



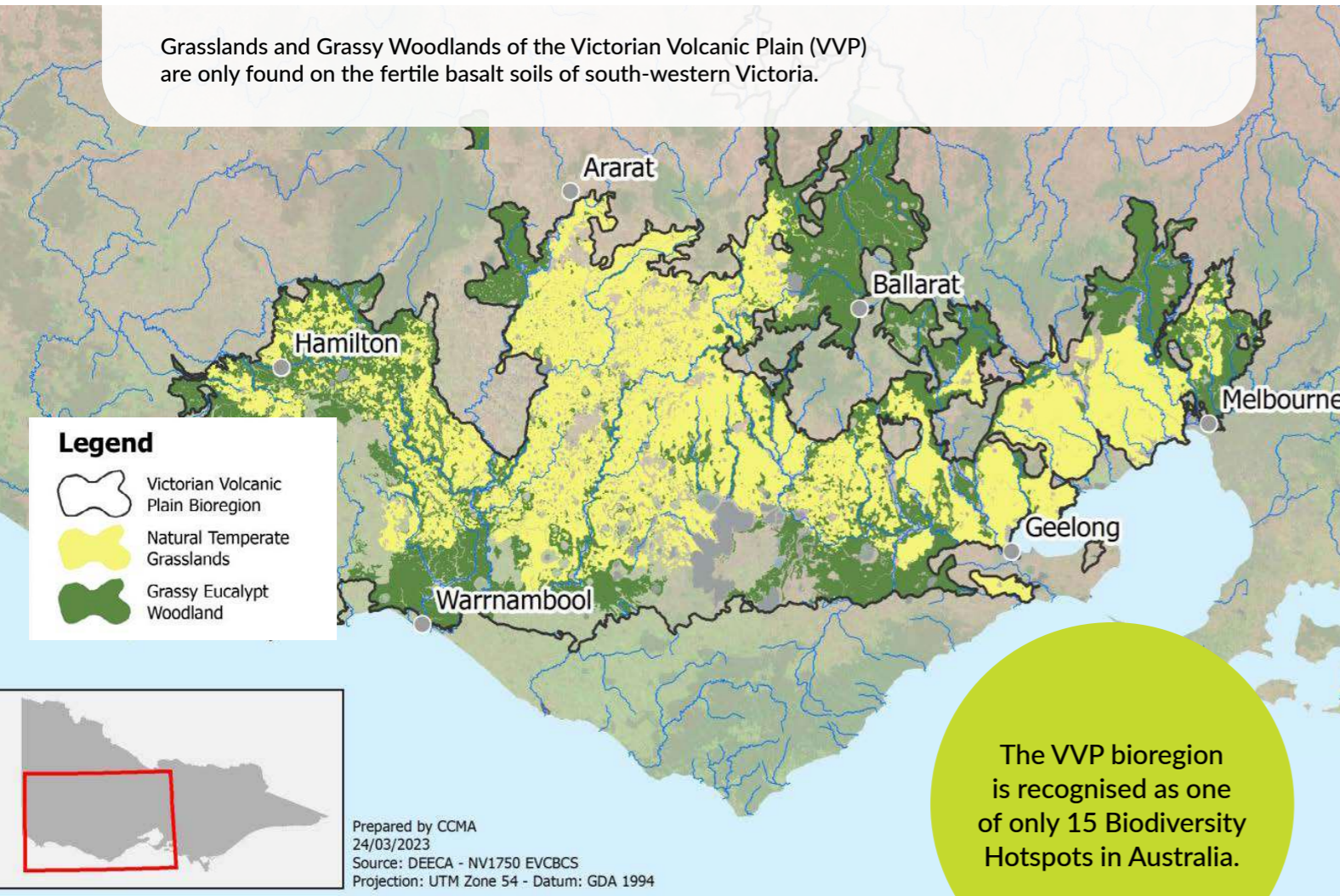
A GUIDEBOOK TO
GRASSLANDS
& GRASSY
WOODLANDS
OF THE VVP

ABOUT THIS GUIDE

This guide is designed to support land holders, managers and the wider community to maintain and improve the unique flora and fauna of our volcanic plains grasslands and grassy woodlands.

Raising awareness and understanding of these unique ecosystems will help ensure that they are protected and restored for future generations.

Grasslands and Grassy Woodlands of the Victorian Volcanic Plain (VVP) are only found on the fertile basalt soils of south-western Victoria.



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WHY ARE GRASSLANDS AND GRASSY WOODLANDS OF THE VVP SO SPECIAL?

In spring and summer, they delight us with spectacular displays of wildflowers and grasses.

Grassy ecosystems exist as small, isolated patches in a landscape largely cleared for agriculture and urban development. These precious remnants are mostly on private land with small areas on public sites such as roadsides, rail reserves and cemeteries.

They provide vital habitat for a diverse range of plants and animals, including numerous threatened species.

Indigenous cultural practices reflect the deep connection that Traditional Owners have to this landscape.

Reducing pressures from weeds, feral animals, livestock, land clearance, and other human activities helps protect native biodiversity and maintain ecosystem function.



These unique communities are among Australia's most threatened ecosystems, **OCCUPYING 1% LESS THAN OF THEIR FORMER EXTENT.**



WHAT CAN WE DO TO HELP?

Appropriate land management practices can help maintain and improve the condition of these grassy communities.

Getting to know plants and animals that live in these communities can increase our understanding of ecosystem health and help guide land management decisions.





WHAT DO THESE GRASSY COMMUNITIES LOOK LIKE?

Natural grasslands and grassy woodlands are types of native vegetation where native grasses are the dominant feature on the ground. The grassy communities that occur on the Victorian Volcanic Plain are officially classified as Natural Temperate Grassland and Grassy Eucalypt Woodland.

Both grasslands and grassy woodlands grow on flat to undulating plains with occasional stony rises, on cracking clay soils derived from volcanic basalt. These soils tend to be fertile but poorly draining.

The dominant grasses, herbs, shrubs or trees can vary between different grassland or woodland communities and are influenced by site conditions such as soil type, rainfall, grazing, nutrients and weed cover.

Key Threats to Grassy Communities

- Vegetation loss through clearing, overgrazing or land use change
 - Unsuitable burning or slashing regimes
- Inappropriate application of herbicides or fertilisers
 - Weed invasion

Natural Temperate Grasslands of the Victorian Volcanic Plain

The ground layer is dominated by native tussock-forming grasses. The main grasses are perennial - meaning they live throughout the year - and include Kangaroo-grass, Wallaby-grasses, Spear-grasses and Tussock-grasses.

The spaces between tussocks can contain a variety of colourful wildflowers such as lilies, daisies, sundews and orchids. Many of these only emerge during spring to early summer, particularly in years with good rainfall.

The nationally Endangered Golden Moth Orchid is only found in the grassy communities of the VVP.

Trees are usually absent or very sparse in the grasslands.

Below: Grassland dominated by Spear-grasses and Wallaby-grasses.

Conservation Rating

The Natural Temperate Grassland of the Victorian Volcanic Plain and the Grassy Eucalypt Woodland of the Victorian Volcanic Plain are both critically endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act (1999)*.

