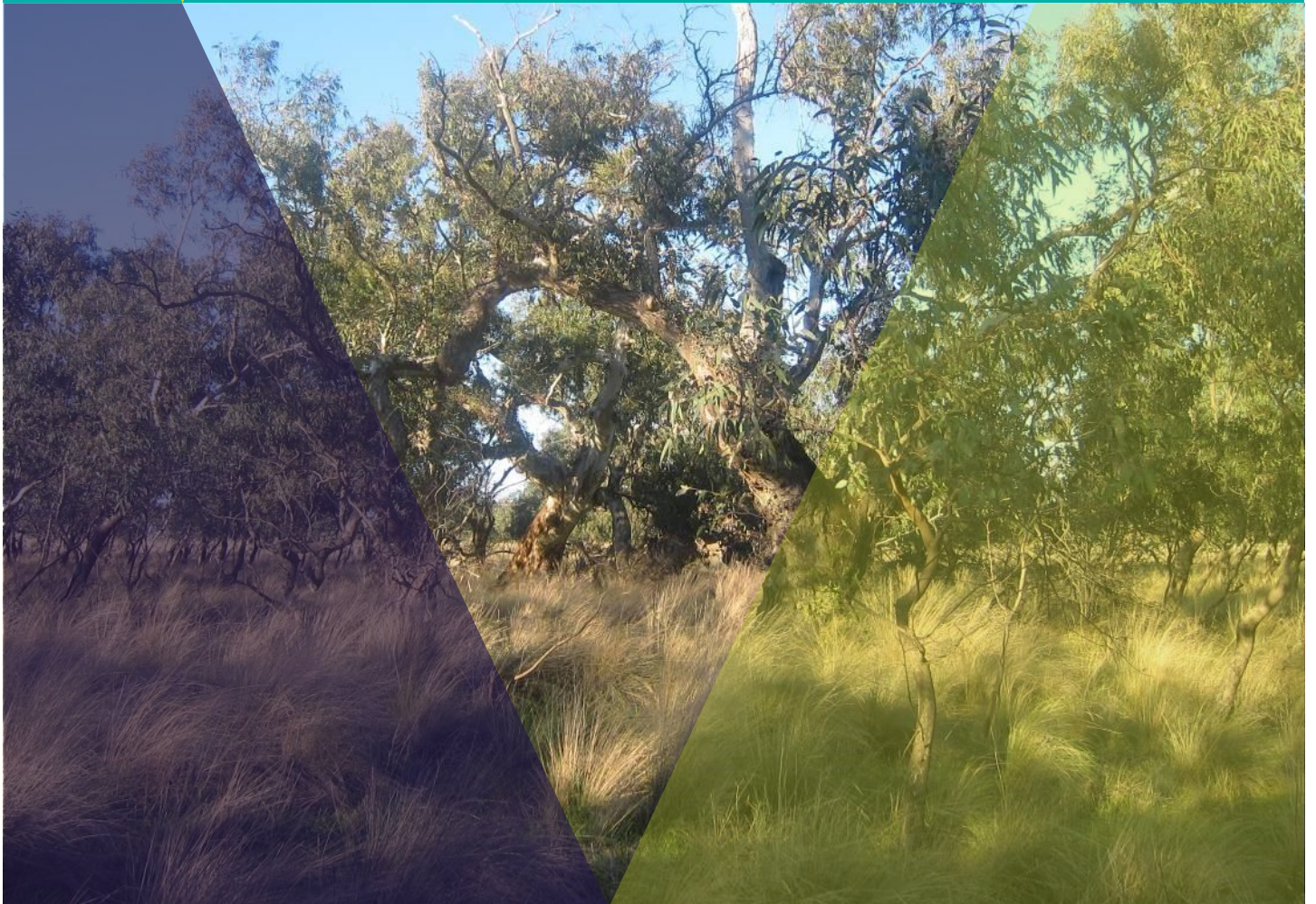


Strategy for establishing a Grassy Eucalypt Woodland Protected Area

Melbourne Strategic Assessment



Acknowledgment

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



The Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation represent the Traditional Owners of the land to which this strategy applies and were engaged in its development. The Department of Environment, Land, Water and Planning (DELWP) commits to partnering together in delivering this strategy.

DELWP acknowledges that the conservation outcomes for the Grassy Eucalypt Woodland (GEW) Protected Area are more likely to be achieved by developing co-operative, collaborative relationships with a range of people and organisations with interests in the GEW Protected Area.

The list below summarises the initial organisations or parties recognised as important stakeholders and thus consulted in the development of this strategy. This list is not exhaustive and will be expanded to incorporate additional groups as required. Equally, inclusion in this list does not imply support for any aspect of this strategy, however attempts have been made to ensure it is inclusive and responsive to the feedback received. Stakeholders that were invited to engage with DELWP on this strategy however did not respond have not been included in the list. It is important to note that not all stakeholders, such as private landowners, have yet been contacted. Stakeholders engaged in developing this strategy (in no particular order) are:

City of Whittlesea, Hume City Council, Darebin Creek Management Committee, Merri Creek Management Committee, Friends of Darebin Creek, Friends of Merri Creek, Trust for Nature, Parks Victoria, Port Phillip and Westernport Catchment Management Authority, Melbourne Water

Photo credit

Steve Sinclair, Arthur Rylah Institute, DELWP.

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Introduction

Woodlands of River Red Gum (*Eucalyptus camaldulensis*) on volcanic soils were once widespread around Melbourne. They were managed for thousands of years by Aboriginal people. The rich agricultural opportunities of the volcanic soils were an important factor leading to the colonisation of the Melbourne area. Agriculture and development resulted in the degradation and loss of these woodlands, and they are now listed as the critically endangered ecological community 'Grassy Eucalypt Woodland of the Victorian Volcanic Plain' (GEW), under the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

To facilitate the sustainable urban growth of Melbourne and mitigate the biodiversity impacts of urban development, the Victorian Government agreed with the Commonwealth Government to deliver a series of conservation outcomes, detailed in the document *Delivering Melbourne's Newest Sustainable Communities, Program Report 2009* (MSA Program Report). The conservation outcomes include the protection of a large portion of the remaining GEW in the Melbourne area and will be delivered as part of the larger Melbourne Strategic Assessment program (MSA program). This will be achieved by:

- permanently protecting 80% of the remaining GEW within the urban growth boundary
- establishing a 1,200-hectare GEW Protected Area outside of the urban growth boundary; and
- improving the quality of retained vegetation including supplementary planting to improve structure.

Within Melbourne's urban growth boundary, GEW will be protected through either Crown land reserves or negotiated on-title land management agreements. The areas identified for protection are described as conservation areas in the *Biodiversity Conservation Strategy for Melbourne's Growth Corridors 2013* (BCS). Due to the previous land use history, the conservation areas being established for the protection of GEW form a mosaic of intact GEW and degraded vegetation to enhance connectivity between high value areas, provide necessary buffers and form practical management boundaries.

The requirements for establishing the conservation areas under the BCS are integrated within Precinct Structure Plans as part of a coordinated approach to land-use planning.

In addition to the conservation areas required by the BCS, Hume City Council and the City of Whittlesea also include requirements in Precinct Structure Plans to retain much of the remaining scattered trees as part of the establishment of new suburbs.

To ensure the preservation of some of the last remaining remnants of GEW in the greater Melbourne area, the Victorian Government agreed also to create a conservation reserve at least 1,200 ha in size outside of the urban growth boundary, south-west of Whittlesea. The MSA Program Report identified a multi-tenure approach to achieve this conservation outcome involving land purchase and transfer to the Crown, and on-title management agreements. Given the multi-tenure approach, this document describes delivery of the conservation outcome as a 'protected area' rather than a 'reserve'.

The establishment of a new protected area will contribute to regional conservation, enhancing landscape linkages to the BCS conservation areas, local reserves and existing creek-line habitat corridors.

1.1 Purpose

This strategy responds to the recommendation of the Victorian Auditor-General's Office independent assurance report to Parliament, *Protecting Critically Endangered Grasslands, June 2020* that the Department of Environment, Land, Water and Planning (DELWP) 'finalises a strategy to progress the Grassy Eucalypt Woodlands Reserve that sets how land for the reserve will be acquired and the funding strategy for delivering this commitment'.

