RMCG

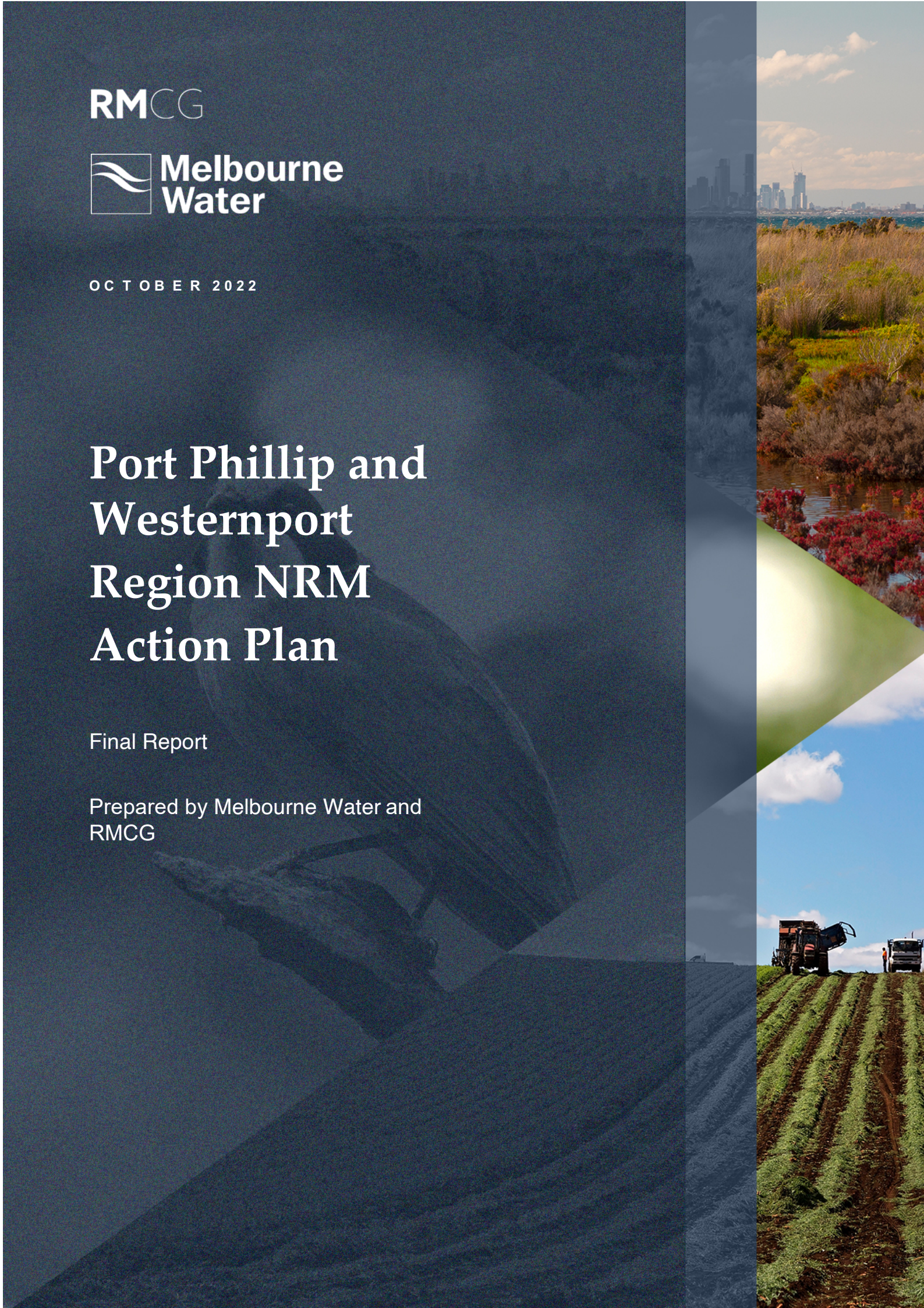
Melbourne Water

OCTOBER 2022

Port Phillip and Westernport Region NRM Action Plan

Final Report

Prepared by Melbourne Water and RMCG



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GLOSSARY

Catchment Management Authority (CMA)

Department of Environment Land, Water and Planning (DELWP)

Environment Protection Biodiversity Conservation Act (1999) (EPBC)

National Landcare Program (NLP2)

Natural Resource Management (NRM)

Port Phillip and Westernport (PPW)

Registered Aboriginal Parties (RAPs)

Regional Catchment Strategy (RCS)

Regional Land Partnerships (RLP)

Service Level Agreement (SLA)

ACKNOWLEDGEMENT OF COUNTRY

We acknowledge the Wadawurrang, Wurundjeri Woi-wurrung, Bunurong as the Traditional Owners of the Country on which this project is conducted. We recognise their continuing connection to land, waters and culture and pay our respects to their Elders past, present and emerging. Moreover, we express gratitude for the knowledge and insight that Traditional Owners and other Aboriginal and Torres Strait Islander people contribute to our shared work.

1 Introduction

1.1 THE RLP PROGRAM

The National Landcare Program (NLP2) is a key part of the Australian Government's investment in natural resource management. The Regional Land Partnerships (RLP) program, a major component of NLP2, is investing in projects over 5 years from July 2018 to June 2023. These projects are in place and are currently being implemented. The aim of the RLP is to "protect, conserve and provide for the productive use of Australia's water, soil, plants and the ecosystems in which they live and interact in partnerships with governments, industries and communities".

The RLP supports projects that contribute to six long-term outcomes (detailed in section 2). Four of these outcomes focus on the recovery of threatened species, protection of threatened ecological communities, and reducing threats to globally important wetlands and World Heritage Areas. A further two outcomes focus on sustainable agriculture. Five of the six outcomes are relevant to the Port Phillip and Westernport (PPW) region (there are no World Heritage Areas in the region).

1.2 THIS PLAN

As a condition of receiving RLP funding, the Service Level Agreement (SLA) with the Australian Government requires Melbourne Water to develop a Natural Resource Management (NRM) Plan for the PPW region. This plan aims to:

- Identify how the delivery of existing and potential future projects will contribute to the RLP outcomes and investment priorities for the region
- Reflect stakeholder aspirations, including Indigenous peoples' land and sea management aspirations
- Identify how actions will be implemented with comprehensive community participation
- Identify the key collaborations and partnerships for delivery
- Identify the monitoring and reporting processes that will be used to measure the achievements and effectiveness of the plan.

Whilst this plan is a requirement under the service agreement between Melbourne Water and the Australian Government, it will also play an important role for Melbourne Water's wider investment in natural resource management in the region. It is intended that the methodology used to identify priorities in this plan will be used more broadly to identify priorities for investment across the PPW region. With this in mind, Melbourne Water intends to use the plan as a working document. It will be revisited regularly so that it can be adapted and refined as projects progress and evolve. It will play a key role in the implementation of the PPW Regional Catchment Strategy (RCS) and will be used to identify areas where the NRM priorities of Melbourne Water coincide with those of other stakeholders in the region, which will present opportunities for collaboration and partnerships.

STRUCTURE OF THE PLAN

In broad terms the plan is presented in three parts:

- The method used to develop the plan – sections 2, 3 and 4
- Regional priorities under three themes - Ramsar wetlands, biodiversity (EPBC threatened species and EPBC threatened ecological communities) and agriculture – sections 5, 6 and 7
- Implementation, and monitoring and reporting on the plan – sections 8 and 9.

PPW NRM REGION ACTION PLAN OVERVIEW

PURPOSE

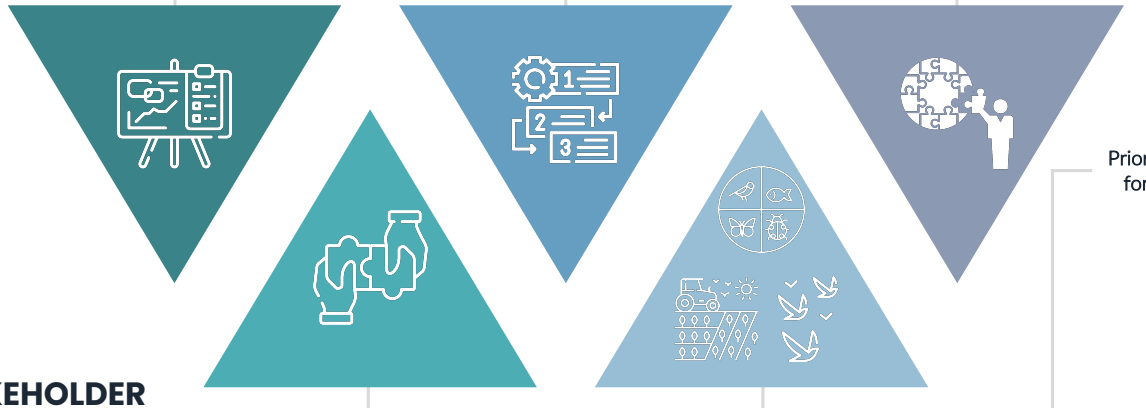
Identify priorities for action and delivery through the RLP Program, RCS and where relevant align to broader priorities within the region

PRIORITY SETTING

A step-wise process was developed for this plan to identify priorities; identification of assets, values and threats, five-year objectives, priority actions to deliver on five-year objectives, analysis of relative costs and benefits of delivering priority actions, qualitative indicators (landscape context, partnerships, outcomes of previous investment, Community and Traditional Owner values, on-going viability of investment)

IMPLEMENTATION

The priorities outlined in the plan will be further refined with partners and collaborators. A mix of consultation and delivery methods will be used to implement projects that are developed with guidance from the plan



STAKEHOLDER ASPIRATIONS

The plan reflects community, other stakeholder and where possible Traditional Owner aspirations for natural resource management across the region. Extensive consultation processes have been delivered to capture these aspirations and the plan outlines the pathway for continuous engagement and collaborative co-design

THEMES

The plan is structured around three key themes Ramsar Wetlands, Biodiversity (EPBC Threatened Species, EPBC Threatened Ecological Communities) and Agriculture. Priorities for each theme have been developed through the priority-setting process

Priorities identified for each theme

Ramsar Wetlands:

- Western Treatment Plan (Western Lagoon)
- Big Marsh (within the Spit Nature Conservation Reserve)
- Altona Coastal Park (Jawbone Reserve, Skeleton Creek)
- Mud Islands
- Observation Point/ Rhyll Inlet
- Stockyard Point
- Tortoise Head
- North-West French Island
- French Island
- Northern Shore (French Island)
- Edithvale South Wetland

EPBC Listed Threatened Species/ Threatened Ecological Communities

- Orange- bellied Parrot
- Leadbeater's Possum
- Helmeted Honeyeater
- Spiny-rice Flower
- Round-lead Pomaderris
- Natural Temperate Grasslands of the Victorian Volcanic Plains
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains

Agriculture:

- Mornington Peninsula
- Yarra Valley
- Werribee
- Drouin
- Bacchus Marsh
- Cranbourne
- Packenham/ Koo Wee Rup
- Priority Soils (across the region)

2 RLP Five Year Outcomes and Investment Priorities

This section presents the 5-year outcomes for the RLP program relevant to the PPW region. All the 5-year outcomes are relevant to the PPW region, with the exception of Outcome 3 which relates to World Heritage properties. For each of the 5-year outcomes relevant to the PPW region, current and (proposed) future investment priorities have been presented (Table 2-1). The rationale for each of the future priorities is detailed in section 4 of this plan.

Table 2-1: Regional Land Partnership outcomes

NO.	FIVE YEAR OUTCOME	INVESTMENT PRIORITIES IN THE PPW REGION	
		CURRENT	FUTURE
1	By 2023, there is restoration of, and reduction in threats to, the ecological character of Ramsar sites, through the implementation of priority actions	▪ Ramsar Protection Program ▪ French Island Feral Cat Eradication Program	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula: ▪ Western Treatment Plant (Western Lagoon) ▪ Big Marsh (within the Spit Nature Conservation Reserve) ▪ Altona Coastal Park (Jawbone Reserve, Skeleton Creek) ▪ Mud Islands Western Port: ▪ Observation Point/ Rhyll Inlet ▪ Stockyard Point ▪ Rams Island (including Bird Island) ▪ Tortoise Head ▪ North-West French Island ▪ French Island ▪ Northern Shore (French Island) Edithvale-Seaford Wetlands ▪ Edithvale South Wetland
2	By 2023, the trajectory of species targeted under the Threatened Species Strategy, and other Environment Protection and Biodiversity Conservation Act 1999 priority species, is stabilised or improved	▪ The Great He Ho Escape ▪ French Island Feral Cat Eradication Program	▪ Orange-bellied Parrot (*Neophema chrysogaster*) ▪ Leadbeater's Possum (*Gymnobelideus leadbeateri*) ▪ Helmeted Honeyeater (*Lichenostomus melanops cassidix*) ▪ Spiny Rice-flower (*Pimelea spinescens subsp. spinescens*) ▪ Round-leaf Pomaderris (*Pomaderris vacciniifolia*)
4	By 2023, the implementation of priority actions is leading to an improvement in the condition of EPBC Act listed Threatened Ecological Communities		▪ Natural Temperate Grasslands of the Victorian Volcanic Plains ▪ Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains

NO.	FIVE YEAR OUTCOME	INVESTMENT PRIORITIES IN THE PPW REGION	
		CURRENT	FUTURE
5	By 2023, there is an increase in the awareness and adoption of land management practices that improve and protect the condition of soil, biodiversity and vegetation	▪ Components of Priority Soils (Farmers Digging Deeper) ▪ Components of other agriculture focus area priorities delivered through the Regional Agriculture and Landcare Facilitator position	▪ Mornington Peninsula ▪ Yarra Valley ▪ Werribee ▪ Drouin ▪ Cranbourne ▪ Pakenham / Koo Wee Rup ▪ Priority soils
6	By 2023, there is an increase in the capacity of agriculture systems to adapt to significant changes in climate and market demands for information on provenance and sustainable production	▪ Western Port (Smart Farming for Western Port Project)	▪ Mornington Peninsula ▪ Yarra Valley ▪ Werribee ▪ Drouin ▪ Bacchus Marsh

3 Stakeholder aspirations

The stakeholder and community aspirations reflected in this plan have been drawn from several engagement and review processes including:

- Through development of the RCS
- Review of existing plans, strategies and reports relevant to the region
- Themed workshops with expert stakeholders (Ramsar wetlands, EPBC listed threatened species/ EPBC listed threatened ecological communities, agriculture)
- Targeted engagement with Traditional Owners.

More information on these processes is provided next.

3.1 RCS ENGAGEMENT

The stakeholder and community aspirations reflected in this plan are drawn partly from the RCS engagement process that was conducted in 2021 during development of the RCS. This included seeking feedback and input through:

- Distribution of an RCS e-newsletter
- Promotion on social media and invitations for input in local media
- Direct communication with various community and partner organisations
- Consultation with major Victorian Government organisations and the 38 councils in the region.

The purpose of the RCS engagement process was to generate an understanding of the community and stakeholder needs and expectations with respect to NRM in the PPW region. Over 100 organisations were engaged in shaping the RCS. Input directly related to the RLP investment themes included:

- Ramsar wetlands
  - Improve waterbird habitat within the Western Port Ramsar site
  - Reduce disturbance of waterbird species during foraging/roosting
  - Support monitoring and collection of data for waterbird populations.
- Threatened Species/ Threatened Ecological Communities
  - Increase the protected area network and improve the condition of vegetation communities in these areas
  - Establishment of biolinks, consider complimentary benefits for species that are not listed at the highest conservation status
  - Regeneration of indigenous vegetation
  - Habitat improvement/restoration.
- Agriculture
  - Soil compaction and erosion
  - Improve awareness of biodiversity on farm and the productivity benefits that flow from protection of biodiversity
  - Moving to a circular economy
  - Regenerative agriculture in the Yarra Valley
    - Soil carbon
    - Protection of farming land.

Current and future opportunities for funding NRM projects are collected through the 'prospectus' which provides a list of potential projects proposed by partner organisations. Projects presented in the RCS 'prospectus' have been considered in developing the priorities for each theme in this plan.

3.2 EXPERT WORKSHOPS

An expert consultation process was undertaken in 2022 to develop and refine priority assets and actions for each theme in this plan (see Appendix 1). The purpose of this consultation was to ensure that in addition to drawing on background data and information, the plan also reflected the considerable experience and expertise of the many organisations and stakeholders in the region. All of this provided vital information for the prioritisation process used in developing this plan. The consultations included:

- Targeted follow up with the Australian Government and Melbourne Water theme leads to source relevant background information and data
- A series of workshops (six in total, two per theme) to elicit expert advice and verify the data and information used to complete the prioritisation analysis. Agencies and organisations that participated in these workshops are listed in Appendix 1 and included Department of Environment Land (DELWP), Water and Planning, Agriculture Victoria, Parks Victoria, Birdlife Australia, Trust for Nature, Phillip Island Nature Parks, local governments, GippsDairy, AusVeg and Landcare
- Targeted follow up with expert stakeholders post the workshops to fill any information gaps.

3.3 TRADITIONAL OWNERS

The Bunurong, Wadawurrung and Wurundjeri people are the Traditional Owners of the land and waters in the PPW region. The Registered Aboriginal Parties (RAPs) for this region are the Bunurong Land Council Aboriginal Corporation, Wadawurrung Traditional Owners Aboriginal Corporation and Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation (Figure 3-1). Country Plans for the three RAPs set out aspirations and will highlight projects that should be pursued as priorities for this region. Currently the Wadawurrung Country Plan is complete but plans for Bunurong and Wurundjeri Woi-wurrung are in development.

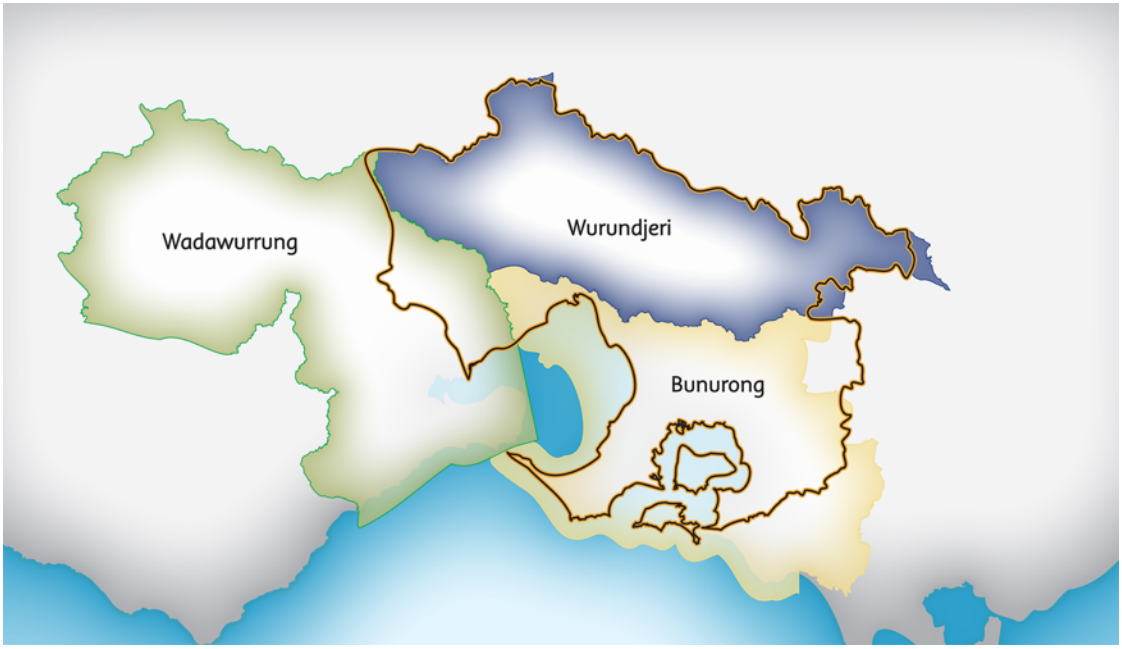


Figure 3-1: Registered Aboriginal Parties in the PPW region (correct as of 1 July 2021) (Source: PPW Regional Catchment Strategy)

This timing for the development of this plan has presented a challenge for Traditional Owner aspirations to be represented and incorporated in this plan. There has been recent engagement of the region's Traditional Owners as part of the preparation of a revised RCS for the PPW region. In recognition of the long history of stewardship of this Country by Traditional Owners the RCS identified four specific targets related to natural resource management:

- Traditional Owners as the 'voice' for waterways and Country (Target 13.1)
- Cultural heritage sites (Target 13.2)
- Indigenous representation in natural resource management (Target 13.3)
- Indigenous employment in natural resource management (Target 13.4).

With these foundational commitments in place, Melbourne Water is committed to continuing to build its relationship with the Traditional Owners of the region, and to ensure this plan reflects Traditional Owner's aspirations for NRM. This will require further discussions with all three groups. To date, Melbourne Water has contacted the three RAPs to brief them on this plan (and the development process) and some discussions have commenced, but more time is required to discuss the most appropriate approach to ensuring their values and interests are reflected in the NRM priorities for the region. It is critical that these discussions occur in concert with the respective group's Whole of Country Plans and on timelines determined by the Traditional Owner groups themselves.

This evolving content can be accommodated in the plan given the commitment to use the plan as a working document (noted in section 1.2).

4 Priority setting

4.1 PRINCIPLES THAT INFORMED THIS PROCESS

The priority-setting process developed for this plan has been based on a set of broad principles. These principles are that NRM priority-setting must be based on:

- Identifying specific environmental assets and their importance (e.g. national significance)
- Setting realistic timebound objectives for those assets
- Considering both the costs and benefits of achieving those objectives (i.e. the most significant asset is not necessarily the highest priority)
- Estimating the benefits relative to costs in order to differentiate between options
- Considering qualitative factors, because it is not possible or practical to quantify all the factors that are relevant to setting priorities.

4.2 PRIORITISATION PROCESS

The prioritisation process used in the plan is described here (see Figure 4-1 and Appendix 2). The overall process comprises two separate steps – a cost-benefit rating complemented by a qualitative analysis.

The key steps in the cost-benefit rating were:

1. *Identify assets and their significance* – e.g. linked to RLP outcomes of Ramsar wetlands, Environment Protection Biodiversity Conservation Act (EPBC) listed species and communities – and drawing from existing plans e.g. RCS
2. *Identify threats to those asset* – drawing from existing management plans where possible
3. *Identify potential actions*, *specifically*:
    a. Relative benefits of actions – likely impact/outcome, scale of actions required, representativeness, time lags (within the plan timeframe vs beyond)
    b. Relative costs of actions – financial resources, technical feasibility, scale of actions, maintenance costs.
4. *Identify relative cost-benefit of actions to protect different assets* – this step highlights projects that will deliver, for example, high benefits for relatively moderate cost, as well as those that might be low cost with high benefits (‘easy wins’).

From this assessment, options that were considered to be relatively cost-effective, were taken into the next part of the assessment which considered other factors that might increase their relative significance for the plan. This step (referred to as the qualitative assessment) focussed on highlighting factors including:

- Situations where the community is already actively working on the asset or the associated threats (e.g. Friends of the Helmeted Honeyeater)
- Traditional Owners highlighting the importance of this same asset or location for cultural reasons
- The strong foundation that previous work by other agencies or organisations would provide for future work
- The viability of retaining the benefits gained from an investment, including factors like tenure, maintenance costs, future land use pressures
- Whether possible future events (like climate extremes) could jeopardise work that might be done on a given asset
- The complexity of the work to be delivered and operating environment, and whether this poses any risk to being able to achieve the desired goals.

4.2.1 THE PRIORITISATION PROCESS IN CONTEXT

The process designed and implemented here is intended to provide Melbourne Water with an on-going system to record and monitor NRM priorities. While the method was strongly influenced by the requirements of the RLP program, it does reflect broad NRM priority-setting principles so will act as a long-term record of the region's priorities.

The process has generated a database of potential priorities for the region (i.e. all potential assets have been recorded) which can be re-visited and adjusted as knowledge changes, as projects progress and as new funding priorities emerge.

It is important to acknowledge that other prioritisation NRM processes have been developed previously and it is likely that those processes also include elements of the above priority-setting process (see Appendix 3). The prioritisation process used in this plan has been developed to primarily meet the SLA requirements of the RLP program. It is transparent, robust and repeatable and has the functionality to be applied more broadly across other investment programs in particular, by amending the criteria use in step 1 – Identification of the environmental or NRM asset.