Grassy Eucalypt Woodlands of the Victorian Volcanic Plain

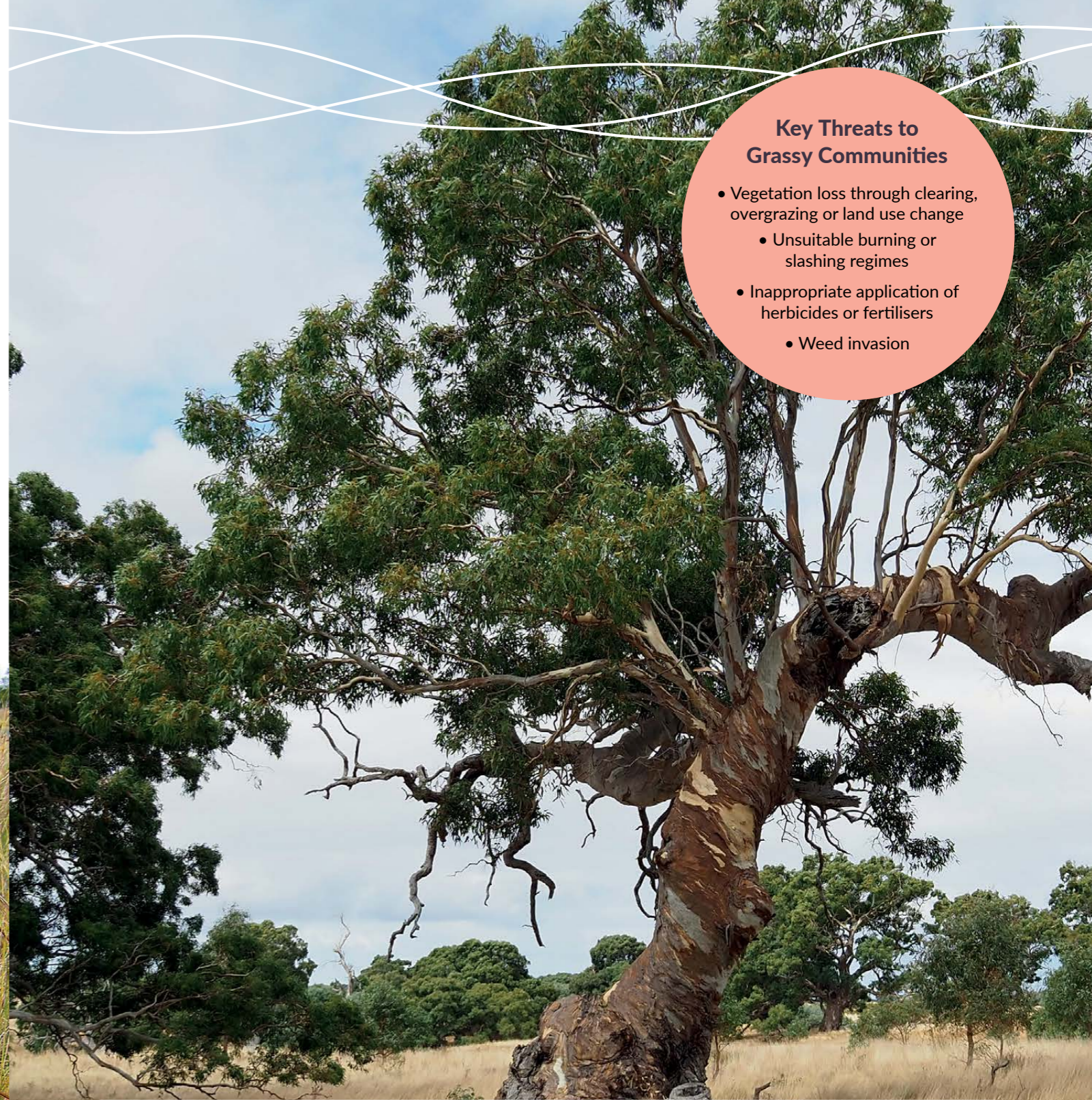
The main difference between the grassland and grassy woodland is a greater presence of trees. Historically, the two communities intergraded, forming a mosaic of grassy vegetation with variable tree cover.

The grassy woodland is an open woodland typically dominated by River Red Gums up to 15 m tall. In higher rainfall areas, Swamp Gum

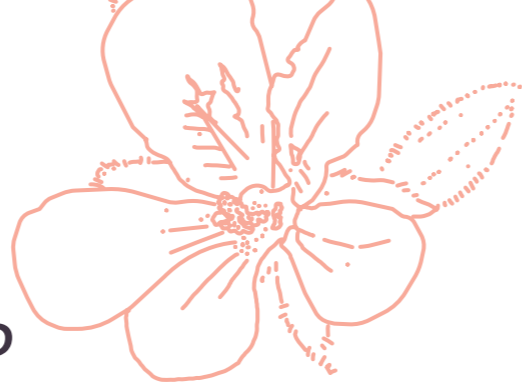
or Manna Gum may be prominent, while in areas of lower rainfall Grey Box or Yellow Box tend to take the place of River Red Gums. A few other trees and shrubs may be present such as Lightwood, Black Wattle, Blackwood, Drooping Sheoak, Silver Banksia, Prickly Tea Tree or Sweet Bursaria. The ground layer has similar grass and herb species as the natural grassland.

Woodland sites where trees have been removed can sometimes look a bit like a natural grassland. These communities are known as 'derived' grasslands.

Above: River Red Gum woodland



NATIVE FLORA OF THE GRASSLANDS & GRASSY WOODLANDS OF THE VVP



Grasses



Kangaroo Grass
Themeda triandra



Spear Grass
Austrostipa spp.



Wallaby Grass
Rytidosperma spp.

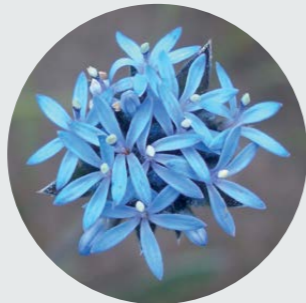


Weeping Grass
Microlaena stipoides

Wildflowers



Pink Bindweed
Convolvulus erubescens



Blue Pincushion
Brunonia australis



Clustered Everlasting
Chrysocephalum semipapposum



Featherheads
Ptilotus macrocephalus



Hoary Sunray
Leucochrysum albicans subsp. *tricolor*



Blue Devil
Eryngium ovinum



Showy Podolepis
Podolepis jaceoides



Murnong/ Yam Daisy
Microseris walteri



Clover Glycine
Glycine latrobeana



Button Wrinklewort
Rutidosia leptorhynchoides



Spiny Rice-flower
Pimelea spinescens subsp. *spinescens*



Grassland Sundew
Drosera hookeri

Orchids & Lilies



Sun Orchid
Thelymitra spp.



Fragrant Leek Orchid
Prasophyllum suaveolens



Golden Moth Orchid
Diuris basaltica



Golden Cowslip Orchid
Diuris behrii

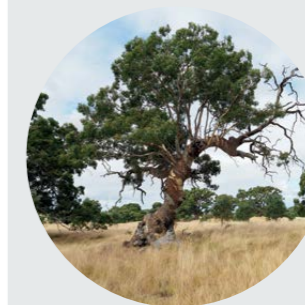


Chocolate Lily
Arthropodium strictum



Milkmaids
Burchardia umbellata

Trees & Shrubs



River Red Gum
Eucalyptus camaldulensis



Drooping Sheoak
Allocasuarina verticillata



Black Wattle
Acacia mearnsii



Silver Banksia
Banksia marginata



Sweet Bursaria
Bursaria spinosa



Tree Violet
Meliccytus dentatus

Fungi & Lichen



Yellow Navel
Lichenomphalia chromacea



Vermilion Grisette
Amanita xanthocephala



Basalt Lichen





Woodland trees and shrubs provide food as well as nesting sites and hollows for birds, bats and possums. Birds of prey use them as perches while hunting over the grasslands.



Wetlands and flooded grasslands with reeds, sedges and rushes are used for waterbirds, frogs and macro-invertebrates. Critically endangered 'Seasonally Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains' ecological community can be interspersed between grasslands and grassy woodlands.



Both living and dead paddock trees provide foraging and nesting sites, and refuges in hollows or under bark. They connect habitats, helping animals move across the landscape.