This strategy forms the overarching framework to guide the establishment of the Grassy Eucalypt Woodland Protected Area (the GEW Protected Area). The strategy details the funding source, the appropriate mechanisms for protecting land and specifies the criteria for identifying and prioritising suitable land for inclusion. The strategy will be supported by an Implementation Plan, Communication Plan, and a landowner engagement program, as well as a formal partnership agreement with the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation (Wurundjeri Woi-wurrung Corporation).

The Implementation Plan will detail the actions and activities that need to occur to ensure the successful and timely delivery of the GEW Protected Area, including formation of a stakeholder reference group to provide guidance on property selection and protection.

The Communications Plan will acknowledge the importance of proactive, inclusive, and continued engagement with Aboriginal Victorians, affected stakeholders, communities and landholders, and will be supported by a long-term, face-to-face landholder engagement program.

1.2 Aboriginal heritage and self-determination

The Wurundjeri Woi-wurrung people are acknowledged as the Traditional Owners of the land where the GEW Protected Area will be established. This strategy will be delivered in collaboration and partnership with the Wurundjeri Woi-wurrung Corporation.

Pupungarli Marnmarnepu: Aboriginal Self-Determination Reform Strategy 2020-2025 guides delivery of DELWP policy and programs, and this strategy seeks to support Wurundjeri Woi-wurrung people and their connection to Country.

Wurundjeri Woi-wurrung people have a long-standing cultural relationship with this landscape and a deep understanding of its biogeographical patterns which informed traditional management regimes. The Wurundjeri Woi-wurrung Corporation has provided the following statement:

The importance of Wurundjeri Woi-wurrung connection to GEW Country

The Grassy Eucalypt Woodlands of Wurundjeri Woi-wurrung Country were once widespread and full of resources which Woi-wurrung people used for day to day living. Similar to the grassland vegetation of the Victorian Volcanic Plains, Grassy Eucalypt Woodlands contain plants with edible tubers (e.g. Bulbine Lilies, Orchids, & Murrnong), plants with fibre (e.g. Lomandra & Dianella), medicine plants (Acacia's & Geranium), and habitat for animals hunted for food (e.g. Wallabies & Possums). The trees and shrubs of the GEW provided wood for tools (e.g. taruaks), hunting (e.g. shields & spears), and travel (e.g. canoes). These are just a few of the cultural values found through GEW ecosystems. Where they remain, the cultural heritage places such as stone artefacts and scar trees are the tangible reminders of the long timeframe of Wurundjeri Woi-wurrung land use and direct influence in maintaining the open woodland with cultural burning. In contrast the last 170 years has seen rapid change and reduction in GEW and Wurundjeri Woi-wurrung peoples' influence on, and presence within it.

Colonisation through Wurundjeri Woi-wurrung Country was rapid, impacting on the people with clearing of Country and forced dispossession. The Wurundjeri Woi-wurrung people see participating in the GEW Protected Area as an opportunity to work with DELWP, Local Councils, Freehold land owners and other parties to rebuild links with Country, reintroduce cultural practice (such as cultural burning regimes), and embed cultural ecological considerations in biodiversity and land management practices. Wurundjeri Woi-wurrung Corporation, as the representative body for Wurundjeri Woi-wurrung people, must be embedded within the ongoing management and restoration processes of this culturally important ecosystem.

The Wurundjeri Woi-wurrung Corporation goals for the Grassy Eucalypt Woodland Protected Area include:

- Participating in policy decisions for the ongoing protection and management of GEW in Wurundjeri Woi-wurrung Country.
- Policy inclusion and recognition of important cultural species (plants and animals) in the management of the GEW Protected Area.
- Support to facilitate broader recognition by other stakeholders of the important cultural ecology of Grassy Eucalypt Woodland.

- Active and proactive participation in land management activities and supporting the return of culturally important plants and animals.
- Active participation in research investigating restoration and management practices of GEW.
- Build relationships and agreement with GEW stakeholders which facilitate Wurundjeri Woi-wurrung access to Country¹ and its resources.
- Development of processes which enable continuation of cultural practice and cultural learning within the Wurundjeri Woi-wurrung Community around the values of GEW, and once established can be shared with broader community to understand these values, and the ongoing management for healthy GEW Country.

¹Country in this context applies to Wurundjeri Woi-wurrung Land and Water. It covers the tangible and intangible cultural assets of Wurundjeri Woi-wurrung people past, present and future, and expresses the desires and needs of the Community in terms of land and water management.

1.3 Vision

The Grassy Eucalypt Woodland Protected Area is healthy Country. It protects our native species as Melbourne continues to grow. It deepens the relationship between people and nature and is nurtured by future generations.

1.4 Governance

The MSA program was established under the EPBC Act and aligned with the Victorian native vegetation controls. The *Melbourne Strategic Assessment (Environmental Mitigation Levy) Act 2020* (MSA Act) was created to strengthen, improve and sustain the MSA program. DELWP is responsible for implementing and administering the MSA program.

1.5 Objectives

This strategy guides how the GEW Protected Area will be established.

The conservation objective of this strategy is to achieve the following conservation outcomes

- At least 1,200 hectares of land is permanently protected for GEW conservation.
- The composition, structure and function of GEW on land permanently protected for GEW conservation improves.

This strategy includes objectives that go beyond the requirements of the EPBC Act, the Commonwealth Government's approvals for urban development issued under the EPBC Act, and the MSA Act. The broader cultural and social objectives of this strategy is to do the following:

- Support the Wurundjeri Woi-wurrung people to achieve their goals for the GEW Protected Area through respectful and meaningful collaboration.
- Identify and protect social, cultural and ecological heritage values of the area where it is conducive to achieving the GEW conservation outcome, particularly sites that are important to Wurundjeri Woi-wurrung people.
- Use the GEW Protected Area to learn and communicate knowledge about the environment.
- Involve the local community in the management of the GEW Protected Area.

The MSA Act allows money collected under the MSA Act to be spent on, among other things, the management of land, and the carrying out of other activities on land, for the conservation of the GEW. When spending money collected under the MSA Act to achieve the conservation objective, DELWP will look at opportunities to achieve the broader cultural and social objectives as well.

Other fund sources will be explored during the implementation of this strategy. There is likely to be greater flexibility concerning how money coming from other fund sources is spent.

1.6 Principles

To ensure the objectives of this strategy are upheld, the following principles will be applied:

- establish the GEW Protected Area as development in Melbourne's growth areas occurs
- establish and manage the GEW Protected Area through partnership with the Wurundjeri Woiwurrung Corporation
- make well-informed decisions by considering multiple sources of knowledge including survey information, traditional knowledge, local community knowledge and scientific data
- make well informed and evidence-based decisions by identifying and addressing knowledge gaps
- make decisions by considering feasibility, likelihood, opportunities, risks and return
- collaborate with relevant authorities and community groups to facilitate sustainable land use planning of high priority areas
- focus engagement and protection on high priority areas
- build and maintain strong relationships with landowners and the local community through consistent engagement and information sharing; and
- apply adaptive management to guide land management decisions.

There are a number of dynamic factors which create uncertainty that this strategy must account for to achieve its objectives. These are:

- current knowledge gaps on vegetation condition and both ecological and cultural values to inform prioritisation of property selection
- fluctuating annual revenue from the Environment Mitigation Levy imposed on urban development regulated under the MSA Act; and
- the outcome of voluntary negotiations with landowners to protect priority properties.

These factors must be monitored and decision making adapted as circumstances evolve.

2. The Grassy Eucalypt Woodland ecosystem

2.1 Definition

The EPBC-listing advice on GEW describes the ecological community (TSSC, 2008). The definition is focussed on the characteristics of the vegetation. In the investigation area, GEW encompasses *all* woodlands on Basalt with the following constraints and exceptions:

- The crown cover of native trees and shrubs in the canopy and mid layers lies within these limits:
 - Lower limit = 5% where trees persist.
 - Upper limit = 30% for trees or tall shrubs that are 5 metres or more in height OR 70% if including regenerating trees less than 5 metres tall.
- Stony knolls that lie within, or adjacent to, a patch of eucalypt woodland are included in the community.
- Some patches may occur in management-induced states that vary from the description (e.g. trees cleared). These are included in the national ecological community where they meet the condition thresholds below.
- The minimum patch size is 0.5 hectares.

The following condition criteria must also be met for GEW to exist:

- One or more of the following native grass genera accounts for at least 50% of the perennial ground layer cover: *Themeda*, *Austrodanthonia*, *Austrostipa*, *Poa* and/or *Microlaena*.

