Biodiversity Council

Delivering houses and saving dragons

Overcoming government policy and implementation failures to ensure the survival of the Victorian grassland earless dragon

June 2025

Victorian grassland earless dragon. Image: Nick Clemann

Acknowledgement

The Biodiversity Council acknowledges the First Peoples of the Sea Country of Australia, and pay respect to their Elders, past, present and future and expresses gratitude for long and ongoing custodianship of Country.

Further information

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Contents

Biodiversity Council

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Executive Summary

The Victorian grassland earless dragon (*Tympanocryptis pinguicolla*) is a fascinating small lizard that uses spider burrows for shelter. In this report, 'the dragon' refers to this species.

The dragon is restricted to native grasslands between Melbourne and Geelong in a region that is being rapidly developed. It is known from just one wild location, on private grazing land that is partly slated for development, putting it at grave risk.

Without immediate evidence-based action, the dragon could become extinct in the wild. This outcome is not inevitable, and the options are not simply a binary choice of building housing or saving the dragon. It is entirely possible for the Australian and Victorian Governments to protect the dragon while delivering more houses for Australians.

This report explains how current efforts to guide Melbourne's growth are failing the dragon and its grassland habitat, and outlines a pathway to:

- prevent its extinction,
- protect the grassland ecosystem, and
- support continued urban development.

The report contains detailed recommendations, for the Australian and Victorian Governments, chief among these is the urgent need to:

- **Protect the wild population** through land purchase and conservation management;
- **Conduct targeted surveys** across suitable habitat, regardless of land tenure;
- **Complete the Western Grassland and Grassy Eucalypt Woodland Reserves**, with a review of boundaries to ensure they capture sites needed for the dragon's recovery
- **Establish new wild populations** using captive-bred dragons;
- **Better involve species experts**—the Victorian Grassland Earless Dragon Recovery Team—in decisions affecting the species.

The dragon's rediscovery is a rare opportunity to prevent extinction. Its fate is a test of how seriously governments take sustainability and environmental law. We must not squander this chance.

While this report examines how to protect the dragon during the roll out of new housing areas on Melbourne's western fringe, that does not mean the Biodiversity Council endorses urban sprawl as a sustainable or effective solution to providing more housing. We recommend the Victorian Government implement the recommendations of Infrastructure Victoria,[1] who urge a focus on 'compact cities' rather than urban sprawl. Their analysis found this would be better for the environment and for people and would save the economy $43 billion by 2056.

Kangaroo grass (Themeda triandra) at Bababi Djinanang native grassland in the Melbourne suburb of Fawkner. Image: Takver CC-BY-SA 2.0 Wikimedia Commons

Summary of key findings

Species and ecosystems at high risk of extinction

The dragon's fate reflects the drastic loss of its grassland habitat in Victoria, of which only 2% remains. The dragon is considered Australia's most imperilled reptile.[2] For over 50 years, there were no verified sightings. However, happily, in 2023, it was rediscovered at a single location just west of Melbourne.

Both the grassland and the dragon are listed as Critically Endangered under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The grasslands also contain ten other nationally threatened species and ecosystems.

The Australian Government is legally obligated to protect nationally threatened species and ecosystems under the EPBC Act. The Australian Government has also committed to preventing extinctions.[3]

With only one known population. Any additional site where the dragon is detected must be protected and managed for the conservation of the species.

Delivering development while meeting environmental protection obligations

The region is undergoing rapid transformation under Melbourne's urban expansion, and the dragon's only known wild population, and other grassland areas where it may occur, have been slated for urban development, placing it at grave risk.

Under the EPBC Act, developments with the potential to significantly impact EPBC Act listed threatened species or ecosystems require Commonwealth assessment and approval. The intention of the approval process is to identify development pathways that avoid and then mitigate impacts to threatened species and ecosystems as much as possible, and to finally offset remaining impacts where suitable. If remaining impacts are likely to be significant, the Australian Government may refuse the project.

To streamline assessments in growth areas, the Australian and Victorian Governments established the Melbourne Strategic Assessment (MSA),[4] a regional approval under section 146 of the EPBC Act. The MSA aimed to meet federal environmental protection obligations through upfront strategic planning, replacing project-by-project assessments. The Victorian Government committed to avoiding, mitigating, and offsetting impacts to EPBC Act listed threatened species and ecosystems in the MSA area.

If well designed and implemented, the MSA had the potential to deliver positive environmental outcomes, including securing the long-term survival of the region's threatened species, such as the dragon.

When the MSA was endorsed in 2010, the dragon had not been recorded in Victoria for more than 40 years. While that complicated planning, the requirement to survey for the species and respond to new information remained.

Crucially, while in 2010 it was believed that the dragon also occurred in New South Wales and the ACT, in 2019 research found that the Victorian dragon was a different species,[5] and is likely to suffer the greatest habitat loss of any species under the MSA. In 2023 it was discovered at one site. This is the only known wild population but it may also occur at other sites.

Some newer urban growth areas fall outside the MSA and still require project-level EPBC approvals if the project is likely to have significant impacts on EPBC Act listed threatened species or ecosystems. Regardless of location, the Australian Government is responsible for ensuring all developments meet their legal obligations to ensure the future of threatened species and ecosystems.

Major failures in development processes

In 2020, the Victorian Auditor General found major failings in the delivery of the MSA and these have not yet been addressed.[6] Failures in the design and the implementation by the Victorian Government mean that the MSA is not meeting its objectives or legal obligations.

The MSA contained a requirement to survey for the dragon which did not occur. Populations that exist but are not known (and hence not protected) face

a perilous future. Targeted surveys for the dragon at potential sites, regardless of tenure, remain an urgent priority.

Conservation reserves promised under the MSA in 2010—most notably the 15,000-hectare Western Grassland Reserve and 1,200-hectare Grassy Eucalypt Woodland Reserve—remain largely unacquired, even though they had a deadline to be secured by 2020.

The failure to rapidly acquire and protect the land earmarked for reserves has led to major degradation of the values that the MSA committed to protect and is undermining the capacity of the reserves to deliver biodiversity benefits sufficient to serve as a credible offset.

The boundaries of the proposed reserve also need to be reviewed to capture dragon rediscovery and potential reintroduction sites, in light of significant new information.

Given how little is left, it is important to protect areas with potentially suitable dragon habitat even if they have not yet been detected there. These sites will be crucial to establishing new populations using animals bred at the Melbourne Zoo conservation breeding program.

The rediscovery of the dragon in 2023, triggered additional legally required actions under the MSA, however most of these have not occurred. Survey guidelines have recently been released by the Australian Government, but conducting targeted surveys for the dragon across all potentially suitable habitats and developing guidelines for the dragon's protection and management if detected remain outstanding.[7]

Despite these basic environmental protection failures, habitat destruction to make way for development continues in areas that may contain undetected dragon populations.

Utilise recovery team experts

Given the dragon's cryptic nature and extreme imperilment, all actions must be guided by the best available knowledge and expertise.

To recover this species it is very important to ensure that experts with the most knowledge and experience with this species are engaged in decisions that affect the conservation of the species. The situation we are in now may have been avoided if species-experts had been more closely involved in planning processes, including surveys for the species and identification of conservation areas.

The Victorian Grassland Earless Dragon Recovery Team—comprising herpetologists and representatives from Zoos Victoria, the Victorian and Commonwealth Governments, Museums Victoria and first peoples —is leading conservation efforts and should be central to all work on the species.

The EPBC Act created a pivotal role for recovery teams in advising on complex management issues and coordinating recovery actions for threatened species.[8] Recovery teams should be central to decision-making for all threatened species within the region.