The **shade and leaf litter** under trees help seedlings to establish.



GRASSLANDS AND GRASSY WOODLANDS PROVIDE A DIVERSITY OF HABITATS



Mosses, lichens, liverworts, algae and fungi form a protective soil crust, helping to hold moisture and reduce weed invasion.



Fallen logs, tree stumps and leaf litter create habitat for small mammals, echidnas, reptiles and invertebrates. Fungi, bacteria and invertebrates live and work within fallen timber and the organic ground layer, returning nutrients to the soil.



Tussock grasses with wildflowers, small shrubs, open spaces and ground features like soil cracks and rocks, all provide food and shelter for invertebrates, birds, small mammals, frogs and reptiles. These soil cracks are very important refuges during fire.



NATIVE FAUNA OF THE GRASSLANDS & GRASSY WOODLANDS OF THE VVP



Wedge-tailed Eagle
Aquila audax



Black-shouldered Kite
Elanus axillaris



Southern Boobook
Ninox novaeseelandiae



Tawny Frogmouth
Podargus strigoides



Brolga
Antigone rubicunda



Eastern Yellow Robin
Eopsaltria australis



Superb Fairy Wren
Malurus cyaneus



Sugar Glider
Petaurus breviceps



Fat-tailed Dunnart
Sminthopsis crassicaudata



Little Forest Bat
Vespardelus vulturinus



Echidna
Tachyglossus aculeatus



Blue Tongue Lizard
Tiliqua scincoides



Little Whip Snake
Suta flagellum



Common Froglet
Crinia signifera



Spotted Marsh Frog
Limnodynastes tasmaniensis



Native Bees
Lassioglossum lanarium



Golden Sun Moth
Synemon plana

VULNERABLE

Grassland Specialist.
This bright day-flying moth prefers grasslands with lots of wallaby and spear-grasses – its larval food plants. Grass tussocks provide shelter and egg-laying sites, but the moths also need open spaces for basking and attracting mates.



Plains Wanderer
Pedionomus torquatus

CRITICALLY ENDANGERED

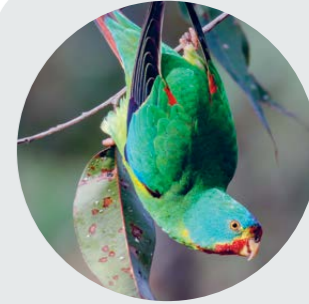
Grassland Specialist.
This shy, quail-like bird prefers sparse native grasslands, feeding on seeds, leaves and invertebrates. It builds a grass-lined nest in a hollow scratched into the ground between tussocks.



Grassland Earless Dragon
Tympanocryptis pinguicolla

CRITICALLY ENDANGERED

Grassland Specialist.
Growing to only 15cm long, this cute little dragon shelters amongst grass tussocks, in spider burrows, and beneath rocks. Not seen on the basalt plains in recent decades, there are hopes it is hanging on in the eastern areas of the VVP.



Swift Parrot
Lathamus discolor

CRITICALLY ENDANGERED

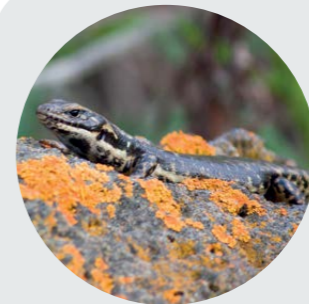
This colourful parrot breeds only in Tasmania and migrates to the mainland each autumn-winter – the longest migration of any parrot in the world! Victoria's grassy woodlands are an important foraging habitat.



Striped Legless Lizard
Delma impar

VULNERABLE

Grassland Specialist.
This legless lizard grows up to 30cm long. Found only in grassland and nearby grassy woodland, it hunts spiders and insects. It shelters at the base of grass tussocks, in soil cracks or beneath logs and rocks.



Corangamite Water Skink
Eulamprus tympanum

ENDANGERED

Found nowhere else, this elusive skink lives on stony rises near wetlands on the VVP, feeding on terrestrial and aquatic invertebrates. Rock piles are a critical component of their habitat, providing cool and humid refuges over summer.



Grey-headed flying-fox
Pteropus poliocephalus

VULNERABLE

One of the world's largest flying foxes, it forages in woodland trees, helping to disperse pollen and seeds.



Southern Bell Frog
Litoria raniformis

VULNERABLE

Also known as the Growling Grass Frog, this large green and gold frog lives in grasslands near permanent or seasonally flooded water bodies. Over winter it hibernates beneath logs, rocks, grass clumps and in deep soil cracks.

ABORIGINAL CULTURAL HERITAGE

Traditional Owners hold a rich cultural knowledge and strong spiritual connection to Country, and have managed the land in a culturally sensitive and environmentally sustainable way for millennia. Many different kinds of cultural heritage values are associated with the grasslands and grassy woodlands of the VVP. Burial sites, artefact scatters, shell middens, stone structures and scar trees are physical reminders of

the connection that Aboriginal people have with this landscape. There are also numerous intangible attributes that are passed across generations, such as **songlines**, **stories** and other cultural practices and **knowledge systems**. Particular places and plant or animal species all hold important cultural and ecological significance.

Protecting cultural heritage

Many cultural assets have survived decades of agriculture and other land uses and need on-going protection. Both physical and intangible values are a precious part of the heritage of the whole community. They provide Traditional Owners with insightful links to their culture and their past. In Victoria, Aboriginal artefacts and cultural places are protected by law, under the *Aboriginal Heritage Act (Vic) 2006*.

Private landholders play an important role in protecting and preserving cultural heritage. You can find out about Traditional Owners' ongoing connection to Country by engaging with the relevant Registered Aboriginal Party (RAP) Groups. Inviting Traditional Owners to access Country with you offers invaluable opportunities to learn together in caring for and managing native grasslands and grassy woodlands. Land management that maintains and protects ecosystems and species will also help to preserve cultural heritage values.

If you discover cultural heritage values, you need to report it to Aboriginal Victoria or the relevant RAP. You can also enter into a voluntary Cultural Heritage Agreement with a relevant RAP to work together to manage and protect Aboriginal cultural heritage places and/or objects.



Bulbine Lilies (*Bulbine bulbosa*) have edible corms



Scar Tree

Grasslands as a rich resource

The diversity of plants and animals living in grassy communities are a rich resource, providing food, medicines and materials.

Roots and tubers of flowers and other herbs provide an important source of carbohydrate; wattle and grass seeds can be ground up for making breads, and nectar-rich flowers like those of Silver Banksia make a delicious, sweet drink when soaked in water. Plants are also a valuable source of medicines.

The fibrous stems and leaves from riceflowers, flax-lilies and grasses are used to make rope, nets and baskets. Implements and tools can be carved out of wood from wattles, eucalypts and she-oaks. Bark removed from large trees can be used to make canoes, shields and shelters.



Grasses are an important food resource for their nutritional values and for traditional weaving practice

Cultural burning

Aboriginal people have used fire for thousands of years to manage grasslands and grassy woodlands. These burns are typically patchy, low intensity fires that trickle through the landscape. Removing thatch to maintain the open grassland structure allows important food and medicine plants to thrive, and the fresh grass growth after the fire attracts herbivores like kangaroos, for hunting.



HOW CAN WE **PROTECT** AND **RESTORE** FLORA AND FAUNA HABITAT IN GRASSLANDS AND GRASSY WOODLANDS?

GIVE NATIVE SEEDLINGS THE BEST CHANCE OF SURVIVAL

by controlling pest animals, such as rabbits and hares. Help small mammals, birds and reptiles survive by reducing numbers of foxes and cats.

AVOID FERTILISERS

near native grasslands, woodlands and paddock trees. They can kill native plants and favour weed species.