OR

- If native grasses account for less than 50% of the perennial ground layer cover, then the patch is either:
 - a) A valuable wildflower site where at least 50% of the ground layer vegetative cover is represented by native dryland forbs (including geophytes) during spring-summer (i.e. September to February inclusive but noting that the ground layer may be sparse in some situations).
 - b) Not heavily invaded by perennial weeds such that perennial weeds comprise less than 70% of the ground layer vegetative cover; or
 - c) If perennial weeds comprise more than 70% of the ground layer vegetative cover, then the patch must have more than ten native perennial species per 100 m² AND a density of at least three big trees per hectare. Big trees are defined here as trees of at least 70 centimetres diameter at breast height (dbh) for eucalypts and at least 40 centimetres dbh for non-eucalypt species.

2.2 Understanding Grassy Eucalypt Woodland ecology

It is necessary to understand the basic ecology of the GEW ecosystem, including the processes of degradation and recovery, in order to prioritise protection and guide management.

In the past, changes in the GEW ecosystem were driven by competition between trees, shrubs and grasses. This competition was influenced by substantial seasonal variation including flood, waterlogging and drought, as well as the use of fire by Traditional Owners as a management tool. Traditional plant use and other sustained anthropological-ecosystem interactions have also shaped the environment over vast time periods, and together, these factors produced an open woodland with a species-rich, grassy understorey.

The introduction of agriculture in the nineteenth century removed many native species, altered vegetation structure and introduced exotic species. This occurred as a direct result of grazing, but also the indirect impacts of excess nutrients from fertiliser, competition from introduced plants, the cessation of traditional management, the replacement of native animals with exotic species such as rabbits and the alteration of natural hydrology. Today, almost all remaining GEW is grazed by livestock, and the legacies of agriculture strongly influence the ecological dynamics of the system.

The Implementation Plan associated with this Strategy will include actions necessary to identify future land management practices. Research and site assessment will be required to further develop existing knowledge of the processes and functions occurring over time in the GEW Protected Area, and ongoing knowledge building will be necessary to inform adaptive management and to support best land management practices.

3. Land use legacy and future management of the Grassy Eucalypt Woodland Protected Area

The proposed location for the GEW Protected Area has a long history of indigenous cultural practice and land management, being nurtured for thousands of years by the Wurundjeri Woi-wurrung people. The investigation area was subsequently surveyed by colonial settlers in the late 1830s, followed by land sales in the 1840s and 1850s. Agricultural settlement brought about significant changes in the management and functioning of ecological processes. Fire regimes changed and grazing by livestock altered the vegetation structure and soil composition. Changes incurred include a shift in soil nutrients and compaction, loss of grazing-sensitive species (such as tall native herbs), reduced eucalypt recruitment, reduced fire frequency, removal of rocks, altered drainage patterns through the draining of wetlands, building of dams and pugging of gilgai plains, and altered competitive interactions which favour some groups of exotics (notably annual grasses). From about 1840 until the present, almost all of the proposed GEW Protected Area landscape had been grazed by sheep and (more recently) cattle and horses.

Land use continues to change and all of the post-settlement factors above remain threats. In addition to these factors, ecological 'debts' incurred by past land uses continue to play out. The GEW Protected Area landscape has seen rapid change in land uses and land management. The Wurundjeri Woi-wurrung peoples' influence on, and presence within the landscape has also changed. Further research into traditional land uses, techniques and optimal fire regimes will inform the transition out of impacted country.

3.1 Cultural heritage in a living landscape

The different phases of historic land-use have left physical traces on the landscape. These include scarred trees and artefact scatters from indigenous management and use. Establishment of the GEW Protected Area will also help in preserving these cultural assets. Under the *Victorian Aboriginal Heritage Act 2006*, the Wurundjeri Woi-wurrung Corporation is the Registered Aboriginal Party for the land to which this Strategy applies. The Wurundjeri Woi-wurrung Corporation is a statutory authority for cultural heritage recognised under this Act and will be engaged in this capacity, in addition to its role as a delivery partner, as required.

3.2 Wurundjeri Woi-wurrung cultural values

As identified by Wurundjeri Woi-wurrung, the GEW area was once full of resources which Woi-wurrung people used for day to day living and, while tangible reminders remain of their use and management of the landscape, rapid colonisation has resulted in both forced dispossession and the clearing of Country. To rebuild Wurundjeri Woi-wurrung links with Country, reintroduce cultural practice, and embed cultural ecological considerations in biodiversity and land management practices, DELWP commits to:

- support identification of important cultural species (plants and animals) in the GEW Protected Area
- support research of traditional land management practices and the cultural ecology of healthy Country in the GEW Protected Area
- facilitate the active participation of Woi-wurrung people in the research of restoration and management practices of GEW
- facilitate the active, proactive and continued participation of Woi-wurrung people in land management activities
- support development of communication materials recognising the important cultural ecology of GEW
- encourage improved accessibility for Woi-wurrung people to Country and its resources within the GEW Protected Area by building and improving relationships with key stakeholders
- support the development of continued cultural learning within the Wurundjeri Woi-wurrung community around the values of GEW, and support future opportunities for the broader sharing of these values toward informed management of healthy Country; and
- seek additional funding sources or partnerships as necessary to deliver the above.

The Implementation Plan and Communication Plan that sit aside this Strategy will be developed in partnership with Wurundjeri Woi-wurrung and will outline the specific actions, range of potential funding sources or partnerships and any other actions required to deliver and monitor progress of the above commitments, including determining Key Performance Indicators (KPIs).

3.3 A state-and-transition model to guide protection and management

Variations in previous land use has resulted in several existing vegetation states. Sites that have had a similar land use history and have changed into the same vegetation state will respond in a similar way to certain management interventions (actions).

These interventions will differ depending on what the final desired state is for the site. For example, if the objective is to move a site from a state of regeneration thicket to a *Themeda* woodland, one intervention is to thin out the regeneration.

DELWP has developed a state-and-transition model for GEW, presented in Figure 7, Appendix 2. *Themeda* Woodland, C3 Woodland and Derived Grassland (C3 & C4) vegetation states are categorised as high priority for protection for the purpose of maximising the amount of GEW protected (Table 1). The states are explained in Appendix 2.

3.4 Management for conservation

Management for conservation involves understanding and manipulating the inevitable processes of change, including dealing with past legacies and introducing new novel techniques. While there is no doubt that the introduction of livestock and the removal of indigenous practices had an immediate, abrupt and negative impact on the GEW ecosystem, it must also be noted that areas of high quality GEW do persist.

There is currently insufficient understanding to predict precisely what will happen to high quality GEW if current management regimes are altered. For example, if grazing is removed or reduced, other ways of removing biomass and weeds will likely need to be found. Knowledge gaps regarding management regimes, as well as potential applications for new technologies, will need to be identified and filled through research partnerships.

In addition to the above, the ability to maintain and enhance GEW condition depends on our ability to manipulate transitions between the vegetation states described above. Land managers must overcome processes that create barriers to the system's ability to restore itself and encourage or create processes that cause desirable transitions. The ability to push ecosystem dynamics in desired directions is dependent on our understanding of the key processes that facilitate or retard transitions. The nature of these processes and our ability to manipulate them is subject to a high degree of uncertainty, thus emphasising the importance of applying an adaptive management approach as an essential part of understanding the transitions. Considering the land use history and range of influences resulting in variable vegetation states across the proposed GEW Protected Area landscape, the appropriate management actions or tools requiring further investigation are likely to include:

- methods to control biomass and promote regeneration
- weed removal using herbicide and other techniques
- vegetation restoration including supplementary planting (to re-establish the near-extinct shrub layer, or augment natural recruitment)
- cessation of fertiliser application
- restoration of natural hydrology and prevention of further alterations to natural water flow.

Given the proximity of the future GEW Protected Area to the developing urban fringe of Melbourne, the ability for land managers to carry out necessary management activities needs careful consideration as the GEW Protected Area is established. For example, requirements for any strategic firebreaks would need to ensure risks to community and assets are reduced from practices such as ecological burning and response to unplanned fire events will need to be factored into the GEW Protected Area design and property selection. Appropriate buffers to manage biomass for this purpose would need to be accommodated without impacting the high-quality areas of GEW to be protected.

The stakeholder reference group, using their knowledge and expertise, will provide advice and guidance on the most appropriate management actions.