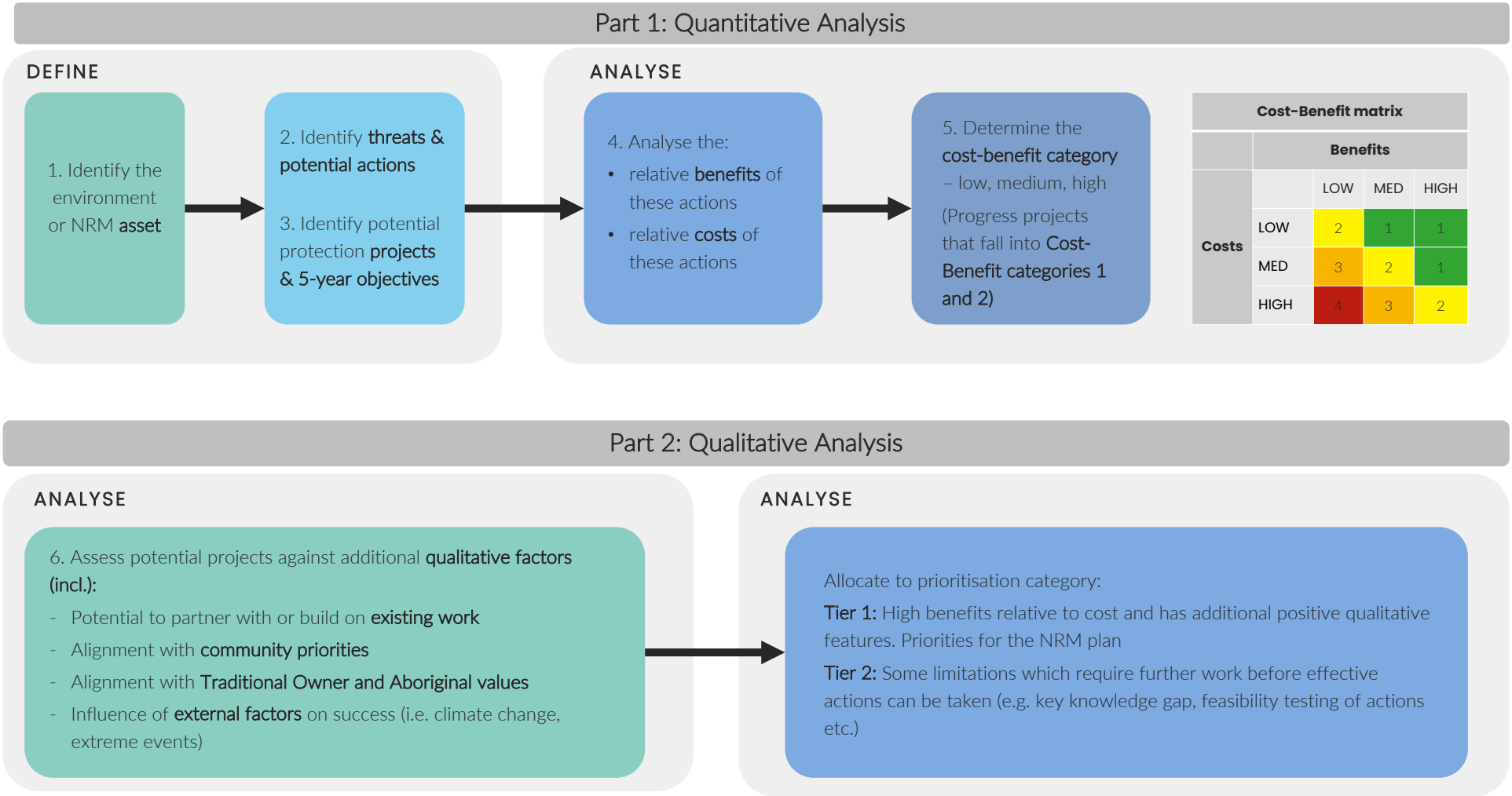


Figure 4-1: Simplified description of the priority-setting process

5 Ramsar Wetlands

5.1 OVERVIEW

Ramsar sites in the PPW Region

The three Ramsar sites within the PPW region include:

- **Port Phillip Bay (Western Shoreline) and Bellarine Peninsula**
- **Edithvale-Seaford**
- **Western Port**

The RLP outcomes for Ramsar wetlands in the PPW region are as follows:

Long-term (10-20 years)
"The ecological character of Ramsar sites is maintained or improved"

Medium-term (5 years)
"By 2023, there is restoration of and, reduction in threats to, the ecological character of Ramsar sites through the implementation of priority actions"

RLP Ramsar Investment Priorities:
Port Phillip Bay (Western Shoreline) and Bellarine Peninsula

- Altona Coastal Park including Jawbone Reserve and Skeleton Creek
- Western Treatment Plant (Western Lagoon)
- Big Marsh
- Mud Islands

Edithvale-Seaford

- Edithvale South Wetland

Western Port

- Observation Point/ Ryll Inlet
- Stockyard Point
- Rams Island
- Tortoise Head
- North-West French Island
- French Island
- Northern Shore (French Island)

3
Ramsar Sites occur in the region

76,485 ha
The total approximate area of Ramsar Sites within the region*

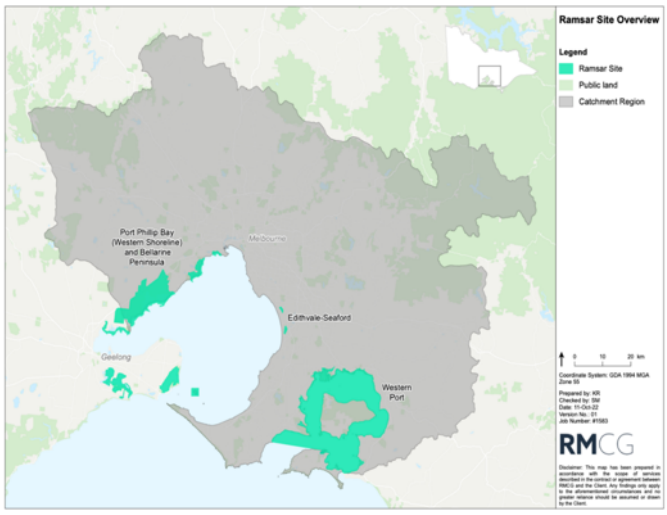
30
Threatened species supported by Ramsar sites across the region*

9
Types of land managers responsible for Ramsar site management*

319
Combined number of waterbird species supported across all three sites*

2,325 ha
Approximate area of Coastal Saltmarsh across all three sites*

** Note these are estimates drawn from the Ramsar Site Management Plans for each site*



The regional long-term (2050), medium-term (2028) outcomes and priority management direction for Ramsar wetlands in the PPW region are shown in the table below. These are drawn from the RCS.

RCS 2028 OUTCOME	RCS 2050 OUTCOME	PRIORITY MANAGEMENT DIRECTION
The ecological conditions of the Western Port Ramsar wetland, Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar wetland and Edithvale-Seaford Ramsar wetland are maintained or improved from 2021 to 2028.	The ecological conditions of the Western Port Ramsar wetland, Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar wetland and Edithvale-Seaford Ramsar wetland are maintained or improved from 2021 to 2050.	▪ Pest animal control ▪ Pest plant control ▪ Behavior modification ▪ Community engagement ▪ Restore hydrological regimes ▪ Habitat enhancement ▪ Citizen science (bird surveys and monitoring) ▪ Environmental education

The priority management directions are based on stakeholder and community aspirations consistent with the priorities and actions outlined in the Ramsar site managment plans which were developed through extensive stakeholder consultation.

5.2 RAMSAR WETLAND CONTEXT

PORT PHILLIP BAY (WESTERN SHORELINE) AND BELLARINE PENINSULA

The Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site is located on the western shoreline of Port Phillip Bay between the major cities of Melbourne and Geelong and on the Bellarine Peninsula (Figure 5-1). The site occurs over 22,650 hectares and across six distinct areas[1]. The site is composed of a range of habitats including freshwater wetlands, estuaries, intertidal shorelines, sub-tidal beds, inland saline wetlands and a wastewater treatment facility. Extensive areas of coastal saltmarsh and seagrass occur within the Ramsar Site, with smaller areas of freshwater vegetation within the Lake Connewarre complex[1].

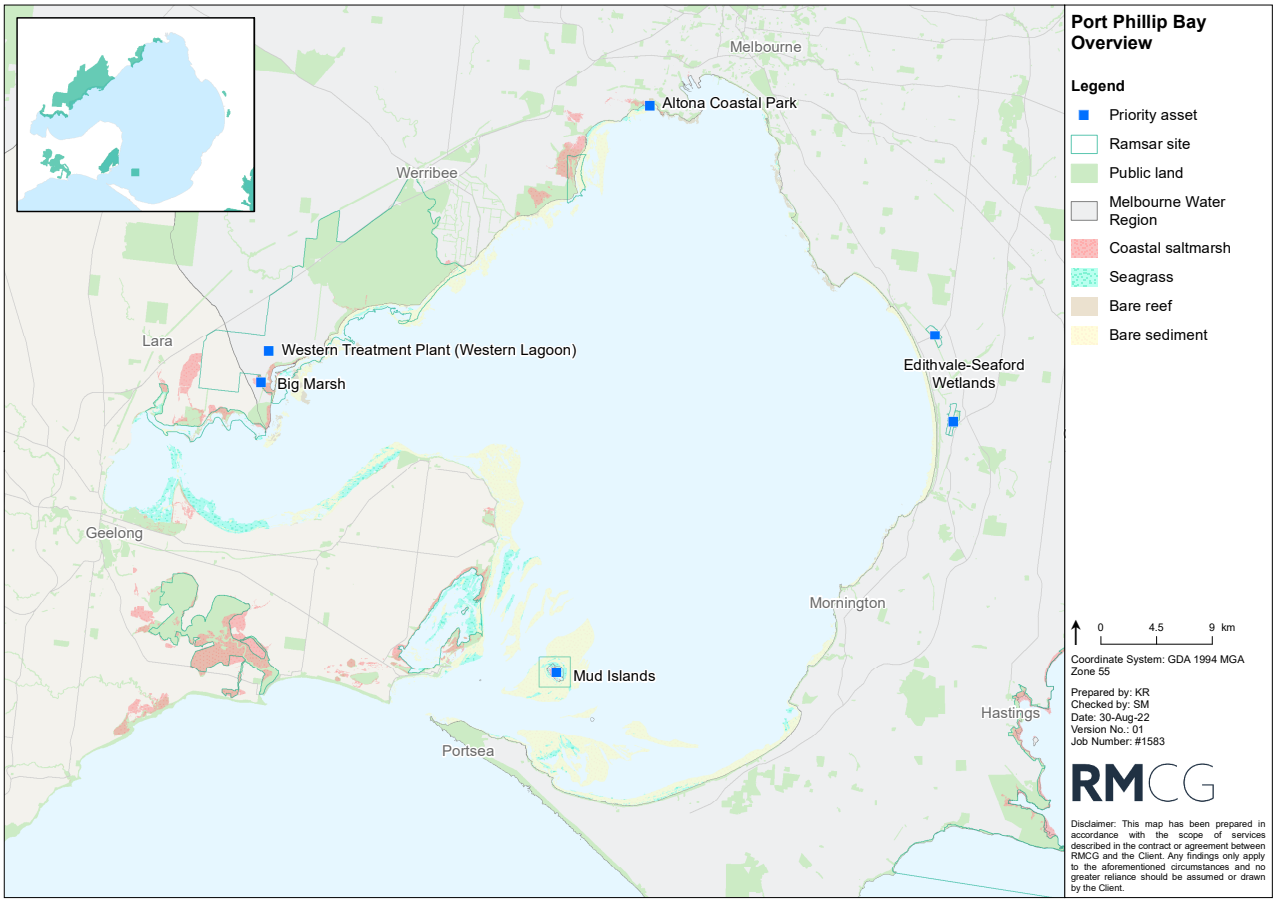


Figure 5-1: Location of the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site

The site provides significant foraging area for a variety of shorebird species particularly across the Werribee/ Avalon section which is high in productivity (supports a high biomass of microorganisms which in turn supports high numbers of invertebrates and fish which are primary sources of food for waterbirds). There are also several important roosting (resting) areas within the site often in close proximity to foraging areas. These include the Western Treatment Plant and The Spit Nature Conservation Reserve; Cheetham Wetlands and the northern shoreline of Mud Islands. The Western Treatment Plant provides an important drought and hunting refuge and hosts the largest mainland breeding colony for Pied Cormorant (*Phalacrocorax varius*). In addition, approximately 120 nesting boxes have been installed at the Western Treatment Plant (mostly used by Chestnut Teal, Pacific Blue Duck, occasionally Pied Stilt and common coastal species). The most significant

[1] Department of Environment, Land, Water and Planning (2018). Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site Management Plan. Department of Environment, Land, Water and Planning, East Melbourne.

breeding area within the site is Mud Islands which is one of only three breeding sites for Australian fairy tern (*Sternula nereis nereis*) and one of two breeding sites for Pelicans in Victoria[2,3].

The natural and artificial habitats across this Ramsar site collectively make it one of the most significant areas in Victoria for migratory waders[4]. A total of 129 waterbird species have been recorded within the Ramsar site and the site regularly supports 20 species of birds listed under international migratory bird agreements[1].

A total of eight species of national significance are known to occur within the site including:

- Orange-bellied parrot (*Neophema chrysogaster*)[5,6]
- Curlew sandpiper (*Calidris ferruginea*)[7]
- Red-necked stint (*Calidris ruficollis*)[7]
- Sharp-tailed sandpiper (*Calidris acuminata*)[7]
- Australian painted snipe (*Rostratula australis*)[8]
- Australian fairy tern (*Sternula nereis nereis*)[9]
- Australian grayling (*Prototroctes maraena*)[9]
- Growling grass frog (*Litoria raniformis*)[9,6].

The Ramsar site is important to at least two indigenous language groups, Mud Islands is part of Country of the Boonwurrung and the remainder of the site is part of Country of the Wathaurong[1]. The Bunurong and Wadawurrung are the Registered Aboriginal Parties for this area[10]. There are many important Indigenous sites within the wetlands, including burial sites, middens and artefacts. The oldest known midden in the area is at least 5,000 years old[4].

The priorities for the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site identified in this plan are shown in Figure 5-1.

WESTERN PORT RAMSAR SITE

The Western Port Ramsar Site is located 60 kilometres southeast of Melbourne and includes a large proportion of the Western Port embayment to the north of Phillip Island (Figure 5-2). The site is composed of large shallow intertidal areas, dissected by deeper channels and covers approximately 60,000 hectares. There are several smaller islands such as Quail, Elizabeth and Rams included in the Ramsar site and Tortoise Head which occurs at the southern tip of French Island[11].

The site is composed of a diversity of wetlands habitats including marine subtidal aquatic beds (underwater vegetation), intertidal mud, sand or sand flats, intertidal marshes and intertidal forested wetlands. Extensive areas of high-quality intertidal marshes (saltmarsh) and intertidal forested wetlands (mangroves) are found

[2] Rogers, D.I., Herrod, A., Menkhorst, P. and Loyn, R. (2010) Local movements of shorebirds and high- resolution mapping of shorebird habitat in the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site. Arthur Rylah Institute for Environmental Research Technical Report Series No. 207. Department of Sustainability and Environment: Heidelberg, Victoria.

[3] Personal Communication with Amy Adams, Bruce Quinn and Chris Purnell from BirdLife Australia, 10th August 2022.

[4] *'Celebrating Australia's wetlands –A showcase of Australian Ramsar sites,* Commonwealth of Australia 2014'.

[5] Listed as Critically Endangered under the EPBC Act 1999.

[6] National Threatened Species Strategy 100 Priority Species.

[7] Personal Communication Will Steele 10th October 2022.

[8] Listed as Endangered under the EPBC Act 1999.

[9] Listed as Vulnerable under the EPBC Act 1999.

[10] The Bunurong Registered Aboriginal Party boundary extends across a significant proportion of the Port Phillip Ramsar site.

[11] Department of Environment, Land, Water and Planning (2017). Western Port Ramsar Site Management Plan. Department of Environment, Land, Water and Planning, East Melbourne.

across the site. Seagrass beds are found throughout the Ramsar site mostly on the intertidal banks and channels[12].

A total of 115 species of waterbird have been recorded within the Ramsar site. It regularly supports more than 20,000 waterbirds this includes over 35 species listed under international migratory bird agreements 12 of which are known to occur at the site regularly (in two-thirds of seasons)[12]. The site supports significant populations of six waterbird species including the Australian fairy tern (*Sternula nereis nereis*), Australian Pied Oystercatcher (*Haematopus longirostris*), Curlew Sandpiper (*Calidris ferruginea*), Eastern Curlew (*Numenius madagascariensis*), Pacific gull (*Larus pacificus*), Red-necked stint (*Calidris ruficollis*).

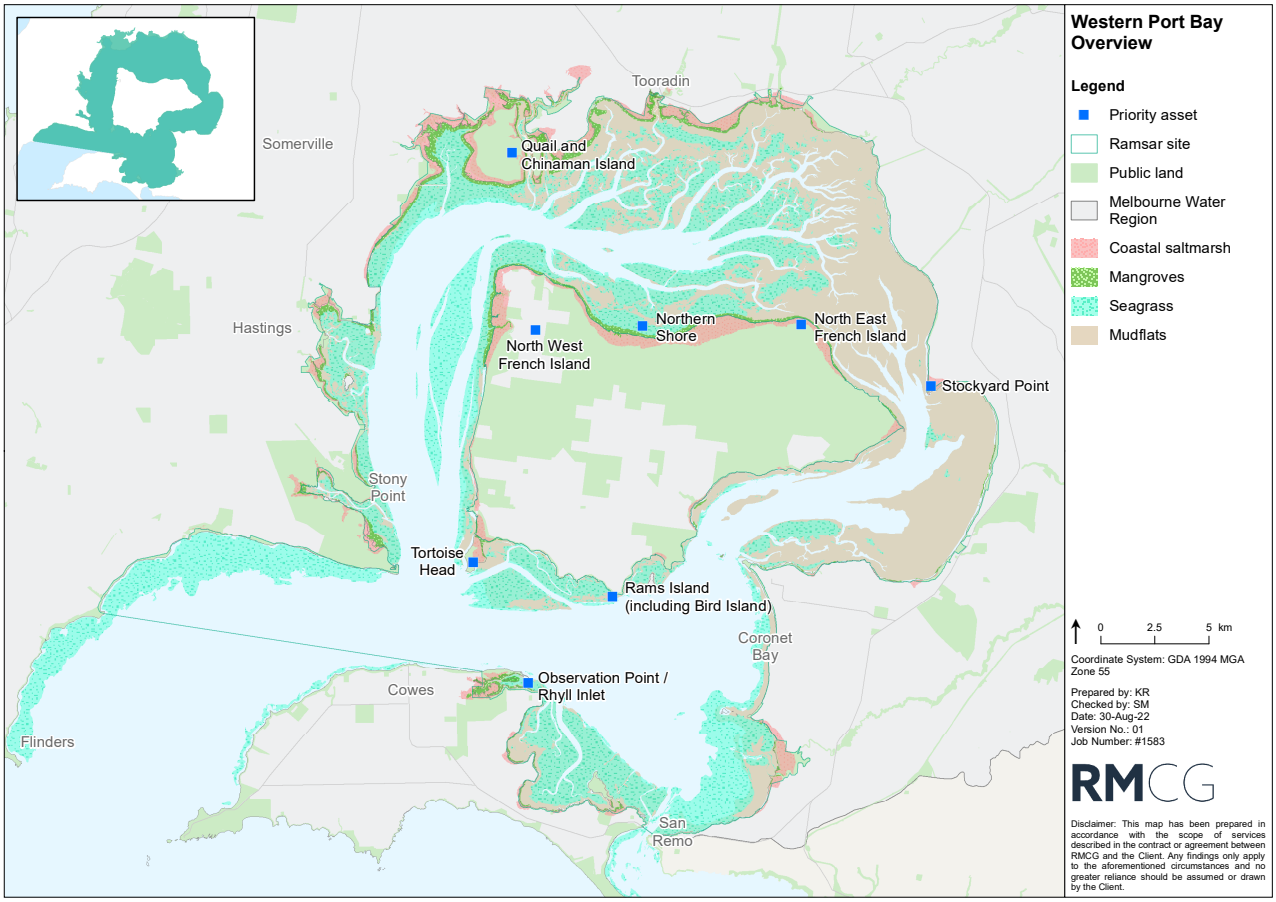


Figure 5-2: Location of the Western Port Ramsar Site.

The site also supports several species of national significance including:

- Curlew sandpiper (*Calidris ferruginea*)[13]
- Eastern curlew (*Numenius madagascariensis*)[13,]
- Lesser sand plover (*Charadrius mongolus*)[14]
- Red knot (*Calidris canutus*)[14]
- Bar-tailed godwit (*Limosa lapponica baueri*)[15]
- Australian fairy tern (*Sternula nereis nereis*)[15]
- Australian grayling (*Prototroctes maraena*)[15].

[12] Hale, J. (2016) Ecological Character Description Addendum - Western Port Ramsar Site. Department of Environment, Land, Water and Planning. East Melbourne.
[13] Listed as Critically Endangered under the EPBC Act 1999.
[14] Listed as Endangered under the EPBC Act 1999.
[15] Listed as Vulnerable under the EPBC Act 1999.

It is also important for marine biodiversity values[11]. Soft sediments comprise approximately two-thirds of Western Port bay and provide significant habitat for a diversity of benthic marine fauna[17]. There is a high diversity of ghost shrimps found in the soft sediments including the locally endemic *Michelea microphylla,* only known from Crib Point; a high diversity of opisthobranchs[16] (sea-slugs and sea-hares); rare rhodolith beds (fields of mobile roughly spherical coralline red algae, Western Port Bay supports one of two known rhodolith beds in Victoria)[17]; Crawfish rock is a marine biodiversity hotspot, with over 600 species recorded at this location, including the potentially endemic and rare hydroid *Ralpharia coccinea*[11].

The priorities in this plan occur across the Western Port Ramsar site as shown in Figure 5-2.

EDITHVALE-SEAFORD WETLANDS

The Edithvale-Seaford Wetlands Ramsar Site is located in Melbourne's south eastern suburbs, approximately 30 km from the Melbourne Central Business District. The site is comprised of two separate wetlands: Edithvale (104 ha) and Seaford (158 ha) (Figure 5-3). It is the only Victorian Ramsar site located in an urban landscape and has experienced a long history of disturbance, and subsequently, the condition of the vegetation, hydrology and water quality has been modified[18]. Edithvale South wetland is the priority identified in this plan for the Edithvale-Seaford wetlands Ramsar site.

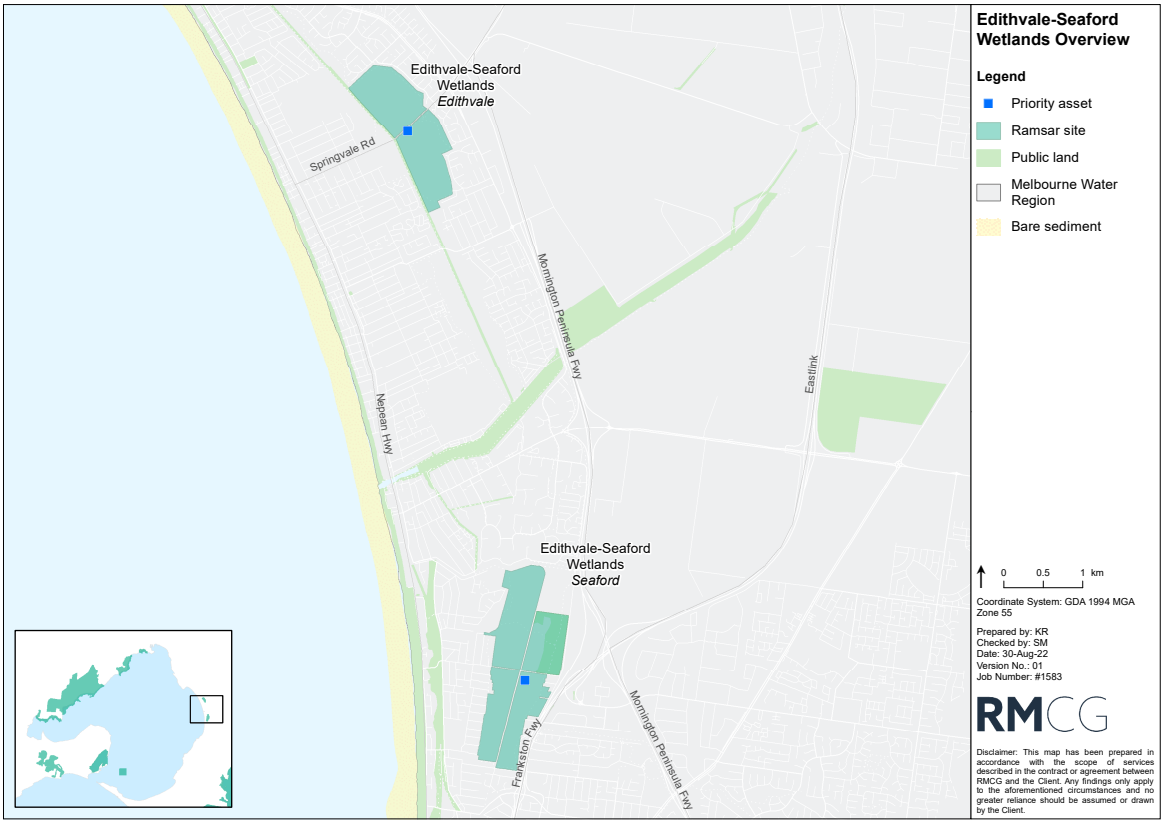


Figure 5-3: Location of the Edithvale-Seaford Ramsar Site

Four Ramsar wetland types occur within the site including seasonal / intermittent freshwater marshes/pools on inorganic soils (116 hectares); seasonal/intermittent saline/brackish/alkaline marshes/pools (11 hectares), freshwater, tree-dominated wetlands (4 hectares); seasonal/ intermittent freshwater lakes (1.4 hectares).

