



Golden Sun Moth. CREDITSIMON BENNETT/FLICKR

SUBMISSION TO

***Draft national recovery plan
for the Golden Sun Moth***

15 October 2025

Victorian National Parks Association

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1. Executive summary

1.1. Who we are

The Victorian National Parks Association (VNPA) is one of Victoria's leading nature conservation organisations. It is an independent, non-profit, membership-based group, which for 70 years has existed to protect Victoria's unique natural environment and biodiversity through the establishment and effective management of national parks, conservation reserves and other measures.

The Grassy Plains Network represents land management professionals, academics, ecologists and community members concerned about the ongoing decline of grassy ecosystems across Melbourne and its surrounds. We advocate for improved grassland protection and management. We are part of the VNPA.

1.2. Key points

- Grasslands are the endangered habitat for Golden Sun Moth and generally should be protected to the greatest extent possible.
- The Melbourne Strategic Assessment may be failing to address Golden Sun Moth KPIs.
- The Melbourne Strategic Assessment is failing to prioritise land associated with Golden Sun Moth.
- All the Melbourne Strategic Assessment land should be immediately acquired.
- Recovery actions should include those responsible for the recovery actions and appropriate costings to help ensure actions actually occur.
- Planning processes generally fail the environment: the Geelong Strategic Assessment highlights that inadequacy.
- Use of non-selective herbicides may be necessary to adequately manage grasslands even though their use may impact Golden Sun Moth resources such as Wallaby Grass.
- Grassland managers need to adopt nuanced approaches to grassland management.
- A comprehensive research program should be implemented.
- Policy implementation should not reward actions such as the deliberate clearing of grasslands by stealth, e.g. deliberate mismanagement allowing weeds to spread and biomass buildup to impact species diversity. This applies to EPBC referrals that impact now weedy or depauperate grasslands. We note *Nasella* species can be good Golden Sun Moth habitat in such instances, but such sites are cleared because the grassland is considered "poor-quality".
- It should be illegal to mismanage grasslands and deliberately cause them to degrade. This is a loophole being exploited. It is a distinct threat not just to grasslands generally but to Golden Sun Moth.
- Grasslands generally need to be better understood beyond broad and often misleading categories such as "poor-quality" or "high-quality".

- Other Sun Moth species should be considered for listing, with appropriate research undertaken.
- Golden Sun Moth sites need to include a substantial buffer around known populations, encompassing a range of habitat features such as slope, likelihood of flooding, sun and exposure.
- Funding should be made available for novel engagement actions.
- Further federal and State purchase of Golden Sun Moth known habitat should be undertaken
- Greater federal oversight is needed to ensure delivery partners act appropriately.
- Secure land tenure for roadsides is important to protect vulnerable grasslands and their fauna.
- Genetic management of Golden Sun Moth populations requires further research and targeted actions.
- It is important to recognise that the persistence in-situ of eggs over multiple years has implications for our observations around management effectiveness.
- Aerial survey may be a better tool for identifying best habitat than on-ground survey for populations.
- The discussion around climate change needs further nuance.
- Some further references are provided for consideration.

2. Discussion

2.1. Critically Endangered grassland too rare to clear and offset

The Natural Temperate Grassland of the Victorian Volcanic Plain are as close to extinction as an ecosystem can get. Latest data from the Arthur Rylah Institute shows only 0.5% of the former extent still exists. Victoria's 2023 State of the Environment Report emphasises that grasslands are continuing to decline. Many of the plants and animals associated with this ecosystem are also rare or threatened, including Golden Sun Moth.

All management for Golden Sun Moth must balance the often-conflicting needs of the ecosystem as a whole and other important flora and fauna.

2.2. Golden Sun Moth and the Melbourne Strategic Assessment

2.2.1. Background

The Melbourne Strategic Assessment (Melbourne Strategic Assessment) is a key Commonwealth-Victorian agreement to protect matters of national environmental significance within the growth areas of Melbourne. One of its key performance indicators is specific to the Golden Sun Moth.

Due to a damning 2021 Victorian Auditor General's Office report into the poor running of the Melbourne Strategic Assessment, the Commissioner for Environmental Sustainability (CES) now audits the Melbourne Strategic Assessment every two years. The results of the 2022 report are public and will be discussed below. At the time of writing, the Victorian Minister for Environment is continuing to withhold the tabling in parliament of the 2024 Audit.

2.2.2. 2022 Audit findings

The 2022 Audit of the Melbourne Strategic Assessment Conservation Outcomes found that there was a general decline in the population of Golden Sun Moth across the Melbourne Strategic Assessment. However, it was unclear if the trend was an issue of detectability, natural annual variability, or the result of a Melbourne Strategic Assessment failure to manage grasslands with appropriate biomass reduction. In addition, in some cases, intense weed management of *Nasella* species may be impacting resource availability for Golden Sun Moth.

The Audit made two recommendations with regard to Golden Sun Moth:

- That DELWP consider changes to Golden Sun Moth monitoring
- That DELWP undertake research into biomass control impacts.