3.5 Monitoring and reporting on progress towards conservation outcomes

Under the MSA Act, the Commissioner for Environmental Sustainability is required to report publicly on the MSA program conservation outcomes every two years. The Melbourne Strategic Assessment Monitoring and Reporting Framework, 2015 (MRF) outlines how DELWP will measure progress towards the conservation outcomes and is based on the principle of adaptive management.

Routine progress reporting to DELWP of management actions undertaken by land managers will be a key requirement of all funding and on-title agreements made, as well as for Crown land reserves. The progress reporting will enable an understanding of vegetation state changes in response to the management actions applied, and to inform the adaptive management approach to land management. Access to private land to enable monitoring of vegetation will be required through negotiated conditions in on-title agreements.

To demonstrate if the management approaches applied are improving the composition, structure and function of GEW, the GEW Protected Area will be monitored against a series of KPIs. Management approaches will be considered successful if:

- the extent of GEW is stable or increasing
- the quality of GEW vegetation is stable or improving
- structural heterogeneity of GEW is maintained
- all indigenous plant and animal species are persisting
- natural ecological, hydrological and geomorphic patterns are retained or restored.

The MRF is a MSA-wide framework which will need to be reviewed and updated to align with the objectives and scope of this Strategy. The KPIs need to align with the program outputs and outcomes for GEW in the MRF. The stakeholder reference group may develop other KPIs that report on broader cultural and social objectives. The MRF will have an important role in providing feedback to inform cycles of adaptive management. Findings will identify the effects of current management actions in order to adapt future management and will identify knowledge gaps to be addressed through further research.

4. Location of the Grassy Eucalypt Woodland Protected Area

The boundary of a broad area within which the GEW Protected Area will be located in, is depicted as the GEW investigation area in Figure 1. This area is a refinement of the investigation area previously published in the BCS (DEPI 2013) and was informed by several datasets that have been created from aerial imagery to indicate the coverage of potential GEW within the study area. The available data, its strengths and limitations, are discussed in Appendix 1. To ensure the high priority areas are the focus for protection, on-ground surveys of both public and private land will be required and will form a key component of a landowner engagement program within the initial phase of the GEW Protected Area's establishment.

The investigation area is zoned a combination of Green Wedge Zone and Rural Conservation Zone. Most of the area is covered by an Environmental Significance Overlay and parts are covered by a Heritage Overlay.

Within the investigation area, the identification of potential locations for protection can initially be narrowed down using known attributes that suggest these locations are more likely to contain GEW, being stony rises or GEW tree canopy. Noting that stony rises are more likely to retain understorey (see Appendix 1). Further consultation with relevant parties including the City of Whittlesea and Wurundjeri Woi-wurrung Corporation will help to further refine initial mapping and identify the areas of high value to focus protection efforts.

Management costs will be minimised by creating appropriate protected area boundaries that enable adequate management access, effective management actions, and reduce edge effects.

The GEW Protected Area will also contribute significantly towards regional conservation, enhancing connectivity to existing habitat corridors along Darebin Creek and the Plenty River, Yan Yean Reservoir, local reserves and GEW conservation areas created under the BCS. Figure 2 illustrates this connectivity.

Figure 1 shows how DELWP refined the investigation area with reference to the extent of stony rises and GEW tree canopy. It is important to note when considering the GEW Protected Area configuration that a proposed freeway (E6) crosses the investigation area (Figure 3) and the impacts to connectivity and management this may present.

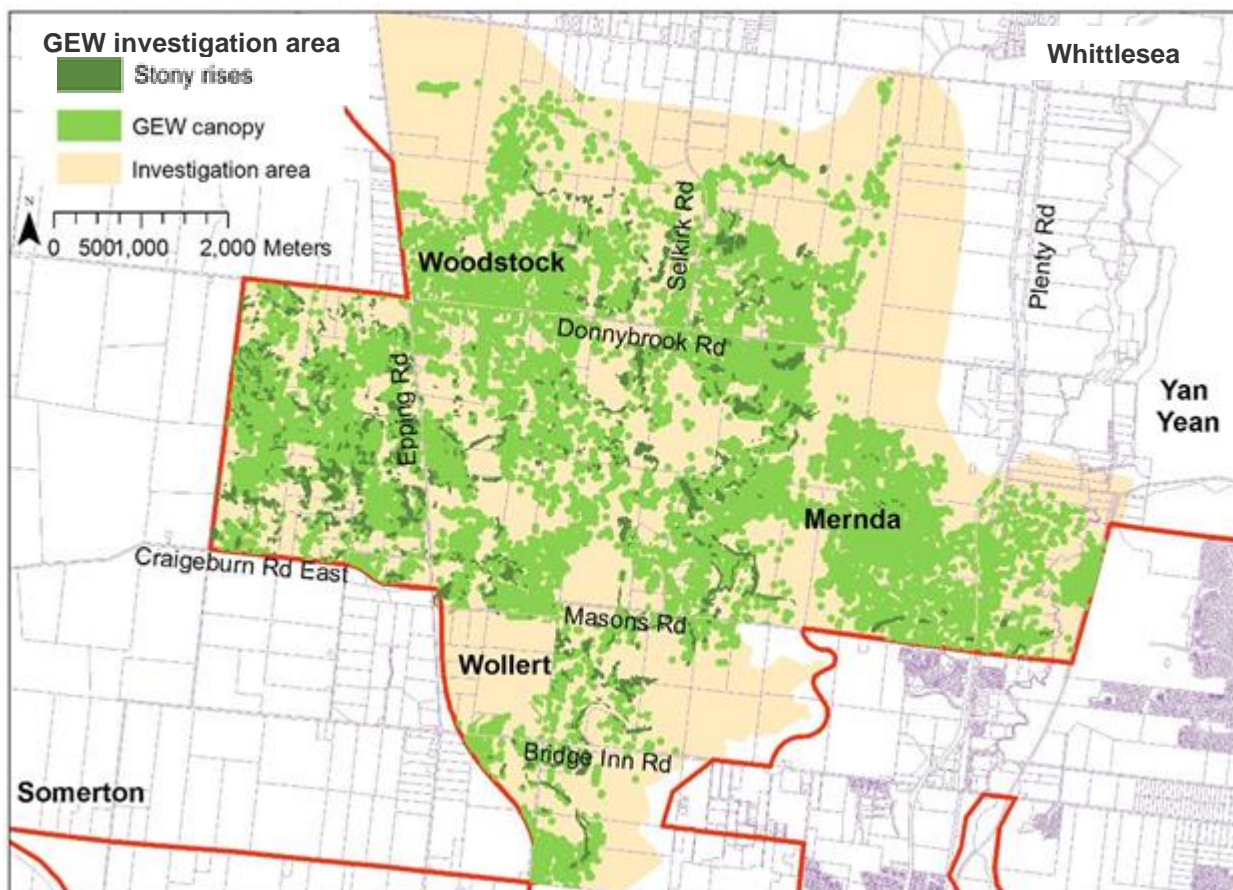


Figure 1. The investigation area in relation to the distribution of 'GEW canopy' and stony rises.