[16] Listed as threatened under the Flora and Fauna Guarantee Act 1988.
[17] Melbourne Water (2011). Understanding the Western Port Environment, A Summary of Current Knowledge and Priorities for Future Research. Melbourne Water, East Melbourne.
[18] Ecology Australia (2016). Edithvale-Seaford Wetlands Ramsar Site Management Plan.

Waterbird habitat includes deeper water surrounded by tall reeds (Edithvale North), shallow wetlands that dry seasonally providing foraging habitat, grading into tall marsh to provide cover (Edithvale South) and a mosaic of deeper water, tall marsh and deeper saline ponds (Seaford North).

The site supports a diversity and abundance of waterbirds averaging annual counts of 5,000 birds. Over 75 species of waterbird have been recorded at the site including 20 species listed under international migratory bird agreements. The site is particularly significant for the Australasian Bittern (*Botaurus poiciloptilus*) and Sharp-tailed Sandpiper (*Calidris acuminata*)[18].

The site regularly supports (two-thirds of seasons) eight species of waterbirds listed under international migratory bird agreements including Common Greenshank (*Tringa nebularia*), Curlew Sandpiper (*Calidris ferruginea*), Latham's Snipe (*Gallinago hardwickii*), Marsh Sandpiper (*Tringa stagnatilis*), Pectoral Sandpiper (*Calidris melanotos*), Red-necked Stint (*Calidris ruficollis*), Sharp-tailed Sandpiper (*Calidris acuminata*), Wood Sandpiper (*Tringa glareola*). Over 20 species of waterbirds have been recorded breeding within the site[18].

The site regularly supports two wetland dependent bird species of national significance:

- Curlew Sandpiper (*Calidris ferruginea*)[19]
- Australasian Bittern (*Botaurus poiciloptilus*)[20,21].

In addition to the Ramsar values the Edithvale-Seaford wetlands provides habitat for many breeding birds, acts as a drought refuge in an urban landscape, are important as a site of Zoological Significance, listed in the state directory of important wetlands, identified as a high value Site of Biodiversity Significance by Melbourne Water and part of the Carrum Important Bird and Biodiversity Area program led by BirdLife Australia[18].

A search of the Victorian Aboriginal Heritage Register identified two sites within the Ramsar site and 15 sites within 200 m of the Ramsar site. These included mostly small deposits of stone artefacts and shell middens[18].

5.3 IDENTIFICATION OF RAMSAR PRIORITIES

The Ramsar wetlands priorities have been identified using the prioritisation process outlined in (Section 4) of this plan. An initial set of priorities were identified using the following sources of information:

- PPWCMA Ramsar Prioritisation Report Final (INFFER)
- Ramsar Site Management Plans (x 2)
- PPWCMA RCS
- Conservation status under the EPBC Act (critically endangered) - for waterbirds
- Western Port Welcome Waterbirds
- Local Movements of Shorebirds and High-Resolution Mapping of Shorebird Habitat in the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site.

The initial set of priorities were presented at the first of two workshops and information gaps were identified. Following the first workshop the priorities were further refined using a combination of three key criteria:

- High value habitat for waterbirds (roosting/ foraging)
- Supports an abundance and diversity of waterbirds
- Supports EPBC listed species (primarily waterbirds) with a conservation status of critically endangered.

[19] Listed as Critically Endangered under the EPBC Act 1999.
[20] Listed as Endangered under the EPBC Act 1999.
[21] National Threatened Species Strategy 100 Priority Species.

A refined set of priorities was presented at the second workshop along with the prioritisation analysis results. Following workshop two targeted follow up with experts was undertaken to fill outstanding information gaps resulting in the final list Ramsar priorities documented in this plan (Table 5-1). The final list of priorities received a high cost benefit score (Rating 1 or 2) and no significant limitations were identified in the qualitative analysis meaning they were rated as Tier 1 priorities.

Detailed prioritisation analysis results are provided in Appendix 4.

Table 5-1: Alignment of RLP outcomes with NRM Action Plan Ramsar wetland priorities

FIVE YEAR OUTCOME	INVESTMENT PRIORITIES
By 2023, there is restoration of, and reduction in threats to, the ecological character of Ramsar sites, through the implementation of priority actions	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula: ▪ Altona Coastal Park (Jawbone Reserve, Skeleton Creek) ▪ Western Treatment Plant (Western Lagoon) ▪ Big Marsh (within the Spit Nature Conservation Reserve) ▪ Mud Islands. Western Port: ▪ Stockyard Point ▪ Observation Point/ Rhyll Inlet ▪ Rams Island (including Bird Island) ▪ Tortoise Head ▪ North-west French Island ▪ French Island ▪ Northern Shoreline (French Island). Edithvale-Seaford Wetlands: ▪ Edithvale South Wetland.

5.3.1 PRIORITIES

A total of twelve priorities were identified through the prioritisation process for the Ramsar wetlands theme (as listed in Table 5-1 above). Details including values, threats, objectives, priority actions and relevant supporting information to demonstrate the importance of these sites for RLP investment is provided next.

Altona Coastal Park (Jawbone Reserve, Skeleton Creek)

VALUES & THREATS

Values: occurs within one of five major waterbird habitats (foraging, roosting) for the Ramsar site (Laverton - Altona); high quality intact saltmarsh vegetation; high quality seagrass beds; supports waterbird breeding; supports EPBC listed waterbirds (Curlew Sandpiper - *Calidris ferruginea*), numbers using the site have increased over the last 10 years; 13 species of waterbird that are rare or endangered have been recorded at the site.

Significant tractable threats:

- Human disturbance (recreation); predation/ disturbance by dogs; weed invasion

OBJECTIVES & PRIORITY ACTIONS

Objective: Reduce disturbance to waterbird foraging and roosting habitat.

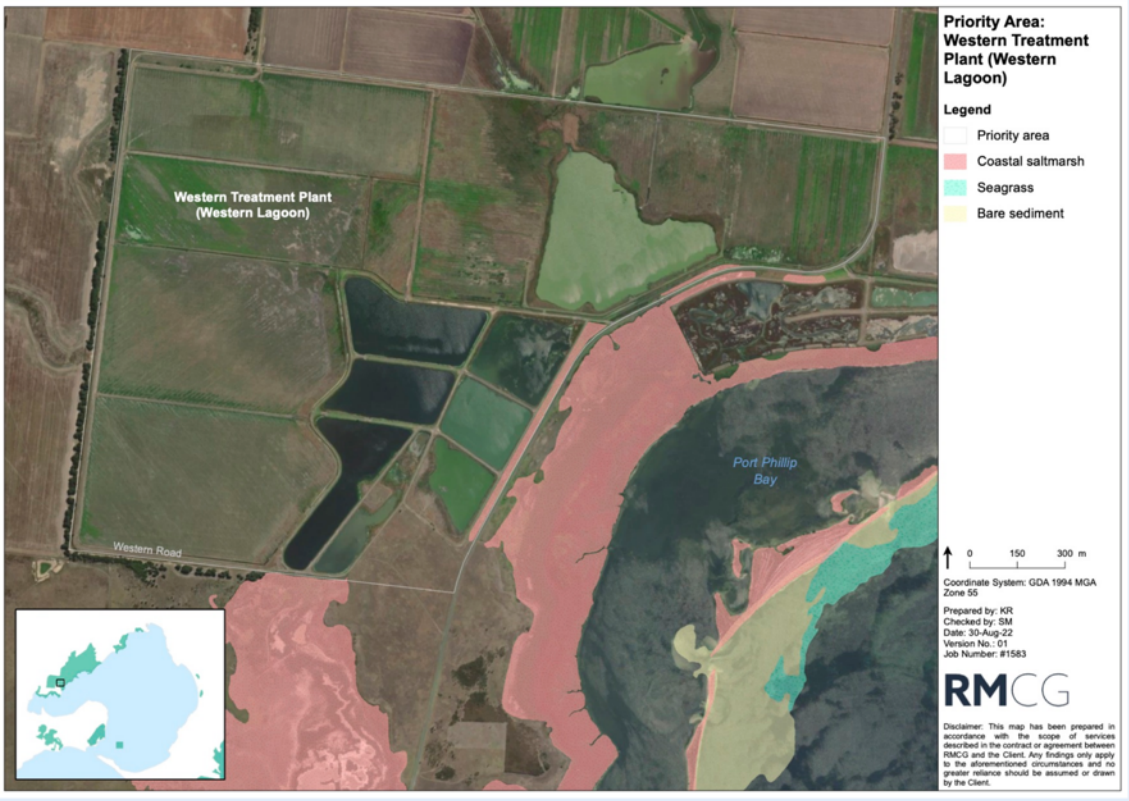
Priority actions:

- Human behaviour modification
- Fencing to manage access

SUPPORTING INFORMATION

This priority is directly adjacent to the Ramsar site boundary and is currently under consideration for inclusion within the Ramsar site. It is connected to Jawbone Flora and Fauna Reserve managed by Parks Victoria. There are long-term collaborative relationships between land managers established (Parks Victoria, Hobsons Bay City Council, Melbourne Water). Previous RLP investment has resulted in weed control moving into a maintenance phase which is now managed through Hobsons Bay City Council. Previous investment in fencing to manage access to sensitive waterbird roosting and foraging sites has been effective.

Western Treatment Plant (Western Lagoon)



VALUES & THREATS

Values: occurs within one of five major waterbird habitats (foraging, roosting) for the Ramsar site (Western Treatment Plan - Avalon); provides waterbird breeding habitat; one of two overwintering sites for Orange- bellied parrot (*Neophema chrysogaster*) in Victoria; recorded sitings of EPBC Act listed Australasian bittern (*Botaurus poiciloptilus*); regularly supports more than 20,000 birds; significant habitat for the EPBC Act listed Growling Grass Frog (*Litoria raniformis*)

Significant tractable threats:

- Hydrological change/ altered flow regime
- Human disturbance (recreation)

OBJECTIVES & PRIORITY ACTIONS

Objective: Enhance roosting habitat for waterbird populations

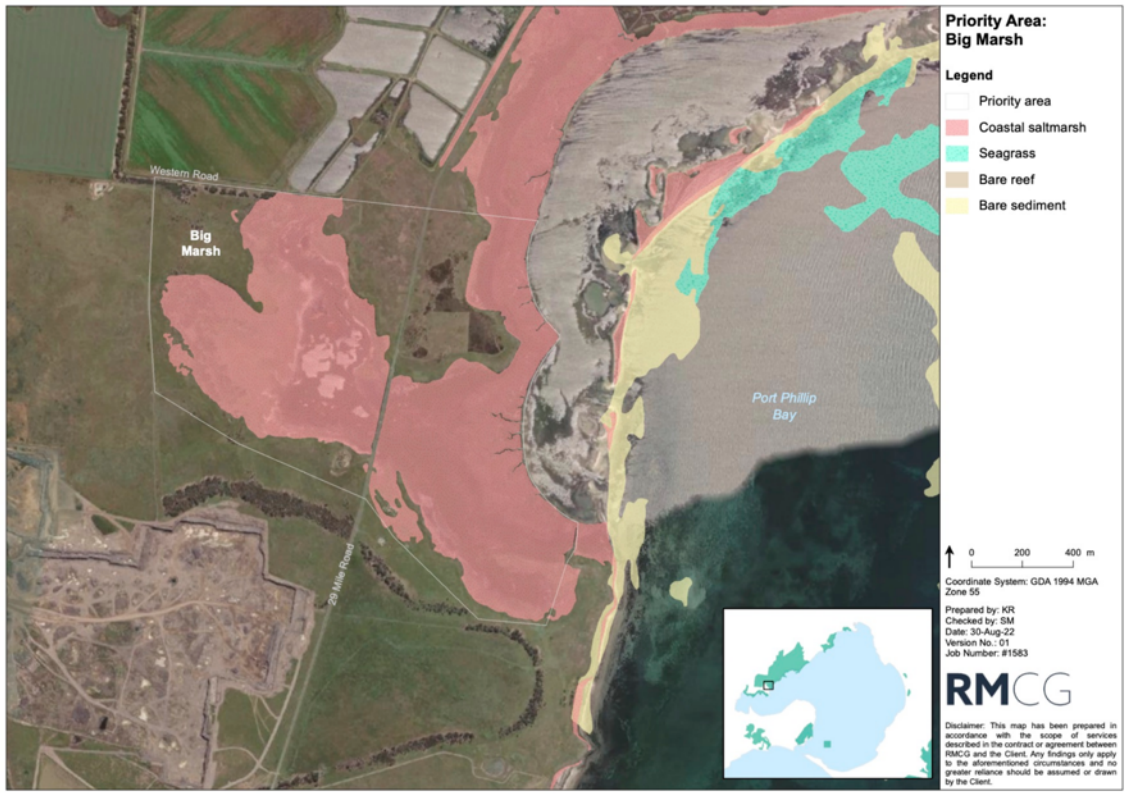
Priority actions:

- Investigative study (roosting site availability)
- Habitat improvement (installation of artificial roosting sites)
- Human behaviour modification

SUPPORTING INFORMATION

The intertidal mudflats located adjacent to the Western Treatment Plant and Ramsar site provide significant foraging habitat for waterbirds. Preliminary evidence from site observations suggests there is currently a shortage of roosting sites for waterbirds, additional investigations to determine the area and location of additional artifical roosting sites is required. Clearing banks, fencing and spreading shell grit at identified locations within the Western Treatment Plant will be important to provide the required area of roosting habitat to support waterbird populations.

Big Marsh (within The Spit Nature Conservation Reserve)



VALUES & THREATS

Values: occurs within one of five major waterbird habitats (foraging, roosting) for the Ramsar site (Western Treatment Plan - Avalon); high value habitat for waterbirds provided; The Dry Saltmarsh vegetation community (underrepresented in Victoria) occurs at this site; one of two major overwintering sites for Orange-bellied parrot (*Neophema chrysogaster*) in Victoria; significant habitat for the EPBC Act listed Growling Grass Frog (*Litoria raniformis*)

Significant tractable threats:

- Hydrological change/ altered flow regime
- Weed invasion

OBJECTIVES & PRIORITY ACTIONS

Objective: Improve the quality of saltmarsh vegetation

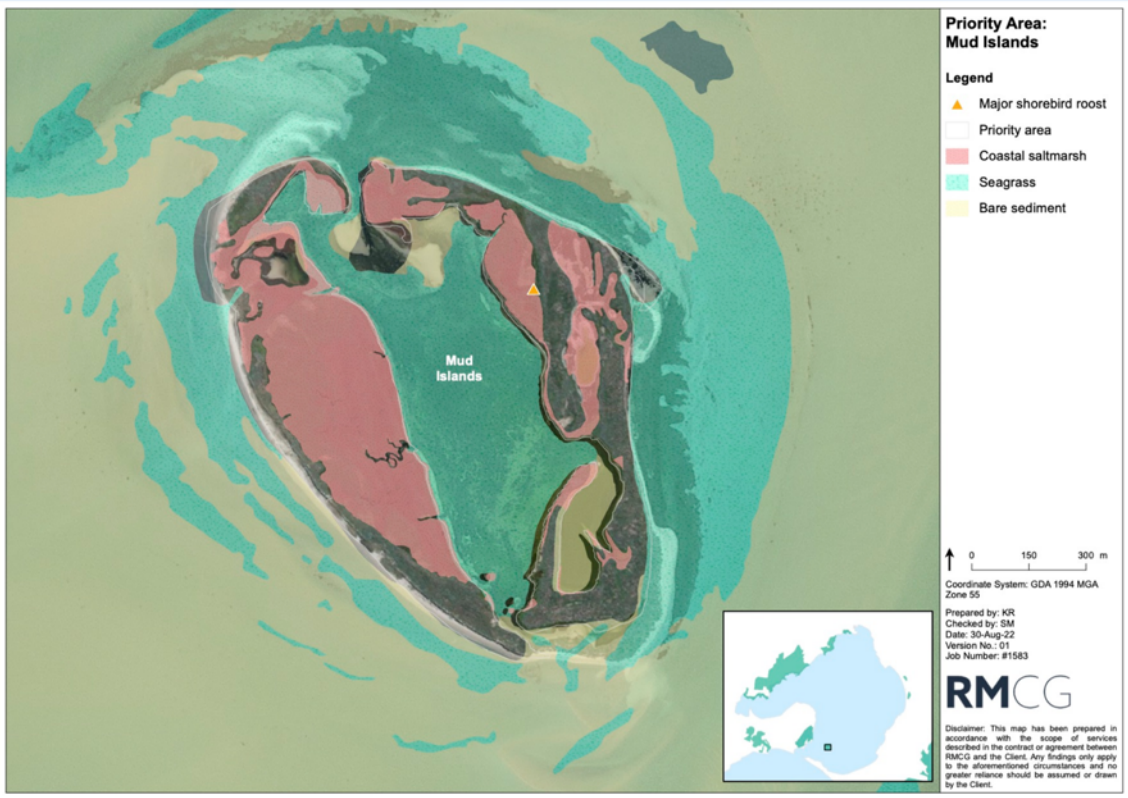
Priority actions:

- Floristic survey's
- Weed control

SUPPORTING INFORMATION

Big Marsh is located adjacent to the T-section lagoon at Western Treatment Plant (a northern pond within the conservation zone) which supports remnant saltmarsh vegetation. Melbourne Water are currently managing water regimes at the T-section lagoon. Incorporating flows from the T-section lagoon and redirecting diffuse overland flows into the northern part of Big Marsh will assist in restoring the Dry Saltmarsh vegetation community. Melbourne Water continue to monitor water data loggers and will work with research partners to undertake floristic survey's to inform future hydrological works. Parks Victoria undertake weed and fox control on the adjacent Spit Nature Conservation Reserve. Further fencing around remnant Dry Saltmarsh vegetation to prevent access from motorbikes and FWDs is currently funded and due to be implemented in 2022 .

Mud Islands



VALUES & THREATS

Values: occurs within one of five major waterbird habitats (foraging, roosting) for the Ramsar site (Swan Bay and Mud Islands); Significant breeding site (one of three in Victoria) for the EPBC Act listed Australian fairy tern (*Sternula nereis nereis*); one of two remaining Pelican (*Pelecanus conspicillatus*) breeding colonies in Victoria

Significant tractable threats:

- Weed invasion
- Human behaviour modification

OBJECTIVES & PRIORITY ACTIONS

Objective: Maintain breeding habitat for the Australian fairy tern (*Sternula nereis nereis*)

Priority actions:

- Behaviour modification
- Weed control (box thorn)
- Community education (weed control methods and timing)

SUPPORTING INFORMATION

Mud Islands is connected to Swan Bay, an extensive and significant foraging and roosting site for waterbirds. The northern shore of the Island is particularly important for roosting. It supports one of three key breeding sites for the Australian fairy tern (*Sternula nereis nereis*) in Victoria; includes significant breeding colonies of Ibis (*Threskiornis molucca*), Crested tern (*Thalasseus bergii*), Storm petrels (*Pelagodroma marina*); is one of two Pelican (*Pelecanus conspicillatus*) breeding areas in Victoria. The Friends of Mud Island are an active volunteer group that continue to undertake environmental works on Mud Island. Training and education (e.g. weed control, timing, methods) would ensure thier works continue to preserve sensitive breeding habitat and would complement the work of public land managers. Given it's location close to the shore human disturbance (boats, water based activity) is a key threat, installation of updated signage in appropriate locations would improve community awareness about the significance of the site for waterbirds.

Stockyard Point

VALUES & THREATS

Values: high value habitat for waterbirds (roosting and foraging); part of a connected complex of highly productive mudflats/ islands; supports an abundance (mean 2,961) and diversity (mean no. species 23) of waterbirds; the EPBC listed Eastern Curlew (*Numenius madagascariensis*) is known to utilise this site.

Significant tractable threats:

- Human disturbance (recreation)
- Fox predation
- Weed invasion

OBJECTIVES & PRIORITY ACTIONS

Objective: Improve the quality of waterbird habitat (roosting/ foraging)

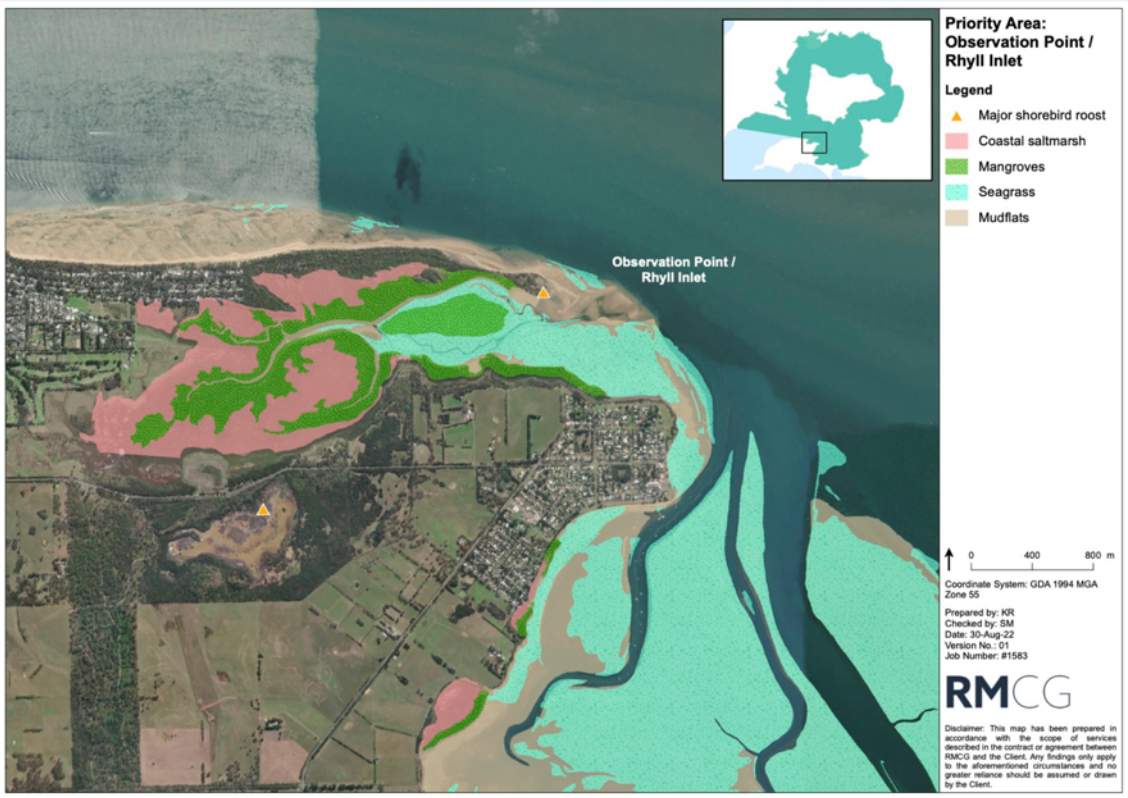
Priority actions:

- Predator control (foxes)
- Weed control
- Human behaviour modification

SUPPORTING INFORMATION

Focus on preventing salt tolerant weeds from invading saltmarsh to maintain the quality of waterbird habitat. Department of Environment, Land, Water and Planning undertake fox control. Furthur work is required to work with the community to understand the importance of the site and effectiveness of fox baiting as a method of fox control. Disturbance from recreational fishing is a threat targeted community engagement will support reducing this threat.

Observation Point/ Rhyll Inlet



VALUES & THREATS

Values: High value habitat for waterbirds (roosting and foraging); supports an abundance and diversity of waterbirds; most signigicant breeding site for Australia fairy tern (*Sternula nereis nereis*), one of three in Victoria, the only site that breeding success has been observed at over the last five years

Significant tractable threats:

- Fox predation
- Cat predation
- Weed control

OBJECTIVES & PRIORITY ACTIONS

Objective: Enhance roosting habitat and improve the survival rate of waterbirds

Priority actions:

- Predator control (foxes, cats)
- Surveillance (foxes. cats)
- Weed control

SUPPORTING INFORMATION

Observation Point/ Rhyll inlet operates as an island and it is possible to restrict access from predators through fencing and continual monitoring. Phillip Island is a fox free environment, however reinvasion is likely and therefore predator surveillance and rapid response following incusion are the focus. Phillip Island Nature Parks currently fund cat, fox and weed control works. Co-funding through RLP would complement existing work, increase the area of control and provide a buffer to protect waterbird habitat around this site.

