Draft Biodiversity Theme Discussion Paper

for North Central Regional Catchment Strategy 2021-2027

September 2020

Please note that this discussion paper was developed at a point in time (September 2020) during RCS development. The discussion paper and the information described in it has formed the basis of the RCS, although some changes have been made to the RCS based on feedback from stakeholders, Traditional Owners and the community. Changes include:

- *Climate change adaptation and habitat connectivity has been strengthened.*
- *Threatened Species and links to DELWP Framework on Threatened species.*
- *More information about significant ecological communities such as the Box-Ironbark forest.*

Preamble

The North Central Regional Catchment Strategy (RCS) is the principle framework for land, water and biodiversity management in north central Victoria. This discussion paper has been written to assist in the development of the North Central RCS for 2021-2027. It provides an overview of the values; condition; trends; threats; policy context and priorities for regional biodiversity. The information herein will be used to frame discussions with stakeholders, guide the development of priorities and outcomes and provide content for the RCS.

Introduction

The bioregions of the north central region reflect underlying environmental features, which are related to patterns of land use and highlight the relationship between many natural resource-based activities and biodiversity assets. Native vegetation is important as it provides a range of vital ecosystem goods and services that underpin the health of the land, water, flora and fauna, and communities of the north central region. These include:

- *Heritage values* Native plants and animals are an important part of the indigenous and non-indigenous cultural heritage of the region and their presence adds much to the value of landscapes.
- *Carbon Sequestration* Native forests and woodlands represent a substantial carbon sink, which might otherwise contribute to greenhouse and climate change issues.
- *Indirect economic benefits* Native vegetation provides environmental services, some of which provide indirect economic benefit. For example; forested areas and riparian zones in our upper catchments, contribute to better quality drinking water.
- *Direct Economic Benefits* Native tree and shrub species are widely used for timber and firewood, and areas of native vegetation are used by apiarists to produce honey. Native pastures contribute to agricultural productivity in most dryland areas. Indigenous elements of the soil biota contribute to the health of soils and productive capacity of agricultural systems. Areas of native vegetation are places of great beauty with significant amenity and recreational values.

Assessment of current condition and trends

Native vegetation

Decline of ecological systems in the north central region has occurred through extensive land clearing resulting in a reduction in the extent and condition of many ecological communities, increased habitat fragmentation and exposure to a range of threatening processes. The current trajectory is still one of decline as the impact of past actions is yet to be fully realised. The original native vegetation of the region has undergone a dramatic decline in extent and quality since European settlement. Table 1 provides a summary of this depletion at a bioregional level. Each bioregion has fared differently due to patterns of human land use, most notably agricultural preferences for gentler landscapes and more fertile soils, as evidenced by the lowest proportion remaining in the; Wimmera (4.6%), Victorian Volcanic Plains (5.8%), Murray Mallee (6.5) and Victorian Riverina (9.2%) bioregions.

Table 1: Extent of native vegetation for each bioregion within the North Central Region Bioregion

Bioregion	**Pre-1750 extent (ha.)**	**Current extent (ha.)***	**Proportion remaining* (%)**
Central Victorian Uplands	139,402	53,882	39
Goldfields	1,001,284	360,645	36
Murray Fans	147,585	28,956	20
Murray Mallee	202,685	13,242	6.5
Northern Inland Slopes	15,004	4,136	28
Victorian Volcanic Plain	162,165	9,471	5.8
Wimmera	424,912	19,628	4.6
Victorian Riverina	908,094	83,494	9.2
Total for north central region	3,001,131	**573,454**	**19.0**

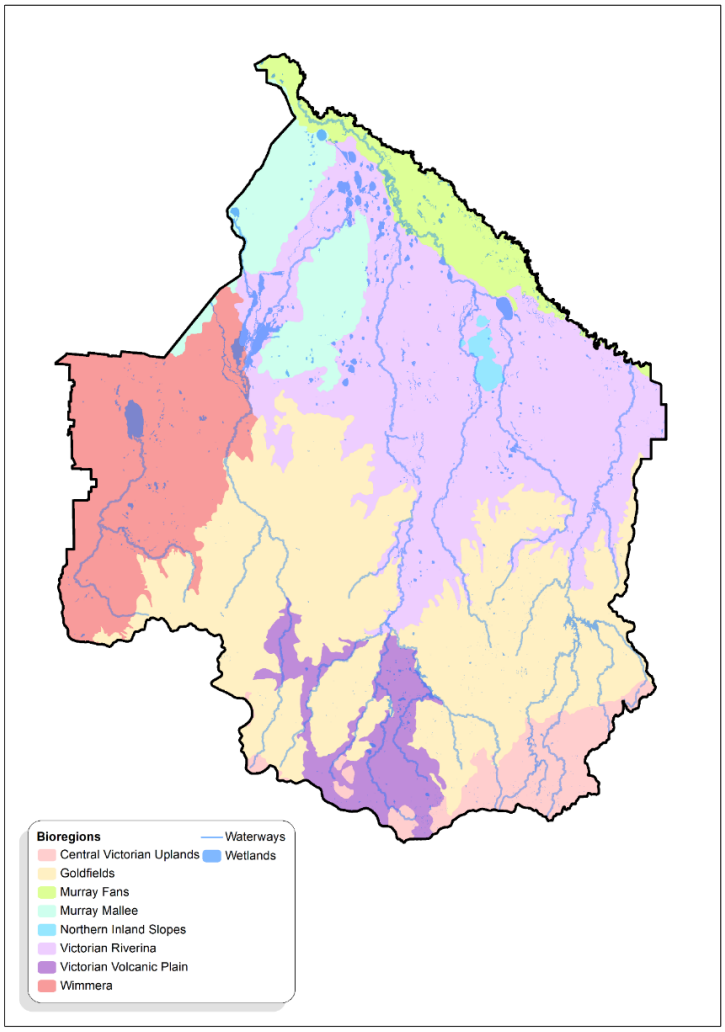


Figure 1: Bioregions of the north central region

***Note:** Current extent figures (and by association proportion remaining) are from current RCS. We've been advised by DELWP to use land cover time series data, now waiting for that data to be cut to bioregions, will update this table when available.

Given the extensive loss in native vegetation extent and quality since European settlement, the first logical step is to maintain what's left. Native vegetation is mapped as Ecological Vegetation Classes (EVCs), derived from land system (e.g. geomorphology, rainfall), vegetation structure, floristic information and other environmental information including aspect, fire frequency and ecological responses to disturbance. At a finer scale than bioregions, EVCs have been shown to be useful surrogates of biodiversity for birds, mammals and trees (but less so for invertebrates and reptiles). In combination with the bioregions, the EVC classification system is an important tool for regional strategic planning as it provides valuable information about the level of depletion and threat status of different vegetation types. It can also inform the planning of on ground vegetation management activities and revegetation. Conservation status of native vegetation is assigned according to a series of criteria which assess within a bioregion; the level of rarity and threat to a given vegetation type, how degraded the remnants are and how secure is the land tenure. This allows a rating of the threat of extinction to be assigned to the EVC. This rating is the EVC's conservation status within the bioregion. Figure 2 shows native vegetation extent across the region according to its conservation status and bioregion boundaries. Figure 2 shows that those bioregions with the smallest remaining proportion of native vegetation have mostly endangered conservation status as compared to those with more remnant vegetation like the Goldfields.

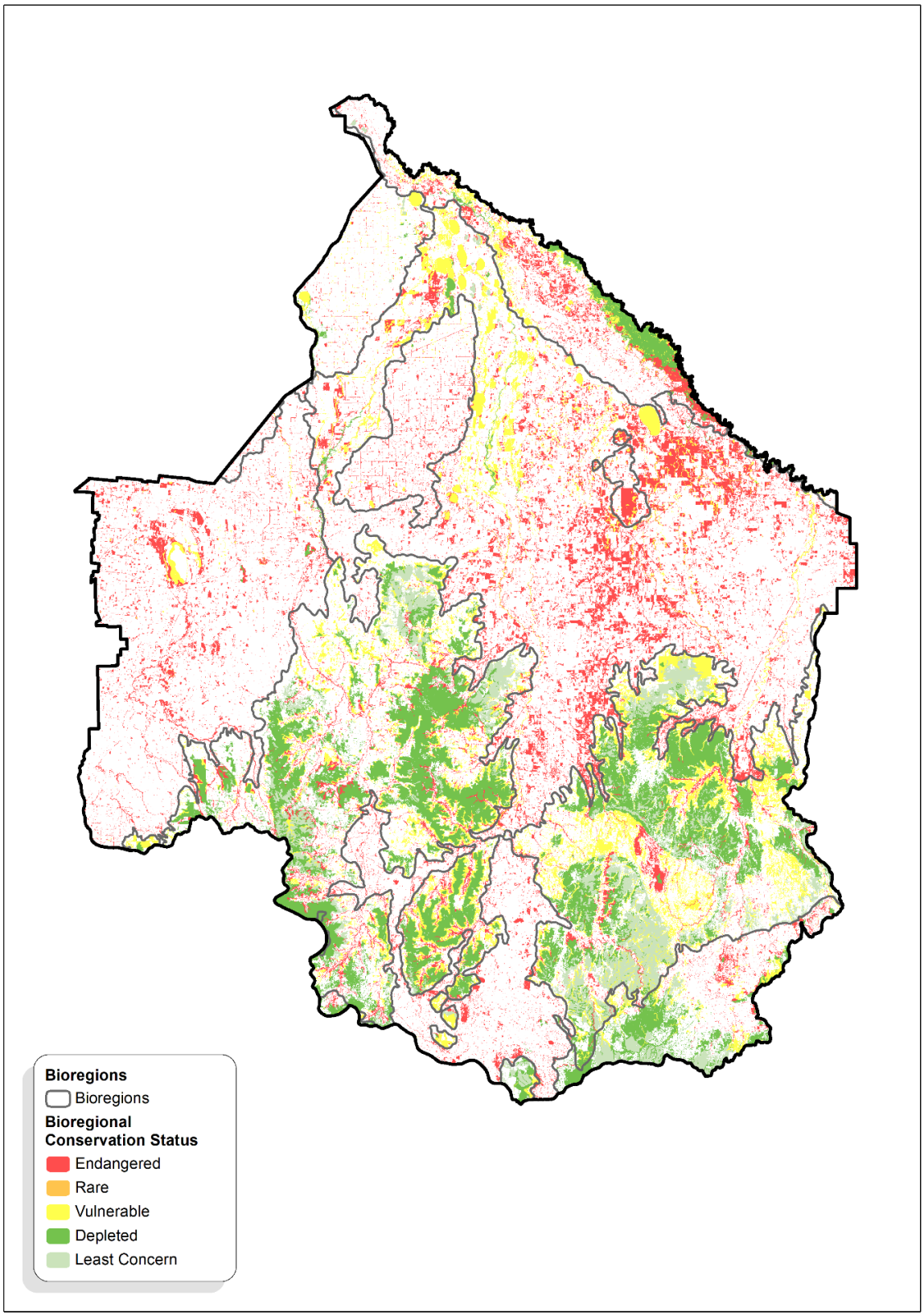


Figure 2: Conservation status of extant vegetation within the north central region