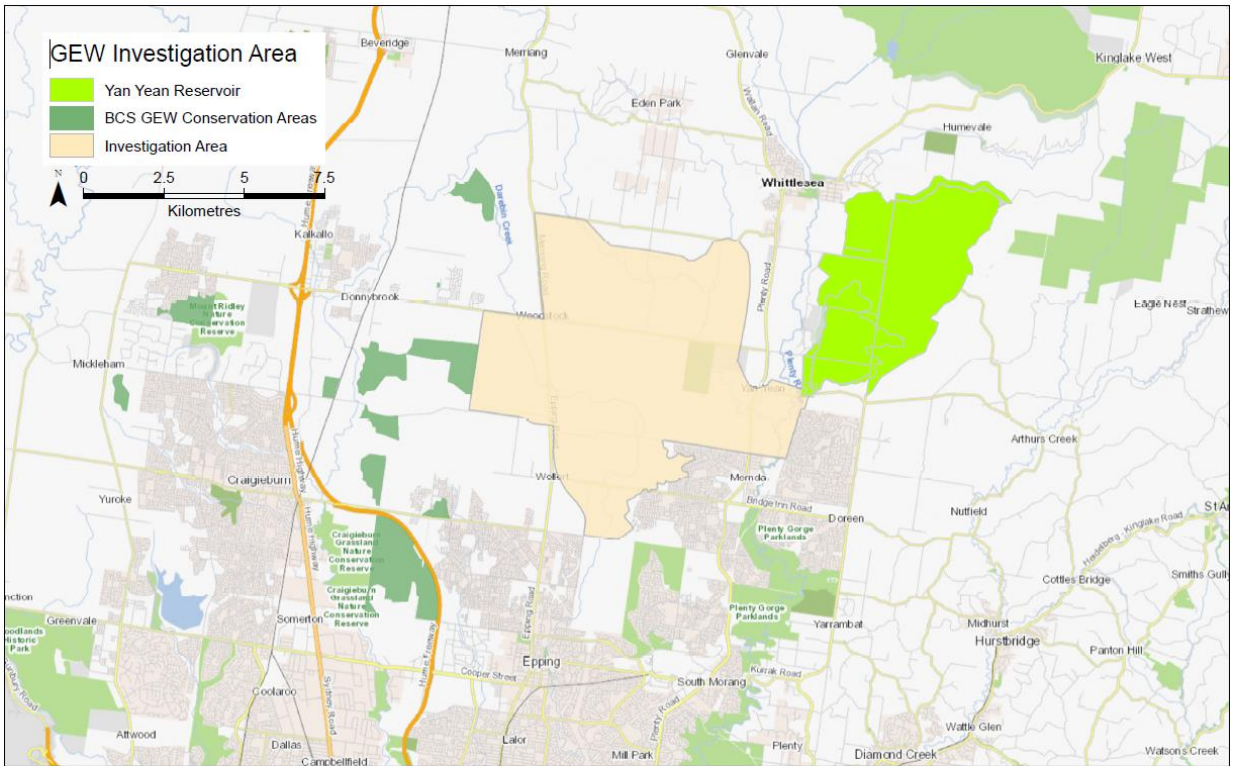


Figure 2. The investigation area in relation to existing habitat corridors.

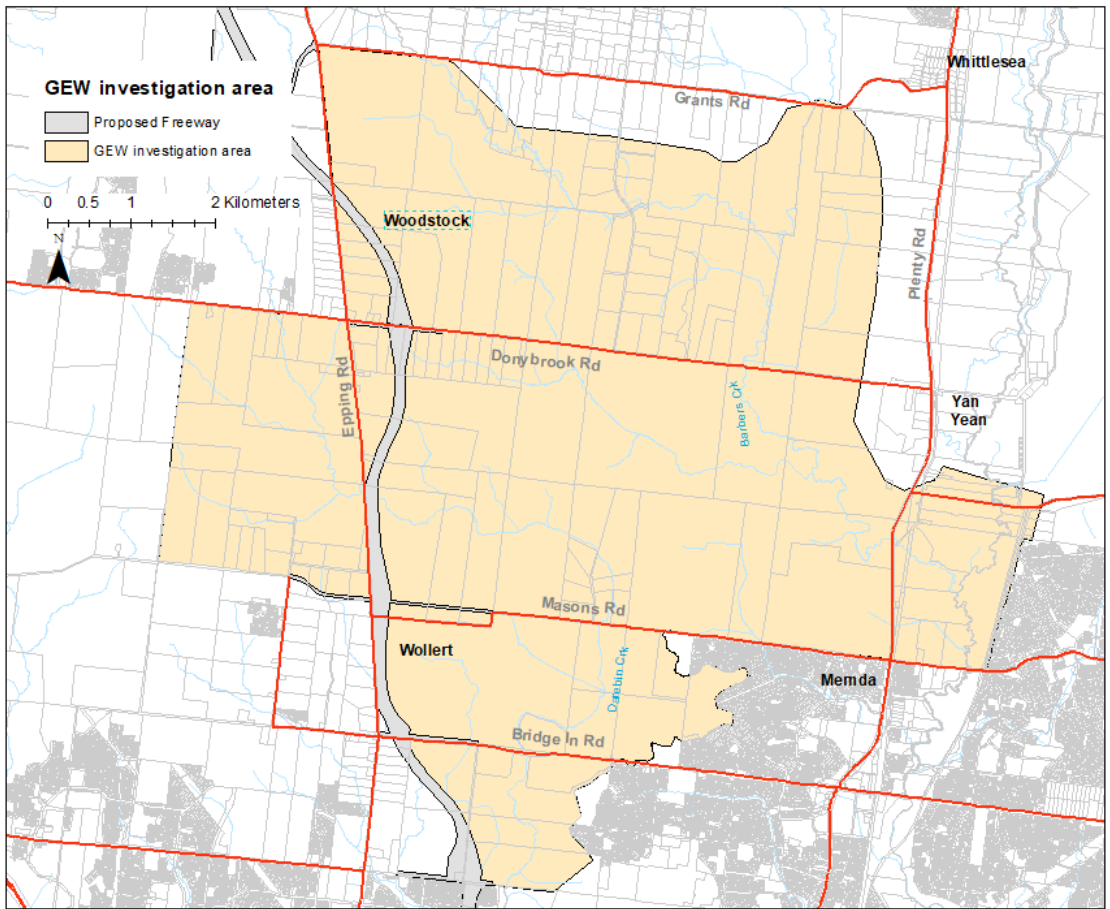


Figure 3. The investigation area and location of the proposed freeway.

5. Protection approach

5.1 Mechanisms

When established, the GEW Protected Area will be a mixture of public and private land managed only for conservation, and private land managed for conservation and other non-conservation objectives.

Under this multi-tenured approach, DELWP will seek:

- Voluntary negotiated purchase and reservation under the *Crown Land (Reserves) Act 1978* (CLR Act). In some circumstances parcels may be sub-divided where only part of a parcel is suitable for purchase.
- On-title private land management agreements and incentives to protect priority areas. The agreements may cover all or part of a parcel.

On-title agreements will restrict land uses that would diminish biodiversity values and will require management actions that improve or restore GEW. The agreements will apply only to the area to be protected and may take a zoning approach to allow various sustainable land-uses within a parcel, appropriate to the values present and management outcome sought.

On-title agreements may be:

- conservation covenants entered with Trust for Nature under the *Victorian Conservation Trust Act 1972*, or
- Land Management Cooperative Agreements made with DELWP under the *Conservation, Forests and Lands Act 1987*.

The mix of protected public and private land is the most effective way to ensure the most important areas of GEW are protected as part of the formal parks and reserves system for nature conservation, while complementing this with management of other areas on private land.

As the GEW Protected Area land acquired by the Crown is consolidated, consideration will be given to whether it is appropriate for reservation as a National Park under the *National Parks Act 1975*.

Where land is privately owned, access may be restricted, including for the purpose of surveying for ecological and cultural values. While access challenges may be overcome within private land agreements or covenants, the GEW Protected Area must evolve over time as parcels are gradually protected, with each newly protected parcel influencing the future priorities and shape of the GEW Protected Area.

Given the patchy distribution of GEW, there is a decision between (at the extremes):

- a protected area with a consolidated shape and minimal edges that includes many areas of non-GEW, and
- a protected area that is tightly delineated around valuable patches that is spatially dispersed, with excisions and multiple parts.

Each of these options has benefits and disadvantages (management and access constraints, costs of land management, visual amenity, etc.). The stakeholder reference group will provide guidance that will be considered in the formation of the GEW Protected Area, to ensure it is ecologically sound and meets stakeholder and community expectations.

Effective and meaningful landowner and community engagement will provide the necessary foundation required to foster a sense of stewardship and enhance the community's capacity and capability to drive protection of GEW. A Communication Plan will guide engagement with landowners, Aboriginal Victorians, Local Government, the community and other interested parties.

In addition, to ensure ecological preservation of high priority areas, while not restricting sustainable land use of low priority areas, DELWP will work with Local Government to review the current statutory planning controls in place across the GEW investigation area to ensure they are appropriate whilst the GEW protected area is being established.

5.2 Prioritising areas for protection

Indicative criteria for selecting priority areas for protection based on the existing vegetation state, as described in Section 3.3, are summarised in Table 1. These criteria will determine where activities such as landowner engagement and incentives and on-ground surveys for example will be prioritised. These criteria are subject to the review overtime with input from the stakeholder reference group. These criteria will also guide protection decisions regarding property as it becomes available. The decision on which parcel of land to protect in comparison to another at a particular point in time, will also need to consider property-specific criteria, including those described in Table 2. Prioritisation will consider the unique characteristics of each parcel and the relative value of each in contributing to the GEW Protected Area.

Protecting the priority areas is dependent on voluntary negotiated purchase and the formation of willing partnerships with landowners. Establishing partnerships will require considered and continuous engagement, followed by ongoing support and provision of sufficient funds for agreed land management actions.