Rams Island (including Bird Island)

VALUES & THREATS

Values: high value habitat for waterbirds (roosting and foraging); part of a connected complex of highly productive mudflats/ islands; supports waterbird breeding (Black swan (*Cygnus atratus*), Pied Oystercatcher (*Haematopus longirostris*), Caspian terns (*Hydroprogne caspia*); one of three significant breeding sites for Australian fairy tern (*Sternula nereis nereis)* in Victoria

Significant tractable threats:

- Human distrubance (recreation)
- Cat predation
- Weed invasion

OBJECTIVES & PRIORITY ACTIONS

Objective: Improve the quality of waterbird habitat (roosting/ foraging)

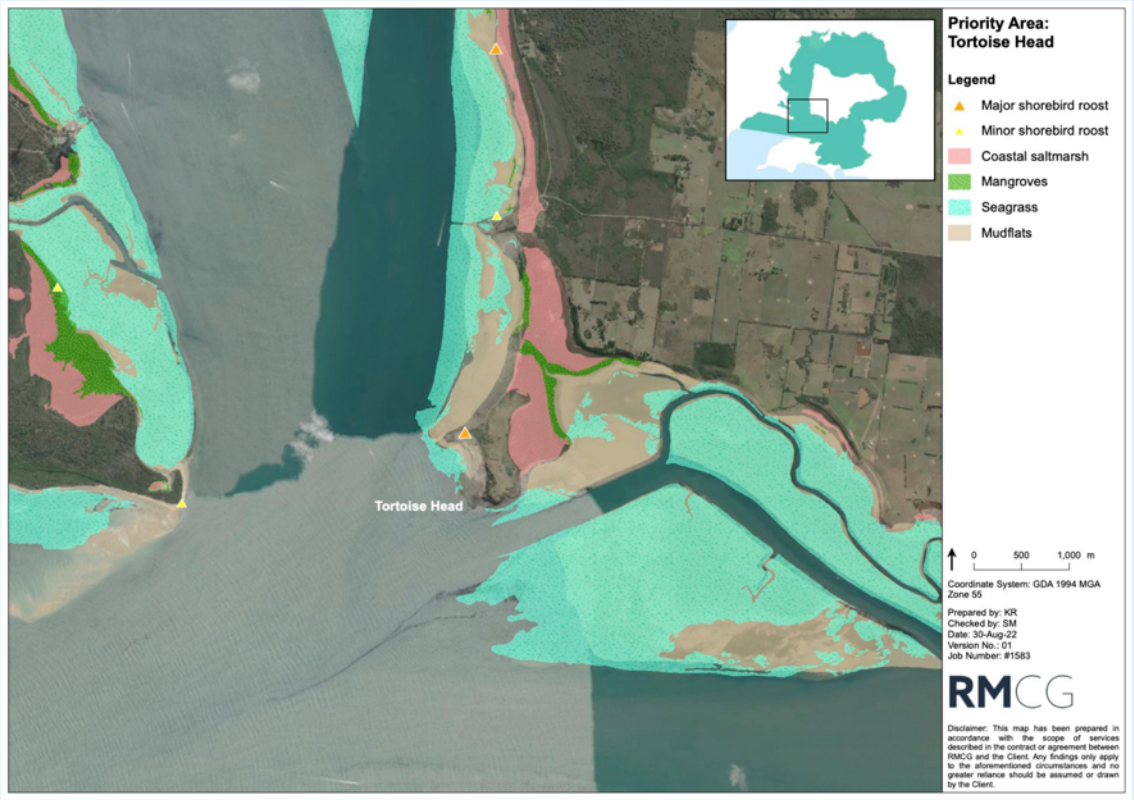
Priority actions:

- Predator control (cats)
- Weed control

SUPPORTING INFORMATION

Friends of French Islands are an active and engaged community group that continue to do work at this site and across French Island. The group coordinates works with Parks Victoria. Cat control works would be rolled into the French Island wide Cat Eradication Program that has been running successfully over the last five years. Current camera monitoring indicates there are still cats present at this site. The site is in good condition and benfits from consistent and continual investment through Parks Victoia and Friends of French Island. The focus of environmental works is habitat protection.

Tortoise Head



VALUES & THREATS

Values: high value habitat for waterbirds (roosting and foraging); part of a connected complex of highly productive mudflats/ islands; supports and abundance (mean 866) and diversity (mean no. species 18) of waterbirds; supports waterbird breeding, Mutton birds (*Puffinus tenuirostris*); location of Sea Eagle nesting sites (*Haliaeetus leucogaster*)

Significant tractable threats:

- Cat predation
- Weed invasion

OBJECTIVES & PRIORITY ACTIONS

Objective: Improve the quality of waterbird habitat (roosting/ foraging)

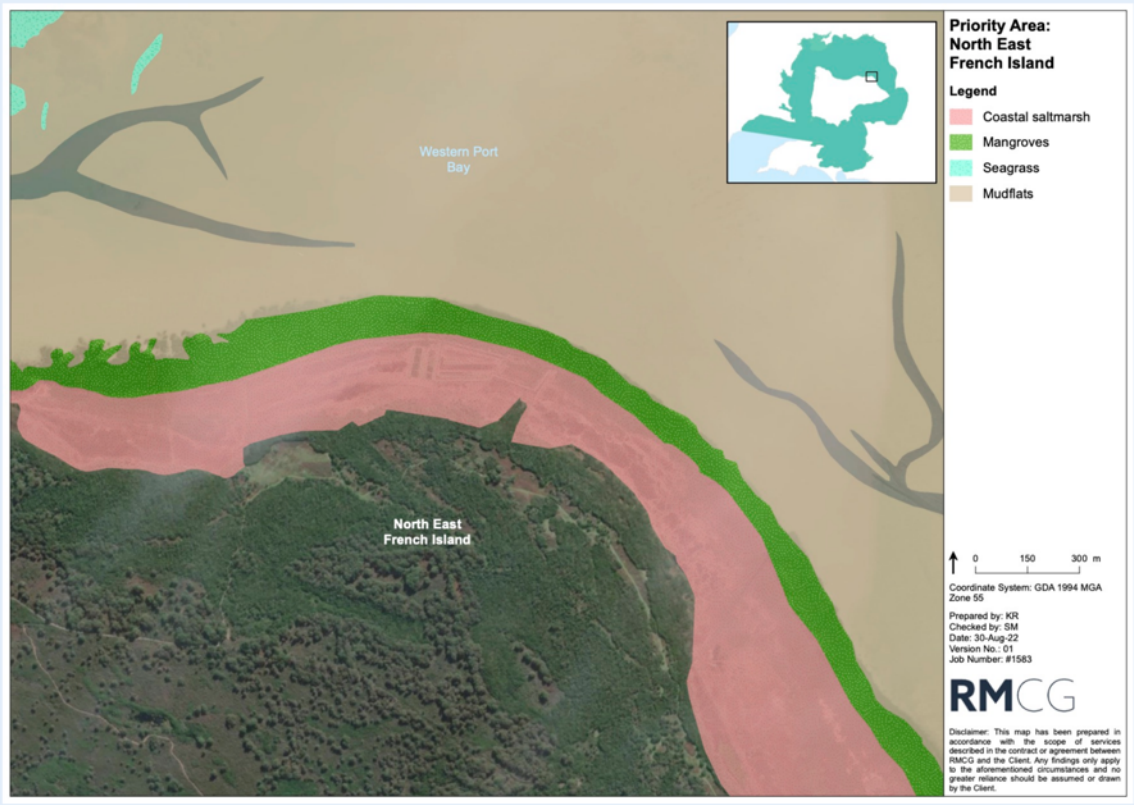
Priority actions:

- Predator control (cats)
- Weed control

SUPPORTING INFORMATION

Cat control will occur under the broader French Island Cat Eradication Program. The focus of weed control will be management of habitat altering weeds (mainly boxthorn). Weed control work is complimentary to cat control. The focus for this site is habitat protection and improvement. The site has benefited from on-going investment from Parks Victoria and the Friends of French Island (an active and engaged volunteer group). Orange-bellied parrot were historically recorded at this site and it is adjacent to the joint Zoos Victoria and DELWP captive release program for Orange-bellied parrot at Moonlit Sanctuary.

North-West (French Island)



VALUES & THREATS

Values: high value habitat for waterbirds (roosting and foraging); part of a connected complex of highly productive mudflats/ islands; supports EPBC listed species (Orange-bellied parrot mainland release program); High quality remnant saltmarsh vegetation

Significant tractable threats:

- Hydrological change/ altered flow regime

OBJECTIVES & PRIORITY ACTIONS

Objective: Reinstate natural hydrological regime to improve the quality of coastal saltmarsh vegetation

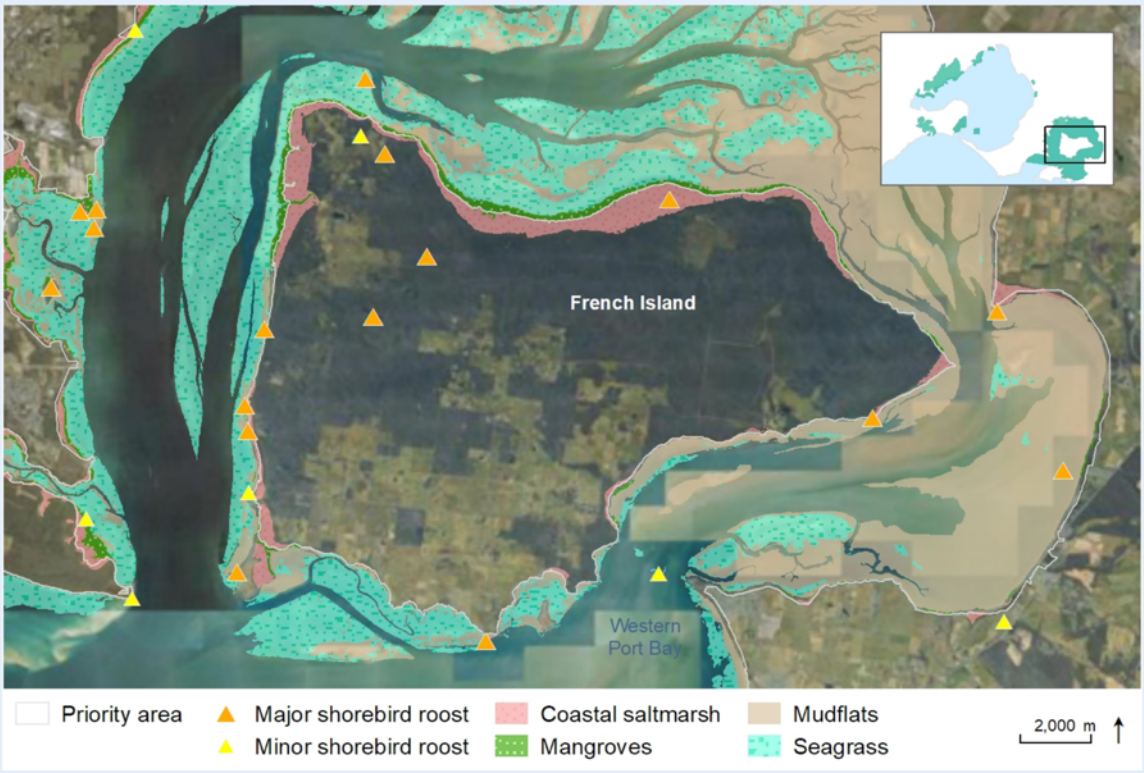
Priority actions:

- Investigative study

SUPPORTING INFORMATION

This site has high quality remnants of coastal saltmarsh vegetation. It has been modified for market gardening and for a brief time was used for salt production. Modified hydrology has disrupted the natural flow regime and degraded the saltmarsh. Initial engagement with the current landholder has been positive with in principle agreement to improving the environmental values of the area. The site provides an important connection to foraging/ roosting habitat across the north of French Island. A foundational study is required to determine hydrological requirements and scope a method and design to improve hydrology.

French Island



VALUES & THREATS

Values: high value habitat for waterbirds (roosting/ foraging) – tidal flats, particularly important roosting/ foraging at high-tide, area of high primary productivity for foraging, part of connected complex of mudflats/ islands; supports an abundance and diversity of waterbirds; supports biodiversity - notable species include French Island Spider Orchid (*Caladenia insularis*), Long-nosed potaroo (*Potorous tridactylus*), Four-toed skink (*Hemiergis peronii*), King Quail (*Synoicus chinensis*), Grey-tailed Tattler (*Tringa brevipes*) and Eastern Barred Bandicoot (*Perameles gunnii*)

Significant tractable threats:

- Cat predation

OBJECTIVES & PRIORITY ACTIONS

Objective: Enhance roosting habitat and improve the survival rate of waterbirds

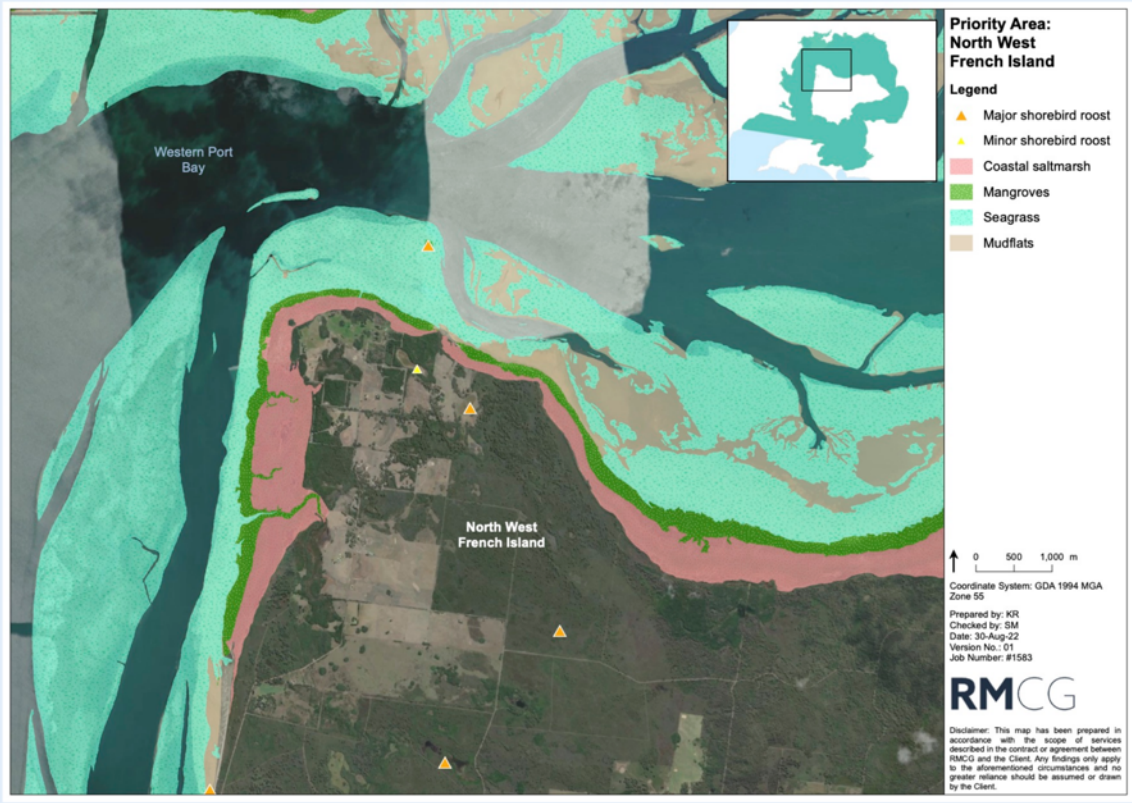
Priority actions:

- Predator control (cats)

SUPPORTING INFORMATION

French Island is a biodiverse site providing habitat for numerous species of state/ local significance, it is one of the Australian Government's Priority Places listed in the National Threatened Sprcies Strategy. French Island is used as a site for the release of captive bred Orange-bellied parrots (*Neophema chrysogaster*) and for reintroduction of Eastern Barred Bandicoots (*Perameles gunnii*). Augmenting and supporting the successful Island wide Cat Eradication Program will assist in reducing predator pressure on waterbirds and other small mammals and birds across the Island. Scat analysis and camera monitoring shows cats are still present on the Island.

Northern Shore French Island



VALUES & THREATS

Values: high value habitat for waterbirds (roosting/ foraging) – (tidal flats, channels, particularly important roosting/ foraging at high-tide, supports waterbird breeding, area of high primary productivity for foraging, part of connected complex of mudflats/ islands); Supports an abundance and diversity of waterbirds;
Supports EPBC listed waterbird species (critically endangered) – Curlew Sandpiper (*Calidris ferruginea*), Orange Bellied Parrot (*Neophema chrysogaster*) (recorded siting's potentially as a result of the Mainland Release Program)

Significant tractable threats:

- Cat predation
- Weed Invasion
- Human disturbance (recreation)

OBJECTIVES & PRIORITY ACTIONS

Objective: Maintain the quality of suitable roosting/ foraging habitat for waterbird populations

Priority actions:

- Predator control (cats)
- Weed control
- Human behaviour modification
- Habitat improvement

SUPPORTING INFORMATION

The northern shoreline of French Island includes a highly productive complex of mudflats and islands. Several priorities including Barrallier Island/ Chicory Lane Reef and Fairhaven have been combined to improve the efficiency and effectiveness of management interventions over a larger area.

Edithvale-South Wetlands

VALUES & THREATS

Values: Provides a variety of wetland habitats for waterbirds; supports high numbers of the EPBC listed Australasian Bittern (*Botaurus poiciloptilus*) and Curlew sandpiper (*Calidris ferruginea*) and the migratory Sharp-tailed sandpiper (*Calidris acuminata*)

Significant tractable threats:

- Fox predation
- Hydrological change/ altered flow regime
- Weed invasion

OBJECTIVES & PRIORITY ACTIONS

Objective: Improve the foraging and roosting habitat for waterbirds

Priority actions:

- Predator proof fencing
- Investigative study

SUPPORTING INFORMATION

The Edithvale-Seaford wetlands Ramsar site is located in an urban landscape that has resulted in the modification of the natural hydrological regime. Melbourne Water are currently undertaking further investigations to determine potential options for improving the hydrological regime to enhance waterbird habitat. Melbourne Water undertake some fox control (trapping) and reed grooming to maintain open water habitat. Fox baiting whilst more effective is not suitable in an urban environment (risk of off target take). The current fencing could be modified to include a floppy fence extension to prevent predators from accessing the critical wetland areas used by waterbirds for foraging, roosting and breeding.

6 Biodiversity

6.1 OVERVIEW

Biodiversity across the PPW Region

The RLP outcomes for biodiversity in the PPW region are as follows:

THREATENED SPECIES
Long-term (10-20 years)
"The trajectory of species targeted under the Threatened Species Strategy and other EPBC Act Priority Species is improved"

Medium-term (5 years)
"By 2023, the trajectory of species targeted under the Threatened Species Strategy, and other EPBC Act listed priority species, is stabilised or improved"

RLP Investment Priorities:
- Orange-bellied Parrot
- Leadbeater's Possum
- Helmeted Honeyeater
- Spiny Rice-flower
- Round-leaf Pomaderris

THREATENED ECOLOGICAL COMMUNITIES
Long-term (10-20 years)
"The condition of EPBC Act listed Threatened Ecological Communities is improved"

Medium-term (5 years)
"By 2023, the implementation of priority actions is leading to an improvement in the condition of EPBC Act listed Threatened Ecological Communities"

RLP Investment Priorities:
- Victorian Volcanic Plains Grassland
- Seasonal Herbaceous Wetlands

627
Number of species recorded within the region over the last 200 years

541,812 ha
The total approximate area of native vegetation cover across the region

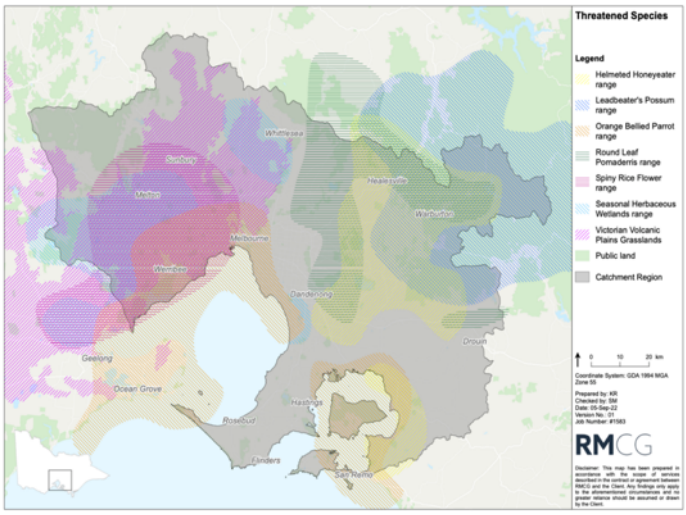
24
Number of ecological communities known to occur in the region

14,000
Number of natural wetlands across the region

33
Number of esturaries across the region

8
Number of marine protected areas across the region

These figures are sourced from the Port Phillip & Western Port CMA Regional Catchment Strategy



The regional long-term (2050), medium-term (2028) outcomes and priority management direction for biodiversity in the PPW region are shown in the table below. These are drawn from the RCS.

RCS 2028 OUTCOME	RCS 2050 OUTCOME	PRIORITY MANAGEMENT DIRECTION
Threatened Species		
Wild populations of all threatened native animal species in the region are retained and have positive trajectories for their population size, health and resilience.	Wild populations of all threatened native animal species in the region are retained and their populations are self-sustainable, secure, healthy and resilient.	• Promote no net loss of habitat • Reduce predation pressure • Control habitat altering weeds • Habitat improvement • Captive breeding and species reintroduction programs
Threatened Vegetation		
All threatened native vegetation species and ecological communities in the region are retained and have positive trajectories for their extent, health and resilience.	All threatened native vegetation species and ecological communities in the region are retained and are self sustainable, secure, healthy and resilient.	• Avoid, minimise and lastly offset vegetation losses • Invasive weed control • Pest animal control (herbivores) • Bushfire control and prevention works • Increase the area of protected vegetation across the region • Revegetation and biokinks

The priority management directions are based on stakeholder and community aspirations consistent with the priorities and actions outlined in the RCS, Protecting Victoria's Environment - Biodiversity 2037 and other related strategies which were developed through extensive stakeholder consultation.

6.2 REGIONAL BIODIVERSITY CONTEXT

The PPW region supports a diverse range of flora and fauna species. Native vegetation provides important habitat for biodiversity and occurs across an estimated 42 per cent of land within the region. Native vegetation is diverse ranging from rainforest to woodlands, grasslands, heaths and marshes. A total of 172,600 hectares is managed through the Parks Victoria estate of National, State and Regional parks and Reserves[22].

An estimated 333 native flora species and 24 ecological communities listed as threatened are known to occur within the region (see Appendix 5 and 6). The extent and quality of native vegetation across the region is declining in response to cumulative pressure from urbanisation, invasive weeds and disease, pest animals (herbivores), changed fire regimes and frequency, climate change and incremental damage. The focus of conservation actions for native vegetation in the region are to protect, enhance and improve the quality of suitable habitat to support biodiversity. Such actions include permanent protection within parks and reserves, revegetation and pest plant and animal (herbivore) control[22].

The region is home to an abundance of fauna species from national icons like the koala and kangaroo to critically endangered species such as Leadbeater's Possum (*Gymnobelideus leadbeateri*) and the Helmeted Honeyeater (*Lichenostomus melanops cassidix*). An estimated 627 fauna species have been recorded across the region over the last 200 years. From the list of species recorded in the region since 1980 an estimated 159 have a conservation status of threatened. A summary of the listing status of species recorded in the region since 1980 is shown in Table 6-1 (see Appendix 5 for the full list of species)[22].

The number of species across the region is declining due to habitat loss and decline, urbanisation and population pressure, climate change, fire, predation, and competition. There are several conservation programs that aim to protect and enhance the populations of threatened species across the region including captive breeding, species reintroductions, habitat restoration, control of habitat altering weeds and predator control[22].

Table 6-1: Summary of the conservation status of flora and fauna recorded in the region since 1980

FAUNA GROUP	FFG ACT STATUS	EPBC ACT STATUS
Birds	▪ Critically Endangered (22 species) ▪ Endangered (28 species) ▪ Vulnerable (29 species)	▪ Critically Endangered (8 species) ▪ Endangered (5 species) ▪ Vulnerable (15 species)
Mammals	▪ Critically Endangered (4 species) ▪ Endangered (8 species) ▪ Vulnerable (12 species)	▪ Critically Endangered (1 species) ▪ Endangered (5 species) ▪ Vulnerable (11 species)
Reptiles and amphibians	▪ Critically Endangered (3 species) ▪ Endangered (8 species) ▪ Vulnerable (2 species)	▪ Endangered (3 species) ▪ Vulnerable (3 species)
Fish	▪ Conservation Dependent (1 species) ▪ Critically Endangered (1 species) ▪ Endangered (9 species) ▪ Vulnerable (1 species)	▪ Critically Endangered (1 species) ▪ Endangered (3 species) ▪ Near Threatened (1 species) ▪ Vulnerable (4 species)
Invertebrates	▪ Critically Endangered (6 species) ▪ Endangered (15 species) ▪ Vulnerable (3 species)	▪ Critically Endangered (1 species) ▪ Endangered (3 species) ▪ Vulnerable (1 species)
Flora	▪ Extinct (1 species) ▪ Critically Endangered (70 species)	▪ Critically Endangered (3 species) ▪ Endangered (18 species)

[22] Port Phillip & Western Port Regional Catchment Strategy (accessed 17.08.22 - https://portphillipWestern Port.rcs.vic.gov.au)

FAUNA GROUP	FFG ACT STATUS	EPBC ACT STATUS
	▪ Endangered (211 species) ▪ Vulnerable (44 species)	▪ Vulnerable (17 species)
Ecological Communities	▪ Threatened (15 communities)	▪ Critically Endangered (5 communities) ▪ Endangered (3 communities) ▪ Vulnerable (1 communities)

6.3 IDENTIFICATION OF BIODIVERSITY PRIORITIES

The biodiversity priorities have been identified using the prioritisation process outlined in (Section 4) of this plan. An initial set of priorities were identified using the following sources of information:

- Port Phillip and Western Port CMA RCS
- Conservation and Listing Advice (FFG Act 1988, EPBC Act 1999)
- National Species Recovery Plans
- National Threatened Species Strategy (2021 – 2031)
- Victorian Biodiversity Atlas records of occurrence.

