitoring and Reporting Framework
No substantial negative change to the known population of button wrinklewort within the Urban Growth Boundary (UGB) in Conservation Area 10. No substantial negative change means that the count of individuals emergent at least once over a five-year period remains above 90% of the baseline.	Program output: A network of conservation areas within the UGB is protected and managed for Matters of National Environmental Significance species and vegetation communities Program outcome: No substantial negative change to the population of button wrinklewort within the Melbourne Strategic Assessment program area

DEECA's MSA MRF also summarises the conservation outcome for the button wrinklewort as a single goal statement: 'no substantial negative change to the population of button wrinklewort within the MSA program area'.

Conservation outcomes assessed

Conservation Outcome 1

No substantial negative change to the known population of button wrinklewort within the UGB in Conservation Area 10. No substantial negative change means that the count of individuals emergent at least once over a five-year period remains above 90% of the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of poor and trend assessment of deteriorating are based on the KPI 1 result that the button wrinkelwort population has been declining since 2018. The population in 2023 (n = 452) is approximately 73% of the baseline population count (617). Therefore, the KPI was not achieved. This decline is evidenced by the frequent recording of dead plants at locations where they had previously been observed alive. DEECA indicated that this is a concerning issue to be urgently addressed.[211]

The confidence assessment of high is due to the long-term data on the button wrinklewort population in Conservation Area 10.

211. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 22 May 2024.

Results indicate that the button wrinklewort has been declining in Conservation Area 10 since 2019 (Figure 51). This is a continuation of the trend that occurred in 2022. In 2023, the population (n = 452) was well below the baseline that is approximately 73% of the baseline population count (617). Historical monitoring data for Conservation Area 10 from 2004 to 2012 from La Trobe University showed that the population declined from 1,072 in 2004 to 472 in 2012.[212] The population count recorded at the same location increased slightly from 2015 to 2018 (from 591 to 638) but declined until 2023. As the MSA 2022 Report identified that the decline was not from a sampling error or an issue of detectability, this result represented a real decline based on the frequent recording of dead plants at locations where these had previously been recorded alive. DEECA indicated that this is an issue of concern that needs to be addressed urgently in the future.[213]

Additionally, recruitment was very low. On average, approximately four recruitments occurred per year. DEECA observed that this is not normal and lower than required for population persistence as another monitored location (a few kilometres away from Conservation Area 10) had much higher recruitment in a recently planted population of 620 plants.[214]

In conclusion, the current population of button wrinklewort in Conservation Area 10 did not fulfill Conservation Outcome 1.

DEECA's MSA MRF summarises the conservation outcomes for the button wrinklewort as a single goal statement: 'no substantial negative change to the population of button wrinklewort within the MSA program area'. DEECA developed a single KPI to report against this single outcome statement:

- KPI 1: The five-year mean population count must remain above a baseline set by the first five years of counts.

The baseline for this species is the mean population count over the first five years of monitoring. This was set in 2019, at 617. Given this KPI is assessed using a total population count, no uncertainty is quantified, meaning that the actual count in every year must remain above the baseline for the target to be met (not the 95% confidence interval as with many other KPIs).

This KPI will be assessed using a 'continuous improvement' approach, where any increase over the baseline in a five-year reporting period will lead to the calculation of a new baseline for subsequent reporting periods.

Monitored areas

Button wrinklewort occurs naturally at only one location within the MSA area, the Truganina Cemetery Grassland (Conservation Area 10). Here, the entire population is contained within an area measuring 90 m x 70 m. This site has been monitored under the MSA since 2015, however, no monitoring took place in 2020 due to COVID-19 restrictions.

Button wrinklewort has also been planted at two further locations, in 2020. These are currently being monitored and — in line with the MRF — will be assessed for their contribution to the KPI when they have survived five years.

KPI 1: Annual population count

Table 66: KPI 1 assessment results for button wrinklewort in Conservation Area 10.