An adaptive management approach will include reviewing the prioritisation of land over time. The overall aim is that quality of all vegetation is maintained at a minimum, with the intent it is improved over the full duration of program delivery.

Table 1. Priorities for protection based on vegetation state.

Vegetation State	Purpose	Priority for protection
<i>Themeda</i> Woodland C3 Woodland Derived Grassland (C3 & C4)	Maximise amount of GEW protected	High
Areas of scattered trees	Protect habitat provided by scattered trees Improve access and connectivity of the GEW Protected Area Improve management boundaries	Moderate
Pasture and cropped areas	Protection will be incidental proximal to other states Improve access Improve management boundaries	Low

Table 2. Property specific criterion to consider in parcel selection.

Criteria	Purpose	Example
Cultural values	Recognises cultural and ecological values of the Wurundjeri Woi-wurrung people, and heritage protected under legislation	<ul style="list-style-type: none"> Cultural ecological values Heritage values or assets
Ecological values	Recognises other values of ecological significance beyond the GEW ecological community present on the site	<ul style="list-style-type: none"> Other Victorian or federally listed rare or threatened species or vegetation communities
Risks to the quality of the values	Recognises the risk to degradation posed by weeds, pest animals and modified hydrology	<ul style="list-style-type: none"> Presence and relative extent of weed or pest animal invasion Modified hydrology is threatening values
Neighbourhood	Recognises the benefit of a consolidated protected area	<ul style="list-style-type: none"> Whether a parcel is isolated from or adjacent to other protected property

6. Funding the Grassy Eucalypt Woodland Protected Area

6.1 Funding for conservation outcomes

The cost of achieving the conservation outcomes identified in this strategy will be funded by an Environment Mitigation Levy on urban development in Melbourne's Growth Areas. The levy is a legal requirement imposed on developers collected under the MSA Act. The Commonwealth Government's approval for urban development under the EPBC Act requires that the conservation outcomes are delivered as urban development occurs. Current forecasting indicates urban development of the growth areas is likely to near completion between 2050 and 2060. Accordingly, the levy amounts will be adjusted over time to keep pace with inflation and other changes to land management and administration costs. The funds to deliver the GEW Protected Area are collected as land is subdivided for development. The rate of implementation is therefore determined by the rate at which development occurs and levies are paid. Estimating the rate of development over a long time period is extremely difficult which makes committing to a timetable for land protection problematic.

Revenue collected from the Environment Mitigation Levy is held in a trust account managed by DELWP and can only be spent on the delivery of the conservation outcomes.

The applicable levy rate for clearing a hectare of native vegetation or habitat type is calculated by dividing:

- the total cost of delivering the relevant conservation outcomes which mitigate or offset the impact, by
- the number of hectares of native vegetation or habitat type.

Delivering conservation outcomes in the GEW Protected Area is directly attributed to mitigating clearing of native vegetation patches and scattered trees. As such, the costs of establishing and managing the Grassy Eucalypt Woodland Protected Area for conservation outcomes are derived from the native vegetation patches and scattered trees component levies.

Estimating the timing and rate of development and therefore the cost of delivering the conservation outcomes over a long time period involves an inevitable amount of uncertainty. The MSA Act requires a review of the estimated costs and levy rates every five years to ensure that cost estimates remain accurate.

6.2 Funding for cultural heritage and social outcomes

Achieving conservation outcomes in the GEW Protected Area will in many cases be aligned with achieving cultural heritage and social objectives outlined in this strategy. Where achieving cultural heritage and social objectives are independent of achieving conservation outcomes, they will be funded through alternative funding sources. DELWP will work with the stakeholder reference group to identify and seek funding sources and partnership opportunities for activities that are not related to achieving conservation outcomes.

7. Timing of actions

A summary of the key actions required to deliver the GEW Protected Area is presented in Table 3. Further detail on the required actions will be outlined in the Implementation Plan. Immediate actions are planned to commence within six to 12 months, medium term actions are planned to commence in one to two years after the publication of this strategy.

Table 3. Actions and the estimated timing.

	Action	Timing	Lead agency
1	Formalise a Partnership Agreement with Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation	Immediate	DELWP
2	Establish governance arrangements, including forming a stakeholder reference group	Immediate	DELWP
3	Develop an Implementation Plan	Immediate	DELWP
4	Develop a Communication Plan	Immediate	DELWP
5	Investigate additional funding and partnership opportunities	Immediate and ongoing until the GEW Protected Area is complete	DELWP
6	Gather knowledge and data on the extent and relative conservation value of land within the GEW investigation area, including assessment of both cultural and ecological values	Immediate and ongoing until the GEW Protected Area is complete	DELWP and relevant delivery partners
7	Review and update MSA Monitoring and Reporting Framework, including KPIs	Immediate	DELWP
8	Undertake a process to guide discussion about land management actions and identify conflicts regarding management preferences using a structured decision-making framework	Immediate and ongoing	DELWP and delivery partners
9	Develop and commence a landowner engagement program	Immediate, commencing July 2021	DELWP in collaboration with Trust for Nature
10	Review statutory planning mechanisms to ensure appropriate land use and protection of GEW in desired areas	Medium term	DELWP in collaboration with Local Government
11	Purchase identified land for transfer to the Crown and reservation under the <i>Crown Land (Reserves) Act 1978</i>	Ongoing. Parcels secured as sufficient revenue from levies becomes available. Continues until GEW Protected Area completion.	DELWP
12	Protect land in perpetuity with on-title agreements	Ongoing. Parcels protected as sufficient revenue from levies becomes available until GEW Protected Area completion.	DELWP and/or delivery partners through Funding Agreements with DELWP
13	On-ground management	Ongoing. Management funded by the MSA Act levy for a 10-year period after protecting each land parcel.	Land management delivery partners through Funding Agreements with DELWP
14	Ecological monitoring and reporting	Ongoing for a 10-year period after a land parcel is protected, and post-10 years as required.	DELWP
15	Review and adapt implementation	Ongoing. This includes review of documents or processes relevant to the implementation of the Strategy, to reflect the findings of research, monitoring or other learnings, and adapt implementation accordingly.	DELWP and/or relevant delivery partner(s)

8. References

Department of Environment, Land, Water and Planning (2015). Monitoring and Reporting Framework: Program Outcomes, for the Melbourne Strategic Assessment. Department of Environment, Land, Water and Planning, East Melbourne.

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

Department of Environment and Primary Industries (2015) Land protection under the Biodiversity Conservation Strategy, Melbourne Strategic Assessment, Department of Environment and Primary Industries, East Melbourne.

Department of Sustainability and Environment (2009). Delivering Melbourne's Newest Sustainable Communities. Program Report. Department of Sustainability and Environment, East Melbourne.

Threatened Species Scientific Committee (TSSC) (2008). Commonwealth Listing Advice on Grassy Eucalypt Woodland of the Victorian Volcanic Plain. [Online]. Department of the Environment, Water, Heritage, and the Arts.

Victorian Auditor General's Office (2020) Protecting Critically Endangered Grasslands, Independent assurance report to Parliament 2019-20: 16, Victorian Government, Melbourne.

9. Appendix

1. Spatial data used to inform potential Grassy Eucalypt Woodland in the study area

The quality of the spatial data used to make decisions is critical – it must be accurate, detailed, and consistent across the investigation area. The data that DELWP currently possess are imperfect, as much of the land in the target area has not been surveyed and the vegetation mapping of individual parcels covers only a small percentage of the investigation area.

Given the patchy coverage of on-ground, surveyed data, several datasets have been created from aerial imagery to provide complete, unbiased coverage of the study area. The available data, its strengths and limitations, are discussed below.

Distribution of 'GEW-relevant' trees

A GIS layer was created which represents every tree relevant to GEW (i.e. within GEW or former GEW) as an individual point. This layer has consistent coverage across the investigation area. It was created from aerial imagery, which is available for the investigation area at sufficient resolution to allow the inspection of individual trees. Planted trees can often be distinguished from remnant trees by their arrangement in rows or clumps and their colour (if they are non-Eucalypts). All roads within the investigation area were travelled, and the landscape was examined with binoculars in order to identify the species of many trees (the Eucalypts in the study area are generally identifiable from a distance of over 100 m with binoculars. Trees which could not be seen were assumed to be *Eucalyptus camaldulensis*). Inlying areas of non-basaltic terrain which are not referable to GEW were excluded.