An initial set of 20 priority species were presented at the first of two workshops and information gaps were identified. This initial set of priority species was identified using existing information including EPBC Act listing, the National Threatened Species Strategy (top 100 species), Sites of Biodiversity Significance, Cultural significance for Traditional Owners, Iconic species (species important for the general community for social, cultural, or economic reasons), the importance of the region for the species. Following the first workshop the priority species were further refined using a combination of key criteria:

Threatened Species

- Conservation status under the EPBC Act (critically endangered)
- National Threatened Species Strategy (100 priority species)
- Regional significance (how important the PPW region is for the species, based on distribution).

The set of 20 preliminary species were assessed against the above three criteria. Those species and any other species in the region which met all three criteria were included in the next stage. This assessment produced a list of 13 species to take to the second workshop

Threatened Ecological Communities

- Conservation status under the EPBC Act (critically endangered)
- Regional significance (how important the PPW region is for the species, based on distribution).

A total of four EPBC listed Threatened Ecological Communities were identified in the region. These were assessed against the above two criteria and included in the list for discussion at the second workshop. Two of the four Threatened Ecological Communities were not included in the final set of biodiversity priorities given only a very small proportion of these communities are estimated to be distributed within the PPW region.

A refined set of priorities (threatened species and threatened ecological communities) was presented at the second workshop along with the prioritisation analysis results. Following workshop two targeted follow up with experts was undertaken to fill outstanding information gaps resulting in the final list biodiversity priorities documented in this plan (Table 6-2). The final list of priorities received a high cost benefit score (Rating 1 or 2) and no significant limitations were identified in the qualitative analysis meaning they were rated as Tier 1 priorities.

Detailed prioritisation analysis results are provided in Appendix 7.

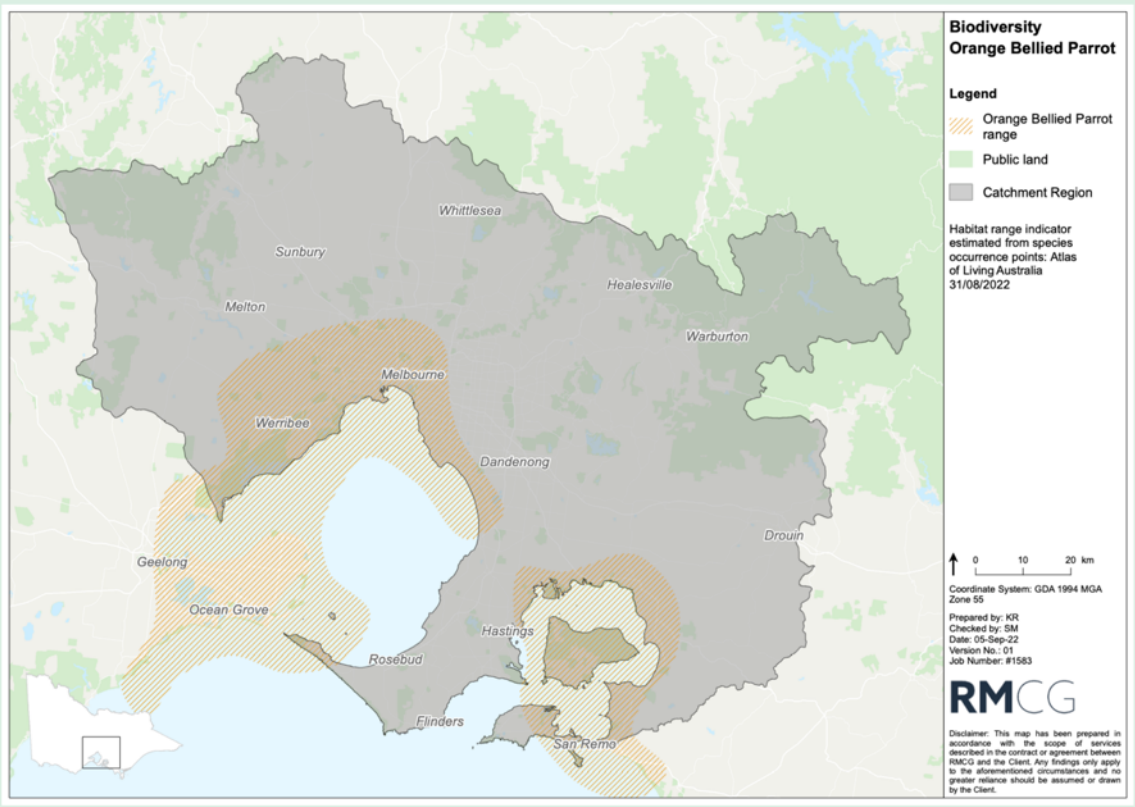
Table 6-2: Alignment of RLP outcomes with NRM Action Plan biodiversity priorities

FIVE YEAR OUTCOME	INVESTMENT PRIORITIES
By 2023, the trajectory of species targeted under the Threatened Species Strategy, and other Environment Protection and Biodiversity Conservation Act 1999 priority species, is stabilised or improved	▪ Orange-bellied Parrot (*Neophema chrysogaster*) ▪ Leadbeater's Possum (*Gymnobelideus leadbeateri*) ▪ Helmeted Honeyeater (*Lichenostomus melanops cassidix*) ▪ Spiny Rice-flower (*Pimelea spinescens subsp. spinescens*) ▪ Round-leaf Pomaderris (*Pomaderris vacciniifolia*)
By 2023, the implementation of priority actions is leading to an improvement in the condition of EPBC Act listed Threatened Ecological Communities	▪ Natural Temperate Grasslands of the Victorian Volcanic Plains ▪ Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains

6.3.1 PRIORITIES

A total of seven priorities were identified through the prioritisation process for the biodiversity theme (as listed in Table 6-2 above), further details including values, threats, objectives, priority actions and relevant supporting information to demonstrate the importance of these priorities for RLP investment is provided next.

Orange-bellied Parrot (Threatened Species)



VALUES & THREATS

Values: two critical overwintering sites where the OBP consistency migrate to annually occur in the region (Western Treatment Plant, The Spit Nature Conservation Reserve); suitable habitat has been identified in Western Port Bay (close to the Moonlit Sanctuary captive release site)

Significant tractable threats:

- Habitat loss
- Habitat degrdation
- Inappropriate fire and grazing regimes
- Human disturbance (recreation)

OBJECTIVES & PRIORITY ACTIONS

Objective: Maintain the extent of quality habitat for OBP

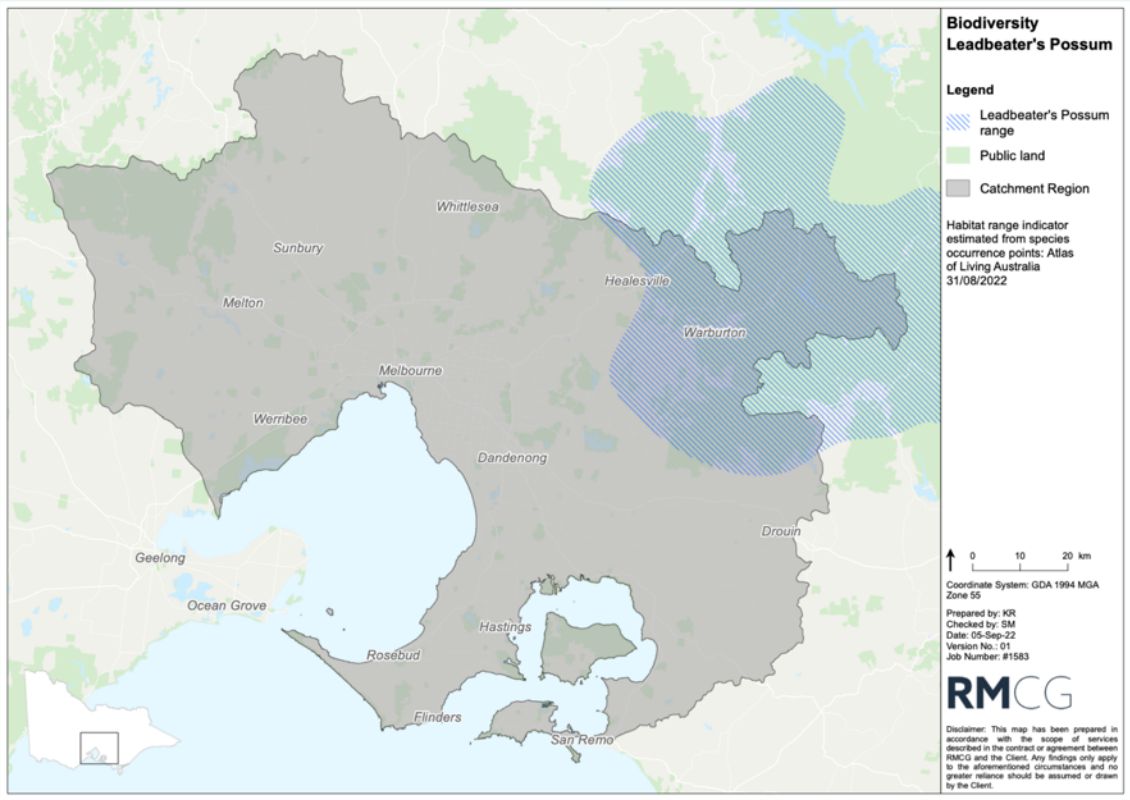
Priority actions:

- Behaviour modification
- Identification of suitable habitat
- Pilot study (systematic monitoring to detect OBP)

SUPPORTING INFORMATION

Zoos Victoria and the Department of Environment, Land, Water and Planning are currently leading a mainland captive release program for OBP. The program has achieved an increase in the number of birds migrating (17 birds in 2017 to 140 birds in 2022). This program will be developing rapid assessment methods for identifying suitable habitat for OBP and is looking to partner with other organisations to roll out a pilot to test the method. In addition, the program is seeking to develop a systematic method for monitoring OBPs across their suitable non-breeding range in Victoria. Other partners include Corangamite CMA, Gleneng Hopkins CMA and Deakin University.

Leadbeater's Possum - lowland spp. (current range) and highland spp. (former range) (Threatened Species)



VALUES & THREATS

Values: endemic to Victoria; only populations of this species are found in this region; range mainly confined to montane ash forests, dominated by *Eucalyptus regnans*, *Eucalyptus delegatensis* or *Eucalyptus nitens*, in the Central Highlands of Victoria

Significant tractable threats:

- Habitat loss (loss of hollow bearing trees)
- Inappropriate fire and regeneration regimes
- Inappropriate hydrological regimes (Yellingbo)
- Predation (feral cats)

OBJECTIVES & PRIORITY ACTIONS

Objective: Maintain the extent and improve the quality of habitat for Leadbeater's Possum

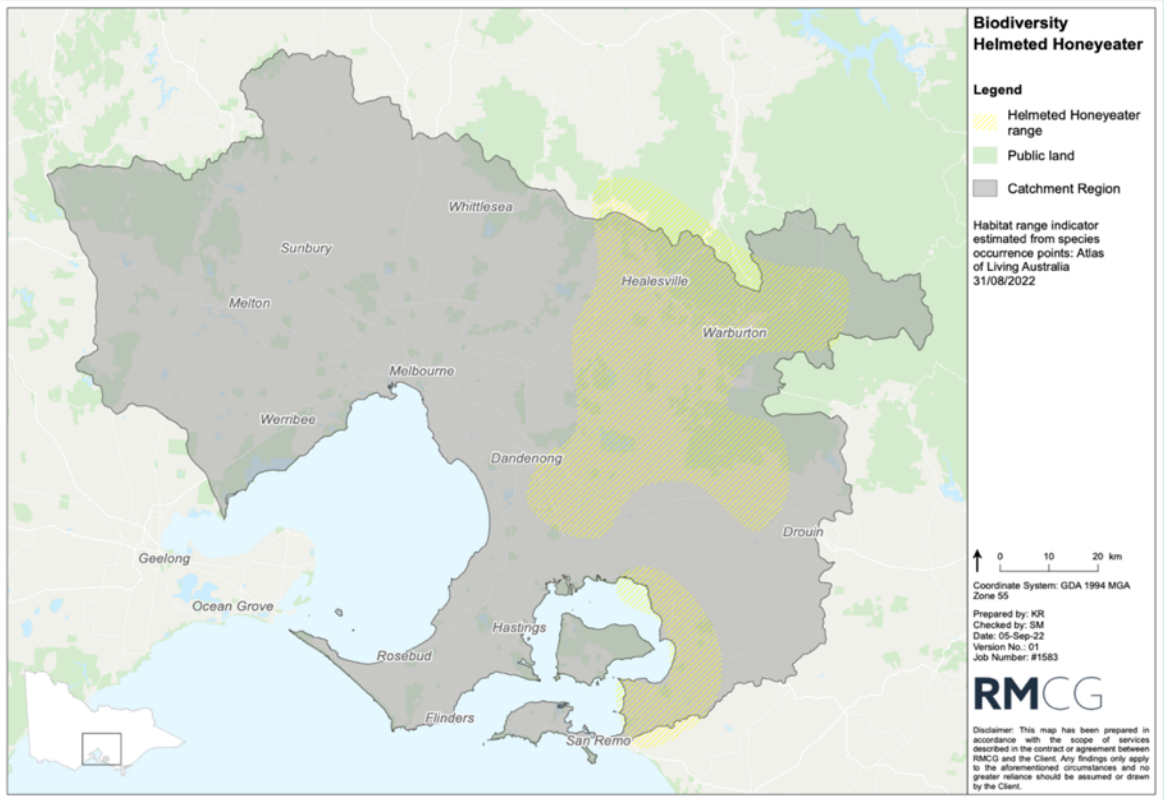
Priority actions:

- Land buy back
- Habitat improvement (connectivity, biolinks)
- Habitat protection (retention of hollow stag trees/ fallen logs)
- Predator control (cats)

SUPPORTING INFORMATION

The Haining Farm project aims to restore and create habitat for Leadbeater's Possum and Helmeted Honeyeater, whilst providing an opportunity for visitors to engage with nature and experience native wildlife in their natural habitat. There are several partners working on this project including Zoos Victoria, Parks Victoria, Depatment of Environment, Land, Water and Planning. Trust for Nature is working on land buy backs to allow for permanent protection of critical habitat.

Helmeted Honeyeater - former range (Threatened Species)



VALUES & THREATS

Values: endemic to Victoria; only populations of this species are found in this region; range restricted to mid-Yarra and Western Port catchments of central southern Victoria

Significant tractable threats:

- Inappropriate fire regimes
- Inappropriate hydrological regimes (Yellingbo)
- Predation (feral cats, foxes)
- Competition from other bird species

OBJECTIVES & PRIORITY ACTIONS

Objective: Maintain the extent and improve the quality of habitat for Helmeted Honeyeater

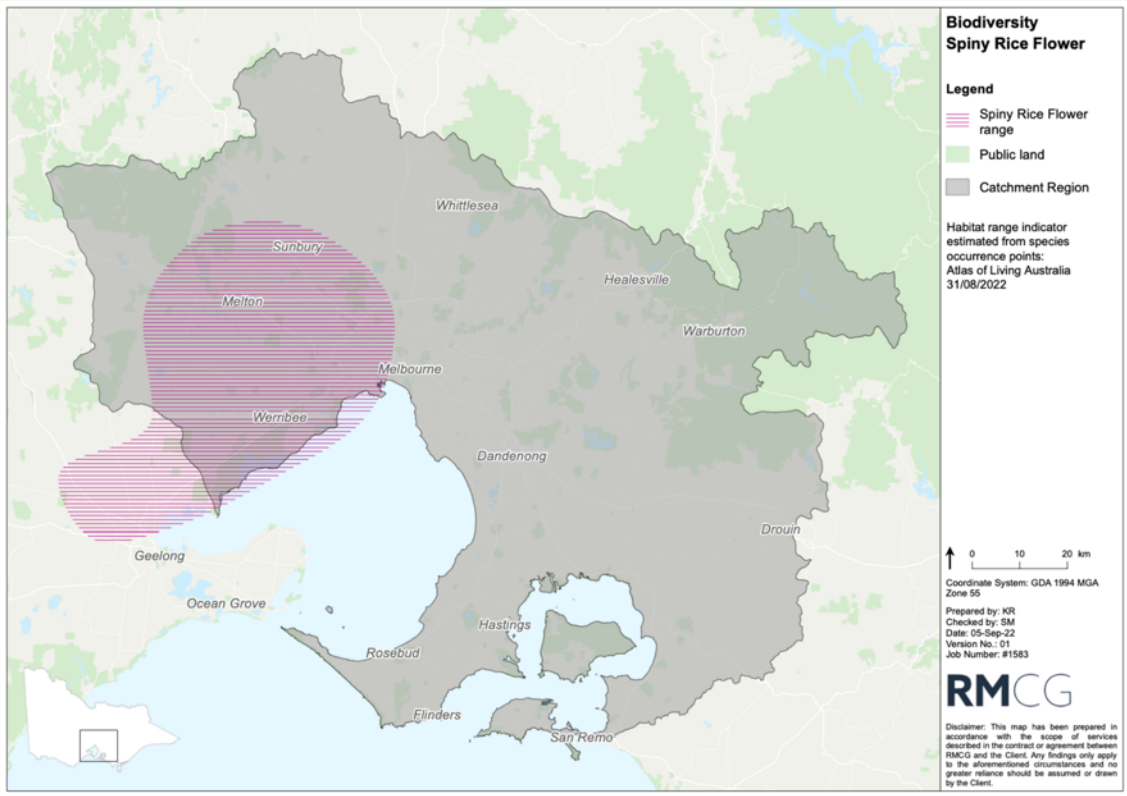
Priority actions:

- Improved hydrological regime
- Predator control (feral cats, foxes, competing birds)
- Modified fire regimes (strategic fuel breaks)
- Habitat improvement (revegetation)

SUPPORTING INFORMATION

There are several organisations and volunteer groups that are actively engaged and working to protect Helmeted Honeyeaters e.g. Friends of the Helmeted Honeyeater, Yarra 4 Life Partnership. A second release site has been identified at O'Shanessy's. Identification of other suitable release sites is important for building a resilient and healthy population. The species distribution of Helemted Honeyeater and the Leadbeater's Possum overlap and there are a number of common habitat requirements between the two species. The map above shows the former range of the Helmeted Honeyeater (the current range is confined to Yellingbo Nature Conservation Reserve and the Maroondah release site).

Spiny Rice-flower (Threatened Species)



VALUES & THREATS

Values: endemic to Victoria, occurs in the central west of the State; known sites within the region - Bacchus Marsh, Truganina Cemetery, Westpoint Business Park Laverton, Lake Borrie Spit, Western Treatment Plant; Approximately 90% of the population occurs in the Victorian Volcanic Plains Bioregion; Local Government where the species is known to exist (Melton Shire, Hobsons Bay City, City of Wyndham, City of Brimbank)

Significant tractable threats:

- Weed invasion
- Human disturbance (rail/ road maintenance)
- Pest animals (herbivores)

OBJECTIVES & PRIORITY ACTIONS

Objective: Maintain the extent and viability of existing populations

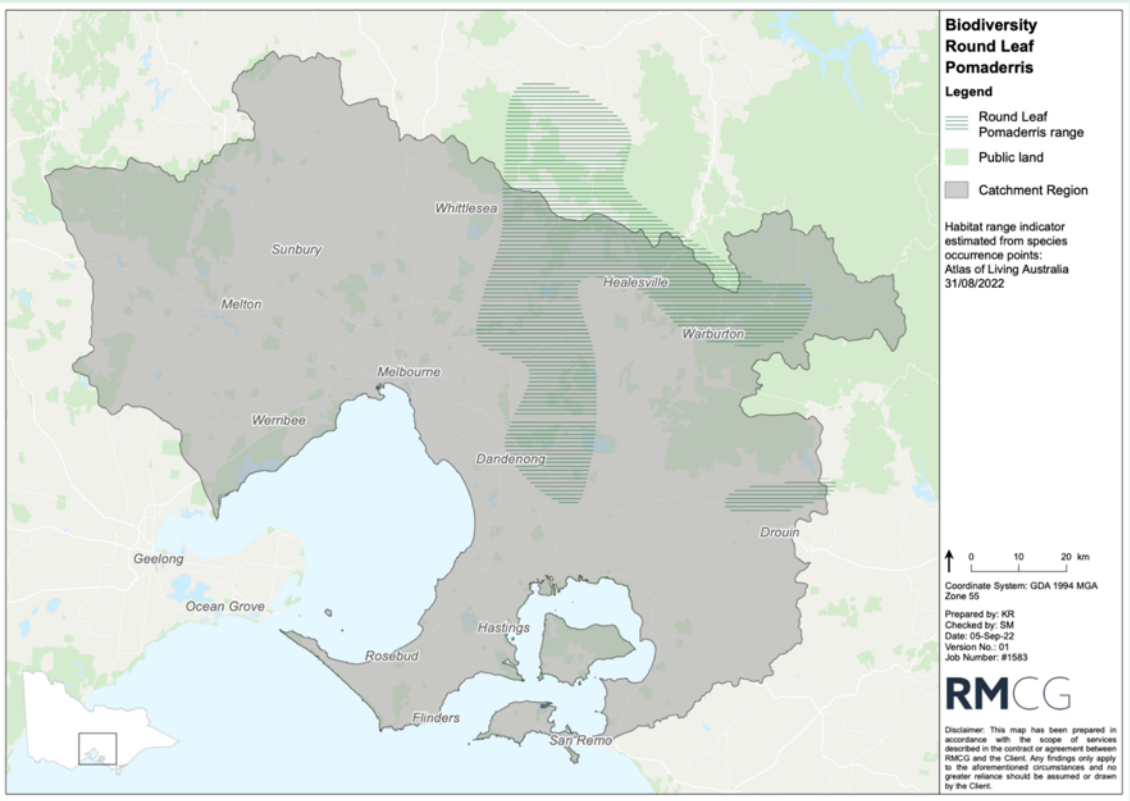
Priority actions:

- Seed collection
- Identification of suitable habitat (existing and potential)
- Herbivore control (rabbits, hare)
- Weed and biomass control
- Improved fire and grazing regimes

SUPPORTING INFORMATION

The Melbourne Strategic Assessment Plan provides guidance for the protection of Spiny Rice-flower. There are several active community groups working to protect the species through propogation and revegetation programs. These groups include Iramoo Wildflower Grasslands Group and Grassy Plains Network. Victoria University are partnering with community groups running a propagation program. The Caring for our Grasslands group are also applying cultural burning practices to improve grassland vegetation.