Trends in native vegetation extent

The recently released Victorian Land Cover Time Series 1985-2019 shows trends over time for different native vegetation classes for the region, refer Figure 3 and Table 2 below. The data shows a decline in the hectares of native grassland (-13%) and native scattered trees (-33%) over the past 34 years. Overall native shrub cover was a small component but relatively stable (-1%) and native tree cover increased by 8%. These native vegetation classes do not account for quality and it is noted that the relatively large area of 'Native Grass Herb' includes grasslands that have been 'derived' through the clearing of tree and/or shrub cover and is likely to include large areas of degraded native pastures. This data will be used to monitor trends going forward and work is underway to integrate this into the standard RCS outcomes framework for all CMAs.

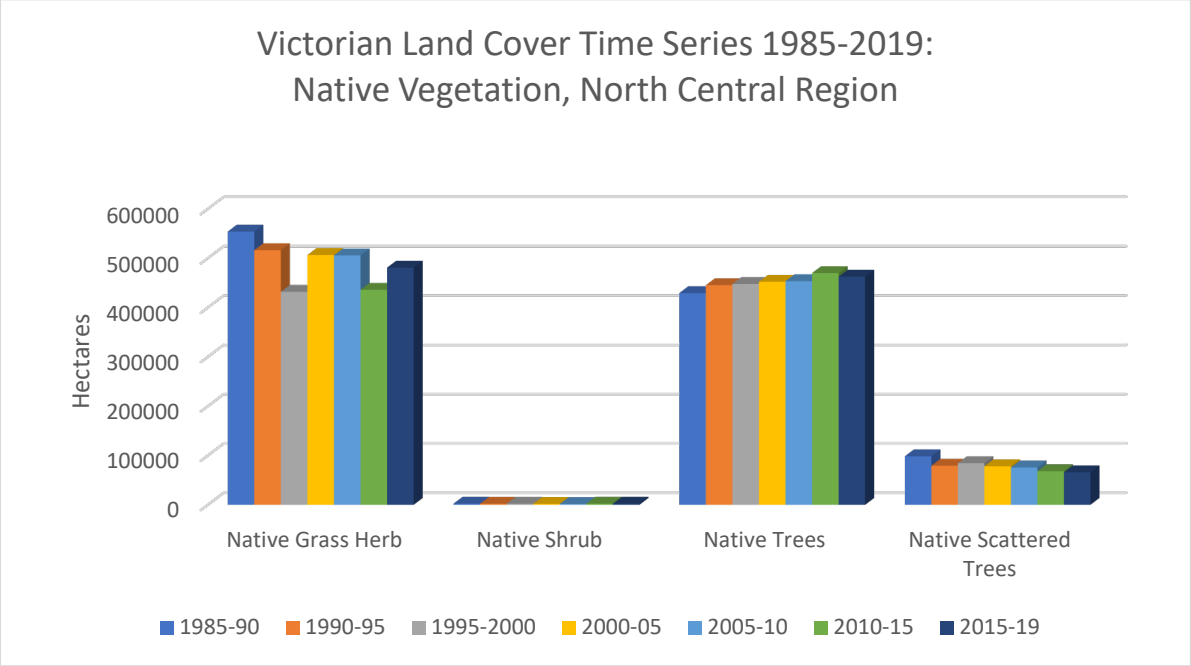


Figure 3: Victorian land cover time series native vegetation classes graph

Table 2: Victorian land cover time series native vegetation classes described

Class	Description	Hectares*	Change trend*
Native Grass Herb	Grasslands and pastures that are predominantly composed of indigenous species grasses and/or low chenopod shrubs. Includes grasslands that have been 'derived' through the clearing of tree and/or shrub cover.	-73,172	-13%
Native Shrub	Native shrub cover	-29	-1%
Native Trees	Native tree cover	33,257	8%
Native Scattered Trees	Native trees scattered in paddocks and woodland along roadsides and streams.	-32,499	-33%

**Hectares and change trend presented as a comparison between first (1985-90) and last (2015-19) time series*

Threatened Species and Communities

A principal value of native vegetation is that it provides habitat. Habitat for rare or threatened species is critical for their survival. The priority biodiversity assets identified in the current 2013-19 RCS include a high concentration of threatened flora and fauna habitat – in fact threatened species are key drivers of the significance and relative priority of these areas. The north central region is home to many threatened flora and fauna species, and a number of threatened communities. All plants and animals, including threatened species have a range of values, intrinsic and extrinsic, in addition to their contribution to broader ecological processes. The conservation of biodiversity, in particular threatened species, is an important part of protecting our natural heritage and maintaining sustainable, productive landscapes. Threatened species and communities are classified according to their conservation status, which may be applied at a range of scales from national, state to bioregional.

At a national level, threatened species and communities are listed under the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*). At a state level threatened species and communities and threatening processes are listed under the *Flora and Fauna Guarantee Act 1988* (*FFG Act*). The number of threatened flora and fauna species recorded in the region (from the Victorian Biodiversity Atlas) listed under each Act are outlined below with a full listing in Appendix 1.

Threatened flora

Total 108 listed threatened flora species recorded in the region.

- 106 of which are *FFG Act* listed
- 36 which are *EPBC Act* listed

Threatened fauna

Total of 40 listed threatened fauna species recorded in the region.

- All 40 of which are *EPBC Act* listed
- 35 of which are *FFG Act* listed

The Victorian Biodiversity Atlas records used here were current as of August 2020. We have since been advised to use an alternative dataset so these numbers and the full listing in Appendix 1 will be updated. In relation to threatened species listings, the Conservation Status Assessment Project is currently working to consolidate *EPBC*, *FFG Acts* and the three Victorian Advisory Lists into a single list of threatened species for Victoria using a Common Assessment Method (CAM) established through an intergovernmental agreement with the Federal and state governments. The consolidated list will have a Federal section (*EPBC Act*) and state section (*FFG Act*) and a species can only be in one of them. As such the threatened species listed in this paper, are subject to change.

Threatened ecological communities in the region that are listed under these Acts include the White Box-Yellow Box and Blakely's Red-Gum ecological community (*EPBC Act* listed) and the Northern Plains Grassland community (*FFG Act* listed) – refer full list in Appendix 1.

Condition

Vegetation condition is the state or configuration (composition, structure and function) of an ecosystem compared to the benchmark that is optimal for a particular benefit or purpose. Despite an improvement in the availability and accuracy of data on native vegetation condition over the past ten years it is not possible to provide a definitive statement of either current condition or trend at a regional or bioregional scale for the North Central CMA region. As for

extent, the condition of native vegetation in Victoria is assumed to be relatively stable in intact landscapes but declining in fragmented landscapes, except where specific interventions are being made. (VCMC 2017).

For spatially explicit assets, such as the RCS priority assets, it is possible to measure vegetation condition and indeed to set measurable goals for condition based on an understanding of benchmark states for particular ecosystems, the nature and extent of specific threats and an assessment of the technical and socio-economic feasibility of a given suite of actions designed to maintain or improve asset quality.

The condition of; native vegetation, threatened species and ecological communities is perhaps best understood by consideration of their conservation status (refer Figure 2) which is generally determined by modelling threats and habitat factors that have an impact on population status.

Major threats and drivers of change

Habitat loss through clearing of native vegetation

Habitat loss, through clearing of native vegetation, subsequent fragmentation and degradation, has and continues to be, a significant threat to biodiversity across northern Victoria. As well as the removal of native vegetation, habitat loss also includes the conversion of grassland to crops or 'improved pasture', which although less obvious in terms of structural changes to the vegetation, is equally destructive. Historically, the agriculture and mining sectors were primarily responsible for broad-scale clearing. Foremost among contemporary motives for clearing are residential developments and agricultural intensification Habitat loss decreases the resource base (i.e., food, shelter and mates) for individual animal species resulting in smaller populations with lower genetic diversity, increasing the probability of local extinction. Impacts on native plant species include their direct removal from the landscape and the viability of the remaining patches (Young and Clarke 2000). As the amount of habitat in a landscape decreases, fewer species are able to sustain viable populations, leading to a decline in species richness. Typically, clearing also decreases the diversity of vegetation types further reducing the number of species for which suitable habitat exists. Moreover, the most fertile parts of a landscape are often preferentially cleared resulting in landscapes that are not representative of the original vegetation composition.