Given the dragon's rarity, even expert consultants are likely to lack experience with the species. New federal survey guidelines are welcome,[7] but the recovery team should also review consultants' survey results and interpretations rather than just be consulted on survey prescriptions.

One positive development for survey efforts is the recent successful trialling of detector dogs, trained to smell out the otherwise highly cryptic dragons. Such canine accomplices may greatly increase future survey efficiency and likelihood of success.[9]

A Victorian grassland earless dragon at the rediscovery site with sheep in the background. Grazing is believed to have maintained the right grass biomass conditions for the dragon. Image: Nick Clemann

Summary of recommendations

Urgent action is required. To avoid extinction of the Victorian grassland earless dragon in the wild, governments must immediately work to implement their commitments under the EPBC Act, Flora and Fauna Guarantee Act (Vic) and the MSA and take evidence-based steps to safeguard this species and its habitat.

Use the species experts - All activities related to the dragon must be done in collaboration with the recovery team, including targeted surveys, management of wild populations and the development of guidelines.

Key recommendations for the Australian Government

- **Secure the species in the wild** – Urgently provide resources for the recovery team to undertake research trials to establish five new wild populations of the dragon in the short-term, using animals from the Zoos Victoria conservation breeding program, with a long-term target of establishing 12–15 self-sustaining wild populations.
- **Audit the MSA** – Audit the Victorian Government's compliance with its 2010 MSA approval. Identify gaps and negotiate a plan with the Victorian Government to meet them. The audit must address commitments to adequately survey for the dragon, protect it in the wild and establish and appropriately manage reserves. Make the findings publicly available in annual reviews until all commitments are delivered.
- **Audit areas outside the MSA** - Audit the performance of development processes, approvals and planning frameworks across regions where the dragon may occur that are outside of the MSA against whether they are meeting the obligations of the EPBC Act in protecting the dragon and other threatened species and ecosystems. This must include within the Bacchus Marsh and Geelong Growth Areas, and areas outside of these that are modelled habitat for the dragon. Make the findings publicly available.
- **Develop industry guidelines** for avoiding, assessing and mitigating impacts on the Victorian grassland earless dragon.
- **Ensure compliance with comprehensive pre-development survey requirements** in all areas where potential habitat will be destroyed outside the MSA, even if habitat is considered low value by consultants. Supply results to the recovery team for interpretation and review.
- **Use the federal Saving Bushland Program** to support the immediate purchase and management of the single property where the dragon has been discovered in the wild. If the dragon is confirmed on other private properties, they should also be purchased.
- **Support research to refine detection methods**.

Key recommendations for the Victorian Government

- **Protect the wild population** - Urgently purchase the property where the only known wild dragon population occurs and ensure that it is secured in perpetuity and appropriately managed by a suitable authority e.g .Trust for Nature or other proven entities e.g. Bush Heritage. Protect every site where dragons are are detected.
- **Secure sites needed for dragon recovery** - Acquire and protect additional sites containing suitable dragon habitat, to support dragon recovery, as determined neccessary by the recovery team.
- **Survey for the dragon** – Support the recovery team to urgently conduct targeted surveys across all potentially suitable locations, regardless of land tenure.
- **Ensure compliance with comprehensive pre-development survey requirements** in all areas where potential habitat will be destroyed within the MSA, even if considered low ecological value by consultants. Supply results to the recovery team for interpretation and review.
- **Secure the species in the wild** – Urgently provide resources for the recovery team to undertake research trials to establish five new wild populations of the dragon in the short-term, using animals from the Zoos

Victoria conservation breeding program, with a long-term target of establishing 12–15 self-sustaining wild populations.

- **Ensure high biodiversity value sites are captured in conservation reserves** - Urgently review the boundaries of the Western Grassland Reserve to ensure it captures the most ecologically valuable remaining grassland remnants, the dragon rediscovery site, and an adequate number of sites containing suitable dragon habitat for dragon recovery, determined by the recovery team.
- **Establish the Western Grassland and Grassy Eucalypt Woodland Reserves** - Urgently complete the acquisition and management of these reserves by 2027 reflecting the revised boundaries.
- **Adapt to significant new knowledge about the dragon as it emerges**, in collaboration with the recovery team. For example, review reserve boundaries if a second wild remnant population is discovered.
- **Make a critical habitat determination** under the Flora and Fauna Guarantee Act 1988 for the grasslands, followed by a **habitat conservation order** to prohibit any development or land use that would impact the grasslands identified for the reserves.

We urge the Australian and Victorian Governments to act swiftly on these recommendations to meet their legal and moral duty to prevent the dragon's extinction and deliver lasting environmental outcomes alongside development.

A male Victorian grassland earless dragon at the rediscovery site in June 2024. Image: Nick Clemann

Western Melbourne's grasslands

The Wadawurrung, Wurundjeri (Woiwurrung), and Bunurong Peoples of the Kulin Nation are the Traditional Custodians of the grasslands.

Ecological Importance

The Natural Temperate Grassland of the Victorian Volcanic Plain is an ancient ecosystem formed over basalt plains by thousands of years of natural processes and Indigenous land management. These grasslands are characterised by a rich variety of native grasses, wildflowers, and cryptic fauna, many of which occurred nowhere else. In this report, the grasslands refers to this ecosystem.

Since European colonisation, over 98% of these grasslands have been lost or severely degraded, primarily due to:

- Agricultural clearing and pasture improvement (ploughing, fertilising, de-rocking)
- Urban development and infrastructure expansion
- Invasion by exotic plants, which can modify ecosystems, such as Chilean needle grass
- Loss of Indigenous land management practices, including cultural burning
- Loss of native animals, including herbivores and digging mammals
- Fragmentation, which isolates small populations of flora and fauna

The ecosystem is Critically Endangered.

Threatened species of the grasslands

The grasslands and associated grassy woodlands support a diverse array of threatened species and ecological communities. They provide vital habitat for some of Australia's most threatened species, including many listed as Matters of National Environmental Significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). They also contain species listed as threatened at the state level under the Flora and Fauna Guarantee Act (Vic), such as the tussock skink (*Pseudemoia pagenstecheri*, lowland form) and fat-tailed dunnart (*Sminthopsis crassicaudata*).

Matters of National Environmental Significance in Melbourne's western growth areas

- Natural Temperate Grassland of the Victorian Volcanic Plain – Critically Endangered
- Grassy Eucalypt Woodland of the Victorian Volcanic Plain – Critically Endangered
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains – Critically Endangered
- Victorian grassland earless dragon (*Tympanocryptis pinguicolla*) – Critically Endangered
- Growling grass frog (*Litoria raniformis*) – Vulnerable
- Striped legless lizard (*Delma impar*) – Vulnerable
- Golden sun moth (*Synemon plana*) – Critically Endangered
- Spiny rice-flower (*Pimelea spinescens subsp. spinescens*) – Critically Endangered
- Button wrinklewort (*Rutidosis leptorrhynchoides*) – Endangered
- Matted flax-lily (*Dianella amoena*) – Endangered
- Small golden moths orchid (*Diuris basaltica*) – Endangered
- Plains-wanderer (*Pedionomus torquatus*) – Critically Endangered

Current Threats

Remaining grassland patches are small, scattered and highly vulnerable. Key current threats include:

- Urban expansion within Melbourne's designated growth corridors
- Cessation or change in grazing levels
- Invasive species such as Chilean needle grass and serrated tussock
- Inappropriate land management (e.g., slashing instead of burning or grazing)
- Habitat degradation from dumping and off-road vehicle use

EPBC Act listed threatened species in Melbourne's western grasslands

Small golden moths orchid. Image: Michael Keogh CC-BY-NC-SA iNaturalist

Growling grass frog. Image: Frase4days CC-BY-NC iNaturalist

Spiny rice flower. Image: Matt Tudor CC-BY-NC iNaturalist

Golden sunmoth. Image: J. de Jong CC-BY-NC iNaturalist

Matted flax-lily. Image: Nick Fitzgerald CC-BY-NC iNaturalist

Plains wanderer. Image: Jim Churches CC-BY-NC-SA iNaturalist

The Victorian Grassland Earless Dragon

Biology and Status

The Victorian grassland earless dragon (*Tympanocryptis pinguicolla*) is a fascinating cryptic lizard adapted to temperate grassland environments.