CONTROL THE SPREAD OF WEEDS,

taking care that herbicides don't adversely affect native plants. Ensure weed seeds are not inadvertently brought into grasslands on machinery and vehicles.

AVOID CULTIVATION, HEAVY VEHICLES AND OTHER FORMS OF SOIL DISTURBANCE

which destroy soil cracks, spider burrows, fungal networks and lichen crusts. Disturbed soil encourages weed invasion.

LIMIT PESTICIDE USE to leave more insects for birds and other fauna, and encourage beneficial invertebrates.

AVOID RODENTICIDES which can have unintended lethal consequences for owls, frogmouths and other birds of prey.

MAINTAIN NATURAL WETLAND SYSTEMS, and exclude stock in times of heavy rain.

USE CAREFUL GRAZING REGIMES, CONTROLLED BURNING OR SLASHING

to maintain an open native tussock grassland with spaces for native herbs, wildflowers and bare ground.

PROVIDE MORE HABITAT.

Encourage natural recruitment by limiting grazing pressure and weed invasion. Revegetation can be used to increase diversity and structure or to extend and buffer an ecological community. It is important to use local species appropriate to the vegetation community at the site.

LEAVE TREE STUMPS, LOGS, DEBRIS AND ROCKS as fauna habitat and nutrients that will eventually be returned back into the soil.

RETAIN BOTH LIVING AND DEAD PADDOCK TREES -

it can take a **CENTURY** for hollows to develop! Protect paddock trees with fencing wider than their canopy to help seedlings regenerate. Allow fallen logs and debris to accumulate beneath them.

How can these actions also benefit farms?

- Native grasslands and grassy woodlands thrive in low nutrient soils, without the need for fertilising.
- Grassy communities are more drought resistant, and help prevent loss of topsoil.
- Limiting pesticide use increases the abundance and diversity of insect pollinators, beneficial soil invertebrates and natural pest control agents.
- Improving habitat for insectivores like birds, microbats and lizards can help control populations of pest insects.
- Rotational grazing can reduce invasive weeds and encourage protein-rich native grasses, increasing the availability of green pick when improved pastures are dry.
- Summer-growing native grasses pose less of a fire risk, and provide feed for livestock when other pastures are sparse.
- Retaining debris, protecting soil crusts and encouraging digging fauna like echidnas, all help to recycle nutrients, improve soil structure and maintain healthy, fertile soils.
- Paddock trees provide shelter and shade for livestock.

MANAGEMENT CONSIDERATIONS

Management techniques for grasslands and grassy woodlands will vary depending on the plant community and past land use of the site. It is best to start with an initial survey to determine which native and exotic plants and animals are present.

Understanding vegetation condition and habitats can help make informed decisions about future management. It is often useful to divide the site into management zones (e.g. vegetation types, weed density, significant species). Compiling this information with the aid of aerial maps can reveal the scale of each issue, where they lie within the overall site and

any points of significance. The information gathered provides a starting point and an overall goal for each management zone.

Once management activities are underway, a monitoring program can be an effective way of recording any changes to the condition of the site so that you can adjust techniques as needed. Photo-point monitoring is an easy way to see visual changes over time. Set up a post overlooking the site, mark the spot where the camera will sit and take photos at set intervals.

Biomass Management

Healthy grasslands have an open structure. The removal of excess plant material stimulates fresh grass growth and provides space between the tussocks for wildflowers and other herbs. In their natural state, this structure would have been maintained through traditional burning practices and grazing by native herbivores. Left unchecked, grasslands gradually become swamped by dense plant growth, leading to a loss of flora and fauna biodiversity.

Biomass management is therefore a key strategy for maintaining or improving the vegetation structure and species composition of native grasslands.

Overgrown grassland with no spaces between tussocks



Healthy native grasslands have open ground and spaces for wildflowers.



Burning

Fire is a very effective tool for reducing grassland biomass, controlling weeds and stimulating the germination and growth of many native grassland species.

Season and frequency of burning are important. Timing will depend on the type of plant community present, the desired outcome and the prevailing conditions. A late summer to early autumn burn is generally considered best for avoiding the reproductive cycle of most plants and animals. In weedier sites, an early spring burn can help reduce cover of cool-season annual weeds prior to setting seed.

Fire frequency depends on how much growth has accumulated and the type of grassland being managed. Grasslands dominated by Kangaroo Grass respond well to a fire interval of 2-5 years. Grassy woodlands require longer fire intervals (at least 6-7 years) to allow shrubs and trees to regenerate. For larger remnants, mosaic or patch burning helps to retain some refuges for animals.

It is important to consult with your local Catchment Management Authority or Council before planning controlled burns.

Below: A low intensity burn



Fencing allows for better management of grazing and canopy tree recruitment.

Grazing

Carefully planned livestock grazing can be used to reduce plant biomass in previously grazed grasslands. Careful timing, frequency and intensity of grazing are critical for ensuring that the grasslands are not negatively impacted. Continual or set stocking can compact soil, destroy soil crusts and fungi, lead to weed invasion and prevent native plant recruitment. Kangaroo Grass tends to be replaced by more grazing tolerant exotic or native grasses when stock disturbance is high. Grazing in woodlands can prevent the recruitment of new eucalypts which are needed to replace old canopy trees.

Removing stock when most native plants are growing, flowering or setting seed (usually mid spring to early summer) leads to the best outcomes. Livestock should

be avoided in sites that have not been grazed in the past, as many native plants, like lilies, orchids and daisies, disappear even under light grazing pressure.

Slashing

Where grazing or burning is not possible, slashing to a height of at least 100 mm can be used to reduce biomass while allowing native grasses to re-grow from above the ground. Slashing should be avoided between early spring and mid to late summer when most native plants are flowering or setting seed. Cutting and baling to remove slashed material, prevents the smothering of native plants and can help control introduced grasses by removing weed seed and nutrient.

WEED INVASION OF GRASSLANDS AND GRASSY WOODLANDS

Introduced plants compete with native plants for space, water and nutrients and degrade grassy ecosystems. Soil disturbance is the major factor that encourages weeds to grow. Careful management can reduce or prevent weed establishment and spread.

Weed seeds can be introduced in many ways including transportation on machinery, in contaminated fodder, carried on the coats of animals, in clothing and in the movement of water, soil, gravel that can be washed or blown in.

Weeds can be controlled using a combination of physical removal and chemical or biological control, as well as careful land management practices (e.g. fire, grazing). Herbicides can be an effective method to control weeds, but without careful planning can kill native grassland plants, and lichen and moss that protect the soil. It is important to use the right herbicide in the right way.