The majority of trees in the investigation area were River Red Gums, relevant to GEW. The resultant GEW tree layer is shown in Figure 4. There are approximately 10,300 relevant trees in the investigation area. The 'GEW-relevant tree' layer is blind to the different types of GEW.

This layer has the following limitations:

- It is not possible to determine exactly which trees are Large or Medium Old Trees (LOTs or MOTs). This is important, given LOTs and MOTs must be offset separately to native vegetation. Field data collected previously from northern Melbourne during the state government's timestamping of native vegetation project in 2013 suggests that ~74% of all trees are LOTs and 14% are MOTs (data taken from 994 measured River Red Gum trees).
- Some tree canopies visible on the imagery and identified with a single point may be the interwoven canopies of multiple, closely spaced trunks, affecting the estimate of tree number.
- Some tree canopies are very small (e.g. after most limbs have been dropped, etc.) or thinly foliated and may have been missed altogether, affecting the estimate of tree number.
- Areas distant from roads could not be viewed properly and some trees may have been mis-identified or mistakenly included as GEW-relevant trees.

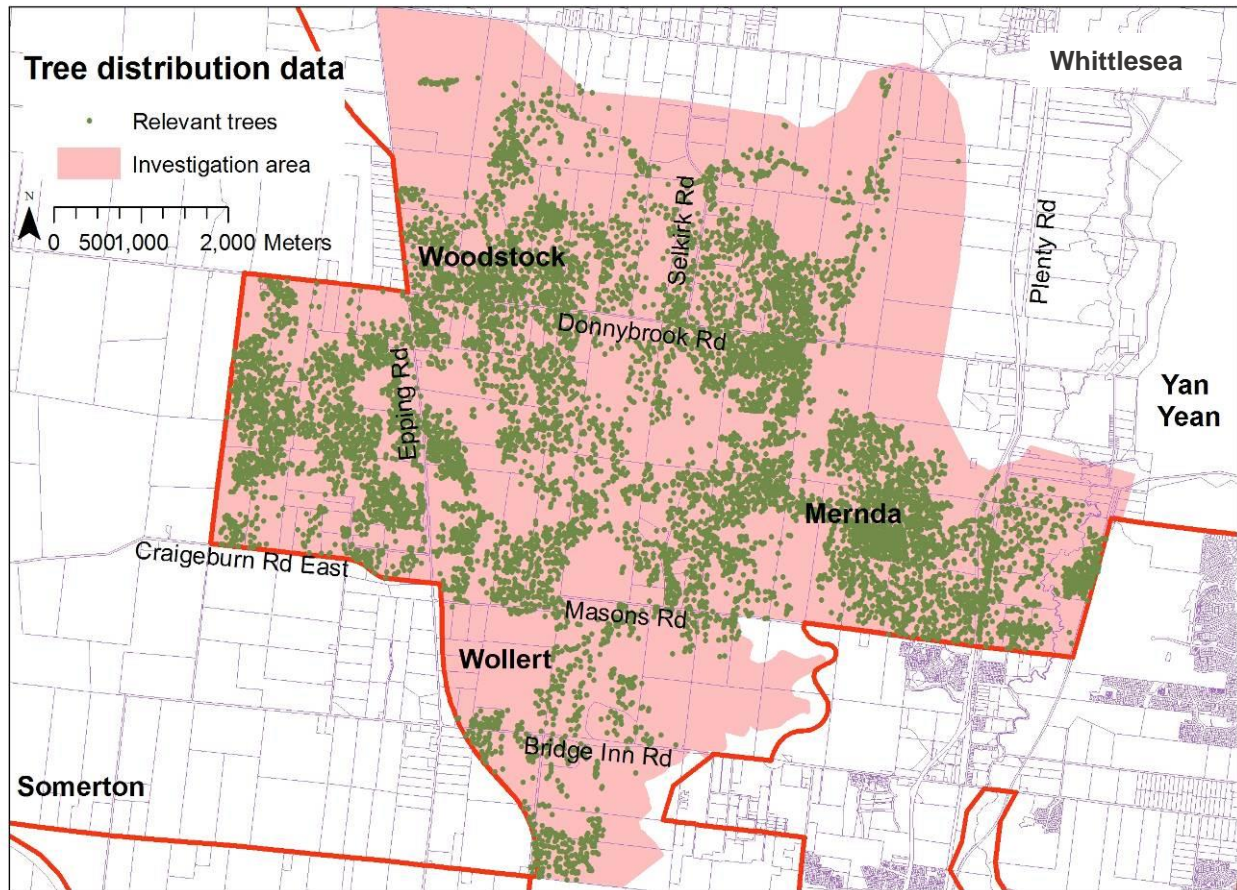


Figure 4. Spatial distribution of trees relevant to GEW.

Distribution of 'GEW canopy'

The 'GEW canopy' is defined here as areas which retain enough canopy trees to meet the tree canopy criterion in the listing, but which may or may not actually meet the criteria for GEW. It allows mapping of all the treed states (*Themeda* Woodland, C3 Woodland and Scattered Trees) in a single category, where the state of the understorey is not known. Most land in this category is probably Scattered Trees. This category is useful because it is so extensive and includes much of the land generally considered to be Red Gum Woodland.

This layer has been created from the tree dataset described above, by establishing a buffer around the point locations of the trees, to encompass all land within a certain radius of the tree trunks. The radius of this buffer has been selected so that the area encompassed is just large enough so that the cover of the tree canopy is 5%. This was achieved by measuring the canopy diameters (north-south and east-west) on 100 randomly selected trees within the study area from aerial photographs (average diameter of *Eucalyptus camaldulensis* was 21 m).

The 5% canopy cover in the 'GEW canopy' area aligns with the minimum canopy criteria for GEW (TSSC 2008; excluding derived grasslands); this 'GEW canopy' dataset thus represents the maximum current extent of treed GEW (but not grasslands derived from GEW). It also represents all areas where treed GEW could be recovered by restoring the understorey beneath existing mature trees.

After buffering the trees, areas of obviously non-native vegetation (dams, buildings, bitumen, etc.) were excluded. Any isolated patches smaller than 0.5 ha were deleted, in line with the GEW description (TSSC 2008).

The 'GEW canopy' GIS layer has the following limitations:

- It is created from the 'Tree distribution' layer and inherits its limitations.
- The radius used to define it is based on an average-sized tree. Given each tree has a canopy of different size and density, the local tree cover will vary somewhat from the intended 5% cover.

The 'GEW canopy' layer is shown in Figure 5.