It is small, under 15 cm from head to tail when fully grown, yet adults can occasionally move over 100 metres per day. They have bold cream and brown patterns with yellow and orange patches on breeding males. They are generally short-lived in the wild, potentially living only one breeding season, making them highly vulnerable to population changes caused by poor conditions.

In addition to its grassland environment, the Victorian grassland earless dragon also appears to be highly dependent on burrowing invertebrates, particularly wolf-spiders. The dragon uses the spider burrows for overwintering, shelter at night and protection from predators and extreme temperatures. They may also use other invertebrate burrows and excavate their own burrows.

The species is largely restricted to the Keilor and Werribee Plains between Melbourne and Geelong. Historical records of the species have occurred at Port Melbourne, Coode Island, Prahran, Essendon, Moonee Ponds and Sunshine.

The species was considered common in the earlier 1900s,[10] with the first observation of them becoming uncommon in 1944.[11] There were no verified sightings between 1969 and 2023, despite targeted surveys for the species from the 1990's to around 2017. Surveys for other western plains grasslands' reptiles failed to detect the dragon.

While the dragon was rediscovered during one of those surveys, the method is not reliable for detecting the dragon, and so those other reptile surveys are not a surrogate for targeted surveys for the dragon.

At the time of the MSA development the advice of relevant experts was that it could still persist within small patches of suitable habitat within the region, and so planning should proceed upon that basis.

When the MSA was endorsed in 2010 the dragon was believed to be the same species as the grassland earless dragons that occur in Canberra and Monaro and Bathurst, however in 2019 the Victorian grassland earless dragon was found to be a separate species.[5]

The dragon was eventually rediscovered in 2023 during a survey for the striped legless lizard on a private property where sheep grazing was occuring.

Three studies have identified it as Australia's most imperilled reptile.[12]

It is formally listed as Critically Endangered under the EPBC Act and under the Flora and Fauna Guarantee Act 1988 (Vic).[13]

Victorian grassland earless dragon. Image: Peter Robertson

Causes of Historical Decline

The species' decline is attributed to:[14]

- The catastrophic loss of native grasslands
- Decline in invertebrates
- Agricultural activities such as ploughing and de-rocking
- Urban development
- Altered fire and grazing regimes, including the removal of biomass management
- Invasive plants invading and modifying habitat
- Predation by introduced species
- Small isolated populations being highly vulnerable to threats

Current Threats to Wild Survival

Despite its rediscovery over two years ago, the Victorian grassland earless dragon remains on the brink of extinction. There are no secure wild populations, and its habitat remains poorly protected.

The only confirmed location of a self-sustaining dragon population is on private farmland, part of which was slated for potential development. Sheep grazing at the property appears to have maintained the right grass biomass requirements for the dragons, but grazing as currently practiced is unlikely to remain economically viable.

Major on-going threats to its survival include:

- Having only one known wild population
- Lack of formal protection and conservation tenure of habitat
- A stop or change in grazing at the dragon site/s
- Destruction of habitat due to proposed urban development
- The existence and location of other potential wild locations are unknown
- Inadequate surveys to detect other potential populations
- Poachers, amateur herpetologists and photographers damaging habitat and injuring or taking animals
- Habitat changes due to invasive plants.
- Predation, including by introduced rodents, cats and foxes

The Victorian Grassland Earless Dragon Recovery Team considers that any development at sites known to support populations of dragons, or at sites from which the species has been recorded in the past, would be inappropriate until a national system of reserves and managed areas is established to ensure the ability of the dragon to survive, flourish and maintain its potential for evolutionary development in the wild, across its natural geographic range.[14]

Striped legless lizard.
Image: Peter Robertson

According to the Draft National Recovery Plan for Grassland Earless Dragons (2023)[15] and the preceding National Recovery Plan (2009)[16] which are both endorsed by the Australian and Victorian Governments the most important objective in conserving this species is to detect populations and recover the species at those locations to the point where an interconnected and stable population occurs in healthy habitat that is well-managed.

The key actions identified by the Australian Government's Conservation Advice for the dragon (2023)[14] are to: 1) Comprehensively identify and survey areas that may harbour a remnant subpopulation, and 2) Reduce the risk of inadvertently eliminating any undetected remnant subpopulation.

The Recovery Plan for Grassland Earless Dragon released in 2009, 14 years before the Victorian Grassland Earless Dragon was rediscovered, states that "Because the Grassland Earless Dragon is now known from so few sites, and its former distribution has been so reduced, all remaining known occurrences are considered critical to the survival of the species."

Aligning with this, the MSA Program Report (2009)[4] required that all developments must implement targeted surveys for EPBC Act listed species, which includes the dragon.

It is very important that the location of populations is kept secret to protect them from poachers and even well-meaning amateur herpetologists and photographers who can create extensive and sometimes irreversible habitat damage while hunting for the dragon.

Conservation Breeding and the Need for Wild Populations

The rediscovery of dragons at one site represents a major conservation opportunity. However, one small population at one site, and that being currently outside the formal conservation reserve system, is a tenuous situation.

To help provide more security and assist with recovery, individual dragons taken from the sole known population have been used to found a conservation breeding program by Zoos Victoria. The intent of the conservation breeding program is to establish an insurance population to produce healthy dragons for establishing additional wild populations, and to help maintain optimal genetic diversity in wild populations.

The conservation breeding program is an incredibly valuable aspect of the work to secure this species but must occur alongside work to protect and manage wild populations.

For meaningful conservation outcomes, the Victorian Government must aim for a long-term target of 12–15 self-sustaining wild populations managed as a meta-population to ensure genetic diversity, with a short-term target of six while techniques and strategies are refined. This requires:

- Protection of suitable habitat from development
- Restoration of degraded sites to suit the requirements of the dragon
- Ongoing habitat management and monitoring
- Research trials of zoo-to-wild translocations to refine techniques and strategies

Using the best available knowledge for a poorly-known species

Many risks to the dragon and other threatened species in this region have been worsened by the Victorian Government's failure to involve recovery teams in key decisions.

Given the highly cryptic nature, rarity and extreme imperilment of this species, it is essential that all activities are based on the best available knowledge and expertise. For this reason, all activities relating to the dragon, including targeted surveys, management of the wild population and the establishment of new populations using zoo-to-wild translocations must be done in collaboration with the Victorian Grassland Earless Dragon Recovery Team.

The EPBC Act created a pivotal role for recovery teams to advise on complex management questions for threatened species and ecological communities and to co-ordinate the implementation of recovery actions in an effective, coordinated and complementary way to achieve the best possible conservation outcomes, plans and programs.[8] Recovery teams should be integral to decision-making for all threatened species within the region.