KPI 1: Population count	Baseline (Population count)	Status 2022–2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was set
Conservation Area 10	617	Not met	N/A	Deteriorating	High	2019

212. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.
213. Department of Energy, Environment and Climate Action (DEECA), 'Personal communication', 22 May 2024.
214. Commissioner for Environmental Sustainability (CES) 2022, 'Strategic audit of the implementation of Melbourne strategic assessment conservation outcomes 2022 Report', Melbourne, Victoria.

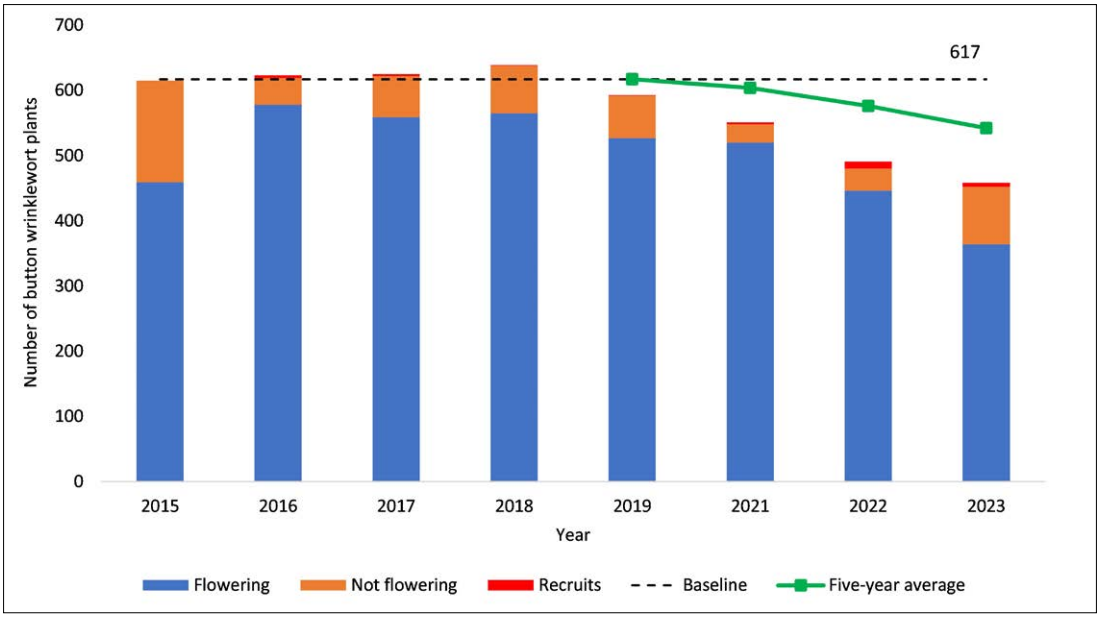


Figure 51: Population count of button wrinklewort in Conservation Area 10 (Truganina Cemetery Grassland and Buffer), 2015–2023. Dashed line shows baseline calculated after first five years of monitoring (n = 617). Source: DEECA.

Key insights and management implications

Recruitment failure in Conservation Area 10 should be researched as indicated by the MSA 2022 Report. This lack of recruitment may become an issue for the long-term viability of the population and currently DEECA does not know the reason of this. However, DEECA has arranged for a research project to start at the end of 2025 on this topic. It will be based at La Trobe University and co-supervised by DEECA. MSA program funds will be used to support the project. This means that at least until the end of 2026, DEECA would not be able to determine which management interventions would provide a method to address this issue.

DEECA has been coordinating management responses to improve this trend. DEECA identifies that rabbits are responsible for much of the decline for the 2022 and 2023 results. In response to this, DEECA has been contracting interim weed and pest management works at Conservation Area 10 for approximately a year while they arrange an ongoing management arrangement. A long-term management plan is currently being discussed with DEECA's environmental research institute (ARI) and La Trobe University which will be in collaboration with Bunurong Land Council Aboriginal Corporation. This will include actions to support populations of button wrinklewort at Conservation Area 10 and within the adjacent expansion area. In addition, the MSA program have a funding agreement in place with La Trobe University for the cultivation of button wrinklewort housed at La Trobe University Wildlife Sanctuary, which will go into Conservation Area 10 and the adjoining grassland expansion area. DEECA expects that this project will introduce more button wrinklewort plants, starting in spring 2024. The data collected as part of this project and future button wrinklewort actions across the MSA area will be included as part of the monitoring and reporting requirements that will help DEECA improve understanding of recruitment success and population decline across MSA program areas.