Round-leaf Pomaderris (Threatened Species)



VALUES & THREATS

Values: endemic to Victoria; only populations of this species are found in this region; it occurs in the middle and upper catchments of the Yarra River, extending marginally north into the headwaters of the Yea River and King Parrot Creek, with disjunct occurrences on the northern outskirts of the Latrobe Valley between Tyers and the Toongabbie-Cowwarr district, in the lower catchment of the Latrobe and Thompson Rivers

Significant tractable threats:

- Weed invasion
- Habitat loss (land clearance)
- Pest animals (herbivores)

OBJECTIVES & PRIORITY ACTIONS

Objective: Maintain the extent and quality of habitat

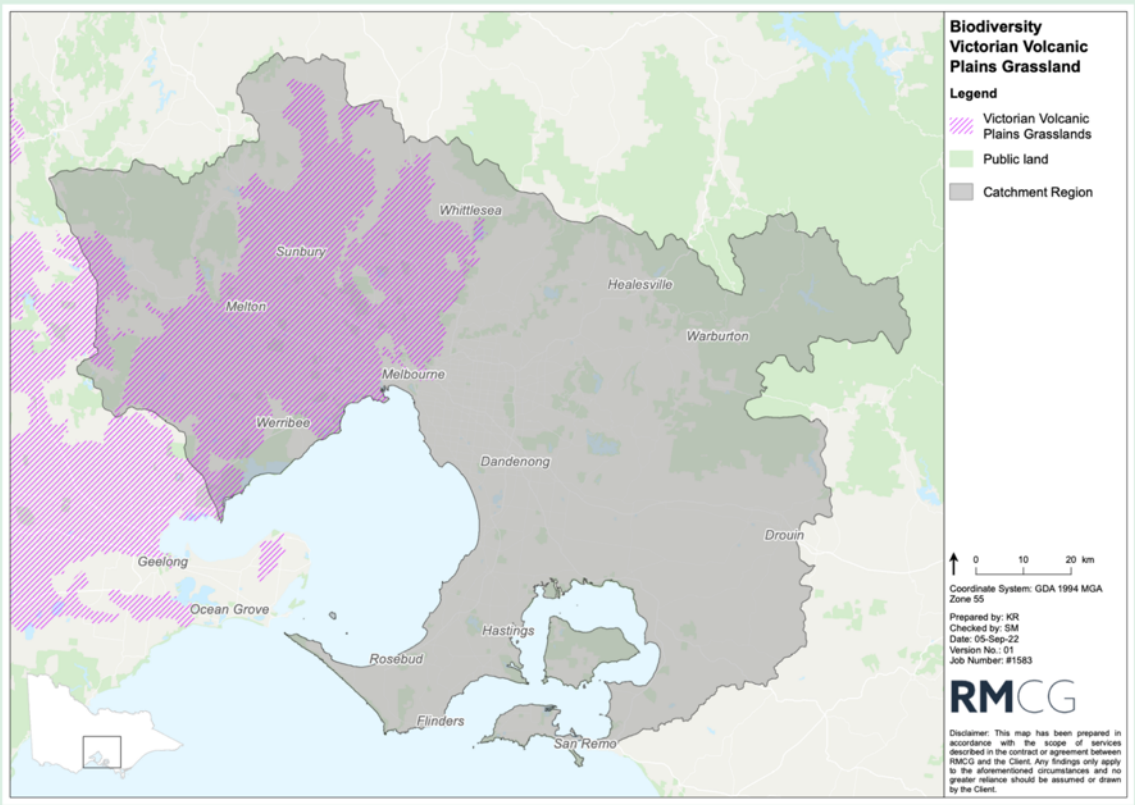
Priority actions:

- Identification of suitable habitat (existing and potential)
- Herbivore control (rabbits, deer, hare)
- Weed control

SUPPORTING INFORMATION

Local council (Yarra Valley and Nillumbik) have partnered in revegetation programs and bushland conservation that benefit this species. Local indigenous nursuries have run propogation programs to supply revegetation stock and promote local planting.

Natural Temperate Grasslands of the Victorian Volcanic Plains (Threatened Ecological Community)



VALUES & THREATS

Values: the ecological community is limited to the basalt plain of Victoria that extends from Melbourne, west to about Hamilton. It occurs in the NRM regions of Port Philip and Westernport, Corangamite, and Glenelg-Hopkins. The ecological community presently has a very restricted geographic distribution and has suffered a very severe decline in terms of its extent and community integrity (Source: Conservation Advice - Natural Temperate Grassland of the Victorian Volcanic Plain).

Significant tractable threats:

- Land clearing
- Weed invasion
- Pest animals (herbivores)

OBJECTIVES & PRIORITY ACTIONS

Objective: Maintain the existing extent of this ecological commuinty within the region

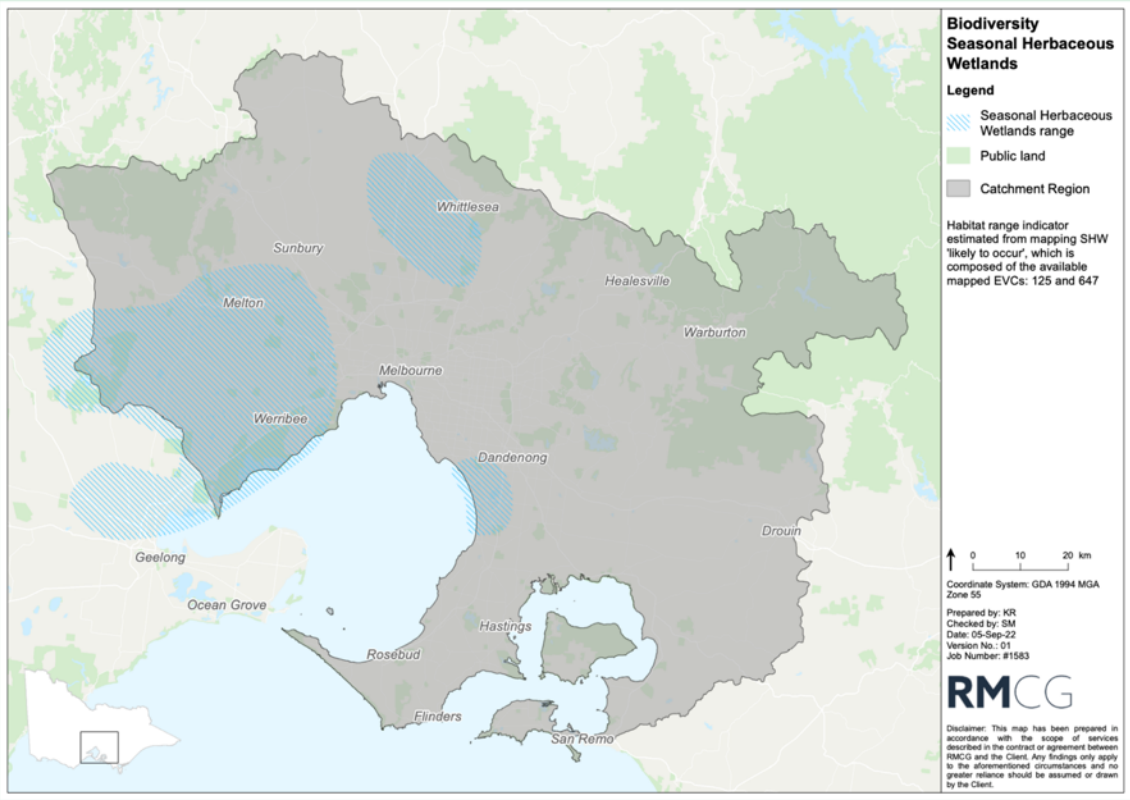
Priority actions:

- Weed and biomass control
- Fencing to prevent access
- Pest animal control (herbivores)
- Revegetation

SUPPORTING INFORMATION

A small proportion of the ecological community falls within the region with most of the distribution falling in to larger patches within the Corangamite, North Central and Glenelg Hopkins CMAs. There are existing programs that could be coordinated across the regions.

Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (Threatened Ecological Community)



VALUES & THREATS

Values: the Seasonal Herbaceous Wetlands ecological community occurs in Victoria, south-eastern South Australia (SA) and southern New South Wales (NSW).The Seasonal Herbaceous Wetlands ecological community is likely to occur in the following Catchment Management Authorities (CMAs) / Natural Resource Management (NRM) Regions in Victoria: West Gippsland, Port Phillip and Westernport, Corangamite, Glenelg-Hopkins, Wimmera, North Central, Goulburn-Broken and North East.

Significant tractable threats:

- Urban development
- Inappropriate land management (grazing)
- Inappropriate hydrological regimes

OBJECTIVES & PRIORITY ACTIONS

Objective: Ground-truthing to identify the current extent and location of the ecological community across the region

Priority actions:

- Investigative study (mapping, modelling, ground-truthing)
- Wetland condition assessments
- Pilot project (develop case studies to demonstrate how the ecological community can be protected on private land)

SUPPORTING INFORMATION

Patches of this ecological community occur within the Western Grasslands Reserve, as a priority these patches should be identified, protected and managed given the longer-term protection of this reserve area. A small proportion of the ecological community falls within the region with most of the distribution falling into larger patches within the West Gippsland, Corangamite, Glenelg-Hopkins, Wimmera, North Central, Goulburn-Broken and North East CMAs. There are opportunities to link in with existing programs being delivered through other CMAs with larger patches of this ecological community in their region.

7 Agriculture

7.1 OVERVIEW

Agriculture in the PPW Region

The RLP outcomes for Agriculture in the PPW region are as follows:

SOIL, BIODIVERSITY & VEGETATION ON-FARM

Long-term (10-20 years)
"The conditions of soil, biodiversity and vegetation are improved"

Medium-term (5 years)
"There will be increased awareness and adoption of land management practices that improve and protect the condition of soil, biodiversity and vegetation"

RLP Agriculture Investment Priorities:

- Managing soil acidification
- Reducing the risk of soil and nutrient loss from wind erosion
- Reducing the risk of soil and nutrient loss from hillslope (water) erosion
- Opportunities for increasing soil organic carbon
- Improving management of on-farm native vegetation

SUPPORTING AGRICULTURAL SYSTEMS TO ADAPT TO CHANGE

Long-term (10-20 years)
"Agriculture systems have adapted to significant changes in climate and market demands"

Medium-term (5 years)
"There is an increase in the capacity of agriculture systems to adapt to significant changes in climate and market demands for information on provenance and sustainable production"

RLP Agriculture Investment Priorities:

- Adapt to growing market preferences for products with demonstrable sustainability credentials, including through traceability mechanisms
- Increase awareness and understanding of changes in climate and markets so that they can adopt effective response strategies that maintain farm productivity and natural resource conditions

44%
Proportion of the region that is agricultural land

2,203
Number of agricultural businesses

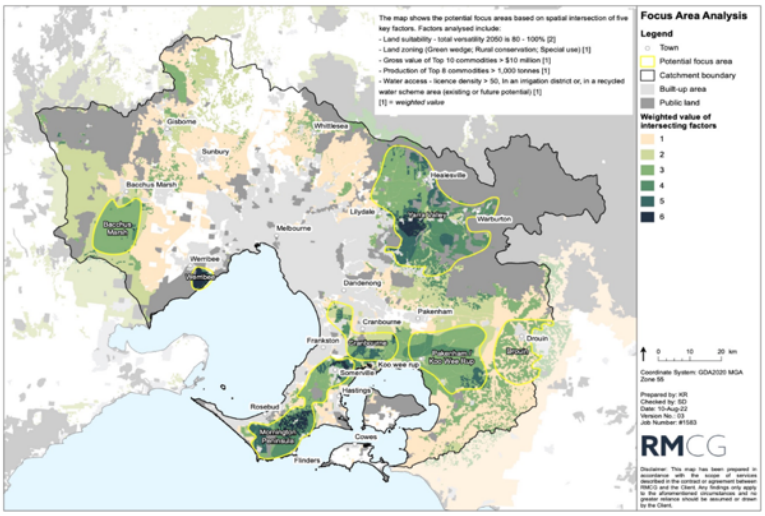
$1.6 billion
Gross value of agricultural production

$276 million
Most significant commodity (by GVAP) - poultry

99%
Most significant commodity (by proportion of production in VIC) Brussel Sprouts

8
Commodities that produce ~50 per cent or more of Victoria's production

These figures are drawn from analysis of the 2015/16 ABS Agricultural Census data.



The regional long-term (2050), medium-term (2028) outcomes and priority management direction for Agriculture in the PPW region are shown in the table below. These are drawn from the RCS.

RCS 2028 OUTCOME	RCS 2050 OUTCOME	PRIORITY MANAGEMENT DIRECTION
Sustainable agricultural systems		
Growing numbers of farms and agricultural industries are adopting evolving sustainable farming methods such as regenerative agriculture, traditional Aboriginal practices, carbon neutral systems, renewable energy use	This region's farms and agricultural industries are recognised as leaders in agri-ecological sustainability and resilience	• Erosion and nutrient management – strawberries, nurseries/cut flowers and vegetable • Native vegetation insectaries – vegetables, wine grapes, fruit • Implementation of circular economy principles - vegetables • Climate change adaptation – perennial horticulture • Fertiliser and effluent management – dairy
Soil health		
The proportion of exposed soil in the region remains in the range 10% to 15%, or less, each year from 2020 to 2028.	The proportion of exposed soil in the region remains in the range 10% to 15%, or less, each year from 2020 to 2050.	• Building soil carbon through improved soil health and condition – all industries • Erosion management – strawberries, nurseries/cut flowers and vegetables

The priority management directions are based on stakeholder and community aspirations which were all developed through extensive stakeholder consultation undertaken through the RCS process and other related projects such as FoodPrint.

7.2 REGIONAL AGRICULTURAL CONTEXT

Of the 1.28 million hectares of land in the region, around 44 per cent is agricultural with significant industries including horticulture, dairying, poultry farming, beef farming, horse management and viticulture. The region had gross value of production of $1.66 billion in 2015-16 which is among the highest for Victoria's regions.

Significant commodities in the region based on the gross value of agricultural production included poultry ($276 million), dairy ($182 million), nurseries ($171 million), cattle and calves ($147 million) and mushrooms ($104 million).

Although this region has a significant urban area, it produces 23 per cent of Victoria's vegetables (including 99 per cent of its brussels sprouts, 87 per cent of its cauliflower, 86 per cent of its mushrooms, 65 per cent of its broccoli and 53 per cent of its lettuces), seven per cent of Victoria's fruit (including 98 per cent of its strawberries, 50 per cent of its kiwi fruit and 49 per cent of its blueberries), 59 per cent of the state's chicken meat and over a third of its eggs. The area currently produces around 41 per cent of Melbourne's fresh produce needs.

Parts of the region are significant for particular crops as a result of their climate, soil, proximity to market and other conditions. For example, the Yarra Valley produces 78 per cent of Victoria's strawberries and Koo Wee Rup grows over 90 per cent of Australia's asparagus.

Given the significance of agriculture in the PPW catchment, Melbourne Water is committed to:

- Retaining important agricultural land in the region, including in the Green Wedges and high value agricultural land
- Supporting the adoption of sustainable farming techniques across all agricultural industries
- Minimising the impacts of nearby urban populations on farming systems
- Supporting the profitability of farming in this region by recognising and rewarding the public good benefits produced from sustainable agricultural land management
- Encouraging 'catchment stewardship' to leave our natural resources in better condition than their current state.

Supporting more sustainable farming practices also has the potential to deliver multiple benefits for the region by reducing the threat posed by agricultural practices to other significant environmental assets in the region like waterways, wetlands and threatened species. Threats to other assets include:

- Pollutants such as chemicals, nutrients and excess sediment entering waterways and wetlands
- Over extraction of water from surface and groundwater sources for agricultural use
- Illegal clearing of native vegetation, and
- Habitat loss and degradation.

Melbourne Water (including the former Port Phillip and Westernport Catchment Management Authority) has a long history of engagement and extension in agriculture that will assist to continue to deliver on these commitments. This includes coordination and implementation of numerous RLP and landholder incentives programs and The *Liveable Communities, Liveable Waterways* incentives program which now incorporates the previous Stream Frontage Management and Rural Land Programs. Melbourne Water also manage surface water diversions in the Yarra River, Lower Maribyrnong River and Western tributary areas for commercial and irrigation uses.

7.3 IDENTIFICATION OF AGRICULTURE PRIORITIES

The Agriculture priorities have been identified using the prioritisation process outlined in (Section 4) of this plan. An initial set of priorities were identified using the criteria, information sources and thresholds shown below in Table 7-1.

Table 7-1: Criteria used to identify agricultural priorities across the region.

CRITERIA	THRESHOLDS	DATA SOURCE
Significant agricultural land		
High land versatility	>80% versatility under 2050 climate projections (Access 1.0 – RCP 8.5)	▪ Deakin Land Suitability Assessment
Water access	Established/emerging irrigation districts, concentrations of agricultural surface and groundwater licensed usage, established/emerging recycled water schemes	▪ Surface and groundwater licences, irrigation districts, recycled water schemes
Production	Agricultural land that supports >50% state production/commodity (8 commodities in total)	▪ ABS Agriculture Census Data – Production
Gross Value of Agricultural Production (GVAP)	The top 10 commodities by GVAP for the region	▪ ABS Agriculture Census Data –GVAP
Green Wedges	Agricultural land in green wedges	▪ Green wedges
Significant Soils		
Soil carbon	Soils identified as having a high potential to capture and retain additional soil organic carbon	▪ CSIRO Soil Carbon Potential Capability Index[23]

An initial set of priorities were presented at the first of two workshops and information gaps were identified. Following the first workshop the priorities for significant agricultural land were further refined by applying a weighting to differentiate the importance of each criteria. Weightings were applied as follows:

- High land versatility – weighting 2
- Water access – weighting 1
- Production – weighting 1
- Gross Value of Agricultural Production (GAVP) – weighting 1
- Green Wedges – weighting 1.

A refined set of priorities was presented at the second workshop along with the prioritisation analysis results. Following workshop two targeted follow up with experts was undertaken to fill outstanding information gaps resulting in the final list agriculture and soil priorities documented in this plan (Table 7-2).

Resulting priorities fall in to two Tiers. Tier 1 priorities are those that received a high cost-benefit score (Rating 1 or 2) and no significant limitations identified in the qualitative analysis. Tier 2 priorities are those that score a lower cost-benefit score (Rating 2 or 3) and/or significant limitations identified in the qualitative analysis.

[23] Limitations of the CSIRO Soil Carbon Potential Capability Index were acknowledged by workshop participants (specifically inaccuracy/lack of ground truthing). As there is limited soil data available at the regional scale this dataset was used as the current best source of information and ensured that soils were included in the prioritisation process.

Detailed prioritisation analysis results are provided in Appendix 8.

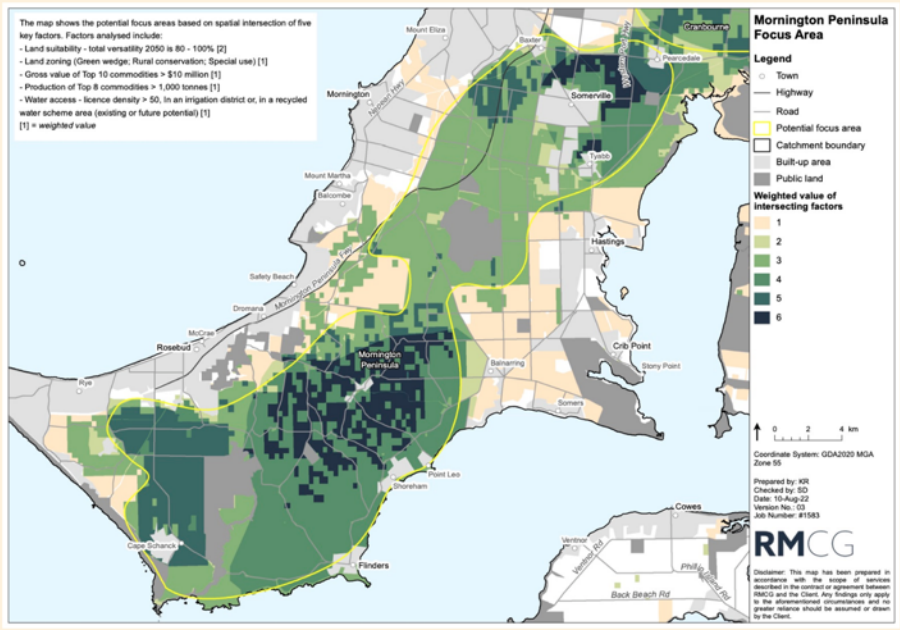
Table 7-2: Alignment of RLP outcomes with NRM Action Plan priorities

FIVE YEAR OUTCOME	INVESTMENT PRIORITIES	
	TIER 1	TIER 2
By 2023, there is an increase in the awareness and adoption of land management practices that improve and protect the condition of soil, biodiversity and vegetation	▪ Mornington Peninsula ▪ Yarra Valley ▪ Werribee ▪ Drouin	▪ Cranbourne ▪ Pakenham / Koo Wee Rup ▪ Priority soils
By 2023, there is an increase in the capacity of agriculture systems to adapt to significant changes in climate and market demands for information on provenance and sustainable production	▪ Mornington Peninsula ▪ Yarra Valley ▪ Werribee ▪ Drouin	▪ Bacchus Marsh

7.3.1 PRIORITIES

A total of 8 priorities were identified through the prioritisation process for the Agriculture theme (as listed in Table 7-2 above), further details including values, threats, objectives, priority actions and relevant supporting information to demonstrate the importance of these priorities for RLP investment is provided next.

Mornington Peninsula (Tier 1)



VALUES

High land versatility (>80%) under 2050 climate projections (Access 1.0 – RCP 8.5), high concentrations of agricultural surface and groundwater usage licences, emerging Tyabb-Somerville Recycled Water Irrigation Scheme, occurs in the Mornington Peninsula Green Wedge, significant location for lettuce, broccoli and strawberry production, significant location for poultry, strawberries and lettuce (Gross Value of Agricultural Production).

THREATS

Significant tractable threats (focus industries - wine grapes and vegetables):

Practices that cause threat:

- Bare fallow between (in space and time) commercial crops

Other threatening processes:

- Pest and disease inclusions
- Urbanisation
- Limited availability of water for agriculture
- Climate change - perennial horticulture; average temperature increase, extreme heat, reduced cold nights

OBJECTIVES & PRIORITY ACTIONS

Objectives:

1. Increase on-farm native vegetation as insectaries to support biological control of insect pests and reduce damage to vegetable crops
2. Increase groundcover to reduce erosion risk and increase soil organic carbon
3. Increase the capacity of perennial horticulturalists to adapt to a change in climate
4. Increase capacity to plan and implement change to business models to respond to urbanisation pressures

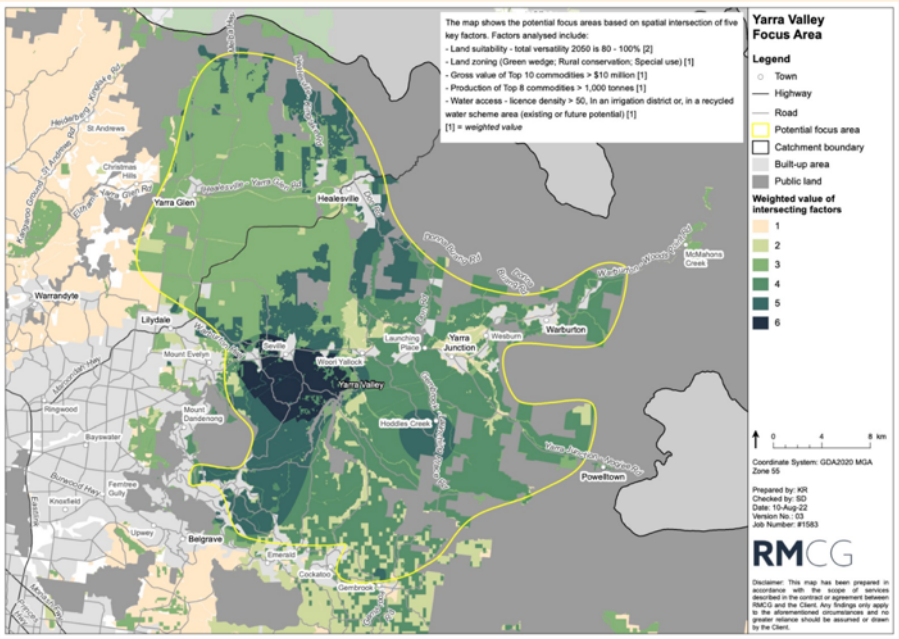
Priority actions:

- Cover cropping on fallow areas or inter-row ground cover
- Reduced tillage
- Native vegetation insectaries (functional biodiversity)
- Perennial horticulture variety selection and adaptation measures (e.g. protectants, shade netting)
- Use alternative water sources for irrigation (e.g. recycled water)
- Investigate feasibility of business model and/or location change to reduce reliance on peri-urban areas

SUPPORTING INFORMATION

Wine grapes and vegetables are significant industries in the Mornington Peninsula agriculture focus area. Melbourne Water has established strong partnerships with Mornington Peninsula Shire (Agribusiness team), and agriculture industry groups (Mornington Peninsula Vignerons Association and AUSVEG) through the delivery of current and past programs. Melbourne Water also have a long history working with the Mornington Peninsula Landcare Network, Landcare groups and landholders in this location. Opportunities exist to link with other focus areas based on industries to maximise reach and potential impact against desired outcomes e.g. Pakenham / Koo Wee Rup and Cranbourne. Discussion groups have been established through the Smart Farming for Western Port Project and will provide an additional network.