The Victorian Grassland Earless Dragon Recovery Team includes herpetological experts, with representatives from Zoos Victoria, the Victorian Government, the Commonwealth Government, Museums Victoria, and traditional custodians, and

is leading conservation efforts to save this species from extinction.[17]

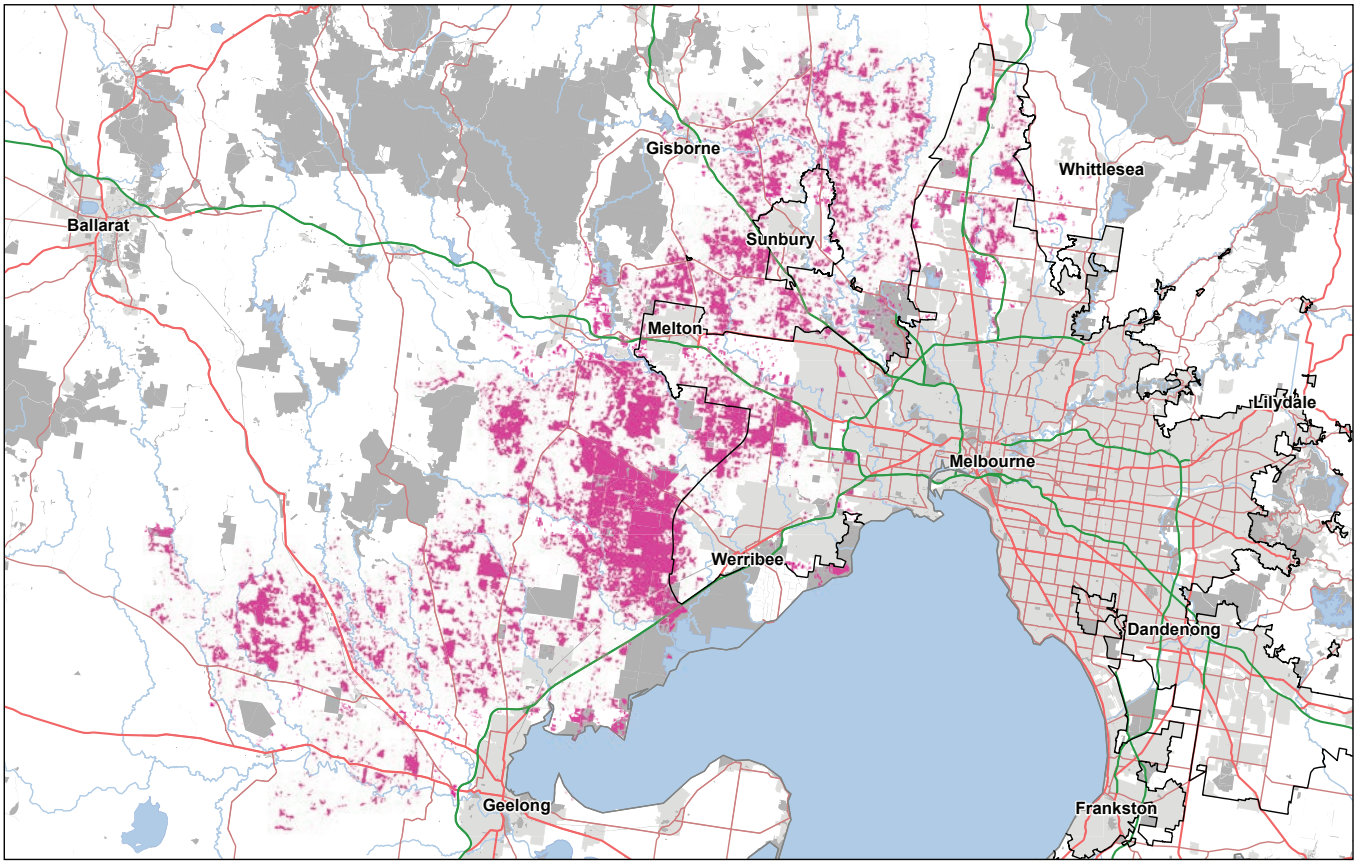
In the case of this species, general environmental consultants, such as those routinely engaged by the development industry, are unlikely to have ever detected the species in the wild or to have the knowledge or experience required to confirm species presence or absence with an adequate level of confidence, or to evaluate the potential value of grassland habitat for the dragon.

Recommendation:

All activities related to the dragon must be done in collaboration with the recovery team, including targeted surveys, management of wild populations and the development of guidelines.

Victorian Grassland Earless Dragon Recovery Team member Peter Robertson using an endoscope to look for dragons at the rediscovery site. Image: Nick Clemann

Victorian Grassland Earless Dragon habitat distribution model



Legend

- VGED modelled habitat
- Built up area
- Public Land
- Urban Growth Boundary

Victorian Grassland Earless Dragon habitat distribution model. Credit: The State of Victoria Department of Energy, Environment and Climate Action (2024) CC-BY 4.0. https://www.environment.vic.gov.au/__data/assets/pdf_file/0020/721811/Victorian-Grassland-Earless-Dragon-Habitat-Distribution-Model.pdf

Victorian grassland earless dragon habitat. Image: Peter Robertson

Legal Obligations to Matters of National Environmental Significance (MNES)

The Australian Government has committed to preventing extinctions.[3] Without rapid intervention, the Victorian grassland earless dragon could be Australia's next extinction in the wild.

The Australian Government also has a legal obligation to protect Matters of National Environmental Significance (MNES) under the EPBC Act. MNES include threatened species, including the dragon, and ecological communities, including the grasslands. There are 12 potential Victorian MNES in the urban growth areas west of Melbourne.

Under the EPBC Act, developments with the potential to significantly impact MNES require Commonwealth assessment and approval. The intention of the approval process is to identify development pathways that avoid threatened species and ecosystems as much as possible, to then mitigate unavoidable impacts as much as possible, and finally to offset remaining impacts where suitable. If remaining impacts are considered too significant, the Australian Government may refuse the project.

The law applies not only to the direct footprint of development but also to indirect and cumulative impacts. This is a significant consideration in this region, where many individual developments are likely to collectively take a significant toll on the remaining 2% of the Critically Endangered grassland ecosystem.

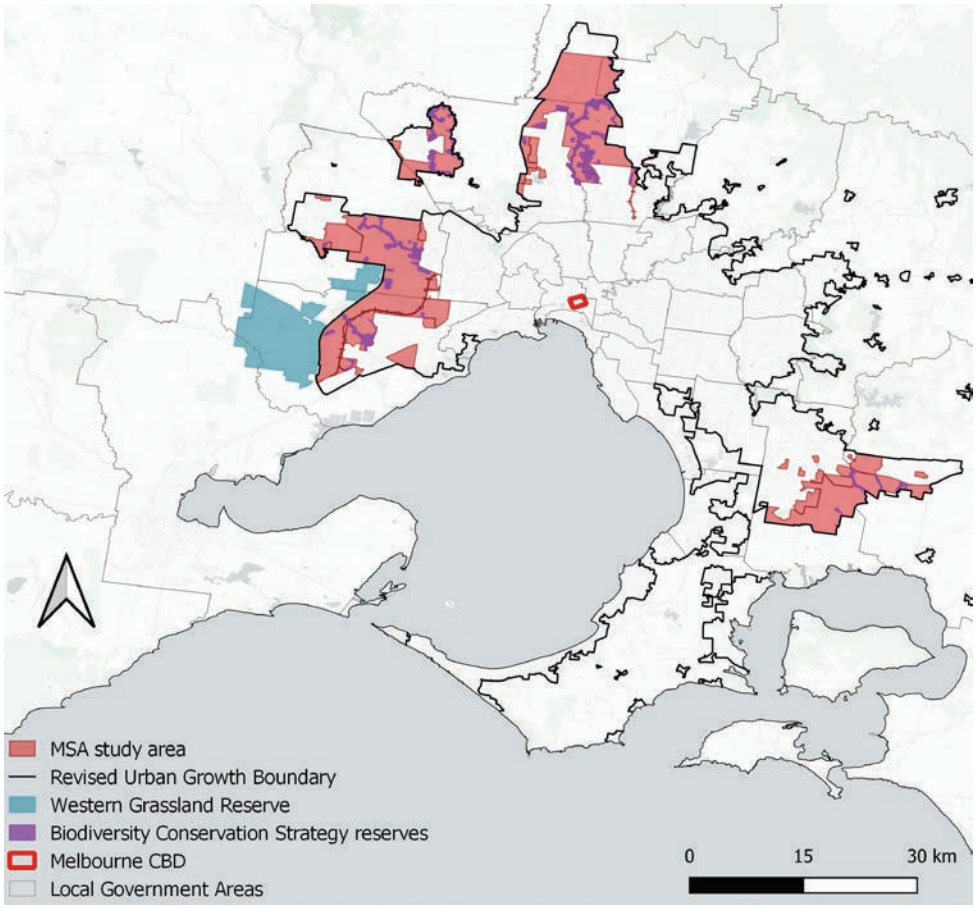
The Australian Government can regulate impacts on MNES in several ways. The most common way is through project-by-project assessment and approvals under Part 9 of the EPBC Act. This is the primary mechanism through which approvals under the EPBC Act have operated. However, there is also provision for the approval of a class of actions through what is known as a strategic assessment under Part 10 of the Act. This usually involves the endorsement of a plan, policy or program that will meet the obligations of the EPBC Act and replace individual project approvals.