African Boxthorn
Lycium ferocissimum



Galenia, Carpet Weed
Aizoon pubescens



Gorse
Ulex europaeus



Sweet Briar Rose
Rosa rubiginosa



Artichoke Thistle
Cynara cardunculus



Serrated Tussock
Nassella trichotoma



Fog Grass
Holcus lanatus



South African Weed Orchid
Disa bracteata



Sweet Vernal Grass
Anthoxanthum odoratum



Spear Thistle
Cirsium vulgare

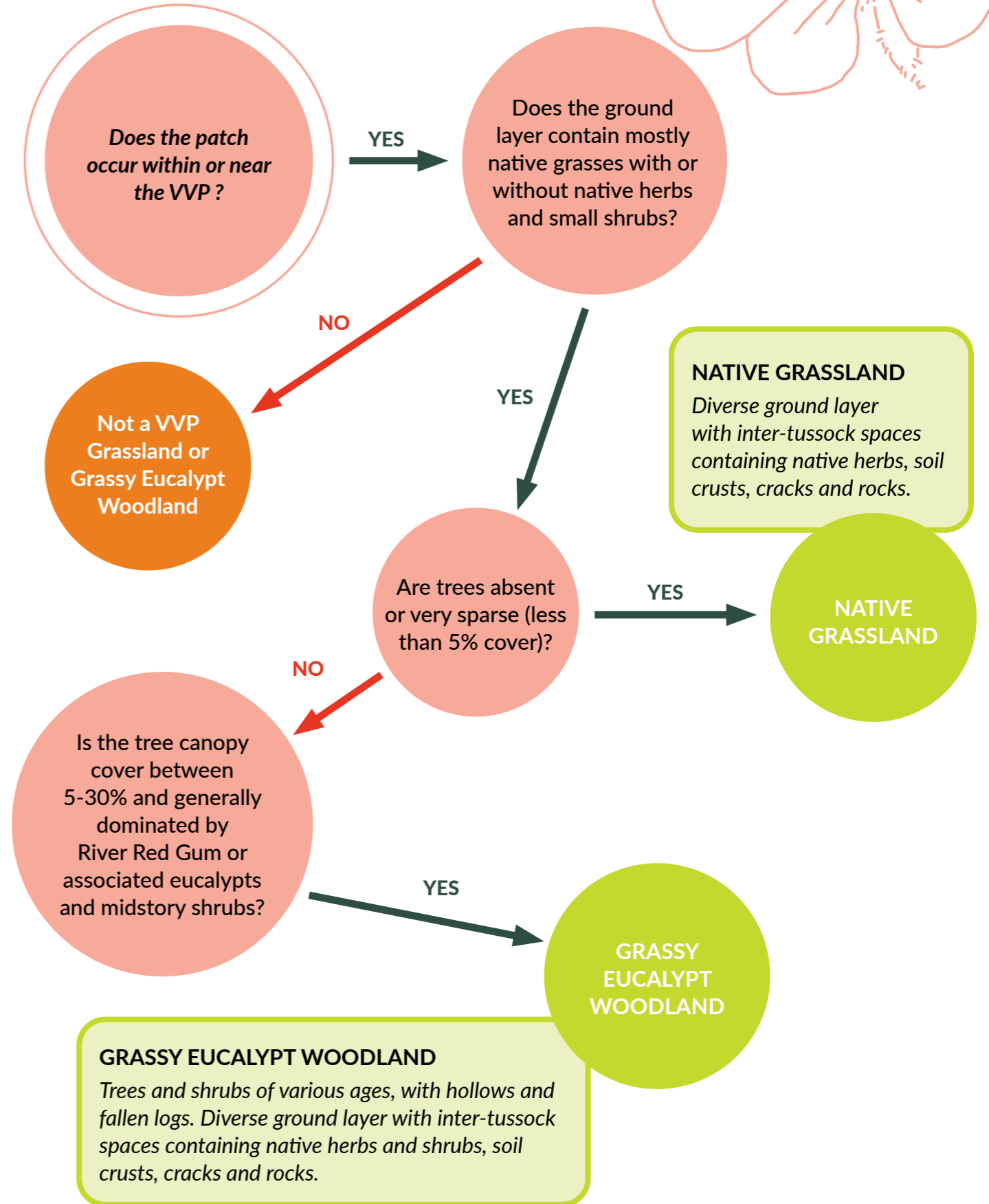


Phalaris
Phalaris aquatica



Chilean Needle Grass
Nassella neesiana

DOES YOUR SITE **SUPPORT** GRASSLANDS OR GRASSY WOODLANDS?



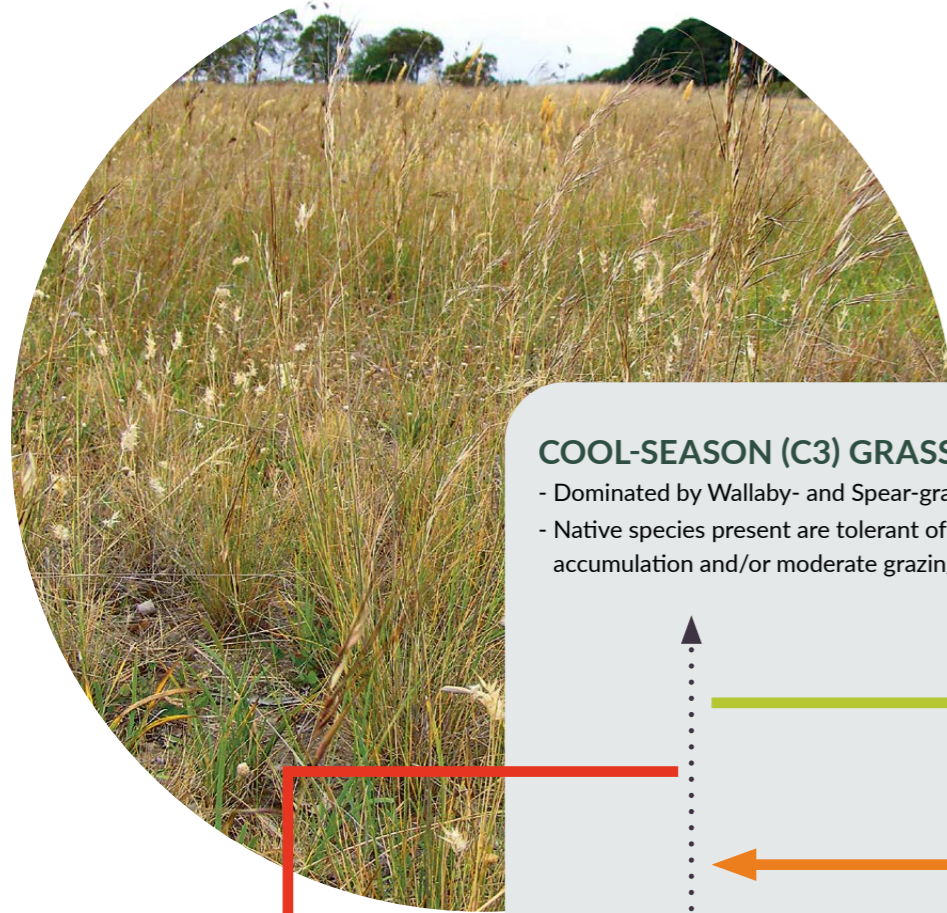
STAGES TO RECOVERY

Condition States of Natural Temperate Grasslands

The condition or state of natural grasslands reflects their history and management.

Management practices that reduce biomass accumulation (including strategic grazing and burning), targeted weed control and revegetation can all help to improve grassland condition and encourage the growth of native herbs and wildflowers.

Grasses photosynthesise through two different pathways, C3 and C4. C3 grasses are winter-active and C4 grasses are summer-active.



COOL-SEASON (C3) GRASSLAND

- Dominated by Wallaby- and Spear-grasses
- Native species present are tolerant of biomass accumulation and/or moderate grazing

RESTORATION

- Release disturbance pressures
- Nutrient depletion
- Seed addition

C4 TO C3 TRANSITION

- Prolonged grazing
- Low level fertilising
- Weed invasion
- Herbicides

THEMEDA (C4) GRASSLAND

- Dominated by Kangaroo Grass
- Native species are less tolerant of biomass accumulation and/or moderate grazing

RESTORATION

- Release disturbance pressures
- Nutrient depletion
- Seed addition/planting
- Cool burning

DEPLETION OF HERB FLORA

- Light grazing
- Biomass accumulation
- Low level fertilising
- Weed invasion
- Herbicides
- Exotic legumes (increased soil nitrogen)

HERB-RICH GRASSLAND

- Usually dominated by Kangaroo Grass
- A diversity of native herbs, wildflowers, small shrubs and other native grasses, including grazing-sensitive species

LOSS OF ROCK

- Mechanical removal
- Soil cultivation

DE-ROCKED (C3) GRASSLAND

- Dominated by Wallaby- and Spear-grasses
- Few native species

NUTRIENT INCREASE

- Heavy fertilising
- Nutrient accumulation by livestock

NUTRIENT-ENRICHED GRASSLAND

- Dominated by introduced grasses and broad-leaved weeds that favour high nutrients
- Few native species



KEY

- Rapid degradation
- Gradual degradation
- Gradual improvement

STAGES TO RECOVERY

Condition States of Grassy Eucalypt Woodlands

The understorey condition states of grassy woodlands are very similar to those of natural grasslands, and will therefore respond in much the same way to the management practices described for grasslands.