DEECA developed a population viability analysis model in 2021 using existing data supplemented by multiple expert judgements to explore the effectiveness of several management options on the persistence of the species.[215] Results suggest a combined management plan of short fire intervals (every 1–3 years) and watering plants to simulate a rainfall pulse is needed to help safeguard the species from extinction. Without combining both actions, the effectiveness of any one action is substantially reduced. Over the last few years, fire has been missing as a tool for on-ground management activities. The last ecological burn was implemented in early 2019. Fires should be considered for future management actions.

215. Regan. TJ, Bruce M, Batpurev K, Farmilo B, Scroggie M, Geary W and Cadenhead N 2021, 'Melbourne Strategic Assessment. Population viability analysis models for threatened plants and animals. Version 1.0', Arthur Rylah Institute for Environmental Research Technical Report Series No. 327. Department of Environment, Land, Water and Planning, Heidelberg, Victoria.

MNES 12: Large-fruit groundsel

Large-fruit groundsel.
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Large-fruit groundsel *(Senecio macrocarpus)*, listed as vulnerable under the EPBC Act, is a perennial daisy growing to approximately 40 centimetres high, with grey foliage and yellow flower heads (Figure 52).[216, 217] The species occurs in grassy woodlands and grasslands, in areas free from intense competition from other plants. It is distributed widely across south-eastern Australia.

216. Belcher RO 1983, New Australian species of *Erechthitoid Senecio* (Asteraceae). Muelleria 5, 119-122; Hills A, Boekel R 1996, 'Action statement No. 68. Large-fruit groundsel Senecio *macrocarpus*.' Department of Natural Resources and Environment, Victoria.
217. Walsh NG 1999, 'Flora of Victoria vol 4: Dicotyledons Cornaceae to Asteraceae', Inkata Press, Melbourne, Victoria.

Figure 52: Image depicting the large-fruit groundsel. Source: DEECA.

DEECA's conservation commitment and relevance to MRF

DEECA published the following statements as conservation outcomes for the large-fruit groundsel (Table 67) by notice in the Victorian Government Gazette. These conservation outcomes are related to different program outputs and program outcomes as specified in the MRF. Details of which conservation outcomes are aligned with KPIs can be found in Table 67.

Table 67: Conservation outcome for large-fruit groundsel and alignment with the Monitoring and Reporting Framework program outputs and outcomes.

Conservation outcomes	Alignment with Monitoring and Reporting Framework
No substantial negative change to known populations of Large-fruit groundsel within the Urban Growth Boundary (UGB) (including but not limited to Conservation Area 5). No substantial negative change means that the five-year mean population count remains above the baseline	Program output: A network of conservation areas within the UGB is protected and managed for Matters of National Environmental Significance species and vegetation communities Program outcome: No substantial negative change to the population of large-fruit groundsel within the program area

Conservation outcomes assessed

Conservation Outcome 1

No substantial negative change to known populations of large-fruit groundsel within the UGB (including but not limited to Conservation Area 5). No substantial negative change means that the five-year mean population count remains above the baseline.

2024 status	2024 trend	2024 confidence
		

Why this assessment in 2024?

The status assessment of good is based on the KPI 1 data. While the baseline of the large-fruit groundsel population is 30.4 (five-year average of population between 2017 and 2022), the population in 2023 dramatically increased to 243. As this increase between 2022 and 2023 is probably due to the wet season, different weather conditions may result in a fluctuating trend in the future.

As the population increased from 12 in 2021 to 243 in 2023, the trend is assessed as improving.