It is important that we continue to maintain and enhance what remaining areas of native vegetation and habitat are left, many of which are already fragmented, in poor condition and subject to ongoing threats. Connectivity between remnants is also important (see discussion under climate change below) but those efforts will be for nothing if the remnants themselves are not maintained.

Threatened species

Risks to threatened species are largely consistent with those identified for native vegetation and habitat, recognising that individual species face quite specific threats. At an individual species level detailed information on threats can be found in documents such as:

- Actions statements that are prepared for species, communities or processes listed under the *FFG Act*, or
- Recovery Plans prepared for single/multiple species and ecological communities listed under the *EPBC Act.*

Threatened species are characterised by attributes such as rarity, they are sometimes ephemeral or cryptic and often exist as small, dispersed populations. For example, threatened flora such as terrestrial ground orchids may only be visible from underground structures when

seasonal conditions are favourable. A period of prolonged drought since the mid-1990s has seen an apparent decline in a number of these species. Species of mobile (e.g. Swift Parrot) or cryptic fauna (e.g. Pink-tailed Worm-lizard) require substantial expertise and survey effort to monitor population trends. For this reason, our knowledge of many threatened species is deficient in areas including population size and viability, responses to management activities, reestablishment techniques and general conservation measures. At an individual species level some of these knowledge gaps are documented in Recovery Plans and Action Statements although there is little knowledge of the cost and feasibility of protection of species, especially where they occur on private land.

While landscape-scale management may have benefits for threatened species, for those that have specific requirements a targeted approach is justified. The Plains Wanderer (pictured here) is a critically endangered species that has already lost 95% of their native grassland habitat through development and cultivation, with an estimated 250 – 1,000 individuals left in the wild. Both the Plains Wanderer and its preferred native grassland habitat are listed under the federal *EPBC Act.* The Patho Plains in the north central region, one of the current RCS priority biodiversity assets, is one of the key remaining sites where the Plains Wanderer are found. While the species can coexist with a sustainable grazing regime there is ongoing loss of habitat due to land use change from grazing to cropping in the region, which is a serious concern for the species. Activities (including converting a native grassland to cropping) which significantly impacts on a listed threatened species such as the Plains-wanderer or ecological community (its preferred habitat) under the Federal *EPBC Ac*t, may have legal consequences such as financial penalties and/or remediation orders. The Northern Plains Conservation Management Network are working with farmers on the Patho Plains to raise awareness, to protect, enhance habitat and monitor populations, with the support of government agencies. The Plains for Wanderers Project, supported by the North Central CMA, currently offers incentives to private landowners who voluntarily put suitable Plains-wanderer habitat under permanent protection using covenants. These efforts are supported by a captive breeding program.

Climate Change

Rapid climate change is placing additional pressure on both individual species and whole ecosystems, posing a severe threat as well as exacerbating the effects of existing threats. Any change to the local ecological niche of species may place them near the limits of their physiological tolerance. As a result, some species and ecological communities are at serious risk of decline or extinction this century. With both environmental and ecological factors changing, it may prove very difficult to maintain the current distribution and abundance of all species and communities.

Natural Decisions were engaged to identify and review climate change considerations for RCS renewal process. The paper states; overall climate change science has become more definitive since the North Central Climate Change Adaptation and Mitigation Plan 2015 (CCAMP 2015) was released. Levels of confidence around temperature increase are very high. Rainfall projections are less certain although trends are commonly downward, accompanied by more frequent, high intensity events (increased potential for flooding and erosion) and overall, less reliable seasons.

Connectivity

Remnant native vegetation in the north central region is highly fragmented so improving connectivity between areas of suitable habitat for different species is already a priority. Climate

change exacerbates the impacts of habitat fragmentation making connectivity even more important. One of the most cited conservation strategies for climate change adaptation is for "climate-wise connectivity [that] aims to also connect current habitat to habitat that will become suitable in the future" (Kelly et al. 2018).

The International Union for Conservation of Nature (IUCN) recently released *Guidelines for conserving connectivity through ecological networks and corridors*. The guidelines a strategic approach to designing climate-wise connectivity which considers the ecological network as a "system of core habitats connected by ecological corridors." When these are well designed they can "enable species to shift ranges and colonise newly suitable habitats and adapt to climatic conditions". (IUCN, 2020, p.14, 21)

Kelly et al. 2018 found that "when prioritising areas for connectivity conservation, approaches include focusing on connecting areas of low climate velocity, refugia, climate analogs, or linking current to future suitable habitats. Riparian corridors should be considered in connectivity plans because of their importance as natural movement corridors, climate gradients, and refugia."

CSIRO analysis has predicated "massive shifts of 60-70% in the composition of vascular plant communities in Victoria with climate change…[including] local extinctions, immigration and big changes in the relative abundance of species." A related study showed "massive changes in the centres of species distribution of 200-400km over the past 60 years, generally polewards and eastwards to higher elevations as predicted by with climate change…The design principles for connectivity are: an inter-patch distance less than 1.3km and gaps less than 150m. If a landscape does not have this, then new habitat needs to be added in the middle." (Doerr, 2017) Scattered tress also play a part.

Liu et al. 2018 modelled connectivity for a group of 12 vertebrates representative of the heavily fragmented box and ironbark forests in north-central Victoria. They produced a multi-species connectivity map for the region testing two different methods, which showed that "pathways strongly aligned with existing patches and strips of native vegetation noting that in this region, pathways aligned with streams and their associated riparian vegetation have relatively high ecological potential and feasibility to contribute to regional connectivity for the assemblage of forest vertebrates."

Through engagement with our regional partners and Landcare Networks we learnt that there are various plans for connectivity and some projects either completed or underway. Various challenges and opportunities were identified:

- Biolinks have been identified but they are not prioritised for action.
- RCS asset boundaries can be a barrier to funding connectivity projects.
- In practice it is difficult to negotiate with landholders, can't do it in dribs and drabs.
- Funding cycles make this difficult, needs to be long-term, large scale, lots of funding.
- Principles for connectivity would be good.
- Consider species movement guilds.
- Marginal land managed for conservation presents opportunities for improving connectivity.

Biolinks Alliance is a capacity and partnership building organisation that is working to improve the connectivity in the region. Whilst they promote connectivity and knowledge building across the region, the projects they work on are community initiated, rather than strategically planned.

Given the inherent difficulties in getting a group of private landholders on board, this is a pragmatic approach.

In summary climate-wise habitat connectivity is a high priority for the region. There has been some work done to highlight priorities for connection. There are many barriers to its implementation given that much of the region is privately owned. However, there are also opportunities; connectivity can be achieved through enhancing riparian corridors which offers many benefits, and even roadsides, by including steppingstones in the landscape between existing remnants as well as building larger corridors. The RCS needs to promote a broad strategic approach and enable local investment and community initiative in this space.

Hydrological connectivity

Connectivity is also important for aquatic species and this is addressed in the water discussion paper, where the following are addressed:

- Alteration of floodplains threaten species that rely on them, such as waterbirds - a priority direction to improve floodplain connectivity is included in the water discussion paper.
- Altered hydrology of waterways including introduction of barriers restricting movement threatens aquatic species including native fish – a priority direction to support the continued implementation of the Native Fish Recovery Plan to address this threat, is included in the water discussion paper.

An overview of threats and related impacts to biodiversity are outlined in the table below:

Table 3: Threats and impacts to biodiversity

Threats	**Impacts**
Extent of native vegetation and habitat reduced and further fragmented by clearing, lopping and destruction through; • regional population growth and associated residential, industrial, infrastructure developments • land use changes (e.g. grazing to cropping) and increased mechanisation (bigger machines leading to less paddock trees) • timber and firewood harvesting • burns and clearing to reduce wildfire risk • conversion of irrigation channels to pipelines • illegal off-road activity on public land. Quality of native vegetation and habitat degraded and further fragmented by • weed invasion • over-grazing by stock, pests (e.g. rabbits) and native herbivores (e.g. kangaroos) • alterations to cultural fire regimes • altered hydrology, run-off from roads, urban areas, agricultural land, and industry (nutrients, contaminants, sediments). Direct loss of native flora and fauna through; • pest animal predation (e.g. foxes and feral cats), poaching and vehicle accidents • diseases introduced/spread by human activity. Climate change compounding the above listed threats with increased temperatures, reduced average rainfall and increased frequency and intensity of floods, droughts and wildfire	The reduced extent and quality of native vegetation and habitat, lead to an overall • Reduction in species richness and diversity. • Further fragmentation and loss of connectivity across the landscape. • Decline in landscape amenity and intrinsic values. There is already evidence of climate change causing large shifts in the composition of communities and changes in the centres of species distribution. For threatened species, this is likely to result in local extinctions.

Are there other important threats that should be considered here?

Policy context

Environment Protection and Biodiversity Conservation Act 1999 Act

The Federal *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) identifies 'matter of national environmental significance,'(MNES) including RAMASR wetlands and threatened species. If an action is likely to have a significant impact on a MNES, it must be referred to the Department of Environment and Energy under this *Act,* to determine if it can proceed.

Victorian Planning Provisions

To remove destroy or lop native vegetation in Victoria, a permit is usually required. Native vegetation removal regulations are primarily implemented through local council planning schemes. *Guidelines for the removal, destruction or lopping of native vegetation 2017* outline how native vegetation removal is assessed and offset. These Guidelines are an incorporated document in all Victorian planning schemes.