Yarra Valley (Tier 1)



VALUES

High land versatility (>80%) under 2050 climate projections (Access 1.0 – RCP 8.5), high concentrations of agricultural surface and groundwater usage licences, occurs in the Yarra Valley and Dandenong Green Wedge, significant location for lettuce, broccoli, strawberry, brussels sprouts, kiwi fruit and blueberry production, significant location for nurseries, cut flowers, strawberries (Gross Value of Agricultural Production)

THREATS

Significant tractable threats (focus industries - strawberries, blueberries, nurseries, cut flowers, wine grapes and orchards):

Practices that cause threat:

- Run-off from paddocks, farm tracks, protected cropping structures (e.g. greenhouses and polytunnels) and hard surfaces
- Exposed soils

Other threatening processes:

- Limited availability of water for agriculture
- Climate change - perennial horticulture

OBJECTIVES & PRIORITY ACTIONS

Objectives:

1. Increase on-farm native vegetation as insectaries to support biological control of insect pests and reduce damage to wine grapes
2. Increase groundcover to reduce erosion risk and increase soil organic carbon
3. Increase the capacity of perennial horticulturalists to adapt to a change in climate
4. Increase capacity to plan and implement change to business models to respond to urbanisation pressures

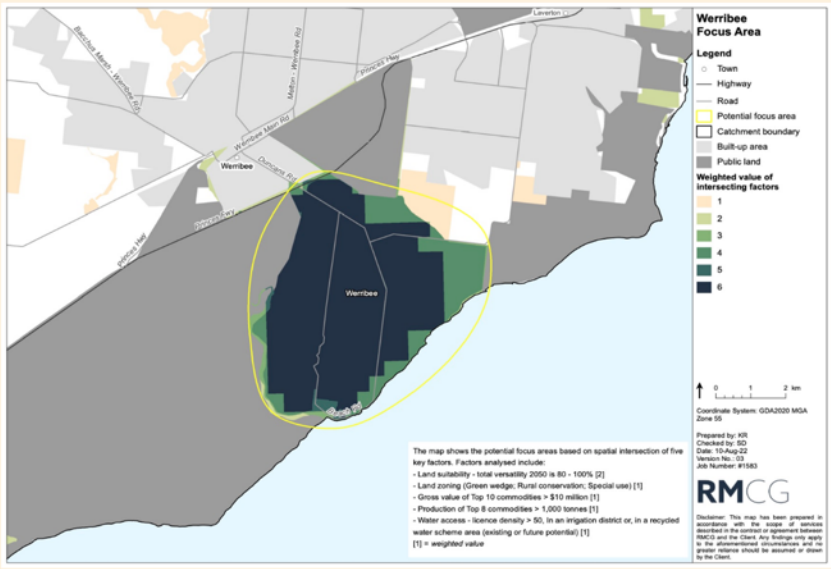
Priority actions:

- Cover cropping on fallow areas or inter-row ground cover
- Reduced tillage
- Native vegetation insectaries (functional biodiversity)
- Perennial horticulture variety selection and adaptation measures (e.g. protectants, shade netting)
- Use alternative water sources for irrigation (e.g. recycled water)
- Investigate feasibility of business model and/or location change to reduce reliance on peri-urban areas

SUPPORTING INFORMATION

Strawberries, blueberries, nurseries, cut flowers, wine grapes and orchards are significant industries in the Yarra Valley agriculture focus area. Melbourne Water has established strong partnerships with Yarra Ranges Council, Agribusiness Yarra Valley, Berries Australia (Strawberry Industry Development Officer), Nursery and Garden Industry VIC (Industry Policy Officer) and Yarra Valley Wine Growers Association through the delivery of current and past programs. Melbourne Water also have a long history working with the Landcare networks (Yarra Ranges, Northern Yarra, Gnangara, Nangana), the Yarra 4 Life project, Landcare groups and landholders in this location. Some connections exist with the nursery and cut flower industry, past collaborations include case studies on insectaries that currently provide guidance for trialling and design of insectaries in the vegetable industry and delivery of a 'best practice' day for Landcare community nurseries in the region.

Werribee (Tier 1)



VALUES

High land versatility (>80%) under 2050 climate projections (Access 1.0 – RCP 8.5), high concentrations of agricultural surface and groundwater usage licences, established Werribee irrigation district and Werribee irrigation district recycled water scheme, occurs in the Werribee South Green Wedge, significant location for lettuce, broccoli and cauliflower production, significant location for lettuce (Gross Value of Agricultural Production)

THREATS

Significant tractable threats (focus industry - vegetables):

Practices that cause threat:

- Bare fallow between (in space and time) commercial crops

Other threatening processes:

- Application of recycled water for irrigation (high salt levels)
- Pest and disease incusions
- Urbanisation – expansion of the regional growth boundary
- Climate change - annual horticulture; extreme heat, intense rainfall events, reduced average rainfall

OBJECTIVES & PRIORITY ACTIONS

Objectives:

1. Increase groundcover to reduce erosion risk
2. Increase soil organic carbon and promote a circular economy through resource recovery
3. Reduce the impacts of water quality constraints on crop and soil health
4. Increase on-farm native vegetation as insectaries to support biological control of insect pests and reduce damage to vegetable crops
5. Increase capacity to plan and implement change to business models to respond to urbanisation pressures

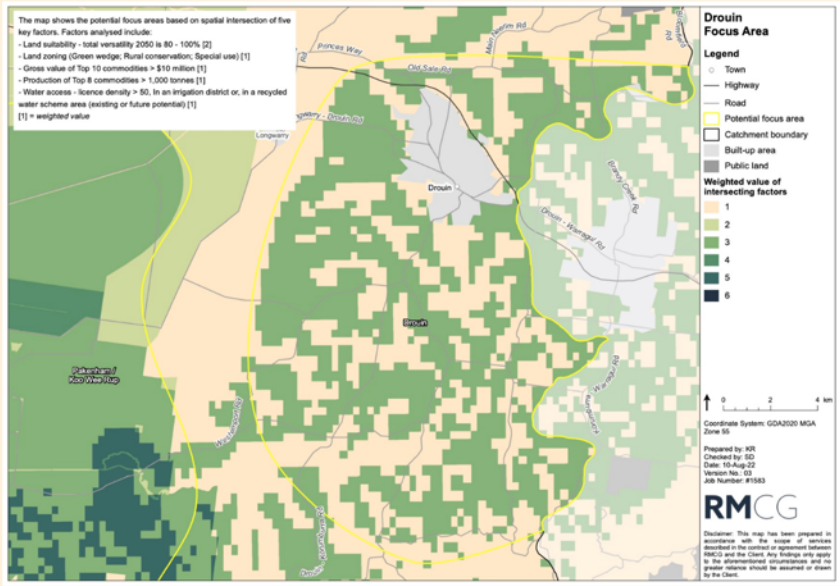
Priority actions:

- Cover cropping on fallow areas
- Reduced tillage
- Use soil ameliorants (e.g. compost)
- Use soil testing and emerging decision support tools (e.g. QUT compost calculator) to inform soil nutrition management (e.g. calcium thiosulfate, gypsum)
- Shandy recycled water with other sources (e.g. river, potable, storm)
- Native vegetation insectaries (functional biodiversity)
- Investigate feasibility of business model changes to manage the pressures of urbanisation (e.g. diversification, use of multiple farm locations, niche products, alternative production systems)

SUPPORTING INFORMATION

Vegetables are a significant industry in the Werribee agriculture focus area. Melbourne Water has established strong partnerships with agriculture industry groups (AUSVEG) through the delivery of current and past programs. Melbourne Water is currently delivering a project in partnership with AUSVEG in this location focused on the establishment of Native Vegetation Insectaries. There is a significant opportunity to build on and expand this work in this focus area.

Drouin (Tier 2)



VALUES

High land versatility (>80%) under 2050 climate projections (Access 1.0 – RCP 8.5), high concentrations of agricultural surface and groundwater usage licences, significant location for dairy, poultry, cattle, eggs and hay (Gross Value of Agricultural Production).

THREATS

Significant tractable threats (focus industry - dairy):

Practices that cause threat:

- Nutrient application poorly matched to pasture and crop nutrient requirements
- Effluent run-off and stock access to waterways and drainage lines

Other threatening processes:

- Limited availability of water for agriculture

OBJECTIVES & PRIORITY ACTIONS

Objectives:

1. Increase the efficiency and sustainability of fertiliser use on farms to improve soil health
2. Increase the use of effluent re-use systems to reduce nutrient run-off and improve water use efficiency on dairy farms

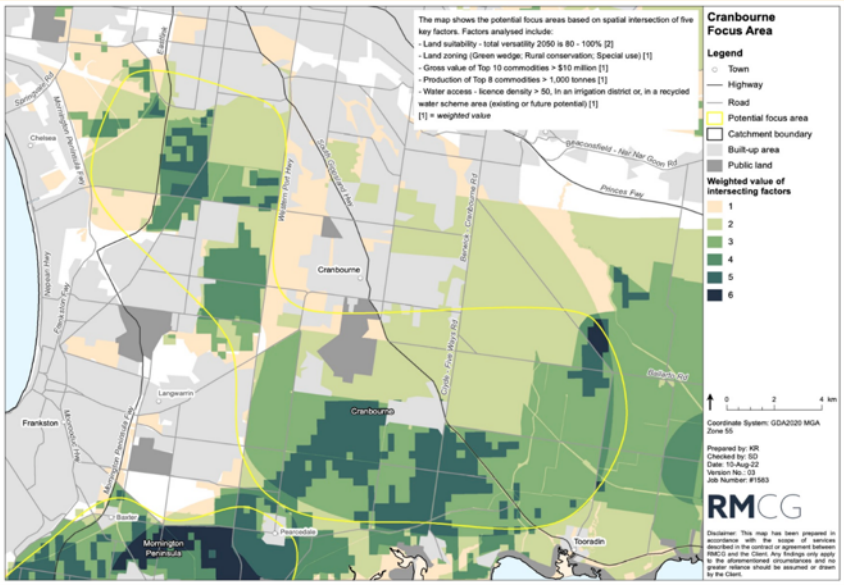
Priority actions:

- Soil and fertiliser management
- Effluent management systems

SUPPORTING INFORMATION

Dairy is a significant industry in the Drouin agriculture focus area. Melbourne Water has established strong partnerships with agriculture industry groups (Gipps Dairy) through the delivery of current and past programs. Melbourne Water has partnered with GippsDairy to delivery Fert$mart in this location. There is a significant opportunity to build on and expand this work in this focus area. Discussion groups have been established through the Smart Farming for Western Port Project and will provide an additional network.

Cranbourne (Tier 2)



VALUES

High land versatility (>80%) under 2050 climate projections (Access 1.0 – RCP 8.5), high concentrations of agricultural surface and groundwater usage licences, established Eastern irrigation scheme (recycled water), occurs in Westernport Green Wedge, significant location for lettuce and cauliflower production, significant location for eggs, cut flowers and lettuce (Gross Value of Agricultural Production).

THREATS

Significant tractable threats (focus industry - vegetables):

Practices that cause threat:

- Bare fallow between (in space and time) commercial crops

Other threatening processes:

- Urbanisation
- Limited availability of water for agriculture

OBJECTIVES & PRIORITY ACTIONS

Objectives:

1. Increase groundcover to reduce erosion risk and increase soil organic matter
2. Increase capacity to plan and implement change to business models to respond to urbanisation pressures

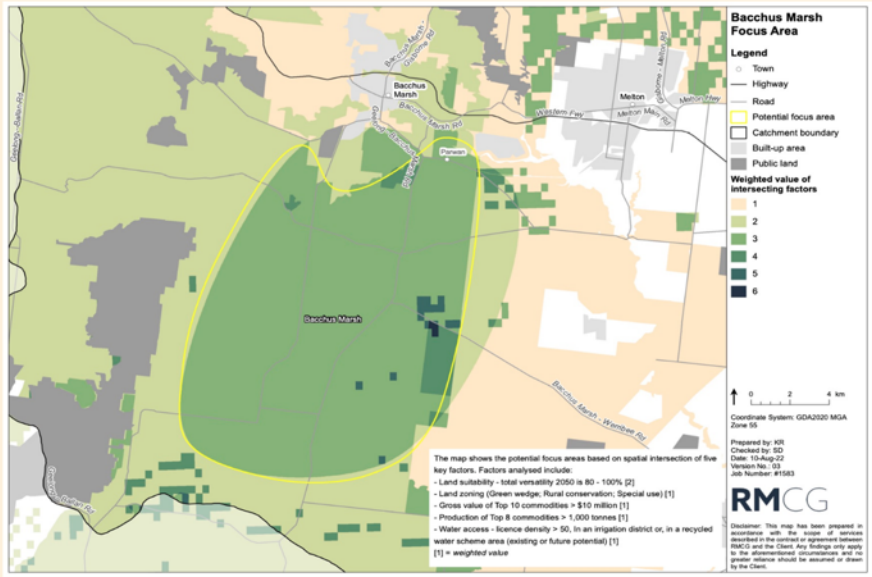
Priority actions:

- Cover cropping on fallow areas
- Reduced tillage
- Use soil ameliorates (e.g. compost)
- Use alternative water sources for irrigation (e.g. recycled water)
- Investigate feasibility of business model changes to manage the pressures of urbanisation (e.g. diversification, use of multiple farm locations, niche products, alternative production systems)

SUPPORTING INFORMATION

Vegetables are a significant industry in the Cranbourne agriculture focus area. Melbourne Water has established strong partnerships with agriculture industry groups (AUSVEG) through the delivery of current and past programs. Pressure from urbanisation brings the long-term viability of investing in the vegetable industry in location into question. This is a direct result of the uncertainty related to the location of the urban growth boundary. Vegetable growers are already taking steps to move production out of this focus area. However, opportunities exist to link with other focus areas based on industries to maximise reach and potential impact against desired outcomes e.g. Mornington Peninsula and Pakenham / Koo Wee Rup.

Bacchus Marsh (Tier 2)



VALUES

Established Bacchus Marsh Irrigation District, occurs in Western Plains South Green Wedge, significant location for lettuce and mushroom production (Gross Value of Agricultural Production)

THREATS

Significant tractable threats (focus industries - vegetables, strawberries, turf and orchards):

Practices that cause threat:

- Bare fallow between (in space and time) commercial crops

Other threatening processes:

- Limited availability of water for agriculture

OBJECTIVES & PRIORITY ACTIONS

Objectives:

1. Increase groundcover to reduce erosion risk and increase soil organic matter
2. Increase the capacity of perennial horticulturalists to adapt to a change in climate

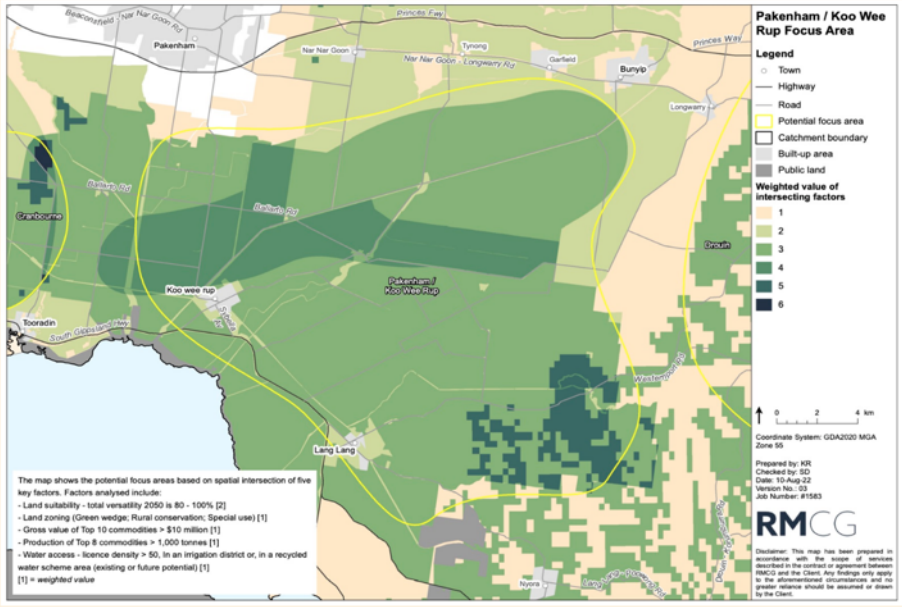
Priority actions:

- Cover cropping on fallow areas
- Reduced tillage
- Use soil ameliorates (e.g. compost)
- Perennial horticulture variety selection and adaptation measures (e.g. protectants, shade netting)

SUPPORTING INFORMATION

Vegetables, strawberries, turf and orchards are significant industries in the Bacchus Marsh agriculture focus area. This focus area has limited versatility under 2050 climate projections (Access 1.0 – RCP 8.5) and its suitability for agriculture is likely to be significantly impacted in the future, especially if the availability of water for agriculture becomes limited. Melbourne Water has established strong partnerships with agriculture industry groups (AUSVEG). However, there are no projects being delivered in this focus area currently.

Pakenham/ Koo Wee Rup (Tier 2)



VALUES

High concentrations of agricultural surface and groundwater usage licences, emerging Pakenham Regional Recycled Water Scheme, occurs in Westernport Green Wedge, significant location for broccoli production, significant location for milk, poultry, cattle eggs, and hay (Gross Value of Agricultural Production)

THREATS

Significant tractable threats (focus industries - vegetables, grazing (beef cattle)):

Practices that cause threat:

- Bare fallow between (in space and time) commercial crops

Other threatening processes:

- Limited availability of water for agriculture

OBJECTIVES & PRIORITY ACTIONS

Objectives:

1. Increase groundcover to reduce erosion risk and increase soil organic matter

Priority actions:

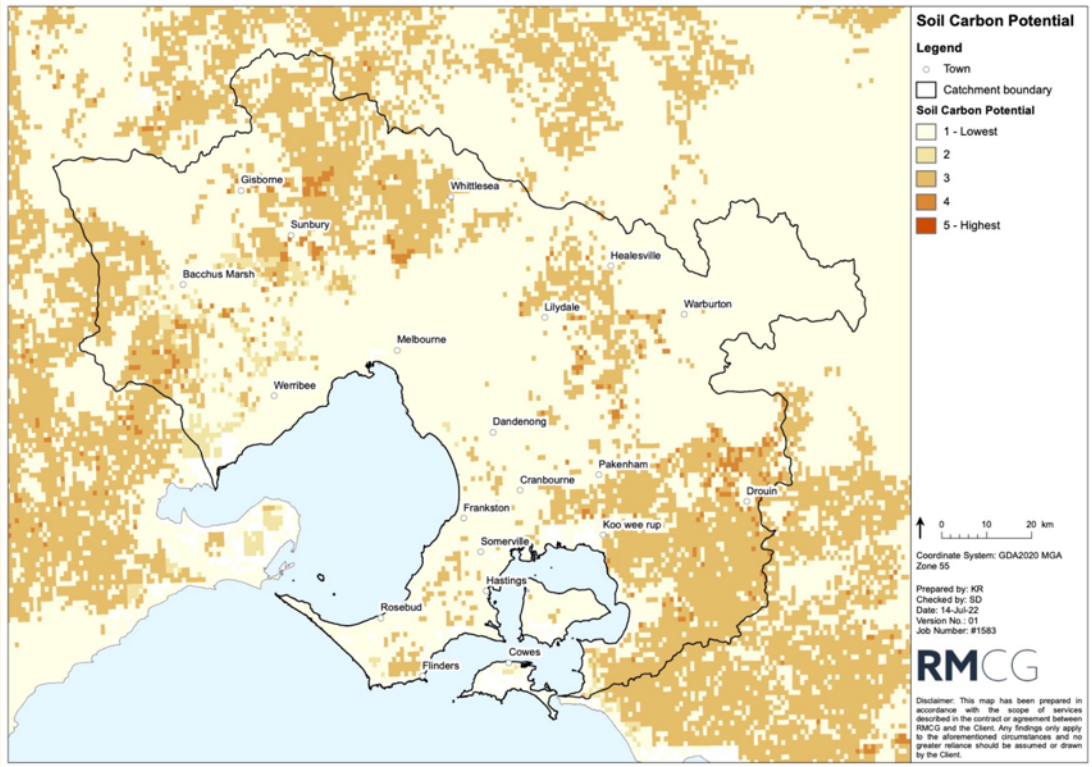
- Cover cropping on fallow areas
- Reduced tillage
- Use soil ameliorates (e.g. compost)
- Use alternative water sources for irrigation (e.g. recycled water)
- Pasture management
- Grazing management

SUPPORTING INFORMATION

Vegetables and grazing (beef cattle) are significant industries in the Pakenham / Koo Wee Rup agriculture focus area. This focus area has limited versatility under 2050 climate projections (Access 1.0 – RCP 8.5) and its suitability for agriculture is likely to be significantly impacted in the future, especially if the availability of water for agriculture becomes limited. Melbourne Water has established strong partnerships with agriculture industry groups (AUSVEG) through the delivery of current and past programs. Melbourne Water also have a long history working with the Westernport Catchment Landcare Network who have strong links with grazing industry in this location.

The Westernport Catchment Landcare Network is currently delivering two projects in partnership with Melbourne Water, South Gippsland Landcare Network, Bass Coast Landcare Network, Latrobe Catchment Network and Mornington Peninsula Shire in this location focused on the links between soil health, farm productivity and profitability. Opportunities exist to link with other focus areas based on industries to maximise reach and potential impact against desired outcomes e.g. Mornington Peninsula and Cranbourne.

Priority Soils



VALUES & THREATS

Values: Soils identified as having a high potential to capture and retain additional soil organic carbon

Significant tractable threats:

- Declining carbon stocks under current land management

OBJECTIVES & PRIORITY ACTIONS

Objectives:

1. Increase groundcover to reduce erosion risk
2. Increase soil organic carbon and promote a circular economy through resource recovery

Priority actions:

- Pasture management
- Grazing management
- Cover cropping
- Use soil ameliorants (e.g. lime, gypsum, organic biological nutrients, compost, manure, biosolids)
- Reduced tillage
- Stubble retention

SUPPORTING INFORMATION

The priority soils focus area cuts across all agricultural industries in the Melbourne water catchment. Melbourne Water has established strong partnerships with local government and agriculture industry groups (horticulture, dairy, grazing) through the delivery of current and past programs. Melbourne Water also have a long history working with the Landcare Networks, Landcare groups and landholders across the region.

The Westernport Catchment Landcare Network is currently delivering two projects in partnership with Melbourne Water, South Gippsland Landcare Network, Bass Coast Landcare Network, Latrobe Catchment Network and Mornington Peninsula Shire focused on the links between soil health, farm productivity and profitability. This project is being delivered in the Drouin, Cranbourne and Pakenham / Koo Wee Rup agriculture focus areas. Opportunities exist to link with other focus areas based on industries to maximise reach and potential impact against desired outcomes.

8 Implementation

8.1 PARTNERSHIPS AND COLLABORATIONS

This plan will be used as a guide to support and assist in planning for the delivery of priority NRM actions across the region. A range of consultation methods will be used to further refine and capture community and Traditional Owner aspirations and determine how they would like to be involved in the delivery of priority actions. Such methods may include however are not limited to:

- Stakeholder workshops
- Targeted engagement
- Feedback survey's
- Review of complimentary data and information from stakeholder organisations (e.g. mapping, plans, strategies, reports)
- Submitting a project proposal through the Port Phillip and Western Port RCS Prospectus Portal[24]
- Collaborative co-design (an iterative and shared process that involves a series of consultation steps to develop a shared understanding and approach that will drive the delivery of collective action).

The consultation will be used to further understand and inform how stakeholders will come together to collectively deliver on the priority actions. Methods of delivery may include however not be limited to a combination of the following:

- Delivery of targeted grants for on-ground works
- Delivery of on-ground works by public land managers and their sub-contractors
- Training and capacity building activities
- Community education and awareness campaigns
- Use of traditional ecological knowledge.

The mix of consultation and delivery methods used will depend on the scope of the project, geographic location, theme, funding requirements and expectations/ needs of partners and collaborators. This plan will build on previous processes used to understand community and Traditional Owner aspirations and deliver priority actions across the region including those undertaken through development of this plan and the RCS.

An indicative list of partners and collaborators across the theme areas for this plan are provided in Appendix 1. This is not a comprehensive list. Further stakeholders are likely to be identified during the detailed project planning, design and application phase. It is also important to note that in keeping with the collaborative co-design approach underpinning this plan, consultation will be iterative and occur across the life of the plan in particular:

- When gathering and refining information to inform funding applications
- In determining the details around on-ground actions
- Identifying accountabilities around the delivery and monitoring of actions
- In reviewing and evaluating the success of projects to inform continuous improvement.

[24] https://portphillipWestern Port.rcs.vic.gov.au/prospectus/prospectus-application-form/

8.2 PROJECT PACKAGING OPPORTUNITIES

The identification of priorities for each theme provides focus areas for investment. Having these focus areas provides the opportunity to package priorities into projects that combined provide a more attractive investment. Packaging allows for improved partnerships and collaboration, pooling of funding, more efficient delivery of actions and increases the impact of the outcomes. Three key examples of how priorities could be further packaged into projects across the PPW region was made apparent through undertaking the prioritisation process and developing this plan. Those three examples include:

- **Within themes** – where multiple priorities within a single theme are packaged together (e.g. Leadbeater's Possum and Helmeted Honeyeater)
- **Across themes** – where common areas for investment are grouped across themes (e.g. Orange-bellied parrot, Big Marsh, Western Treatment Plant (Western Lagoon) and Northern Shore (French Island))
- **Other biodiversity assets** – where clusters of multiple species of conservation significance are located within the biodiversity priority areas identified in the plan (See Appendix 9 for a full list).

8.2.1 WITHIN THEMES

IMPROVING HABITAT FOR WATERBIRDS

What: Improving the hydrology to reinstate a more natural flow regime will contribute to improving the condition of existing coastal saltmarsh and in the longer-term result in an increased area of this vegetation community. In addition, provision of additional roosting sites close to saltmarsh foraging areas will reduce the time and energy cost of waterbirds who would otherwise need to fly further distances from the foraging area to find a suitable roost.

Why: Land that is modified for use in agriculture including cropping, grazing and the installation of tracks impact the persistence of coastal saltmarsh vegetation which relies on a natural regime of wetting and drying to maintain extent and condition. When the natural regime is disrupted, water is not delivered to the coastal saltmarsh when it is needed and the quality of the water that is delivered is not suitable to sustain the vegetation (i.e. may be hypersaline or contain too much freshwater).