The confidence assessment is moderate based on the data of the large-fruit groundsel population in the Western Grassland Reserve. Data could be improved by expanding the collection within the Urban Growth Boundary, particularly in Conservation Area 5.

Large-fruit groundsel is the only one of the 12 MNES that had an improving trend in ecological characteristics, and this is likely due to favourable weather conditions for the species in which to populate. However, this assessment is based on a location outside the UGB (Little Raven) with no survey information on the ecological condition available within the UGB, including Conservation Area 5. Based on the BCS, Conservation Area 5 is the only location that has a confirmed presence of large-fruit groundsel in conservation areas.

KPIs assessed

DEECA's MSA MRF summarises the conservation outcomes for the large-fruit groundsel as a single goal statement: 'no substantial negative change to the population of large-fruit groundsel within the program area'. DEECA developed a single KPI to report against this single outcome statement:

- KPI 1: The five-year mean population count that must remain above a baseline set by counts over the first five years.

This KPI will be assessed using a 'continuous improvement' approach, in which any increase over the baseline in a five-year reporting period will lead to the calculation of a new baseline for subsequent reporting periods.

Monitored areas

In 2015, when the MRF was written, only one naturally occurring population of large-fruit groundsel was known (in Conservation Area 5). This area has not yet been protected under the MSA and has not been the subject of monitoring.

In 2017, a small, previously unknown wild population was discovered on a parcel of land in the WGR, known as 'Little Raven'. Monitoring of this population commenced in 2017. There are two plots in the Little Raven area that sample the two clusters of large-fruit groundsel (Figure 53).