DELWP claim they are "Changing the existing occupancy measure to an abundance measure" and "Looking into relationships between golden sun moth and grassland biomass and composition" but given past performance these claims need to be independently verified. However, due to the 2024 Audit findings being withheld, it is unclear if the Victorian government have acted in any substantial way on these recommendations.

2.2.3. Failure to acquire Golden Sun Moth habitat

The Melbourne Strategic Assessment has not been acquiring its 36 Conservation areas and the Western Grassland reserve in a manner consistent with protecting conservation values. Rather, they have had other priorities, such as establishing a core area. It is likely that the purchase of Golden Sun Moth habitat has not been prioritised.

The Melbourne Strategic Assessment has also been very slow in acquiring the land they must acquire. The delay in acquiring these sites has led to areas of high-quality habitat being degraded by weed infestation, dumping of soil, over grazing and neglect, and in one case a future Conservation Area being completely destroyed by a land holder.

Persistent calls have been made since the 2010 agreement was made to purchase all the land as soon as possible, rather than incrementally acquire it over half a century. There is no doubt this would lead to better conservation outcomes. It was one of the key recommendations of the Victorian Government's own Inquiry into Ecosystem Decline. Yet a faster land acquisition process has failed to emerge.

2.3. Lessons from the Geelong Strategic Assessment

The planning process for the Northern and Western Geelong Growth Areas highlighted the general inadequacy of the planning system to adequately address environmental matters.

The City of Geelong developed base concept plans for 5300 ha of land without doing any adequate survey for Golden Sun Moth as well as other significant species such as Striped Legless Lizard. Belatedly, and reluctantly, surveys were undertaken that revealed many hundreds of hectares of Golden Sun Moth.

Then, most of that was considered 'low-quality' because of weed presence, and they were consequently offset.

Finally, many areas that should have been preserved could not be, because planning had proceeded on the lines laid out in the original concept plans. Arguments to protect patches of grassland were met with "we can't move the activity centre", even though the location of the activity centre was decided before adequate environmental assessments were made.

Better controls need to be implemented within the planning system to avoid such poor outcomes. In general, many projects get green lights from planning processes because of arguments around cost and convenience to developers.

2.4. Recovery actions should include those responsible

We believe that the proposed "Recovery Actions" should also include those responsible for undertaking that proposed actions as outlined in the plan. Without clear roles and responsibilities outlines within such documents these actions have tended to be passed around different levels of government and organisations without the actions being taken.

Recovery Plans should also include costings to help ensure actions are actually undertaken.

2.5. Herbicide use

In practical terms, it may be difficult to avoid using non-selective herbicides such as Glyphosate and Flupropanate to manage dense or large infestations of *Phalaris aquatica* or Serrated Tussock. We need to be aware of making trade-offs that unduly impact critically endangered grasslands.

Nevertheless, grassland managers need to take a more sophisticated and nuanced approach to the management of difficult and devastating weeds such as Serrated Tussock. This requires:

- More funding
- More research
- More communication of alternative approaches
- A greater willingness to adopt alternative management strategies from grassland managers who for institutional reasons are risk adverse. These are organisations that fail to understand that the avoidance of risk is a risk in itself.

2.6. Potential for mismanagement to be rewarded

Failure to manage weeds and to control biomass is a common tactic used by developers and land bankers to clear critically endangered grassland by stealth. Lack of grassland management can lead to an increase in the *Nasella* species known to be good habitat for Golden Sun Moth.

In such cases, if development is subsequently allowed to proceed because 1) either the grassland no longer meets threshold conditions for protection, or 2) because Golden Sun Moth populations in *Nasella*-dominated sites are considered less worthy of protection, then in effect we are encouraging developers' deliberate mismanagement tactics.

It is important that policy implementation avoids unintended consequences.

2.7. Make mismanagement an offense

As noted in above, clearing grassland "by stealth" through mismanagement that allows weed spread and excessive biomass is a common tactic used to ease the path to development.

The only provisions in place to prevent this are those controlling weeds of national significance. These provisions are only very poorly enforced, are focused on agricultural issues more than environmental issues, and are thus inadequate.

Laws should be enacted requiring appropriate grassland management.

2.8. "Low-quality" grassland can be a misnomer

Grassland quality has become almost stereotyped. Areas of *Themeda*, embedded rock and forb presence are considered valuable, while C3-dominated grasslands less so. There is some logic to this, but only some.

The rediscovery of the Victorian Grassland Earless Dragon in a heavily grazed, very weedy, "poor-quality" grassland is a case in point. Research is now beginning to suggest that it is

the insect diversity of the VGED rediscovery site that is an essential component of its significance.

In general, much greater attention needs to be given to insect biomass and functional diversity as a measure of grassland quality. It would be interesting to see any correlations with Golden Sun Moth presence. This should be included in any Golden Sun Moth research program.