Flora and Fauna Guarantee Act 1988

The Flora and Fauna Guarantee Act 1988 provides for the listing of threatened species, threatened communities and potentially threatening processes. The *Flora and Fauna Guarantee Amendment Act 2019* came into effect on June 1, 2020, which aims to improve the implementation and enforcement of the Act including; *consideration of the rights and interests of Traditional Owners and the impacts of climate change…consideration of biodiversity across government…clarifies existing powers to determine critical habitat.. gives effect to a consistent national approach to assessing and listing threatened species… modernises the FFG Act's enforcement framework*. The *FFG Act* requires that a Biodiversity Strategy is prepared which includes proposals for achieving the objectives of the Act, targets to measure the achievement of the objectives and a monitoring, evaluation and reporting framework. *Protecting Victoria's Environment - Biodiversity 2037* is the current Biodiversity Strategy under the *FFG Act.*

Protecting Victoria's Environment - Biodiversity 2037

Protecting Victoria's Environment - Biodiversity 2037 (the Biodiversity Plan) was launched on 4 April 2017 and gazetted as the new Flora and Fauna strategy, a requirement of the *Flora & Fauna Guarantee Act 1988*. The Biodiversity Plan is a high-level strategy that was supported as a bi-partisan plan by government, developed and backed by key stakeholders and partners and underpinned by the best available evidence that guarantees a continuous and concerted approach to biodiversity conservation over the next 20 years. The development was informed by the following principles: values, living systems, sharing and collaborating, knowledge and decisions making, and these principles will guide implementation. It recognises that stopping the decline of Victoria's biodiversity will not be achieved overnight. It contains ambitious targets that will require a concerted effort over many years by government and its partners across Victoria to put biodiversity back on a path to recovery. The vision and goals of the Biodiversity Plan are outlined below:

"Victoria's natural environment is healthy" goal will be achieved by stopping the overall decline of threatened species, securing the greatest possible number of species in the wild, and improving the overall extant and condition of native habitats across land, waterways, coasts and seas.

The strategy acknowledges a shift in biodiversity conservation since 1997, that builds on current work with a strong focus on people – getting them to connect with and act for nature, addressing the influence of climate change and focusing on long term outcomes and securing the greatest net benefit for the greatest number of species.

Some Local Governments in the region have developed their own biodiversity strategies in response to the Biodiversity Plan. Implementation of the Biodiversity Plan is intended to be through the regional Biodiversity Response Planning process and the RCS supports this.

Partners and community

To achieve the goal of reversing the decline in biodiversity will require a supportive community. Hence, community education is an integral part of protecting native vegetation, habitat and threatened species. An integrated approach to regional community education between all partners will build understanding and knowledge of biodiversity in ways that enables landholders and broader community to be active participants in conservation activities. Many important areas of remnant habitat are located on private land and managing them for biodiversity generally relies on collaboration with private landholders. Without their cooperation, the best science-based planning will count for little. Sustained collaboration between landholders, community groups and agencies, with an understanding of their respective knowledge and aspirations has been a feature of native vegetation programs in the region for many years. Recognising local knowledge and tapping into the wisdom and experience of local networks is a key factor underpinning successful habitat conservation initiatives.

Traditional Owners – The north central region includes the traditional lands of Barapa Barapa, Dja Dja Wurrung, Taungurung, Wadi Wadi, Wamba Wemba, Wotjobaluk and Yorta Yorta peoples. Traditional Owners have a spiritual connection to Country and understand the importance of healthy and connected land, water, biodiversity and people. They are the traditional custodians of their Country and obligation to care for it. Each of the Traditional Groups of the north central region are being engaged to better understand their aspirations for land, water and biodiversity management so that we can reflect in these in the RCS.

State government authorities such as the Department of Environment, Land, Water and Planning (DELWP) and Local Governments have a role to play in enforcing legislation designed to

protect terrestrial biodiversity including; the *Flora and Fauna Guarantee Act 1988* (FFG Act) and the *Planning and Environment Act 1978* and associated Victorian Planning Scheme. DELWP are also a referral authority for the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) which protects matters of national environmental significance including threatened species. Water Authorities, CMAs and the EPA have a role in enforcing legislation that protects riparian and aquatic biodiversity which is addressed in the water theme discussion paper.

Public land managers including DELWP, Parks Victoria, Local Governments, Water Authorities, Regional Roads Victoria, V-line have a role to play in managing areas of native vegetation and habitat, including some significant parks and reserves within the region. Dja Dja Wurrung Traditional Owners are now jointly managing six parks transferred to Aboriginal title under the Recognition and Settlement Agreement of 2013 including:

- Greater Bendigo National Park
- Hepburn Regional Park
- Kara Kara National Park
- Kooyoora State Park
- Paddys Ranges State Park
- Wehla Nature Conservation Reserve.

Non-government organisations play various roles in biodiversity conservation.

- **Trust for Nature** focus on restoration and protection of biodiversity on private land using covenants.
- **Bush Heritage Australia** buy and manage land to conserve landscape and native species.
- **Birdlife Australia** are an organisation focused on bird conservation, who undertake research, conservation works, community engagement and education.
- **Connecting Country** is a community run organisation who work to restore and enhance biodiversity in the Mount Alexander region, they undertake on ground works, community engagement and monitoring programs as well as supporting Landcare and Friends groups.
- **Threatened Species Conservancy** are a group of threatened species recovery specialists who undertake targeted on-ground actions and community engagement.
- **Biolinks Alliance** is a capacity and partnership building organisation that is working to improve the connectivity, condition and resilience of landscapes and halt the further decline of species. The Central Goldfields member group is targeting a large area entirely within the north central region extending west of Bendigo to St Arnaud.

Community-based NRM groups like Landcare and Friends of groups play a critical role in connecting people to nature, involving private landholders and educating the broader community. Our region is fortunate to have more than 160 Landcare, regenerative agriculture and/or environmental volunteer groups actively working across the north central region, generating significant social, environmental and economic benefits through effective catchment management. During the 2018-19 year, more than 3,300 members volunteered over 80,000

hours to Landcare driven NRM action, valued at $2.4M. (*Source: 2018-19 North Central Landcare Report Card*).

Private landholders - Eighty-seven per cent of land in the region is privately owned and most of it utilised for agriculture. As such, rural landholders continue to be the foundation for landscape scale NRM in the region.

Broader community - The health of our catchments will rely on the active involvement of the regional community. People who farm and manage land or live in towns, work, volunteer or go to school all have a role to play.

Regional priority setting

Assets

Current assets

The current 2013-19 RCS priority biodiversity assets were identified based on; significant values considering threats and feasibility to manage. A range of data and information sources were utilised including; ecological databases, expert opinion from ecologists and those with local knowledge, together with modelling and decision support tools. Community knowledge of local assets, including their values, threats and condition was a key consideration. Areas were first identified through engagement with the community and partner organisations. They were mapped at various scales from small patches of bush and remnant vegetation through to large areas of public land. Most of these assets were amalgamated to form the priority biodiversity assets shown on the maps herein. The DSE tool NaturePrint was used extensively in the identification and refinement of priority assets. An assessment was also made of the relationship between priority assets and threatened flora and fauna habitat (using NaturePrint and other relevant data). This demonstrated strong alignment of habitat for threatened species with the current priority biodiversity assets.

Review of assets

Given the extensive process undertaken to identify the current priority biodiversity assets, we will review and build on what we have, considering new knowledge, policy and strategy, for RCS for 2021-27. An opportunity arose to review the priority biodiversity assets for the RCS in partnership with regional DELWP, aligning our process with their regional Biodiversity Response Planning (BRP).

BRP, as described in chapter 7 of the Biodiversity Plan, is a process which aims to bring together Victorians to work towards an agreed approach to address biodiversity decline. In recent times obtaining resources for biodiversity conservation has become increasingly competitive, which can be at odds with the need to work together. BRP is therefore a collaborative planning process separate from the funding context to strengthen partnership and alliances across the board. BRP is viewed by DELWP as long-term community wide change management process aiming to foster a culture of "working together for biodiversity". As a change management process, small steps and targeted engagement which builds relationships, trust, capacity, awareness, understanding and knowledge will be required to achieve outcomes, and this is best achieved in a regional context. BRP brings together programs within DELWP, partner agencies such as CMA, and land managers, Traditional Owners and the broader community.

Following an initial period of joint DELWP/CMA stakeholder engagement between March and June 2020, DELWP and the CMA have been reviewing the RCS priority biodiversity assets in relation to engagement outcomes and DELWP's latest biodiversity information and modelling available via NatureKit - https://www.environment.vic.gov.au/biodiversity/biodiversity-interactive-map. Many different layers are available in NatureKit such as ecological vegetation

classes, Strategic Biodiversity Values (SBV), Strategic Management Prospects (SMP), SMP threat layers, species records collected via Victoria's Biodiversity Atlas, and habitat distribution models.

For the RCS, priority biodiversity assets will be set for the next 6 years. However, BRP will be an ongoing process, with priorities refined and reviewed over time based on; new information, stakeholder drivers, policy changes, landscape events etc. The BRP process is also asking more detailed information of stakeholders, seeking to map action across the landscape and identify gaps, to understand priority species and threats at a local and regional level. The BRP process is utilising the SMP decision support tool to inform priorities. SMP is a decision support tool that helps biodiversity managers identify and prioritise the most effective and efficient management options for the greatest number of species.

The RCS on the other hand is a high-level strategy and does not include detailed action planning. The current RCS priority biodiversity assets capture areas with significant biodiversity values - but threats and feasibility to manage were also considered. The current RCS shows a map demonstrating alignment between the highest 3 values (7, 6 & 5) of Natureprint priorities for action and the biodiversity assets. This has been reproduced with the current Strategic Biodiversity Values (SBV) in Figure 4 overleaf. SBVs combine information on biodiversity values with vegetation type and condition to show the relative value of landscapes in Victoria and can be used to identify priority areas for protection. An analysis of the proportion of high value (top 35%) SBV captured by current assets was also undertaken as shown in Figure 5. This exercise has identified opportunities to capture some additional areas of high SBV in our priority assets.