Additional management considerations relate to the canopy layer. Grassy woodlands can be maintained in good condition by leaving existing trees and allowing natural regeneration of seedlings to replace old trees. Under certain conditions, dense thickets of regenerating Eucalyptus seedlings may need to be thinned to prevent them from outcompeting other native species.



KEY

- ➔ Rapid degradation
- ➔ Gradual degradation
- ➔ Gradual improvement



NUTRIENT-ENRICHED DERIVED GRASSLAND

- Dominated by introduced grasses and broad-leaved weeds that favour high nutrients
- Few native species

NUTRIENT INCREASE AND TREE LOSS

- Heavy fertilising
- Nutrient accumulation by livestock
- Tree removal
- Grazing

NUTRIENT DEPLETION

- Leaching from soil profile
- Biomass control
- Replanting/seed addition

SCATTERED TREES

- Isolated eucalypts and/or paddock trees
- Understorey dominated by exotic species tolerant of high nutrients or intensive grazing

RESTORATION

- Release disturbance pressures
- Seed addition/planting
- Nutrient depletion
- Protect seedling recruitment

TREE LOSS AND UNDERSTOREY DEGRADATION

- Intensive grazing
- Heavy fertilising
- Over-sowing with exotic pasture species
- Weed Invasion

COOL-SEASON (C3) WOODLAND

- Intact eucalypt canopy
- Understorey dominated by Wallaby- and Spear-grasses
- Other trees and shrubs may be present

RESTORATION

- Release disturbance pressures
- Seed addition/planting
- Cool burning
- Nutrient depletion

C4 TO C3 TRANSITION

- Prolonged grazing
- Low level fertilising
- Biomass accumulation
- Weed invasion
- Herbicides

INTACT WOODLAND

- Intact eucalypt canopy
- Understorey dominated by Kangaroo Grass
- May also support a diversity of native herbs, other trees and small shrubs including grazing-sensitive species

RECRUIT RELEASE

- Grazing removal

THICKET THINNING

NUTRIENT INCREASE

- Heavy fertilising
- Nutrient accumulation by livestock

RESTORATION

- Leaching from soil profile
- Biomass control
- Seed addition/planting
- Nutrient depletion

RE-PLANTING

- Eucalypt canopy and other trees or shrubs

LOSS OF TREES

- Removal
- Lack of recruitment (grazing)

REGENERATION THICKET

- Very high density of *Eucalyptus* or other tree or shrub seedlings



NUTRIENT-ENRICHED WOODLAND

- Understorey dominated by introduced species that favour high nutrients
- Few native species



DERIVED C3 OR C4 GRASSLAND

- Understorey dominated by native grasses



CASE STUDY 1

Steve Donaldson

Property Owner and Manager

Since integrating natural grasslands into his whole farm management, Steve Donaldson has come to appreciate the many benefits that this approach can bring, both at a business and personal level.

Steve Donaldson has been managing the family's merino sheep farm near Inverleigh for the last 25 years. Back in the wet summer of 2010-11, when parts of the farm were not needed for grazing, Steve noticed a flush of new tree seedlings in a large area of the property. Thinking that this might be the start of something special he sought advice from his local CMA. He soon learnt that this was indeed a rare patch of natural grasslands and grassy red gum woodlands, connecting the adjacent Inverleigh Flora Reserve along 12 km of creek lines to the Bannockburn Reserve in the east.

Funding opportunities through the CMA supported Steve to fence off 52 ha of grassy woodland, allowing him to avoid grazing the area between early spring to mid-summer, when native grasses are flowering. Steve finds that this grazing regime fits in well with his farming practices, as at this time of the year, there is usually plenty of improved pasture available elsewhere. It also has the benefit of offering a source of extra feed in drier years when improved pastures need to be rested. Steve notes that native grasses stay green for longer and the extra 2-3 weeks of green pick at the end of summer puts more weight on his sheep at a time when improved pastures have dried off. As a bonus, the large paddock trees provide valuable shelter for the sheep over those hot summer months. The sheep are usually left on the native pastures until the autumn rains break. In particularly wet years, the native grasslands are not needed for grazing, and are rested to allow native seedlings to establish. Fallen logs are no longer seen as a source of firewood, instead being left to lie as fauna habitat.

Habitat trees - fallen logs left lying beneath large paddock trees that are full of hollows. Careful grazing management has allowed for natural recruitment of new trees.



Seasonal grazing promotes the growth of native grasses, which provide green pick towards the end of summer, when improved pastures have dried up.



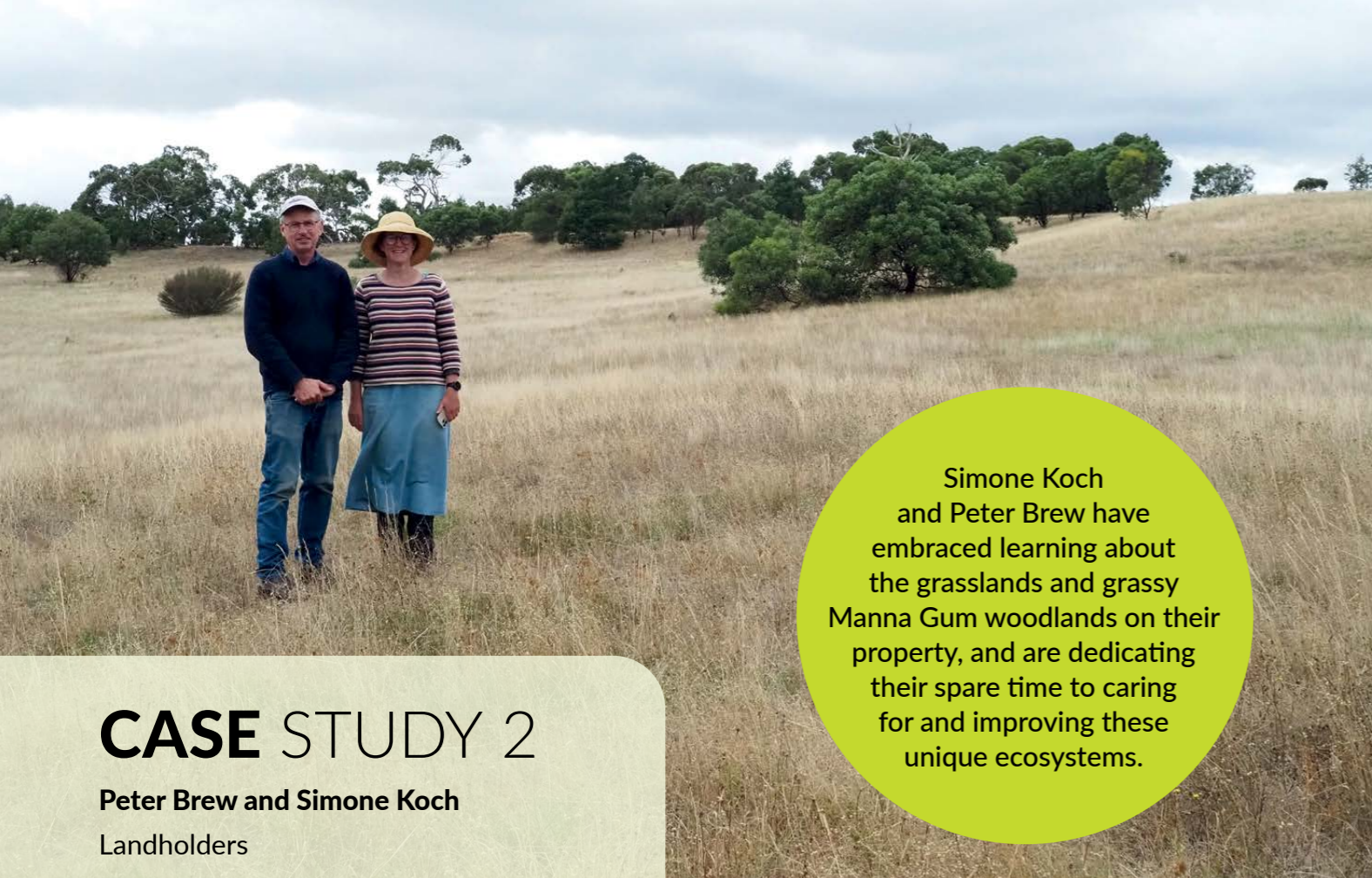
Stock have been excluded from a further 8 ha of Steve's grassy woodland which is now dedicated to conservation. Steve has been rewarded with a noticeable increase in the amount of native grasses and wildflowers, including orchids, in this area. In addition to adopting a grazing regime that supports native grasses, Steve has secured extra CMA funding to help treat box thorn and the highly invasive tussock and needle grasses, as well as control rabbits. While this does impose an extra workload to running the farm, the techniques learnt are now being applied across the whole property. Steve is also very vigilant at minimising the re-introduction of Chilean needle grass - ensuring that vehicles and machinery are free of grass seeds before entering the property.