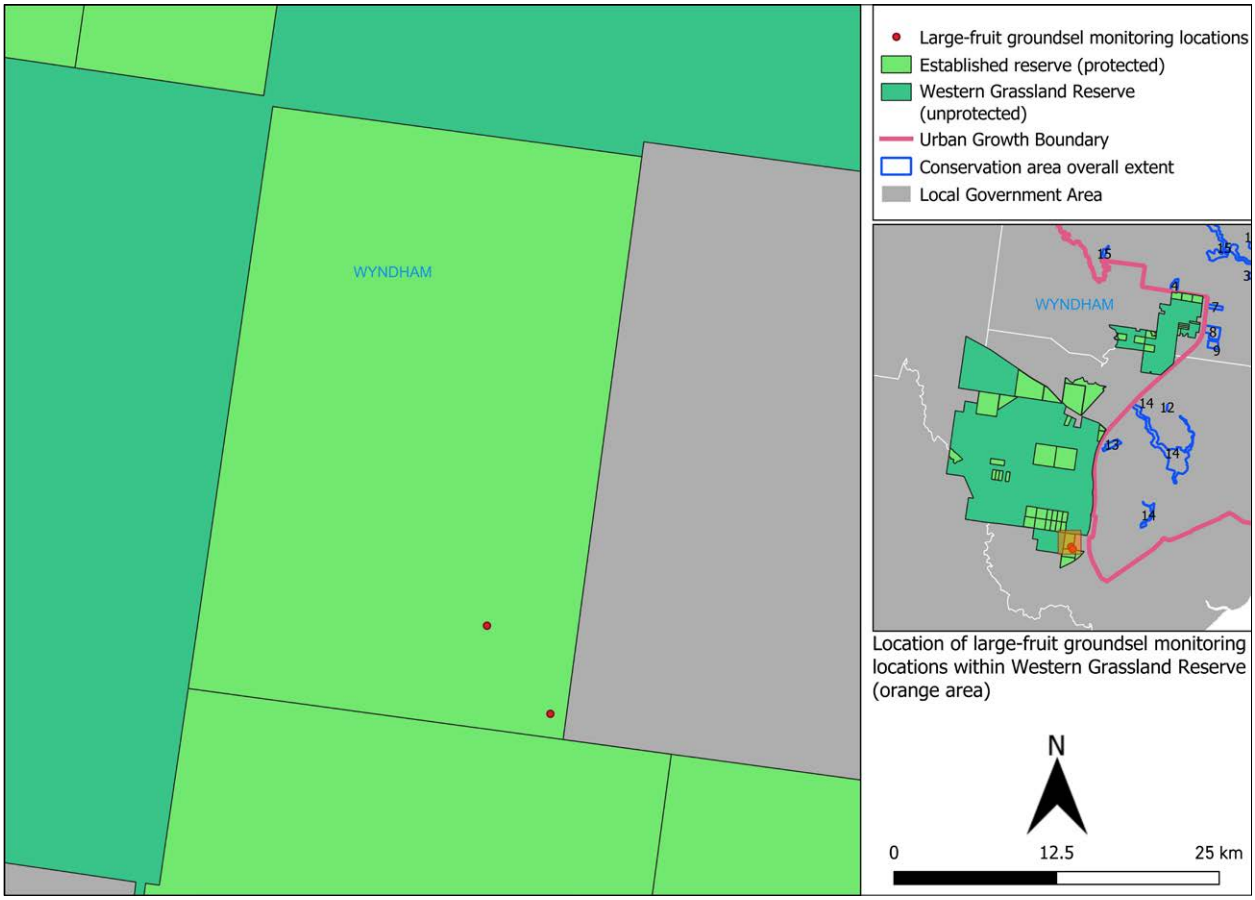

Figure 53: Two survey plots for monitoring large-fruit groundsel populations located in the south-eastern part of the Western Grassland Reserve. Source: DEECA.

There are also three introduced populations of the large-fruit groundsel in the MSA area:

- In 2012, a population was established on One Tree East. This population was previously reported as an 'other measure' but this is currently extinct.
- In 2012, a small population was established at Mount Cottrell NCR.[218] This population was previously also reported as an 'other measure'. As of 2021, this population consists of only two individuals.
- A translocated population occurs on Little Raven. This population is monitored under a different project and is not reported on here.

The baseline for this species in the main population in CA5 has not been set, as this site remains unprotected.

The baseline for the small population at 'Little Raven' was set in 2022, at 30 plants.[219]

KPI 1: Proportion of monitoring sites that are occupied

This MNES has a single KPI: 'The five-year mean population count, which must remain above a baseline set by the first five years of counts'.

Figure 54 demonstrates that large-fruit groundsel population increased in 2022 with a wet spring-summer season. As no survey occurred in 2020 due to the COVID-19 pandemic, the baseline was set in 2022 to calculate the first five-year average of population in Little Raven. As 2022 was the initial year of the population spike (99 plants), the baseline is set to 30.4 even though population count between 2017 and 2021 was below 16 (Figure 54). In 2023, the population dramatically increased in Little Raven from 99 to 243. As this increase between 2022 and 2023 is probably due to the wet seasons, different weather conditions may result in a fluctuating trend in the future.

218. Department of Environment, Land, Water and Planning (DELWP) 2015, 'Monitoring and Reporting Framework – Melbourne Strategic Assessment', East Melbourne, Victoria.
219. This baseline is different from what was reported in the 2022 report as that figure was based on the survey of 4 years within 5 years as there was no annual survey in the year of 2020 due to COVID lockdown. The first five years of survey data includes the survey data in 2022, making the baseline from 13 to 30 plants.

Table 68: KPI 1 assessment results for large-fruit groundsel in Conservation Area 5 and Little Raven in Western Grassland Reserve.