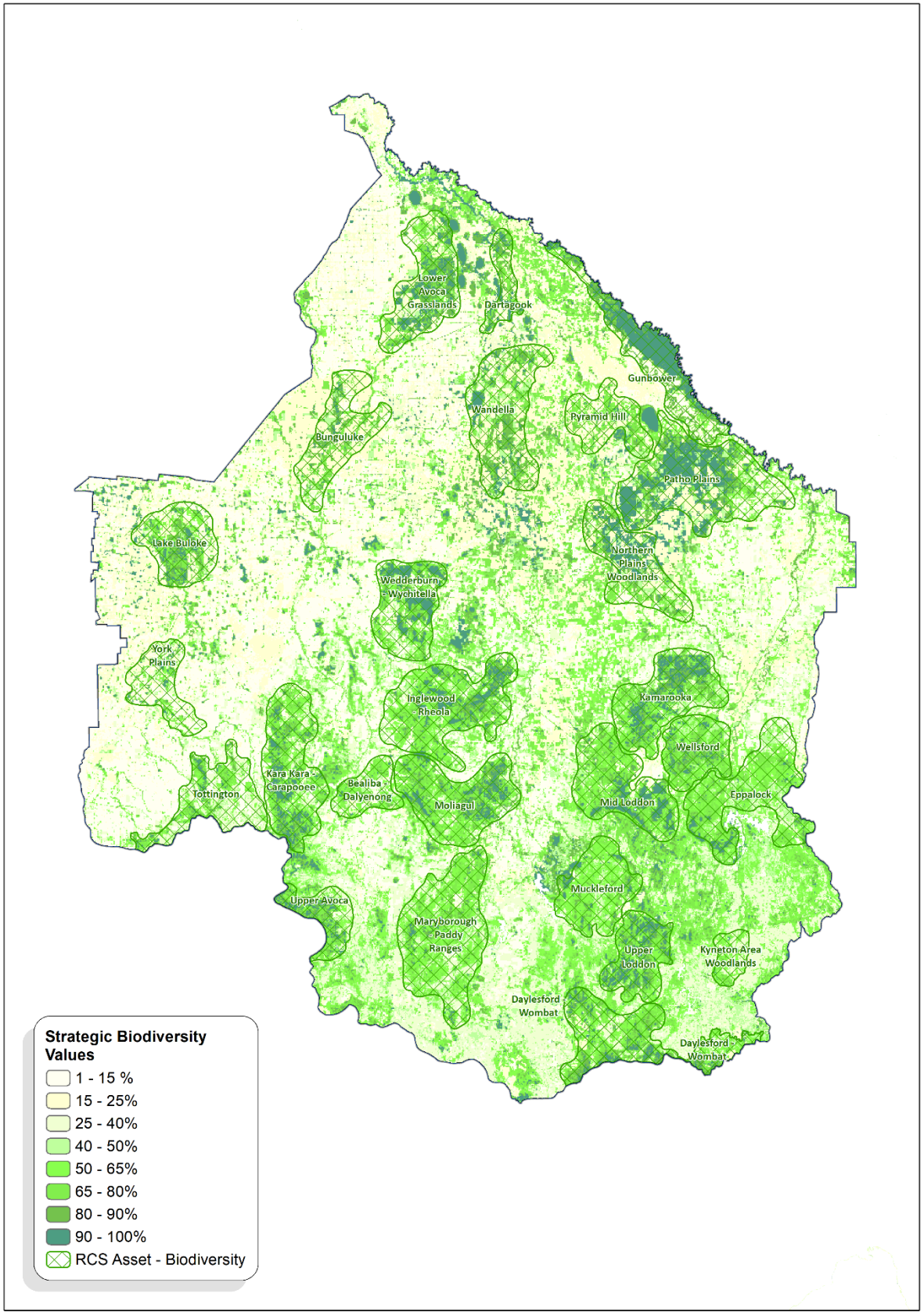


Figure 4: Strategic Biodiversity Values and current RCS biodiversity assets

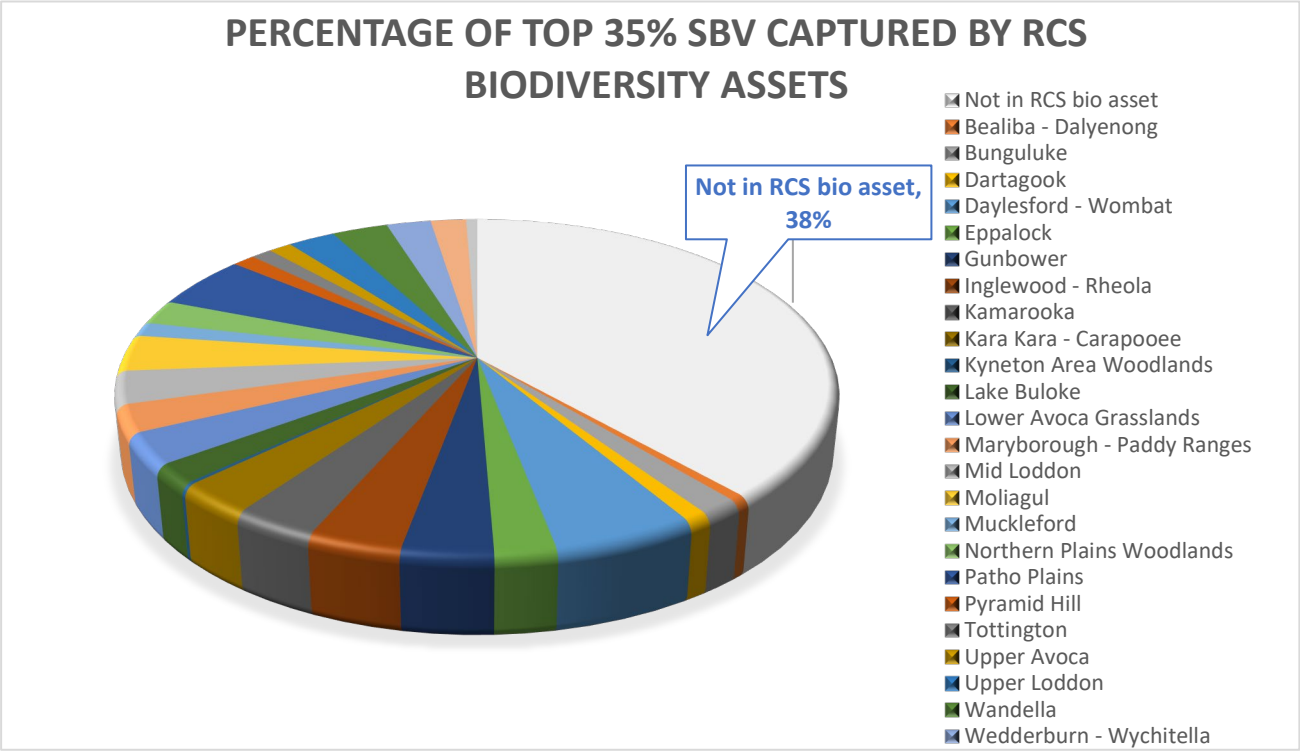


Figure 5: Proportion of top 35% SBV inside and outside current biodiversity assets

This graph that shows 62% of the top 35% SBV are captured by current 2013-19 biodiversity assets. An additional 4% of these high value SBVs, totalling 32,000 hectares, are captured by current and proposed RCS waterway and wetland assets (a 200-metre buffer was applied to either side of the waterway centreline to include riparian zones and enable this analysis).

The SMP modelling includes Habitat Distribution Models which are informed by known (records) and potential (modelled) habitat. The analysis gives places that support many species or threatened species more weight. However, SMP is not designed to identify which places are more important than others to protect (unless protection is a specific management action under consideration, e.g. covenanting). SMP is designed for action planning and is being used by DELWP to inform BRP. A map showing current RCS biodiversity assets and the SMP cost effective actions is included overleaf. The darkest colours show the highest-ranked actions where the best biodiversity value for money can be achieved compared to other actions state-wide. SMP is for decision support and should complement local knowledge and experience, particularly where the model is lacking with regards some threats or information regarding management. SMP will be an important tool for project planning for RCS delivery.

Insert pdf of SMP map

The RCS assets aren't identified for protection and the RCS will not provide a detailed action plan, so neither SBV or SMP is fit for purpose on its own. Considering the original approach to RCS priority setting, we are using SBV to review areas of significant values in relation to current assets and cross checking with SMP with regards relative benefits that could be realised by taking action in those areas.

Proposed updates to the current biodiversity assets have been identified by comparing priority areas suggested through RCS/BRP engagement to date, SBV and SMP. Where these aligned, and there was a concentration of values either; adjacent to an existing asset or large enough to constitute a new asset, they have been proposed as updates, as shown on the map overleaf. Some redrawing of boundaries is also proposed. These proposed updates are being shared for discussion and feedback received will be considered in confirming assets for the new RCS.