The Melbourne Strategic Assessment (MSA) Program Report (2009)[4] was endorsed under section 146 of the EPBC Act by the Hon Peter Garrett, Minister for the Environment, Heritage and the Arts on 2 February 2010.[18] It was designed to replace project-by-project federal environmental assessments within Melbourne's expanded urban growth boundary with a program-level agreement.[4] It aimed to streamline development approvals while ensuring the protection of MNES.

There are additional urban growth areas not included within Melbourne's revised urban growth boundary, that have been planned after the 2008 planning update Melbourne @ 5 million,[19] notably around Bacchus Marsh and Geelong. However, these areas are not part of the Melbourne Strategic Assessment and are therefore not covered by the MSA approval under Part 10 of the EPBC Act. Where developers may significantly impact MNES, they must follow the project level assessment or approvals processes under Part 9 of the EPBC Act (as is the case for the Bacchus Marsh Growth Area), unless the area is subject to another strategic assessment under Part 10 of the EPBC Act (as is the case for the Northern Geelong Growth Area.)

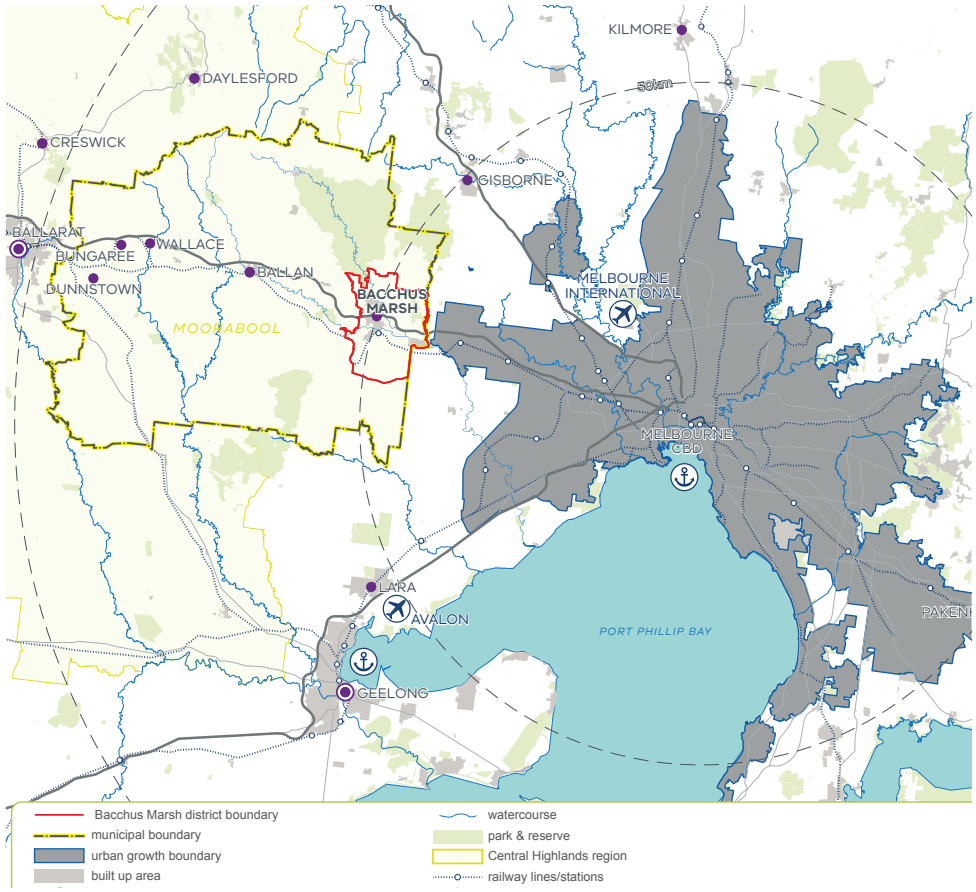
Victorian Grassland Earless Dragon habitat destruction near the rediscovery site. Image: Nick Clemann

MSA boundary and proposed biodiversity conservation reserves



The MSA study area and proposed biodiversity conservation reserves. Source: Gutierrez, M., Gordon, A., & Bekessy, S. A. (2024). Journal of Environmental Planning and Management.[28]

Location of Bacchus Marsh Growth Area



Boundary of Bacchus Marsh District Urban Growth Framework marked in red.
NB: This includes current township boundaries, future development areas and areas that won't be developed. Source: https://vpa-web.s3.amazonaws.com/wp-content/uploads/2024/08/Bacchus-Marsh-Urban-Growth-Framework-Final-Report-August-2018.pdf

Timeline of key events

1968–1969	The last confirmed sightings of the Victorian grassland earless dragon before its rediscovery. The sightings were around Rockbank, Little River and Geelong.
1988–1990	Unconfirmed sightings of the Victorian grassland earless dragon, including areas that would be in the expanded urban growth boundary.
2009	Australian Government and Victorian Government sign an agreement which sets the scope for assessing the impacts of Melbourne's expanded urban growth boundary (MSA).[34] The Victorian Government releases the Strategic Impact Assessment Report for the MSA. [35] While the Report notes that it is unlikely that the Grassland Earless Dragon will be found in the MSA area, it commits to targeted surveys for the dragon as a precaution.
2010	The Federal Environment Minister endorses the Program Report for the MSA.[4] The Program outlines how the MSA will be implemented, including measures to avoid, mitigate and offset impacts on Matters of National Environmental Significance and required environmental outcomes. The Program Report requires targeted surveys and prescription for species not already covered to ensure all listed species and ecological communities are identified and assessed prior to planning and construction of development works.
2013	The Federal Environment Minister approves[29] urban development within the Western growth corridor (Melton and Wyndham), North-western growth corridor (Sunbury) and Northern growth corridor (Hume, Whittlesea and Mitchell).
2018	Victorian Planning Authority releases Bacchus Marsh Urban Growth Framework[30] (NB: outside MSA area).
2019	Research determines that the Victorian grassland earless dragon is a separate species to grassland earless dragons found in New South Wales and the ACT.[5] This has significant implications for any remaining populations in Victoria.
2020	The Victorian Auditor General finds that the Victorian Government did not meet its commitments to deliver the Western Grassland Reserve and Grassy Eucalypt Woodland Reserve by 2020 and that current governance arrangements are inadequate to effectively oversee program delivery and manage risks.[6] Research finds that the Victorian grassland earless dragon is the Australian reptile at greatest risk of extinction.[2]
2022	The Federal Environment Minister releases Threatened Species Action Plan 2022–2032 with a commitment to 'stopping the extinction of Australia's plants and animals.'[36] The Victorian Commissioner for Environmental Sustainability releases a Strategic Audit of Implementation of the MSA Conservation Outcomes Report which finds significant limitations with the program logic, monitoring and reporting making it difficult to measure outcomes for MNES.[37]
2023	Victorian Grassland Earless Dragon population confirmed west of Melbourne (NB: outside MSA area). The species is listed as Critically Endangered under the EPBC Act.[31] 16 male and 13 female dragons are collected from the wild and used to found a conservation breeding program at Melbourne Zoo. By the end of the year, dragons had hatched in captivity.
2024	The Federal Environment Minister and all State Environment Ministers agree to ambitious national targets, including 'no new extinctions'.[32] The Federal government releases Australia's Strategy for Nature[3] which re-affirms a target of 'no new extinctions'.