KPI 1: population count	Baseline (count of plants)	Status 2022-2024	Reason for non-assessment	Trend	Data confidence	Year that baseline was/ will be set
Conservation Area 5	N/A	Not assessed	Population not yet under MSA management	N/A	N/A	N/A
Little Raven	30.2	Met	N/A	Improving	High	2022

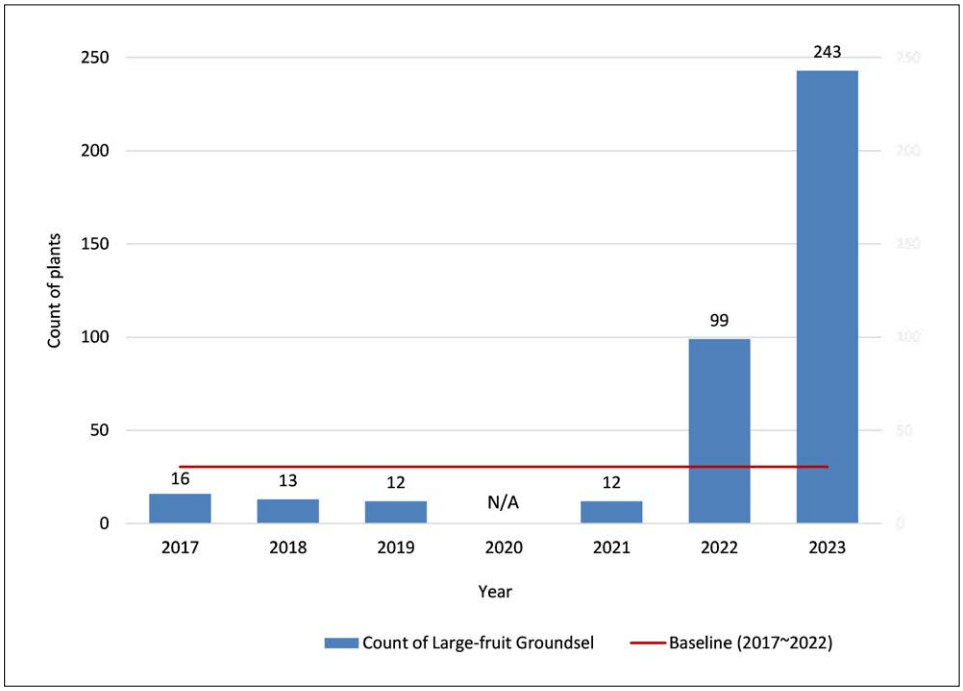

Figure 54: Population count of large-fruit groundsel at Little Raven, 2017–2023. Baseline count (30.4) is set based on 2017–2022 data and 2020 data are not included in this calculation. Source: DEECA.

Key insights and management implications

The natural large-fruit groundsel population at Little Raven is small and, until 2021 the number of plants recorded declined slightly from 16 to 12. The population increased significantly, likely due to a strong wet season in 2022 that led to a population boom in the Little Raven area to 243 in 2023.

Large-fruit groundsel disperses widely due to wind dispersal and can likely produce viable seeds from selfing — meaning that new populations can be founded by one or a few individuals.[220, 221]

The population discovered in 2016–2017 at 'Little Raven' appeared on recently burnt ground and may have dispersed relatively recently from a nearby population on the railway line.[222]

Of the 16 plants detected originally, 13 have died so far and one was not found in the survey in 2023. However, large number of new plants have been found in 2022 and 2023. The number of plants recorded in both years is approximately three to eight times larger than the baseline. However, this finding only applies to Little Raven and currently no information was available for the known population of large-fruit groundsel within the UGB, including Conservation Area 5.

220. Ahrens CW and James EA 2015, 'Range-wide genetic analysis reveals limited structure and suggests asexual patterns in the rare forb *Senecio macrocarpus*'. *Biological Journal of the Linnean Society*, 115(2), pp. 256-269.
221. Mráz P, Ahrens CW and James EA 2024, 'Australian *Senecio macrocarpus* and *S. squarrosus* were suggested as apomictic but are fully sexual: evidence from flow cytometric seed screening analyses', *Plant Systematics and Evolution*, 310(3), pp. 1-7.
222. DELWP, internal document, provided 21 January 2022.