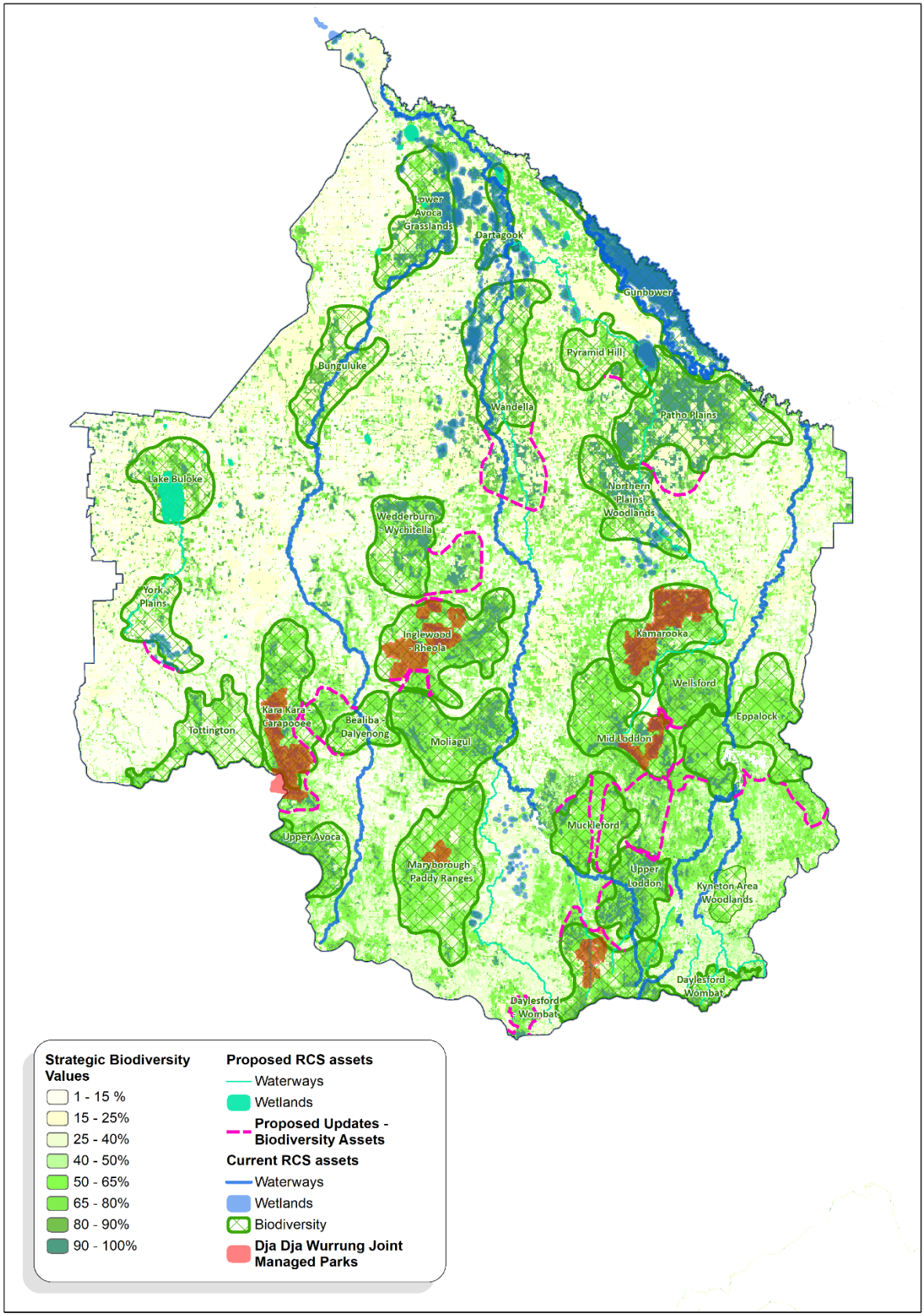


Figure 6: Proposed updates to priority biodiversity assets

Directions

The Biodiversity Plan outlines twenty key priorities (refer Appendix 3) which articulate how its' vision and goals will be achieved. The ***Victorians value nature*** goal and associated priorities are more relevant to the community theme of the RCS and they have informed development of draft priority directions in the community discussion paper.

Biodiversity Plan priorities relevant to the ***Victoria's natural environment is healthy*** goal, together with; outcomes of engagement with partners and the broader community to date, and the threats and trends identified in this paper, have informed development of the following draft RCS priority directions for biodiversity.

	Responds to	**Draft Direction**
1	The Biodiversity Plan, Priority 1: Deliver cost-effective results utilising decision support tools in biodiversity planning processes to help achieve and measure against the targets.	Maintain and enhance the quality of our remnant native vegetation and habitats with a focus on RCS priority biodiversity assets, utilising decision support tools (including Strategic Management Prospects) to maximise benefits
2	Traditional Owners in biodiversity	tbc
3	Climate Change Adaptation and Mitigation Plan 2015, Stakeholder engagement for RCS renewal Research	Build climate-wise connectivity by • promoting a broad strategic approach and • enabling and encouraging local investment and action • leveraging opportunities to improve connectivity
4	Suggested at online biodiversity forum with partners in May The Biodiversity Plan; • Priority 9: Establish sustained funding for biodiversity. • Priority 10: Leverage non-government investment in biodiversity.	Establish a regional biodiversity forum for RCS partners, involved in biodiversity planning and management (including Landcare Networks) to; • collaborate to proactively address habitat loss, • promote collaboration, coordinate effort and share knowledge, • explore options to secure sustained investment and develop/maintain a prospectus for non-government investors, and • explore opportunities for carbon sequestration to maximise benefits for regional biodiversity.
5	Threat/trend: Native vegetation loss is continuing The Biodiversity Plan;	• Improve the retention and restoration of native vegetation and habitat on private land through; community education and farm planning / stewardship programs and

	Responds to	Draft Direction
	• Priority 11: Increase incentives and explore market opportunities for private landholders to conserve biodiversity.	exploring other approaches such as the use of incentives
6	The Biodiversity Plan, Priority 17: Deliver excellence in management of all land and waters. Climate Change Adaptation and Mitigation Plan 2015	Collaborate to understand and respond to climate change impacts on regional biodiversity including, but not limited to; • monitoring species/habitats vulnerable to climate change • undertaking local testing of climate change adaptation strategies for biodiversity (e.g. using different provinces for revegetation to better match future climates)

We welcome your comments on these draft priority directions. What would you change/add?

Outcomes

An RCS outcomes framework has been outlined in the guidelines to enable consistent monitoring and reporting on condition and management across the state. The framework mandates statewide policy outcomes, policy indicators and regional outcome indicators at the same time allowing each CMA to develop a vision, regional outcomes and regional outcome indicators, to articulate what success looks like across themes and local areas at a regional and local level. For the biodiversity theme, the outcomes have been informed by the Biodiversity Plan as explained here.

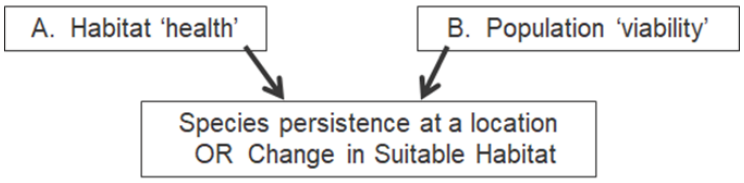
For the ***Victoria's natural environment is healthy*** goal of the Biodiversity Plan, there are state-wide targets and contributing targets as well as enabling actions described. The expected north central regions' contribution to these targets provided by DELWP, have informed RCS outcomes for biodiversity.

The ***Victoria's natural environment is healthy*** goal is based on years of science and investment in modelling. By 2037 the goal is for a net improvement in the outlook across all species, as measured by Change in Suitable Habitat, with the expected outcomes being:

- That no vulnerable or near-threatened species will have become endangered.
- That all critically endangered and endangered species will have at least one option available for being conserved *ex situ* or re-established in the wild (where feasible under climate change) should they need it.
- A net gain of the overall extent and condition of habitats across terrestrial, waterway and marine environments.

Without sustained investment this goal is aspirational. For our efforts to be worthwhile there needs to be long-term investment and associated monitoring. DELWP analysis shows that based on a sustained period of investment at an increased, but plausible level, appropriate management could be established and maintained to deliver (on average) a 100% net positive Change in Suitable Habitat (CHS) for threatened species in 50 years' time. CSH is the increase in

the suitability of habitat at a location at a future time. For example, 50 years in response to sustained management of relevant threats. What is "suitable" is broad in scope. For example, the type and quality of habitat relevant for a species and other factors that influence how much a species can make use of habitat at the location, considering threat load, genetic vigour and climate change. Progress of effort against the contributing targets will be measured as a "change in suitable habitat".



The 20-year outputs to deliver the targets are terrestrial based. The first five years will be important to undertake enabling work for the future – this will include incorporating and translating waterway and marine data into this cost-benefit framework, including more specific climate change data and developing a more holistic understanding of fire – total fire regimes and interaction with other threats. This approach shifts us away from crisis response for single species and is focused on prevention and earlier intervention at a landscape scale to manage ecosystems and ecological process for the benefit of all species, rather than planning for threatened species one at a time.

State-wide aspirational targets have been set on this basis, and the required amount of management identified, making the long-term target more tangible for stakeholders. Interim targets (by 2027) assume; 50% of the revegetation and permanent protection targets with 80% of the priority locations for weeds, pest predator and herbivores under sustained management The north central regions' contribution to these statewide targets as provided by DELWP, are outlined in the table below. These have informed the long term (20-year) and medium term (6-year) RCS outcomes for biodiversity.

North central region contribution (hectares) to statewide interim (2027) and 20-year (2037) Biodiversity Plan targets

	2027 North Central Contribution	**2027 Statewide Target**	**2037 North Central Contribution**	**2037 Statewide Target**
Total area permanently protected since 2017	6,500	100,000	13,000	200,000
Total area in priority locations under sustained weed control (not year by year cumulative total)	56,000	1,200,000	70,000	1,500,000
Total area of revegetation in priority locations for habitat connectivity since 2017	11,000	100,000	22,000	200,000
Total area in priority locations under sustained herbivore control (not year by year cumulative total)	104,000	3,200,000	130,000	4,000,000

	2027 North Central Contribution	2027 Statewide Target	2037 North Central Contribution	2037 Statewide Target
Total area in priority locations under sustained pest predator control (not year by year cumulative total)	32,000	1,200,000	40,000	1,500,000

Trust for Nature are a key RCS partner organisation. They are a not for profit conservation organisation who focus on restoration and protection of biodiversity on private land using covenants. Trust for Nature have undertaken some analysis to further inform a discussion around the permanent protection targets for the RCS.