Key issues with the Melbourne Strategic Assessment (MSA)

To achieve its objectives, the MSA committed to the actions listed below. Each was intended to ensure that development could proceed without undermining biodiversity protection obligations under the EPBC Act. However, there have been major issues in the implementation of these mechanisms.

It should also be noted that when the MSA was endorsed in 2010 the dragon was believed to be the same species as the grassland earless dragons that occur in Canberra and Monaro and Bathurst. Developers of the MSA may therefore have held the belief that the MSA would not have as significant an impact on the dragon as there were multiple known populations in News South Wales and the ACT. However, in 2019 new research showed that the Victorian grassland earless dragon is a separate species, found nowhere else but Melbourne's western grasslands,[5] and as such the dragon is likely to suffer the greatest habitat loss of any species under the MSA.

The MSA's 2009 Program Report,[4] which was endorsed by the Hon Peter Garrett, Minister for Environment Protection and the Arts, pursuant to section 146 of the EPBC Act[18] committed to consider new knowledge as it occurred, especially with regard to rediscovered or newly listed threatened species.

Page 19 of the Program Report[4] states: 'Adaptive management mechanisms are identified to ensure that as the context changes and new information emerges, matters of national environmental significance will be accounted for as part of implementing the Program.'

This means that the state of knowledge and decision made in 2010 are not a valid reason to fail to respond to the 2019 research findings and 2023 rediscovery and to adequately protect and conserve the Critically Endangered dragon in 2025.

In addition, Page 30 of the Program Report[4] states: 'No impacts are permitted on a matter of national environmental significance under this Program unless an approved prescription is in place.' A presciption in not in place for the dragon; therefore, no impact is permitted.

Critically Endangered spiny rice flower at Mount Cottrell. Image: J D Knowles CC-BY-NC iNaturalist

Developing species-specific prescriptions to guide management

A species-specific prescription sets out how a threatened species within a development area will be protected and managed, including how to avoid, mitigate and offset impacts on the species.

The 2010 MSA approval required species-specific prescriptions to be developed by the Victorian Government, approved by the Australian Government and in force before precinct planning was finalised. The 2010 approval also made the development of a species-specific prescription an obligation for any newly listed or rediscovered species, such as the dragon.

Survey guidelines have recently been released by the Australian Government.[7] However a full prescription has not yet been prepared for the dragon despite its rediscovery, leaving a regulatory vacuum within the MSA. In the absence of a prescription, developments are proceeding without appropriate safeguards, increasing extinction risk.

Given that the dragon also occurs outside of the MSA, an alternative and likely more effective mechanism would be for the Australian Government to develop Industry Guidelines, such as those developed for migratory shorebirds,[20] or southern cassowary[21]. These would fulfil the need for a species-specific prescription. To ensure they reflect the most up-to-date knowledge on this species, the guidelines should be developed with or reviewed and endorsed by the recovery team.

Recommendation:

The Australian Government to urgently develop industry guidelines for avoiding, assessing and mitigating impacts on the Victorian grassland earless dragon, in collaboration with the recovery team.

Conducting targeted surveys for listed species

Populations that may exist but are not known (and hence not protected) face a perilous future.

The MSA approval required that surveys be conducted before development to identify whether threatened species were present in areas proposed for clearing, however for some species these did not occur. This was essential to trigger prescriptions and guide mitigation measures.

In practice, surveys have not been systematically undertaken for the dragon across potential habitats, resulting in critical planning decisions being made without full knowledge of biodiversity values. Some precincts have advanced through planning processes and approvals despite lacking comprehensive surveys, weakening the legal integrity of the MSA commitments.

There is an urgent need to conduct targeted surveys for the species across areas within and outside of the MSA areas. The location of targeted surveys should be tenure blind and guided by habitat suitability models and for the model to be refined in response to survey results. Currently, there are land access constraints on survey efforts

Likely Victorian Grassland Earless Dragon habitat destruction near the rediscovery site. Image: Nick Clemann

to seek to find additional populations of dragons. These targeted surveys should be undertaken or guided by the recovery team.

Standard pre-development surveys are also not reliable at detecting the species. The dragon is very cryptic, and easily overlooked in surveys. Based on what has been learnt at the discovery site, detections tend to be clumped, so even if they occur in an area, the chance of surveying where they have aggregated is low. This means that even if the dragon is present at another site, there is a high chance of it not being detected in surveys. The interpretation of non-detections should therefore be reviewed by the recovery team.

One positive recent development for survey efforts is the successful trialling of detector dogs, trained to smell out the otherwise highly cryptic dragons. Detector dogs trained specifically for this species could increase future survey efficiency and likelihood of success.[9]

The Victorian Government should also outline how past and planned surveys will meet the obligations of the 2010 endorsed program.

Given the profound consequences of losing even a single wild dragon population, it is important that ecological consultants conduct comprehensive surveys prior to the destruction of any potential habitat using the approved guidelines[7] and that the recovery team are able to review the interetation of non detections prior to any works on site.

Ensuring compliance with pre-development survey conditions is the responsibility of the Victorian Government within the MSA and the Australian Government outside the MSA. The recovery plan advises implementing and enforcing strict operational – rather than monetary – penalties to incentivise compliance.[15]

Given the paucity of information about the dragon and its habitat, the results of the surveys should be provided to the recovery team for review and interpretation, even in areas considered low-value habitat by consultants. The Victorian Government should be guided by the recovery team in decision regarding which habitat areas need to be protected for current and future dragon recovery.

Recommendations:

Australian and Victorian Governments to support ongoing research to refine detection methods.

The Victorian Government to support the recovery team to conduct targeted surveys for the dragon in areas of high potential regardless of land tenure.

Ensure comprehensive pre-development surveys are undertaken using approved guidelines in all areas where potential habitat will be destroyed, even if the habitat is considered low value by consultants.

Provide all pre-development survey results to the recovery team for interpretation and review, and consider the advice of the recovery team before remnant grasslands are destroyed.