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Appendix A & Abbreviations

Appendix A - Flora and fauna species

Common name	Scientific name
Flora species	
Annual ryegrass	**Lolium rigidum*
Bulbous canary-grass	**Phalaris aquatica*
Button wrinklewort	*Rutidosis leptorrhynchoides*
Carpet weed	**Galenia pubescens* (now called *Aizoon pubescens*)
Catsear	**Hypochaeris radicata*
Globe artichoke	**Cynara cardunculus*
Kangaroo grass	*Themeda triandra*
Large-fruit groundsel	*Senecio macrocarpus*
Matted flax-lily	*Dianella amoena*
Nardoo	**Marsilea drummondii*
Oxtongue	**Helminthotheca echioides*
Poa species	*Poa* sp.
River red gum	*Eucalyptus camaldulensis* subsp. *camaldulensis*
Serrated tussock	**Nassella trichotoma*
Small golden moths orchid	*Diurus basaltica*
Spear-grass	*Austrostipa mollis*
Spiny rice-flower	*Pimelea spinescens* subsp. *spinescens*
Tussock grass	*Poa labillardierei*
Fauna species	
Golden sun moth	*Synemon plana*
Growling grass frog	*Litoria raniformis*
Southern brown bandicoot	*Isoodon obesulus* subsp. *obesulus*
Striped legless lizard	*Delma impar*

*Exotic species or species that are native but can be invasive in particular habitats

Abbreviations

Abbreviation	Definition
AgVic	Agriculture Victoria
ARI	Arthur Rylah Institute
BCS	Biodiversity Conservation Strategy
C3G	C3 grassland
CAD	Conservation Areas Declaration
CaLP Act	*Catchment and Land Protection Act 1994*
Commissioner	Commissioner for Environmental Sustainability
CES Act	*Commissioner for Environmental Sustainability Act 2003*
CFL Act	*Conservation, Forests and Lands Act 1987*
DEECA	Victorian Department of Energy, Environment and Climate Action (formerly DELWP)
DELWP	Victorian Department of Environment, Land, Water and Planning (DEECA as of 1 January 2023)
DG	De-rocked grassland
DNP	De-rocked and nutrient-enriched pasture
DoH	Department of Health
EPA	Environment Protection Authority Victoria
EP Act	*Environment Protection Act 2017*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESD	Ecologically Sustainable Development
EVC	Ecological Vegetation Class
FFOD	Forests and Fire Operations Division (DEECA)
Framework	Framework for the Victorian State of the Environment 2023 Report – Science for Sustainable Development
FTE	Full-time equivalent
GEWPA	Grassy Eucalypt Woodland Protected Area
ha	Hectares
HCC	Hume City Council
HG	Herb-rich grassland
KPI	Key performance indicator
LGA	Local Government Authority
m	Metres
MCC	Melton City Council
Minister	Minister for Environment
MNES	Matters of National Environmental Significance
MSA 2022 Report	Strategic Audit of the Implementation of Melbourne Strategic Assessment Conservation Outcomes 2022 Report
MSA MRF	Melbourne Strategic Assessment Monitoring and Reporting Framework
MSA program	Melbourne Strategic Assessment program
MSA Act	*Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020*
n	Total number of individuals

Abbreviation	Definition
N/A	Not applicable
Natural temperate grassland of the Victorian Volcanic Plain	Natural temperate grassland
NCR	Nature Conservation Reserve
NG	Nutrient-enriched grassland
P&E Act	*Planning and Environment Act 1987*
PAO	Public Acquisition Overlay
PAR	Property Assessment Report
PSP	Precinct Structure Plans
PV	Parks Victoria
RBGV	Royal Botanic Gardens Victoria
STM	State-in-transition model
TG	*Themeda* grassland
Secretary	Secretary of the Department of Energy, Environment and Climate Action
UGB	Urban Growth Boundary
VAGO	Victorian Auditor-General's Office
WCC	Wyndham City Council
WGR	Western Grassland Reserve

Matted flax-lily.
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ISSN 2653-6099

Published by the Commissioner
for Environmental Sustainability,
Victoria, 2024

Level 36, 2 Lonsdale Street
Melbourne Victoria 3000

info.ces@ces.vic.gov.au
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