Trust for Nature notes the Biodiversity Plan commitment to an additional 200,000 ha of permanent protection on private land by 2037 and its commitment under priority 18 to 'maintain and enhance a world-class system of protected areas'. On this latter point, they note the Biodiversity Plan indicates an estimated shortfall of 2.1 million hectares of additional habitat needing formal protection to achieve priority 18 (p. 49), mostly on private land.

Using the National Reserve System's guidelines for establishing a comprehensive, adequate and representative reserve system, Trust for Nature have mapped the extent of under-represented EVCs across the State where they occur in contiguous patches of 1000+ hectares on both public and private land. They have cut that spatial layer to private land and calculated the total extent of these under-represented EVC patches in each CMA region.

From this analysis, they estimate there is a total of 678,913 ha of under-represented vegetation on private land in the north central CMA region. Using rolling averages of covenanting outcomes over the last twenty years, they suggest that aiming to protect 5% of this total (33,944 ha) over the next 20 years would be a useful, reasonable target. This exceeds the 6-year contribution of 6,500 ha permanently protected (since 2017) suggested by DELWP. We have included the Trust for Nature numbers for our outcomes now, (20-year target and used to calculate the 6-year and 20-year SMART outcomes for permanent protection, rounded to the nearest 1000) noting that some further consideration regarding feasibility may be required.

We welcome your comments on these draft outcomes.

Outcomes	**Indicators**
Long-term (20+ years) SMART regional outcome for biodiversity • 34,000 ha increase in the area permanently protected by 2037 • 22,000 ha of revegetation in priority locations for habitat connectivity (since 2017) • 70,000 ha of priority assets under sustained weed control (not year by year cumulative total) by 2027 • 130,000 ha of priority assets under sustained herbivore control (not year by year cumulative total) by 2027 • 40,000 ha of priority assets under sustained pest predator control (not year by year cumulative total) by 2027	In addition to the standard set below, regionally relevant indicators can be added: RCS guidelines suggest the following standard set of indicators to be used across the state: • Increase in the area of permanent protection (ha) • Extent of native vegetation (ha) • Area (ha) of weed control in priority locations. • Acre (ha) of pest herbivore control in priority locations. • Area (ha) of pest predator control in priority locations.

Outcomes	Indicators
Medium-term (6 year) SMART regional outcomes for biodiversity: • 10,000 ha increase in the area permanently protected by 2027 • 11,000 ha of revegetation in priority locations for habitat connectivity (since 2017) • 56,000 ha of priority assets under sustained weed control (not year by year cumulative total) by 2027 • 104,000 ha of priority assets under sustained herbivore control (not year by year cumulative total) by 2027 • 32,000 ha of priority assets under sustained pest predator control (not year by year cumulative total) by 2027	Updated work from the indicators working group (refer Appendix #) suggests the only state wide *outcome* indicators for biodiversity will be: • Area of permanent protection (ha) • Extent of native vegetation (ha)

Vision

Do we need a new vision for biodiversity?

Vision of *Protecting Victoria's Environment – Biodiversity 2037*
Victoria's biodiversity is healthy, valued and actively cared for

Biodiversity vision from current 2013-19 RCS:
Native vegetation extent and condition is improved across the North Central region. Ecological processes are maintained and enhanced and the present diversity of species and ecological communities and their viability is maintained or increased across each bioregion.

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Appendix 1 Threatened Species and Communities Lists

North central region investment priorities as per the National Landcare Programme's Regional Land Partnerships' NRM plan requirements.

Threatened Species

- Australasian Bittern (Bird)
- Eastern Curlew (Bird)
- Malleefowl (Bird)
- Plains-wanderer (Bird)
- Red-tailed Black-Cockatoo (south-eastern) (Bird)
- Regent Honeyeater (Bird)
- Swift Parrot (Bird)
- Button Wrinklewort (Plant)
- Plains Rice-flower (Plant)
- Turnip Copperburr (Plant)
-

EPBC threatened ecological communities

- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregion
- Grassy Eucalypt Woodland of the Victorian Volcanic Plain
- Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia
- Natural Grasslands of the Murray Valley Plains
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains
- White Box-Yellow Box-Blakely's Red Sum Grassy Woodland and Derived Native Grassland

Threatened fauna recorded in the north central region from the Victorian Biodiversity Atlas, accessed August 2020

Common Name	**EPBC**	**FFG**
Alpine Tree Frog	Vulnerable	L
Australasian Bittern	Endangered	L
Australian Grayling	Vulnerable	L
Australian Painted Snipe	Endangered	L
Bar-tailed Godwit	Vulnerable	
Curlew Sandpiper	Critically Endangered	L
Eastern Curlew	Critically Endangered	L
Eastern Hare-wallaby	Extinct	L
Eastern Quoll	Endangered	L
Eltham Copper Butterfly	Endangered	L
Flat-headed Galaxias	Critically Endangered	X
Golden Sun Moth	Critically Endangered	L
Great Knot	Critically Endangered	L
Greater Glider	Vulnerable	L
Greater Sand Plover	Vulnerable	
Grey-headed Flying-fox	Vulnerable	L
Growling Grass Frog	Vulnerable	L
Heath Mouse	Endangered	L
Long-nosed Potoroo	Vulnerable	L
Macquarie Perch	Endangered	L
Malleefowl	Vulnerable	L
Murray Cod	Vulnerable	L
Murray Hardyhead	Endangered	L
Painted Honeyeater	Vulnerable	L
Pink-tailed Worm-Lizard	Vulnerable	L
Plains-wanderer	Critically Endangered	L
Red Knot	Endangered	
Regent Honeyeater	Critically Endangered	L
Regent Parrot	Vulnerable	L

Common Name	EPBC	FFG
Silver Perch	Critically Endangered	L
Sloane's Froglet	Endangered	
South-eastern Long-eared Bat	Vulnerable	L
Southern Greater Glider	Vulnerable	L
Spot-tailed Quoll	Endangered	L
Striped Legless Lizard	Vulnerable	L
Superb Parrot	Vulnerable	L
Swift Parrot	Critically Endangered	L
Trout Cod	Endangered	L
White-throated Needletail	Vulnerable	L
Yarra Pygmy Perch	Vulnerable	L

Threatened flora recorded in the north central region from the Victorian Biodiversity Atlas, accessed August 2020

Common Name	EPBC	FFG
Angular Saltbush		L
Annual Buttons		L
Australian Anchor Plant		L
Basalt Peppercress	Endangered	L
Ben Major Grevillea	Vulnerable	L
Bendigo Spider-orchid		L
Black Gum	Vulnerable	L
Blunt Club-sedge		L
Bow-lip Spider-orchid		L
Brilliant Sun-orchid	Vulnerable	L
Buloke		L
Button Wrinklewort	Endangered	L
Candy Spider-orchid	Vulnerable	L
Castlemaine Spider-orchid		L
Chariot Wheels	Vulnerable	L
Charming Spider-orchid	Endangered	L
Clover Glycine	Vulnerable	L
Clumping Golden Moths		L
Crimson Spider-orchid	Vulnerable	L
Cut-leaf Burr-daisy		L
Dainty Phebalium		L
Dookie Daisy		L
Douglas' Spider-orchid		L
Downy Swainson-pea		L
Dwarf Swainson-pea		L
Eastern Spider-orchid	Endangered	L
Erect Peppercress	Vulnerable	L
Fragrant Leek-orchid	Endangered	L
Grey Grass-tree		L
Hairy Tails		L
Hoary Scurf-pea		L
Inland Leek-orchid		L
Jericho Wire-grass		L
Kamarooka Mallee		L
Large-flower Crane's-bill		L
Large-fruit Yellow-gum		L
Large-headed Fireweed	Vulnerable	L
Limestone Sida		L
Little Pink Spider-orchid	Endangered	L
Lowly Greenhood	Endangered	L
Magnificent Spider-orchid		L
Marbled Marshwort		L

Common Name	EPBC	FFG
Maroon Leek-orchid	Endangered	L
Matted Flax-lily	Endangered	L
McIvor Spider-orchid	Endangered	L
Narrow Goodenia		L
Nealie		L
Northern Golden Moths		L
Northern Sandalwood		L
Ornate Pink-fingers	Vulnerable	L
Pale Leek-orchid	Vulnerable	X
Pale Plover-daisy		L
Plains Billy-buttons		L
Plains Spurge		L
Plump Swamp Wallaby-grass		L
Prince-of-Wales Feather-moss		L
Purple Diuris		L
Purple Eyebright	Endangered	L
Red Swainson-pea	Vulnerable	L
Red-cross Spider-orchid		L
Ridged Water-milfoil	Vulnerable	L
River Swamp Wallaby-grass	Vulnerable	X
Robust Greenhood	Critically Endangered	L
Rock Orchid		L
Rough Eyebright		L
Rough-seed Wire-grass		L
Salt Paperbark		L
Scented Bush-pea		L
Scented Spider-orchid		L
Shiny Daisy-bush		L
Silky Glycine		L
Silky Swainson-pea		L
Slender Club-sedge		L
Slender Darling-pea	Vulnerable	L
Slender Water-milfoil		L
Small Milkwort		L
Small Quillwort		L
Small Scurf-pea		L
Small Sickle Greenhood		L
Small-leaf Wax-flower		L
Soft Sunray		L
Southern Shepherd's Purse	Endangered	L
Spiny Rice-flower	Critically Endangered	L
Spotted Emu-bush		L
Stiff Groundsel	Endangered	L
Striped Water-milfoil		L
Stuart Mill Spider-orchid		L

Common Name	EPBC	FFG
Swamp Diuris		L
Swamp Leek-orchid		L
Swamp Sheoak		L
Tan Leek-orchid		L
Tawny Spider-orchid	Endangered	L
Tough Scurf-pea		L
Turnip Copperburr	Endangered	L
Umbrella Wattle		L
Velvet Daisy-bush		L
Venus-hair Fern		L
Wavy Marshwort		L
Weeping Myall		L
Western Water-starwort		L
Whipstick Westringia	Endangered	L
White Sunray	Endangered	L
Whorled Zieria		L
Winged Peppercress	Endangered	L
Yarran		L
Yarran Wattle		L
Yellow-lip Spider-orchid	Endangered	L
Yellow-tongue Daisy		L

Threatened communities listed under the Flora and Fauna Guarantee Act 1988

Creekline Grassy Woodland Community

The Creekline Grassy Woodland (Goldfields) Community occurs as small remnants within the box-ironbark ecosystems of Victoria.