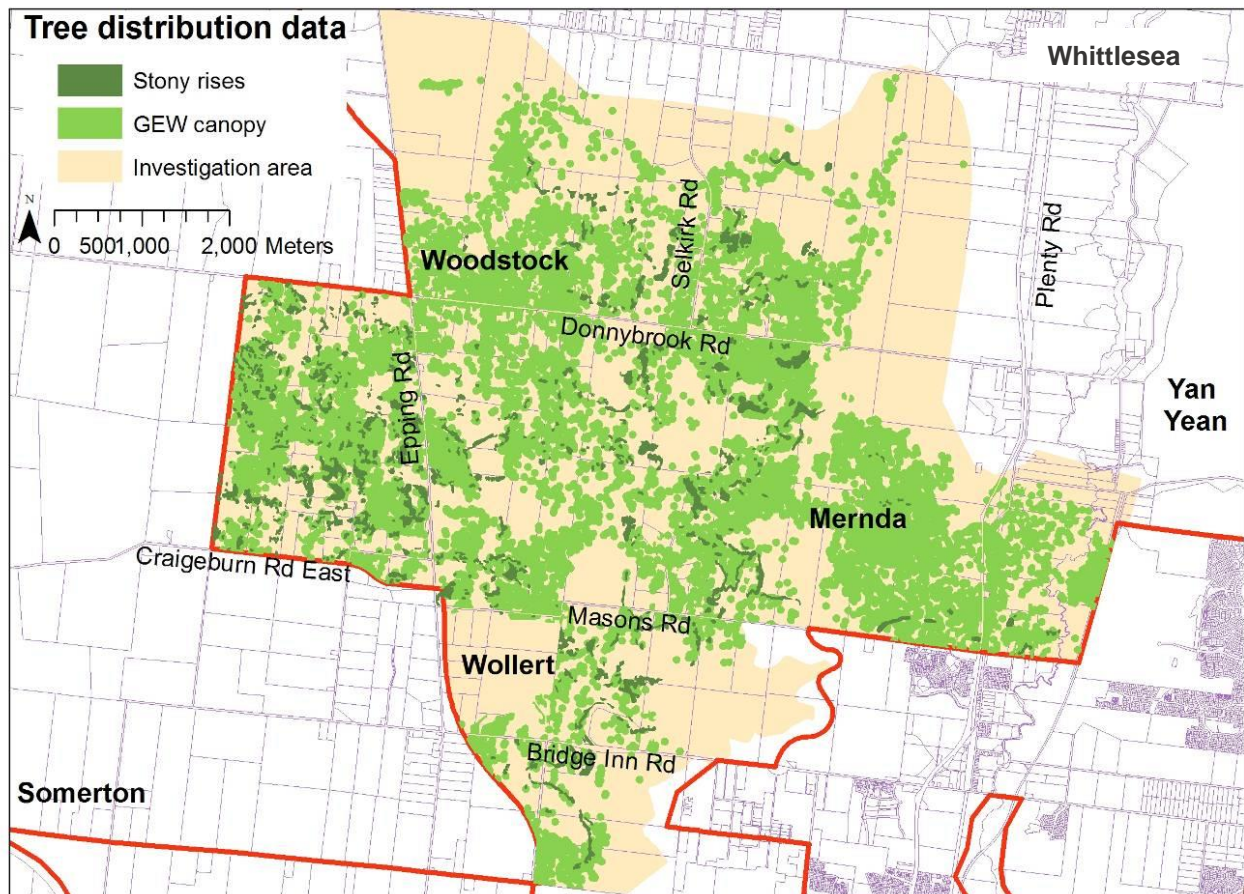


Figure 5. Distribution of 'GEW canopy' and stony rises.

Distribution of Stony rises (GEW 'stony rises' type)

Stony rises are almost always clearly visible on aerial photographs (see Figure 6), and their distribution has been captured by manual interpretation of aerial imagery across the study area. These areas correspond directly to the 'stony rises' type of GEW described above. The GEW definition (TSSC 2008) also explicitly states that GEW extends onto stony rises, wherever they are 'adjacent to' a patch of Eucalypt Woodland (here taken to mean in 'in contact' on a GIS layer, to current or known former GEW, including 'GEW canopy').

Field inspections of numerous properties have revealed that stony rises retain their native vegetation cover at a much higher frequency than the intervening plains. In general, the distribution of stony rises can be used as a useful surrogate for the likely distribution of understorey vegetation likely to meet the GEW understorey criteria.

The 'stony rises' GIS layer has the following limitations:

- aerial photo interpretation is subject to human error
- boundaries of some stony rises are indistinct and their bounds may be locally subjective
- the layer is not a perfect surrogate for GEW - not all stony rises retain native vegetation cover (e.g. those which have been used as platforms to lay hay in otherwise boggy paddocks, or those that have been aerially top-dressed with fertiliser).

The 'stony rises' layer is shown in Figure 5, above.



Figure 6. An aerial photograph (within the investigation area) showing the arrangement of landforms. Stony rises (R) are clearly visible, sometimes surrounded by 'halos' of moisture (W). The plains between the stony rises often display gilgai features (G). Trees are distributed across all of these landforms, while shrubs are often concentrated on the stony rises (S). This photograph was taken in summer 2008-2009, after many years of drought, when grass cover was low and the geomorphic features were particularly obvious.

2. Grassy Eucalypt Woodland state-and-transition model to guide protection and management.

DELWP has developed a state-and-transition model for GEW, presented in Figure 7.

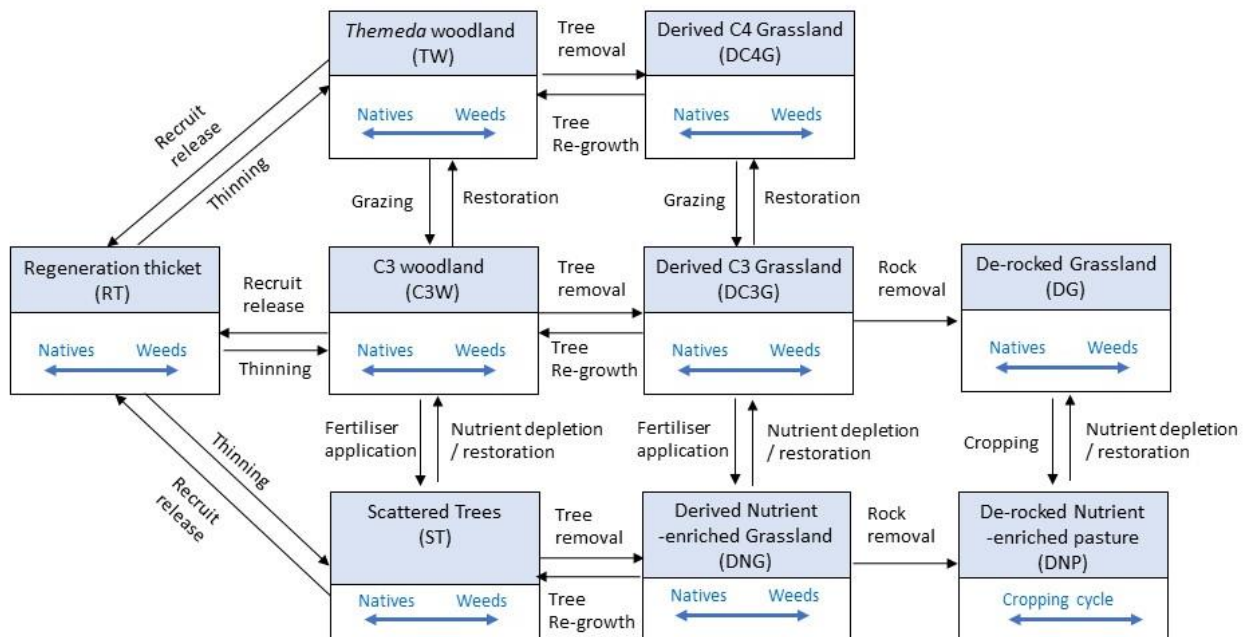


Figure 7. State-and-transition model describing GEW. This model applies to GEW as it occurs on undulating plains with an understorey naturally dominated by *Themeda triandra*. Sites naturally dominated by Common Tussock Grass (*Poa labillardierei*) naturally lack the States TW and DC4G. Some possible states are not shown because they are not known to exist in the current landscape (e.g. Pre-colonial reference state; derived shrubland, etc.). This model is based on the published state-and-transition model currently being used for Natural Temperate Grassland of the Victorian Volcanic Plain.

***Themeda* Woodland**

This state includes vegetation with an intact eucalypt canopy and an understorey strongly dominated by Kangaroo Grass (*Themeda triandra*). It is the rarest and most intact state in the contemporary landscape. It has often experienced light or intermittent grazing over a long period, but rarely fertiliser application, over sowing, de-rocking or cropping. It is a priority for protection.



Figure 8. *Themeda* Woodland.

C3 Woodland

This vegetation has an intact eucalypt overstorey, with an understorey dominated by native grasses; however, Kangaroo Grass has been replaced by native species tolerant of prolonged grazing (usually cool-season (C3) grasses such as Spear Grass (*Austrostipa*) and/or Wallaby Grass (*Rytidosperma*)). These areas have often experienced prolonged moderate to heavy grazing, they possibly have some history of low-degree fertiliser application and oversowing but have never been de-rocked or cropped.



Figure 9. C3 Woodland.

Derived Grassland States (DC3G and DC4G)

Derived grasslands no longer have any trees but retain a ground layer dominated by native grasses. Land in this state has usually been subject to prolonged moderate to heavy grazing, possibly with some history of low-degree fertiliser application and oversowing but has not been de-rocked or cropped, resulting in grassland dominated by C3 grasses such as Spear Grass (*Austrostipa*) and/or Wallaby Grass (*Rytidosperma*) (DC3G). In rarer instances, land may have experienced light or intermittent grazing over a long period, but rarely fertiliser application, oversowing, de-rocking or cropping, in which case a C4 grassland dominated by Kangaroo Grass (*Themeda triandra*) will remain (DC4G).



Figure 10. Derived C3 Grassland.

Scattered Trees

These areas contain *Eucalyptus* trees, but the understorey is dominated by exotic species characteristic of high nutrient agricultural environments. Such areas are widespread but are degraded. The land has a long history of intensive grazing, fertiliser application and possibly oversowing of exotic pasture species.



Figure 11. Scattered trees.