Steve is keen to adopt more sustainable regenerative agricultural techniques, and has been attending workshops and courses to learn more about soil health and integrated pest management. He hopes that avoiding the use of fertilizers and insecticides in the native grasslands will promote healthier soils and beneficial organisms that can control pests like red-legged earth mites. Aside from the obvious benefits to native ecosystems, such practices could offer significant cost savings associated with purchasing chemicals.

Steve has gained a much greater appreciation for, and understanding of, native ecosystems and cultural heritage. He is proud to be part of a project that goes far beyond the boundaries of his farm, connecting parcels of bushland across the landscape and providing benefits to the greater community.

Steve Donaldson (centre) with Corangamite CMA staff Madeleine Slingo (left) and Jess Lill (right)





CASE STUDY 2

Peter Brew and Simone Koch
Landholders

Simone Koch and Peter Brew have embraced learning about the grasslands and grassy Manna Gum woodlands on their property, and are dedicating their spare time to caring for and improving these unique ecosystems.

Initially attracted by the farm's investment potential, Peter and Simone quickly fell in love with its rare grassy communities and are now hooked!

Melbourne architects and lecturers, Peter Brew and Simone Koch, bought their 100 ha property adjoining the Bannockburn Reserve, six years ago. They soon met up with the Friends of Bannockburn Bush who introduced the enthusiastic couple to the native flora and fauna of the woodlands, and provided a wealth of advice around weed control. Soon Peter and Simone decided to design and build an eco-home on the property so that they could dedicate their spare time to caring for and nurturing their grasslands. It has become an obsession and true labour of love.

Thanks to the vision of previous owners, parts of the property have been set aside for conservation since the 1980s, and progressively expanded to encompass the entire 50 ha of grasslands and grassy woodlands. Support through environmental offset programs and partnerships with the CCMA and locals Friends Group, has boosted their capacity to treat woody weeds like box thorn and gorse, control pest animals, and also provided invaluable guidance and advice on managing these special ecosystems.

With the removal of sheep seven years ago, and ongoing dedicated weed control, there have been noticeable differences in the quality and extent of the

grasslands. In spring they come alive with colourful wildflowers - chocolate lilies, Austral stork's-bills, common everlastings, blue pincushions, featherheads just to name a few. Thirteen species of orchids have been recorded so far, progressively flowering from autumn to spring. Perhaps one of the most special finds are several large patches of the nationally threatened clover glycine. They share their property with a diversity of fauna species - from echidnas and wallabies, to wedgetail eagles, owls, tawny frogmouths and large flocks of white-winged choughs (Peter's favourites). Simone has observed pardalotes and white-faced herons nesting in the woodland trees and pobblebonk frogs are sometimes heard in the grasslands when weeding.

Peter and Simone avoid the use of chemical herbicides and painstakingly dig or grub out weeds like South African weed orchid, flatweed, slender thistle, phalaris and serrated tussock grass (apparently the taproots of flatweed make a very nice tea and can also be pickled!). For widespread grass infestations it's been a matter of trial and error to see what works best. For example, slashing before seed set has worked well for new infestations of the perennial brown top bent grass.

Along the fringes of the woodland, new eucalypt seedlings sometimes need to be kept in check to ensure they don't encroach too much into the grasslands, but Peter and Simone are careful to leave some young trees to replace the big old paddock trees when they eventually die. They have noticed that the conditions beneath these trees favour the growth of native

plants over the exotic pasture grasses. Clover glycine, for example, is often found growing close to manna gums. Thinning out dense stands of river red gum seedlings has encouraged more native rice grass and spear-grasses in the ground layer. Another facet of their grassy woodland management has included propagating and reintroducing a more diverse mid-story, with shrubs like tree violet, snowy mint-bush and sweet bursaria to provide an extra structural layer.

Keeping a watchful eye, Peter and Simone spend approximately 20 hours a week each, walking through targeted conservation areas of their property with hand tools and buckets, as well as assessment without tools once a month which takes a whole day. Their main approach is to observe the country, work with the weather and climatic conditions, and gently steer the vegetation community in the right direction by allowing the native plants to flourish while holding back the undesirable ones.

Simone's and Peter's advice to other landholders thinking about caring for some grassy woodlands is "Just do it! Find some good field guides to familiarise yourself with the local flora, start weeding the best quality parts of native vegetation and expand from there, and walk the site weekly". Their long-term vision is for their grassland and grassy woodland to become part of the Bannockburn Reserve - a lasting legacy for the entire community.



Peter's experience as a CFA volunteer has given him the confidence to trial autumn burning as a way of controlling perennial grasses like Yorkshire fog and quaking grass, across parts of the grasslands. This has proven to be highly successful for reducing biomass, tipping the balance from exotic to native grasses and creating space for wildflowers.