Two sub-communities have been identified. Both have River Red Gum (Eucalyptus camaldulensis) forming open overstorey canopy, often with larger old trees. Groundcover is a dense layer of grasses and sedges including Weeping Grass (Microlaena stipoides = M. stipoides var. stipoides), Tall Sedge (Carex appressa), rushes (Juncus spp.), Wirilda (Acacia retinodes = Acacia provincialis), Black Wattle (Acacia mearnsii), and Rough-barked Honeymyrtle (Melaleuca parvistaminea). Broome (Bromus spp.), Quaking-grass (Briza spp.) and Fescue (Vulpia spp.) are commonly present weed species. Yellow Box (Eucalyptus melliodora) and Grey Box (E. microcarpa) occur in one of the sub-communities, whereas the other has a characteristic understorey dominated by Common Tussock-grass (Poa labillardierei = P. labillardierei var. labillardierei) and Kangaroo Grass (Themeda triandra).

The community occurs as a woodland interface between the undulating sedimentary rises and the geologically younger alluvial plains. It fringes shallow or ephemeral drainage lines on the lower slopes of box-ironbark forests but is distinct from the riparian vegetation found along permanently flowing streams on the alluvial plains.

Grey Box - Buloke Grassy Woodland Community

The Grey Box - Buloke Grassy Woodland Community is a mainly grassy woodland found on flat or very gently undulating plains in northern Victoria and a few places in central Victoria. It tends to develop in the absence of fire on sites with relatively fertile, fine-grained soils.

Grey Box (Eucalyptus microcarpa) is usually the structurally dominant tree over a lower stratum of Buloke (Allocasuarina luehmannii). Where fire is absent over a very long period, buloke may become the dominant species. The ground layer is mainly grasses such as Bristly Wallaby-grass (Danthonia setacea = Rytidosperma setaceum), Squirrel-tail Fescue (Vulpia bromoides), Soft Brome (Bromus hordeaceous = B. hordeaceus), Windmill-grass (Chloris truncata), Common Wheat-grass (Elymus scaber = E. scaber var. scaber), occasionally Kangaroo Grass (Themeda triandra) and (rarely) Tussock-grass (Poa sieberiana). Although a shrub layer is usually lacking, a scattering of wattles is present at some sites, including Deane's Wattle (Acacia deanei), Gold-dust Wattle (A. acinacea) and Golden Wattle (A. pycnantha) and a few other shrubs such as Drooping Cassinia or 'Chinese Scrub' (Cassinia arcuata)

Northern Plains Grassland Community

The Northern Plains Grassland Community is restricted to the naturally treeless plains of northern Victoria and dominated by largely perennial tussocky grasses and an occasional, sparse occurrence of trees or large shrubs.

The community is a tussock grassland dominated by Danthonia spp. (including Danthonia setacea = Rytidosperma setaceum and D. caespitosa = Rytidosperma caespitosum) and Stipa spp. (including Stipa nodosa = Austrostipa nodosa and S. gibbosa = Austrostipa gibbosa) and other sub-dominant grasses, together with a variety of shrubs and herbs. The families Asteraceae (including Brachyscome chrysoglossa and Vittadinia gracilis) and Chenopodiaceae (including Atriplex semibaccata, Maireana excavata, Einadia spp.) are characteristic. The community is readily

distinguished from other grasslands and grassy woodlands in Victoria by the absence of Themeda triandra.

The Northern Plains Grassland Community extends from Echuca in the east to the Patho Plains near the Loddon River in the west. Its soil type and rainfall are probably the two main influences on its floristic composition, although this has been much modified by land-use practices. Soils are heavy and vary from calcareous clay loams to cracking clays that may be inundated for short periods. The higher rainfall regions to the east tend to have greater representation of native perennial grasses while the drier areas to the west tend to be richer in chenopods.

Lowland Riverine Fish Community of the Southern Murray-Darling Basin

The Lowland Riverine Fish Community of the southern Murray-Darling Basin is characteristic of the geographical area that defines its distribution, and by a selected suite of native fish taxa that is typical of and largely restricted to the area.

The geographical area that delineates this fish assemblage can be broadly defined as the lowland river reaches and associated floodplains of the Murray River tributaries in Victoria that drain the northern slopes of the Great Dividing Range, together with the lowland section and floodplain of the Murray River upstream of the South Australian border. The major streams involved are: the Mitta Mitta, Ovens, Broken, Goulburn, Campaspe, Loddon and Avoca Rivers. Whilst this community mainly occurs in the lowland river reaches, some species may also occur (at least at certain times) in both the slope and upland river reaches.

The fish fauna is predominantly characterized by the following native fish species: Agassiz's Chanda Perch (Ambassis agassizii), Silver Perch (Bidyanus bidyanus), Murray Hardyhead (Craterocephalus fluviatilis), Non-specked Hardyhead (Craterocephalus stercusmuscarum fulvus), Flat-headed Galaxias (Galaxias rostratus), Western Carp Gudgeons (Hypseleotris klunzingeri, now considered to be a species complex), Trout Cod (Maccullochella macquariensis), Murray Cod (Maccullochella peelii, previously Maccullochella peelii peelii), Golden Perch (Macquaria ambigua), Macquarie Perch (Macquaria australasica), Murray Rainbow Fish (Melanotaenia fluviatilis), Southern Purple-spotted Gudgeon (Mogurnda adspersa), Bony Bream (Nematalosa erebi), Flat-headed Gudgeon (Philypnodon grandiceps) and Freshwater Catfish (Tandanus tandanus). Other widespread or uncommon species may also occur over parts of the distribution of this community: Southern Pigmy Perch (Nannoperca australis), River Blackfish (Gadopsis marmoratus), Two-spined Blackfish (Gadopsis bispinosus), Australian Smelt (Retropinna semoni), Short-headed Lamprey (Mordacia mordax), Short-finned Eel (Anguilla australis), Broad-finned Galaxias (Galaxias brevipinnis) and Barred Galaxias (Galaxias fuscus).

Many of these constituent species have undergone significant reductions in range and abundance since European settlement. There have been considerable changes to habitats throughout the distribution of this community, caused by a range of factors, and the introduction of alien fish species within the range of the community, such as Brown Trout (Salmo trutta), Rainbow Trout (Oncorhynchus mykiss), Carp (Cyprinus carpio), Goldfish (Carassius auratus), Tench (Tinca tinca), Oriental Weatherloach (Misgurnus anguillicaudatus), Eastern Gambusia (Gambusia holbrooki) and Redfin Perch (Perca fluviatilis).

Victorian Temperate Woodland Bird Community

The Victorian Temperate Woodland Bird Community has been defined as a suite of bird species, mainly associated with drier woodlands on the slopes and plains north of the Great Dividing Range, that seem to have declined markedly in numbers since records began.

The 24 species in this group are the Painted Button-quail (Turnix varia), Bush Stone-curlew (Burhinus grallarius), Red-tailed Black-Cockatoo (Calyptorhynchis banksii graptogyne), Little Lorikeet (Glossopsitta pusilla), Superb Parrot (Polytelis swainsonii), Swift Parrot (Lathamus discolor), Turquoise Parrot (Neophema pulchella), Barking Owl (Ninox connivens), Brown Treecreeper (Climacteris picumnus victoriae), Speckled Warbler (Chthonicola sagittata), Western Gerygone (Gerygone fusca), Regent Honeyeater (Anthochaera = Xanthomyza phrygia), Yellow-tufted Honeyeater (Lichenostomus melanops meltoni), Fuscous Honeyeater (Lichenostomus fuscus), Black-chinned Honeyeater (Melithreptus gularis), Brown-headed Honeyeater (Melithreptus brevirostris), Painted Honeyeater (Grantiella picta), Jacky Winter (Microeca fascinans), Red-capped Robin (Petroica goodenovii), Hooded Robin (Melanodryas cucullata), Grey-crowned Babbler (Pomatostomus temporalis), Ground Cuckoo-shrike (Coracina maxima), Apostlebird (Struthidea cinerea), and Diamond Firetail (Stagonopleura guttata).

The distributions of these birds differ between species. Many are closely associated with (but not exclusive to) northern Victorian drier woodlands dominated by box, stringybark, ironbark, yellow gum or river red gum eucalypts, or by buloke or cypress-pine. Many such woodlands originally had an open structure, a light shrubby understorey, a grassy ground cover with fallen timber, an abundance of tree-hollows and other nesting sites, and available sources of seeds, nectar and insects throughout the year. Since European settlement, most of these woodlands have been cleared for agricultural production, or fragmented and degraded, greatly reducing the resources available to these birds; many sites now also have cats and foxes present. Some species are found in other habitats: the Superb Parrot, Apostlebird and, to a lesser extent, the Ground Cuckoo-shrike are mainly found in habitats along or near the Murray River, while the Red-tailed Black-Cockatoo is confined to the far south-west of the state, in woodlands on sandy soils that are dominated by Brown Stringybark (Eucalyptus baxteri) and Desert Stringybark (E. arenacea) and the nearby woodlands dominated by River Red Gum (E. camaldulensis), Yellow Gum (E. leucoxylon) or Buloke (Allocasuarina luehmannii).