2.9. Federal EPBC appear to be favouring development over Golden Sun Moth

A recent EPBC referral EPBC 2025/10148 raised concern on the value given to protecting Golden Sun Moth populations. The proposed warehouse development is at a site with a known population of Golden Sun Moth, within a larger context of several notable populations of Golden Sun Moth. In particular it was noted that:

- The site's high weed presence, in particular Chilean Needle Grass, is a consequence of mismanagement. The proponent has encouraged the clearing by stealth of the native vegetation on site through the spread of weeds.
- The proponent argued that the Golden Sun Moth present are less significant because they are at the southern extent of the species' range. This is shameful undervaluing of a population of a threatened species, as well as being poor genetics.
- The proponent argued that the population is isolated because no Golden Sun Moth has been found nearby. This was poor logic because lack of data does not mean absence; it just means lack of successful survey.

The Federal Government approved the development proposal. While reasons have not been publicly given, it is hard not to be concerned that weight was given to the poor arguments noted above.

2.10. Further federal and State purchase of Golden Sun Moth known habitat

Further investment should be made by Federal and State governments to acquire Golden Sun Moth habitat such as the past National Reserve System Program that was used to acquire Terrick Terrick National Park. This can include Trust for Nature covenants on private land (Responsible: Federal government) this can mitigate the risk of fragmentation and genetic isolation.

2.11. Greater federal oversight

Greater federal oversight of fire management works by the states (Responsible: Federal Government) would be useful. We need a national approach to fire management that embraces current scientific understandings and avoids a culture wars approach to this vital conservation tool.

2.12. Secure land tenure for roadsides

Roadsides, railway lines and travelling stock routes are relatively unprotected strongholds for critically endangered grasslands. We need stronger laws to provide urgently needed protections. Roadside vegetation and its fauna are easily destroyed: accident, lack of information, misuse, and poor institutional processes are all factors here. (Responsible: Federal and State governments)

2.13. Genetic management of Golden Sun Moth populations

Further research is required to develop an understanding of current genetic issues and the means to improve genetics via translocations of new genes into areas where migration of Golden Sun Moth is not possible (Responsible: Federal, State and Local governments).

2.14. Other species in the same genera probably at risk also

Other Sun Moths are likely rare or endangered and should be considered for EPBC listing.

2.15. Need to ensure habitat variability across Golden Sun Moth sites

It is important to preserve appropriate habitat around a known Golden Sun Moth population. Habitat needs vary from year to year depending on rainfall, biomass, heat, prevailing winds, disturbance patterns, dynamic species distribution, aspect and other factors. Where a population is observed one year may not be optimal habitat in subsequent years.

Where possible, we need to ensure a population's patch of habitat includes varying elevations and slope directions, as well as a substantial buffer to accommodate other variation. It must be a mosaic of vegetation types. Golden Sun Moths prefer drier, warmer, north-facing slopes.

The Recovery Plan should stipulate management actions such as excluding at a small-scale fire (until after emergence) and excluding grazing from north facing, higher elevation patches dominated by *Austrostipa* and *Rytidosperma* species due to the likely presence of eggs. These likely areas need to be fenced off and managed specifically for best Golden Sun Moth outcomes.

Such information on habitat preferences should be used to restore, not just manage, Golden Sun Moth sites.

2.16. Implication of the Golden Sun Moth breeding cycle

Research indicates that Golden Sun Moth eggs can survive in situ for up to 3 years. This has implications for reviewing effective conservation practices. For instance, the observation of a good flying season may not indicate good management actions immediately preceding that event but rather be the consequence of older eggs hatching after failure to emerge during previous bad years.

2.17. Survey

Using landscape predictors of occurrence may be more effective than survey to identify populations and should be considered. This could be done aurally to identify future populations or better locations for translocation.

2.18. Climate change

Some further clarity is needed in the discussion of climate change. Years of drought tended to have the highest emergence rates for Golden Sun Moth which prefer drier conditions. Obviously not to the extent that vegetation dies and they have no food, but

they seem unaffected (so far) by long term climate changes, whereas local / short term extreme weather events have a proportionally much greater impact.

“There is little evidence for the effect of long-term weather changes on the golden sun moth, but a significant effect of local weather conditions and extremes on golden sun moth distribution and abundance. This is because temperature controls emergence of the golden sun moth during their short summer breeding period.” **Spatial and temporal determinants of golden sun moth *Synemon plana* distribution** (<https://doi.org/10.1111/aec.12181>)

2.19. Engagement

Consider funding organisations such as the Grassy Plains Network to undertake novel Golden Sun Moth engagement activities, e.g.

- Golden Sun Moth kite festival
- Flash crowd tours to grasslands on Golden Sun Moth flying days.

2.20. Further references to better consider

The research from Kutt seems to have been inadequately incorporated into the Recovery Plan. For example, consider revisiting:

- Identification of reliable predictors of golden sun moth *Synemon plana* habitat over multiple survey years can benefit conservation, restoration and surveys for new populations. <https://doi.org/10.1007/s10841-016-9901-y>
- Spatial and temporal determinants of golden sun moth *Synemon plana* distribution. <https://doi.org/10.1111/aec.12181>
- Eliciting and integrating expert knowledge to assess the viability of the critically endangered golden sun-moth *Synemon plana*. <https://doi.org/10.1111/aec.12431>