Critically Endangered plains wanderer. Image: Indra Bone CC-BY-NC iNaturalist

Establishing and managing conservation reserves

Biodiversity offsets are conservation actions theoretically used to compensate for unavoidable impacts from development on biodiversity, once steps have been taken to avoid and mitigate impacts as much as possible.[22]

To compensate for impacts on grassland and grassy woodland areas being developed, under the 2010 Program Report[4] the Victorian Government made commitments to establish a 15,000–hectare Western Grassland Reserve (WGR) and a 1,200–hectare Grassy Eucalypt Woodlands Reserve (GEWR) by 2020, and to retain 80% of all Grassy Eucalypt Woodland within the growth areas in secure conservation reserves. Parks Victoria will be the manager of the reserves.

To facilitate its acquisition, the area of the Western Grassland Reserve was covered by Public Acquisition Overlays (PAO) in 2010.

However, as of 2020, only 26% of the 15,000–hectare Western Grassland Reserve (WGR) had been acquired. And according to the Victorian Auditor General, as of May 2025, the Victorian Government has not yet acquired any land for the planned 1,200–hectare Grassy Eucalypt Woodland Reserve (GEWR).[6]

Failure to rapidly acquire and protect land earmarked for the reserves has led to major degradation of the values the MSA committed to protect and is undermining the capacity of the reserves to deliver biodiversity benefits sufficient to serve as a credible offset.

Key causes of ecosystem degradation that have occurred since 2009 within areas earmarked for the reserves but not yet acquired by the Victorian Government include:

- Lack of weed control and increased weed invasion
- Lack of ecologically appropriate fire regimes
- Removal of biomass management, including grazing, causing vegetation to become too dense
- Conversion of grassland to cropping, which involves ripping and tilling the soil, which destroys the soil profile, removing or crushing rock habitat, replacing grassland vegetation with agricultural species, and application of herbicides and pesticides.
- Bulldozing as a precursor to development
- Dumping of contaminated fill, including fill containing asbestos.

The Victorian Government does have avenues to ensure that grasslands earmarked for the reserve are adequately managed to protect their values. In Victoria, clearance of native vegetation is regulated under the Planning and Environment Act 1987. The Victorian Government has not taken compliance action when landholders within the grassland reserves have degraded vegetation by moving from grazing to cropping. This has been justified on the basis that 'existing use' rights within the Act enable landholders to continue using the land for an agriculture purpose even if the planning scheme may otherwise prohibit or require permission for the activity. However, the Victorian Government may constrain these rights by developing a Code of Practice[23] that a landholder must comply with.

To provide greater protection, the Victorian Government should make a critical habitat determination under the Flora and Fauna Guarantee Act 1988 for the grasslands which are

A site in the middle of the Western Grassland Reserve. Image: Andrew Booth

listed as a threatened community. With a critical habitat determination in place, the Victorian Government could make a habitat conservation order to prohibit any development or land use that would impact grasslands identified for the reserves.

Among the weeds, serrated tussock, one of Australia's worst grassy weeds, is now found across significant areas of the WGR and has the potential to smother the grasslands.

The degradation that is occurring will also increase the cost to Parks Victoria (and therefore tax-payers) of restoring and managing the reserve, for example, because much greater levels of weed control, revegetation and possibly even invertebrate reestablishment will be needed.

Some properties earmarked for the reserve have degraded substantially over the past 15 years. As the intent of the reserve is to conserve the ecosystem, the boundaries should urgently be reappraised to ensure properties with the highest remaining ecological values in the region are included within the reserve.

The reserves were also not planned with the dragon, and its habitat needs in mind. As part of the reappriasal dragon recovery team members should be consulted to ensure the reserves capture habitat needed for the dragon's recovery.

It is then crucial that the remaining land earmarked for the reserves is acquired as quickly as possible, before biodiversity values degrade further, and for adequate funding to be allocated to the restoration and management.

The biggest impediment to the timely purchase of the land is that the Victorian Government has not allocated adequate funding to do so. The Victorian Government is relying on financial levies collected from developers within the growth corridors to amass funds that can then be used to purchase the land. This process has been slow. In the intervening years, the value of the land has risen considerably.

This presents a risk that the scheme will not collect enough funds to complete the land acquisition.

Despite missing the 2020 deadline the problem with lack of available funds still has not been solved due to a lack of political will.

Lack of available funds is also contributing to excessively prolonged negotiations with landowners covered by the PAOs causing them considerable frustration. As a result some property owners have sold their properties to third parties, something that is not prevented by the PAO, and the Victorian Government has then been forced to compensate the landholders for 'loss on sale.'[24] So, in some instances the program has lost funds without acquiring properties or improving management of the Western Grassland Reserve.

The Victorian Government should acquire the land as intended by the 2010 Program Report.

Waiting for funds to trickle in before land is purchased has proven to be a failure and alternative approaches are needed.

Recommendations:

The Victorian Government to urgently reappriase the boundaries of the WGR to capture the most ecologically valuable remaining grassland remnants, the rediscovery site, and grasslands essential for the conservation of the dragon.

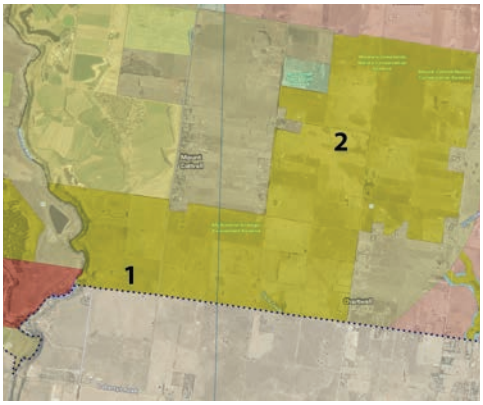
The Victorian Government to complete the acquisition and management of the WGR and GEWR by 2027, reflecting the revised boundaries.

Victorian Government to make a critical habitat determination under the Flora and Fauna Guarantee Act 1988 for the grasslands, followed by a habitat conservation order to prohibit any development or land use that would impact grasslands identified for the WGR.

Smothering invasive weed, serrated tussock, seed heads piling up in areas earmarked for grassland reserves. This location shown with 4 on Wyndham Planning Scheme Map next page. Image: Wyndham (2017)[33]

4

Evidence of habitat damage by tilling of land earmarked for the Western Grassland Reserve



Right: Melton (top) and Wyndham (bottom) Planning scheme maps. Yellow shows areas identified for the Western Grassland Reserve.

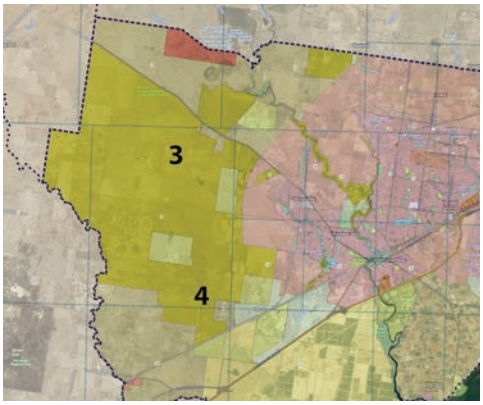
Left: Aerial photos showing examples of damage to land earmarked for the Western Grassland Reserve due to tilling. The locations of the damage are shown on the planning scheme maps with numbers.

Image sources:

Planning scheme maps:
Melton Planning Scheme https://planning-schemes.app.planning.vic.gov.au/Melton/maps.

Wyndham Planning Scheme https://planning-schemes.app.planning.vic.gov.au/Wyndham/maps

Aerial images:
USGS Earth Explorer. https://earthexplorer.usgs.gov/



Securing the species in the wild

Regardless of land tenure, any site where the dragon is found should be protected and the dragon population managed for its conservation at that place (in situ), given the huge uncertainty associated with ad-hoc relocation of the species, its scarcity and high degree of extinction risk.

There is only one known location of the dragon in the wild, but this site is private land and not yet secure.