Common Eutaxia



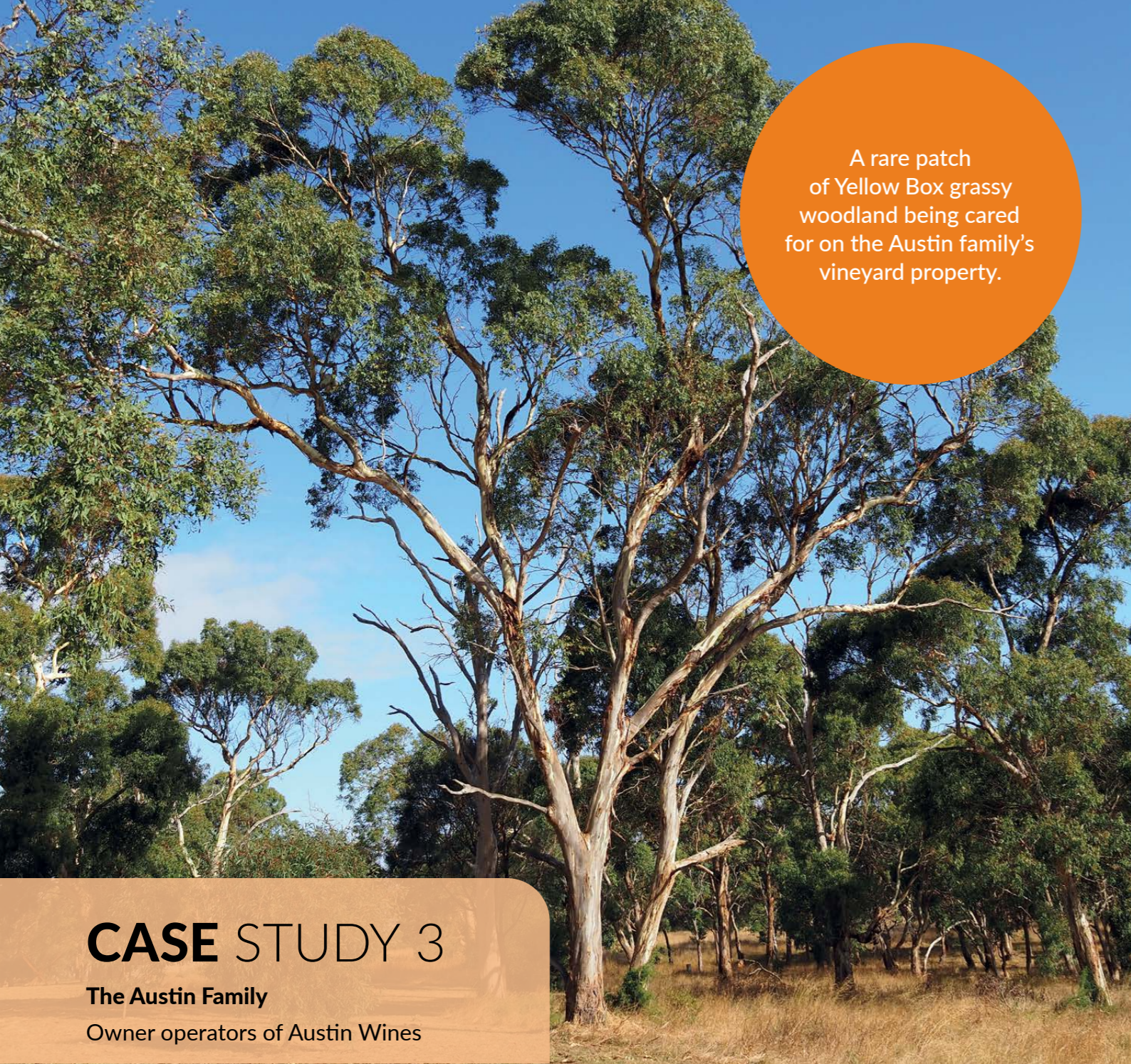
Rabbit-eared Sun Orchid



Austral Stork's-bill



Nodding Greenhood



A rare patch of Yellow Box grassy woodland being cared for on the Austin family's vineyard property.

CASE STUDY 3

The Austin Family
Owner operators of Austin Wines

When Richard and Pamela Austin purchased their property in the Moorabool Valley, they didn't realise that it contained a rare patch of threatened grassy woodland. Now, the Austin family is keen to learn more about this special plant community and want to share it with the public.

Richard and Pamela had a desire to grow grapes and make wine, and purchased their beautiful acreage in Sutherlands Creek in 1990. The 30 ha woodland has not been grazed since horses were removed in

2014, but the significance of the grassy Yellow Gum Woodland was not fully appreciated until they were approached by CCMA staff in 2020.

Since then, Richard has worked with the CCMA to treat weeds like box thorn, serrated tussock grass, horehound and carpet weed. Understanding the value in protecting the woodland's habitat, fallen logs are now left to lie. Regular monitoring by researchers from the Arthur Rylah Institute has helped guide management decisions for caring for the vegetation community at the site.

Richard would like to encourage local naturalists to record the flora and fauna that live in the woodland. He has a vision of providing a parking area with interpretive signs, encouraging cellar door visitors to pause, appreciate and learn more about these grassy communities.



Left to right: Tim James with Richard, Belinda and Scott Austin



Dead trees provide perches and hollows for wildlife

The family business is now run by their son Scott and his wife Belinda, who are eager to learn more about the woodlands and how they might fit into their business operations. They are keen to explore the marketing potential of their grassy woodlands, as a way of bringing these unique ecosystems to the attention of the wider community.

Together with operations manager, Tim James, the family are steering their vineyard management towards more sustainable practices. They hope to harness the benefits offered by the woodland's biodiversity, such as native pollinators and beneficial birds, microbats and insects to help reduce the need for pesticides in the nearby vineyards. They have already expanded the areas of native vegetation, engaging local school groups in revegetation projects to create natural corridors between the woodland and nearby creek lines. Future revegetation plans include a "planting for pollinators" focus.

Ensuring that the grassy woodlands are protected for future generations to enjoy is important to the Austin family. They would like to see them become a community-focussed place, a place of learning and nature appreciation.

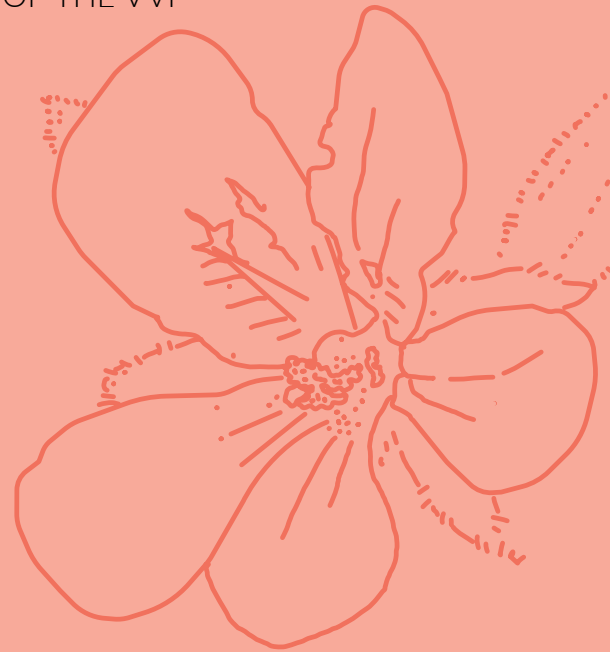


A GUIDEBOOK TO GRASSLANDS & GRASSY WOODLANDS OF THE VVP

This guide was developed on the lands, waters and seas of the Wadawurrung People of the Kulin Nation and the Kirrae Whurrong, Djagurd Woorroong, Gulidjan and Gadubanud People of the Maar Nation and the CCMA acknowledges them as the Traditional Owners.

This guide was developed by Ecological Associates, in partnership with the Protecting the Victorian Volcanic Plains Project Team. This project utilises a partnership approach. It is an initiative of the Wadawurrung Traditional Owners Aboriginal Corporation, the Department of Energy, Environment and Climate Action, the Geelong Field Naturalists Club, Greening Australia, the Golden Plains Shire Council, Geelong Landcare Network, Trust For Nature, Arthur Rylah Institute for Environmental Research and Sustainable Biorich Landscapes.

This program is supported by the Corangamite CMA, through funding from the Australian Government National Landcare Program.



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Mark Antos	Geoff Heard	David Pearce	Emily Scicluna	The Woodlands and Wetlands Trust
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FURTHER INFORMATION ABOUT VVP GRASSLANDS AND GRASSY WOODLANDS CAN BE FOUND AT:

www.ccma.vic.gov.au/projects/victorian-volcanic-plains

www.wadawurrung.org.au

www.eastermaar.com.au



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