Being at only a single location places the species at high risk of extinction due to a catastrophic event, which could be as simple as a reduction or removal of stock grazing, or a fire. The Victorian Government must urgently purchase this site from the current owners and effectively manage potential threats to the dragon population at the site.

The locations of the proposed Western Grassland Reserves were identified based on ecological values recorded prior to the rediscovery of the dragon.

The MSA included a requirement for the ongoing inclusion of new knowledge, especially in response to newly listed or rediscovered species.

In the case of Victoria's dragon, the new knowledge since the MSA's 2010 endorsement is that the dragon is surviving, but could easily be pushed to extinction. It is not the same species as other grassland earless dragons found in New South Wales and the ACT. It is completely dependent on western Melbourne's grasslands and is found nowhere else. Of all the threatened species impacted by the MSA, it will experience the largest loss of habitat under the MSA.

The boundaries of proposed reserves need to be reviewed to capture dragon rediscovery sites and an adequate number of sites containing suitable dragon habitat to support dragon recovery. The suitablity of habitat must be determined by the recovery team.

The Victorian Government must support the recovery team to urgently work to establish additional wild populations using dragons from Zoos Victoria's conservation breeding program.

To secure the species in the wild, the Victorian Government must aim to successfully establish five additional secure self-sustaining wild populations in the short term and 12–15 in the long term, that are managed genetically as a meta population.

Dragon experts from the recovery team suggest that restoration and management of the sites will likely be needed to allow the dragon populations to persist. As this work has never been attempted and is completely unproven, it should be undertaken in collaboration with the species recovery team and using a research and adaptive management approach.

This would involve performing reintroductions as research trials, in which a detailed monitoring program is designed and implemented to ensure that it can provide effective feedback to improve reintroduction and long-term management strategies over time.

The decision by the Victorian Government not to introduce a levy for the dragon within the MSA has meant that the Victorian Government must resource the required conservation actions directly. In contrast, fees are levied wherever any potential growling grass frog habitat within the MSA is developed. The levies collected provide funding for the Victorian Government to fund recovery actions for the growling grass frogs such as securing and improving natural habitat and purpose building new habitat.[25]

Recommendation:

The Victorian Government to urgently purchase the property where the only known wild dragon population occurs and ensure that it is secured in perpetuity and appropriately managed by a suitable authority e.g .Trust for Nature or other suitable entities with proven management credentials e.g. Bush Heritage, guided by the recovery team.

The Australian Government to support the immediate purchase of the property where the dragon has been discovered in the wild using the federal Saving Bushland Program.

The Victorian Government to acquire and protect additional sites containing suitable dragon habitat, to support dragon recovery, as determined neccessary by the recovery team.

The Australian and Victorian Governments to urgently provide resources for the Victorian Grassland Earless Dragon Recovery Team to undertake research trials to establish five new wild populations of the dragon in the short-term, using animals from the Zoos Victoria conservation-breeding program, with a long-term target of establishing 12–15 self-sustaining wild populations.

Monitoring compliance and ecological outcomes

In 2020, the Victorian Auditor-General's Office (VAGO) found major shortcomings in the delivery of MSA.[6] The audit found that the Victorian Government had not adequately delivered its commitments to secure and manage conservation reserves, including the 15,000–hectare Western Grassland Reserve and that implementation delays, poor planning, and insufficient oversight had resulted in significant habitat loss and degradation. It also found that in some cases, offset obligations were being discharged through commitments to land that was not yet acquired or managed. The audit highlighted a lack of accountability, transparency, and monitoring across responsible agencies. It recommended urgent action to improve governance, accelerate reserve acquisition, and clarify how and when conservation outcomes would be achieved. The findings reinforce broader concerns that the MSA, in its current form, is failing to uphold its legal and ecological obligations under the EPBC Act.

The MSA envisioned ongoing monitoring to ensure commitments were met and to adapt management where needed. However, oversight has been weak; the 2020 VAGO Audit found that current governance arrangements were inadequate to effectively oversee program delivery and manage risks.

The Victorian Commissioner for Environmental Sustainability's MSA Conservation Outcomes Report (2022)[26] found that 12 years after the program started, the MSA program had yet to establish long-term datasets for many threatened species under its management and that problems with the MSA program logic severely limited the ability to assess program effectiveness and undertake adaptive management. The poor governance and program logic, lack of data, and constraints on adaptive management have allowed implementation failures to accumulate, eroding the public trust that the MSA is fulfilling its legal and ecological obligations.

There is a growing risk that Precinct Structure Plans and the MSA's Biodiversity Conservation Strategy (BCS)[27] will be used to justify continued development without appropriate assessment of their impacts on newly listed or rediscovered species. In particular, there is concern that the identification of conservation areas under the 2013 BCS is being treated as fixed, despite the MSA's original requirement for ongoing assessment, and the on-going inclusion of new knowledge, especially in response to newly listed or rediscovered species.

Development proposals continue to be approved in areas that have not undergone updated surveys, particularly for rediscovered species like the dragon and plains wanderer. This practice effectively sidesteps the adaptive management intent of the MSA and undermines its legitimacy as a substitute for case-by-case federal environmental approvals. This undermines the principle that the MSA should replace, not eliminate, rigorous environmental assessment.

Recommendation:

The Australian Government to undertake a full and transparent audit of the Melbourne Strategic Assessment's compliance with the 2010 approval.

The Australian Government to undertake a full and transparent audit of the performance of development processes, approvals and planning frameworks across regions where the dragon may occur that are outside of the MSA to determine whether they are meeting the obligations of the EPBC Act.

The MSA committed to offset the environmental impacts of habitat destruction associated with the construction of new suburbs west of Melbourne but is failing. Image: Jaana Dielenberg

Conclusion

The rediscovery of the Victorian grassland earless dragon presents a rare second chance, but one that can only be realised if governments uphold their legal and moral obligations under the EPBC Act.

The Melbourne Strategic Assessment was designed to provide a structured and strategic solution to urban growth and environmental protection. However, without urgent reform, it risks becoming a mechanism that facilitates extinction.

Without undertaking the recommendations outlined in this report, the Victorian and Australian Governments will have squandered the opportunity to prevent the extinction of one of Australia's most imperilled reptiles, and will further undermine public trust in our environmental protection systems.

The Australian and Victorian Governments have the opportunity to deliver urban development in this region and ensure the survival of threatened species and ecosystems, if they adopt evidence-based approaches matched with adequate resources and political will.

This will ensure that irreplaceable components of Australia's natural heritage, such as the Victorian grassland earless dragon and its grassland ecosystem, can be experienced by future generations.

The case is a litmus test of how sustainably we live in this nation, and of how effective government legislation and processes are for achieving such sustainability.

The rediscovery of this dragon offers a fragile thread of hope; we should not allow inadequate policy and planning to squander that opportunity.

Victorian grassland earless dragon. Image: Nick Rutter

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Biodiversity Council

The Biodiversity Council brings together leading experts including Indigenous Knowledge holders to promote evidence-based solutions to Australia's biodiversity crisis. It was founded by 11 universities: The University of Melbourne, The University of Western Australia, The Australian National University, The University of Adelaide, The University of Sydney, The University of Queensland, Deakin University, The University of Canberra, Monash University, Macquarie University, and The University of New South Wales. It is hosted by The University of Melbourne. The council was established by seven founding donors: The Ian Potter Foundation, The Ross Trust, Trawalla Foundation, The Rendere Trust, Isaacson Davis Foundation, Coniston Charitable Trust and Angela Whitbread.

Image: Victorian grassland earless dragon habitat. Image: Nick Clemann