Changing management regimes at the Western Treatment Plan, primarily the decommissioning of sewerage ponds has resulted in the reduction of available roosting habitat for waterbirds. With more birds than roosts the birds spend a higher proportion of time and energy searching for a suitable roost after foraging. This additional time spent searching for a roosting site can mean birds are unable to meet their energy requirements (this can result in being more vulnerable to predation and reduce breeding success).

By improving the hydrological and flow regime in decommissioned sewerage ponds and installing artificial roosts the area of suitable habitat (foraging and roosting) for waterbirds can be increased and the condition of existing habitat improved.

Where: Western Treatment Plant (Western Lagoon) and Big Marsh (within the Spit Nature Conservation Reserve).

REDUCING PREDATION PRESSURE ON WATERBIRDS

What: Supporting public land managers (Parks Victoria) and the community on French Island to work towards the eradication of cats from French Island and maintain the island and surrounding intertidal areas fox free. Continued engagement with residents on the island to build awareness of the impacts of feral cats on waterbirds and small mammals combined with on-ground actions (cage traps, curiosity baits, soft jaw leg-hold traps) and monitoring for the presence of cats through scat analysis and remote cameras will assist to remove the last remaining cats on the island and reduce predation pressure on waterbirds and other small mammals. In addition,

monitoring for foxes at the same time (scat analysis and remote camera's) will be important to maintain a fox free environment on the island.

Why: Feral cats and foxes predate on waterbirds and small mammals. Waterbirds are particularly vulnerable during foraging, roosting and during the breeding season. Foxes and cats predate on fledglings and can impact the breeding success of waterbirds. The presence of predators also results in disturbance meaning the waterbirds spend time and energy avoiding predators instead of resting at a roosting site or feeding.

Where: The whole of French Island with a particular focus on the southeast shoreline **(**Rams Island (including Bird Island) and Tortoise Head), northern shoreline.

HABITAT ENHANCEMENT – LEADBEATER'S POSSUM AND HELMETED HONEYEATER

What: The habitat range of Leadbeater's Possum and Helmeted Honeyeater overlap. There are a suite of common key threats impacting the habitat of both species including inappropriate fire regimes, inappropriate hydrological regimes and predation (cats, foxes). Coordinating the implementation of priority actions to address the key threats common to both species will assist in improving habitat across the landscape where they occur. Such actions may include predator control, modification of fire regimes and habitat improvement (revegetation, improved connectivity and biolinks).

Why: Priority actions will assist in improving the current area of suitable habitat for both species and potentially lead to increasing the range of suitable habitat available. Increasing the quality and area of habitat will assist in supporting the survival of these species. These actions also serve to strengthen efforts to improve habitat in areas that are suitable for these two species and could be used as future release sites.

Where: Where the range of Leadbeater's Possum and Helmeted Honeyeater overlap in the north-east of the PPW region.

PARTNERSHIP APPROACH FOR PROTECTING THREATENED ECOLOGICAL COMMUNITIES

What: The two threatened ecological communities identified as priorities in this plan are the Victorian Volcanic Plains Grasslands and Seasonal Herbaceous Wetlands. Although these communities occur across the PPW region, only a small proportion of their overall range occurs within the region. Given there are existing projects focused on these communities in neighbouring regions, partnering with those existing projects is likely to be the most effective way to benefit these vegetation communities. In addition, the range of both communities overlaps within the region so there are opportunities to run joint or concurrent projects (e.g. within the Western Grasslands Reserve).

Why: Existing Programs in neighbouring regions could be extended to include the proportion of the vegetation community that falls within the PPW region. Focusing efforts where the range of these two threatened ecological communities overlaps within the region will increased the effectiveness of management interventions.

Where: The Western Grasslands Reserve and adjoining private land (Victorian Volcanic Plains Grassland, Seasonal Herbaceous Wetlands) and Hearns Swamp (Seasonal Herbaceous Wetlands).

STRAWBERRIES & NURSERIES/CUT FLOWERS – EROSION AND NUTRIENT MANAGEMENT

What: Supporting strawberry and nursery growers to reduce water erosion on farm to prevent soil carbon and nutrient loss and impacts on surrounding environmental assets. Recommended practices from the Strawberry Good Practice Guide and EcoHort Guidelines for Managing the Environment (nursery) will form the basis of an extension program aimed at increasing the adoption of soil cover, drainage management and remedial actions.

Why: Soils can move off-farm as a result of water erosion when water comes in contact with exposed and/or unstable soils (soils with poor structure). Protected cropping structures (e.g. greenhouses and polytunnels) and the use of plastic mulch are a particular risk for strawberry and nursery (where plants are grown for transplanting, for use as stock for budding and grafting, or for sale) farms. Erosion can happen as a consequence of heavy rain, excess irrigation, or when drainage water from paddocks, farm tracks, protective cropping structures and areas around sheds and buildings moves across the land. When water, either as rainfall or irrigation, falls faster than the soil can absorb it, it begins to flow over the soil surface. Flowing water, particularly when concentrated down bare and/or steep slopes, has the potential to pick up and transport detached soil particles and associated nutrients.

Where: Strawberry and nursery growers in the Yarra Valley (Tier 1) and strawberry growers Bacchus Marsh (Tier 2) focus areas.

VEGETABLES – EROSION AND NUTRIENT MANAGEMENT

What: Supporting vegetable growers to reduce water erosion on farm to prevent soil carbon and nutrient loss and impacts on surrounding environmental assets. Recommended practices from the EnviroVeg Land and Soil Module will form the basis of an extension program aimed at increasing the adoption of soil cover (e.g. cover crops) and reduced tillage.

Why: Soils can move off-farm as a result of water erosion when water comes in contact with exposed and/or unstable soils (soils with poor structure). Periods of bare-fallow between (in space and time) commercial crops and the intensity of cropping rotations are a particular risk for vegetable farms. Erosion can happen as a consequence of heavy rain, excess irrigation, or when drainage water from paddocks, farm tracks and areas around sheds and buildings moves across the land. When water, either as rainfall or irrigation, falls faster than the soil can absorb it, it begins to flow over the soil surface. Flowing water, particularly when concentrated down bare slopes, has the potential to pick up and transport detached soil particles and associated nutrients.

Where: Vegetable growers in Mornington Peninsula (Tier 1), Werribee (Tier 1), Cranbourne (Tier 2), Koo Wee Rup (Tier 2) and Bacchus Marsh (Tier 2).

VEGETABLES, WINE GRAPES & FRUIT – INSECTARIES (FUNCTIONAL BIODIVERSITY)

What: Support vegetable and wine grape growers and orchardists to increase on-farm native vegetation as insectaries (functional biodiversity) to support biological control of insect pests and reduce damage to commercial crops. The establishment of native vegetation on areas of non-productive land also contributes to increased native habitat and connectivity that creates broader biodiversity benefits amongst what are typically highly fragmented landscapes.

Why: Native vegetation insectaries (functional biodiversity) are areas of flowering native plants on a farm. They attract and maintain beneficial insect populations by providing habitat and shelter from highly disturbed crop areas as well as alternative food sources, namely pollen and nectar. The goal of on-farm insectaries (functional biodiversity) is to enhance diversity and abundance of beneficial insects on farm to build resilience, particularly against seasonal variations and pest incursions. Acting as a 'fixed home address' for beneficial insects to interact with crops, they complement cultural and biological control methods of integrated pest management (IPM) programs.

Where: Vegetable and wine grape growers and orchardists in Mornington Peninsula (Tier 1); grape growers, orchardists and berry growers in the Yarra Valley (Tier 1); vegetable growers in Werribee (Tier 1); Cranbourne (Tier 2); Koo Wee Rup (Tier 2) and Bacchus Marsh (Tier 2).

VEGETABLES – CIRCULAR ECONOMY

What: Increase the capacity of vegetable growers to implement circular economy principles to minimise resource use and maximise reuse of organics and water. This includes promoting the use of alternative fit-for-purpose water sources (e.g. recycled water schemes), developing extension programs for on-farm composting of generated organic wastes, and using soil ameliorants (e.g. compost) to improve soil health and nutrient management.

Why: A circular economy continually seeks to reduce the environmental impacts of production and consumption, while enabling economic growth through more productive use of natural resources. Circular economy principles promote waste avoidance with good design and effective recovery of material that can be reused. Water and nutrient availability are particularly important in intensive vegetable productions systems. Alternative water and nutrient sources will not only improve farm production and resilience, but will also reduce waste and the offsite impact of agricultural production to the environment.

Where: Vegetable growers in Mornington Peninsula (Tier 1), Werribee (Tier 1), Cranbourne (Tier 2), Koo Wee Rup (Tier 2) and Bacchus Marsh (Tier 2).

PERENNIAL HORTICULTURE – CLIMATE CHANGE ADAPTATION

What: Increase the capacity of wine grape growers and orchardists (e.g. apples, cherries) to adapt to a changing climate through an education program that focuses on adapted crop type and varieties, grafting, improved water storage and irrigation efficiency, shelter and shade, decision support tools and planning for changes to business models.

Why: Climate change affects horticultural production in the PPW catchment in a number of ways. The effects will depend on location, soil type, crop type and management. Reduced average rainfall and increased temperatures will increase risk for horticultural enterprises, particularly in areas at the margins of enterprise suitability. A drier climate will reduce the availability of water and increase cost of water for horticulture as well as change the distribution of pests and diseases. To successfully adapt to climate change, managers will need to improve irrigation practices. Temperature changes will make crop type and variety selection increasingly important, particularly for long-lived perennial crops. An increase in frequency and severity of extreme events (e.g. hot days, drought, flood) will also require investment in infrastructure (e.g. shade netting, sub-surface drainage) to maintain resilient production systems.

Where: Wine grape growers and orchardists in Mornington Peninsula (Tier 1), Yarra Valley (Tier 1) and orchardists in Bacchus Marsh (Tier 2).

DAIRY – FERTILISER AND EFFLUENT MANAGEMENT

What: Helping dairy farmers with efficient and sustainable fertiliser and water use through the delivery of Fert$mart and upgrades to effluent management systems. Fert$mart is an established program that educates and assists farmers to undertake efficient and sustainable fertiliser use. It encompasses the dairy industry's national nutrient management guidelines, developed to improve the efficiency and profitability of fertiliser use, and to improve soil health on Australian dairy farms.

Why: The production and utilisation of pasture as the main feed source is key to the future success of the dairy industry. With rising input costs and decreasing availability of water for agricultural use, dairy farmers need to be supported to better manage their fertiliser and water use.

Managing effluent is important on dairy farms. A well designed and managed effluent system can save time and ensure the resource is utilised effectively. In the past, dairy effluent hasn't been valued. However with continuing research and a far better understanding of effluent management the industry focus has shifted away from a waste mentality to a resource utilisation approach. If managed carefully, irrigation of dairy effluent to pastures

and crops can make good use of the nutrients, organic matter and water. It can also help to minimise the pollution of streams and groundwater.

Where: Dairy farmers in the Drouin (Tier 2) focus area.

SOIL HEALTH – SOIL CARBON

What: Increase the capacity of farmers to adopt sustainable and regenerative farming practices which improve their farms soil health and condition. On-farm demonstration sites, comprehensive soil testing and benchmarking, farmer driven discussion groups, knowledge building field days, and farmer training and planning programs will be used to support farmer's knowledge of soil carbon and practices proven to increase soil health and productivity and decrease the level of exposed soil in the region.

Why: Our region's soils are ancient and fragile. The plants, animals and microorganisms that have maintained them for millennia are stressed through the introduction of European plants, animals and farming techniques. Today, there are many issues that affect our soils and landscapes including climate change, acidification, compaction, salinity, erosion, dumping of clean or contaminated soil, fertility decline, and decline of biodiversity.

Safeguarding the health of our soils is vital to our region's future. The costs from degraded soils and their management can be very high and impact agricultural producers, commerce, industry and urban settlements, and the natural ecosystem.

Where: Grazing (beef cattle) enterprises in Koo Wee Rup (Tier 2) and priority soils (Tier 2) across the region.

8.2.2 ACROSS THEMES

What: There are two key overwintering sites for the Orange-bellied Parrot that occur across the PPW region Ramsar sites (The Spit Nature Conservation Reserve and Western Treatment Plant (Western Lagoon) - Port Phillip (Western Shoreline) and Bellarine Peninsula). In addition, there are several other areas of suitable habitat within the Western Port Ramsar Site (Tortoise Head and North-West French Island). Tortoise head is in close proximity to Moonlit Sanctuary (a captive breeding release site) and North-West French Island is in proximity to a mainland captive breeding release site.

Priority actions to improve waterbird habitat for Ramsar wetlands (e.g. control of habitat altering weeds, improved hydrological regimes) within the above priority sites will assist in enhancing habitat for Orange-bellied Parrot and potentially extend the area of suitable habitat for captive release programs. Priority actions that directly benefit Orange-bellied Parrot include improved survey techniques to enhance detection and development of methods to identify suitable release sites.

Why: Combined the priority actions listed directly above will support efforts to protect Orange-bellied Parrot and contribute to sustaining populations into the future. Coupling these actions improves the chances of successful species protection compared to completing the actions in isolation.

Where: At key sites for Orange-bellied Parrot across the region (priority sites in this plan; The Spit Nature Conservation Reserve and Western Treatment Plant (Western Lagoon, Tortoise Head, North-West French Island); locations where Birds on Farms events overlap with Orange-bellied Parrot habitat (current and potential)

8.2.3 OTHER BIODIVERSITY ASSETS

What: Taking a holistic view across the PPW region there is overlap in the distribution of priority threatened species and threatened ecological communities identified in this plan. In addition, a suite of other EPBC listed species (endangered and vulnerable) occur within the range of habitats occupied by the priority species and ecological communities across the region including:

- 50 fauna (21 listed as endangered, 29 listed as vulnerable)
- 22 flora (6 listed as endangered, 16 listed as vulnerable).

(See Appendix 9 for a map and a full list of the 72 species and their conservation status).

Using this initial list of 72 species it is possible to focus on the known records of those 72 species within the distribution range of the priority species in this plan (see Map in Appendix 10 for an example of this approach). Then refining those 72 species down to include only species that are in the National Threatened Species Strategy Top 100 List. For example, there are six species listed as either endangered and vulnerable that are in the Top 100 species list and are known to occur within the habitat range of the Orange-bellied Parrot (*Neophema chrysogaster*) (Figure 8-1).

Why: During the planning and project design phase it is possible to identify opportunities to undertake priority works that will benefit multiple species which will generate a greater impact across the landscape. This may include identification of common habitat suitability parameters such as patch size and resources (food, shelter) for a suite of species. Complimentary priority actions might include revegetation, creation of biolinks and predator control.

Where: Within the habitat range of priority threatened species and threatened ecological communities identified in this plan for example Orange-bellied Parrot (*Neophema chrysogaster*) (Figure 8-1).

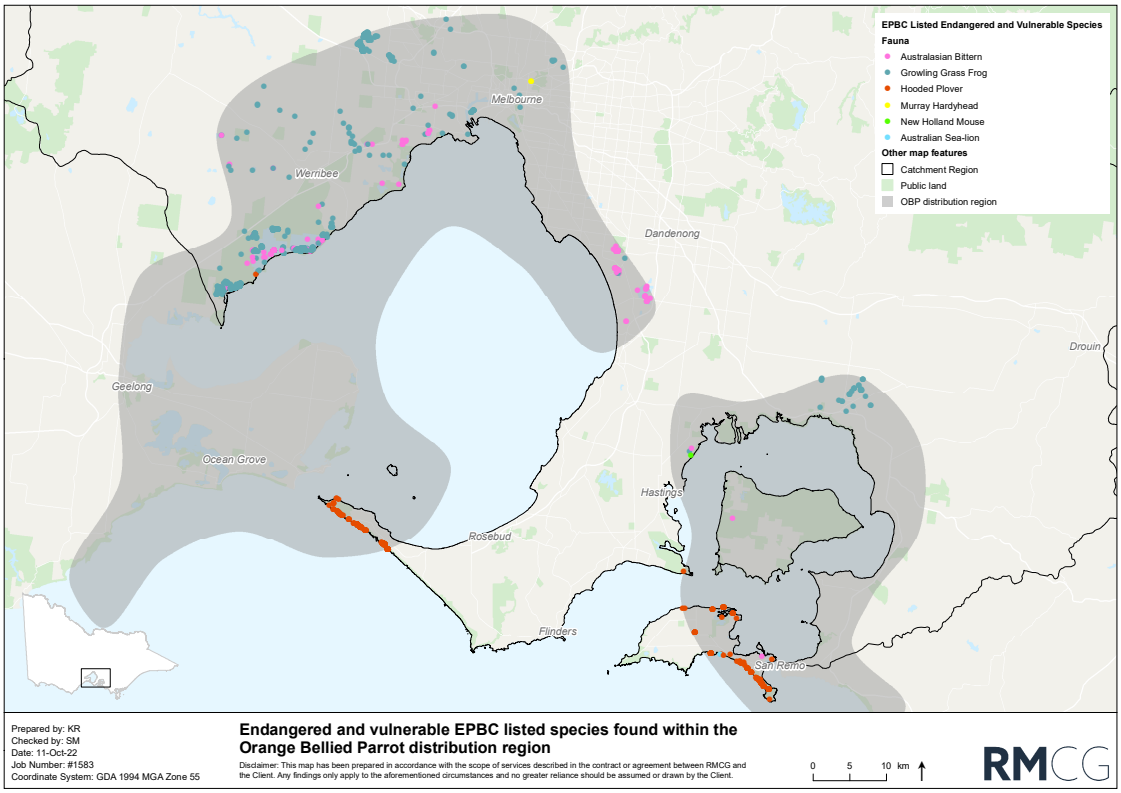


Figure 8-1: EPBC listed species (endangered, vulnerable) that are on the National Threatened Species Top 100 species list and are known to occur within the range of distribution of Orange-bellied Parrot (a priority threatened species identified in this plan).

What: Identification of clusters of EPBC listed species (endangered and vulnerable) within the habitat range of the priority threatened species and ecological communities in this plan shows that there are 'hot spots' where multiple species occur in the landscape (Figure 8-2). These 'hot spots' could be considered focus areas for investment where opportunities to partner and collaborate with other agencies (e.g. state and local government, Parks Victoria), Landcare and local community groups could be further explored. Collectively partners can deliver works in a more coordinated manner. Works might include larger scale habitat enhancement works such as biolinks, predator control and pest plant management.

Why: Concentrating effort within the focus areas can identify opportunities to pool funding and maximise outcomes. This approach can increase the effectiveness of management interventions by focusing efforts into a specific location that will benefit multiple species.

Where: Northern Melbourne Focus area.

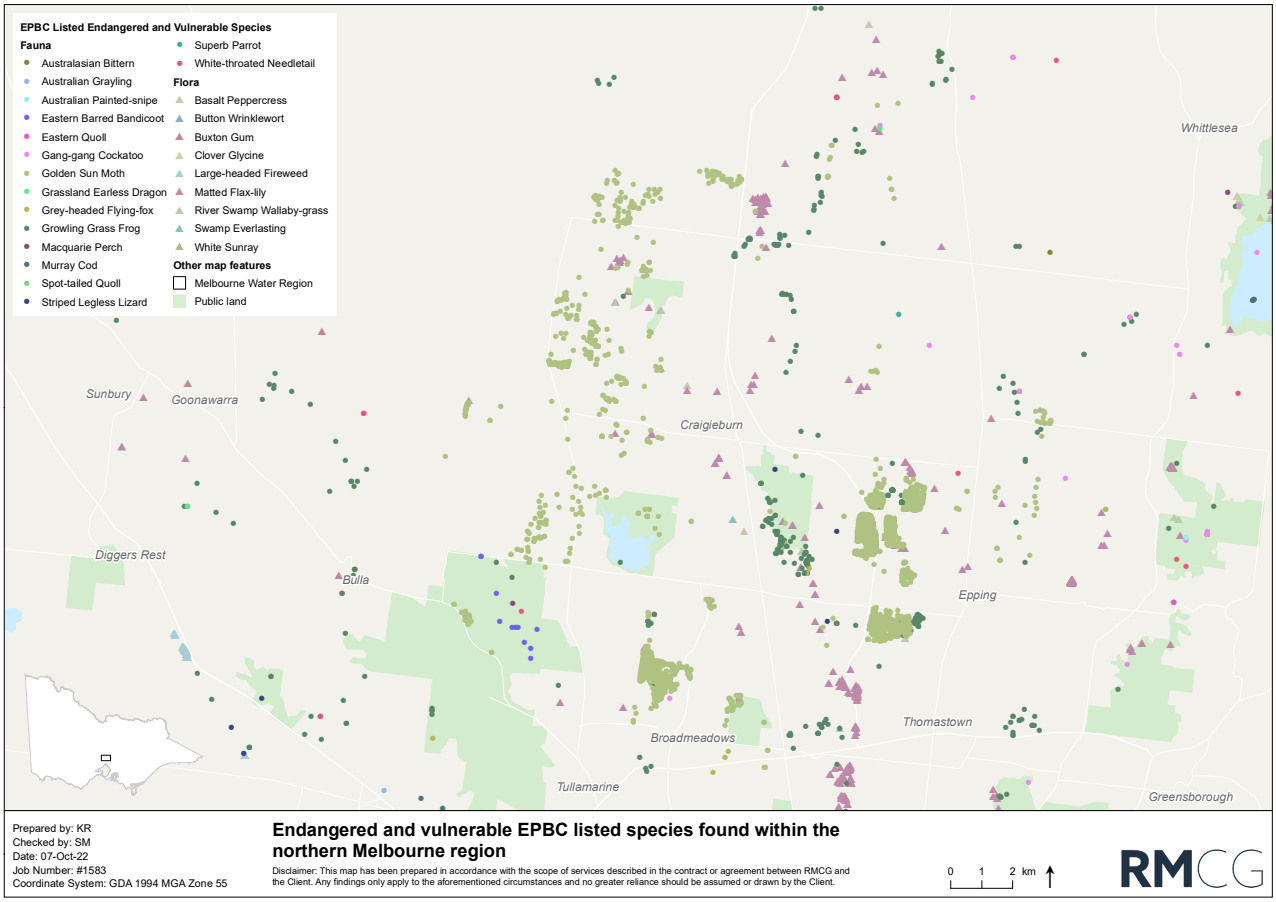


Figure 8-2: EPBC listed species (endangered and vulnerable) that occur within the Northern Melbourne focus area.

8.3 NEXT STEPS

This plan sets out the higher-level priority actions for each of the three themes and provides an overview of potential project packages to provide a solid foundation for informing future RLP Program funding applications and where relevant other investment opportunities. The key next steps beyond this plan are identified below in Figure 8-3.

Figure 8-3: Roadmap of next steps for the planning, design and delivery of priority actions in this plan

9 Monitoring, Evaluation, Reporting and Improvement

This section sets out a framework that will guide monitoring and reporting on the progress of investments in the priority assets identified in this plan. The approach set out in Table 9-1, Table 9-2 and Table 9-3 identifies the high level data that delivery partners will be required to collect in order to demonstrate progress towards the objective for each priority asset. It is anticipated that more detailed data will also be collected by the project delivery teams.

In addition to this project level monitoring, the approach to adaptive management is also described here.

ADAPTIVE MANAGEMENT APPROACH

As noted already, Melbourne Water intends to use this plan as a working document. The prioritisation results for the three themes – Ramsar wetlands, biodiversity and agriculture – are presented in Appendices 4, 7 and 8 of this plan. The transparency of this process allows these priorities to be readily revisited and re-assessed.

The adaptive management approach is structured around two key activities:

1. **Annual reviews** of projects focussed on the priority assets listed in this plan – this discussion, which will be integrated into regular reporting requirements, will examine the available data for each project, identify lessons learned over the previous year and determine whether any adjustments are required for the coming year.
2. **Mid-term review of the NRM plan** – this review (at the 2–3-year mark) will examine the progress of projects that are focussing on the priority assets and will revisit the priorities set for the plan. The aim of this review is to identify whether there have been changes or developments that warrant changes to the priorities for the plan. This review will be based on critically re-examining the prioritisation results recorded for each asset and could result in:
    a. New assets being considered as a priority
    b. Changes in the priority given to assets in the current plan (as a result of reviewing progress of projects to date or new information about threats or assets).

Table 9-1: Monitoring plan for priority assets – Ramsar wetlands

INVESTMENT PRIORITY	OBJECTIVE	PRIORITY ACTIONS	MONITORING	TIME
Port Phillip Bay (Western Shoreline) and Bellarine Peninsula:				
Altona Coastal Park (Jawbone Reserve, Skeleton Creek)	Reduce disturbance to waterbird foraging and roosting habitat	Behaviour modification Fencing to manage access	Actions taken to change behaviour to reduce access Additional area protected via fencing Area of the site where disturbance has been reduced	Annual (or on delivery)
			Area of improved foraging and roosting habitat	Year 1 and Year 5
Western Treatment Plant (Western Lagoon)	Enhance roosting habitat for waterbird populations	Investigative study Habitat improvement (installation of artificial nesting sites) Behaviour modification	Study completed Actions/changes/ recommendations from study Number of artificial nesting sites installed Actions taken to change behaviour to reduce access	Annual (or on delivery)
			Area of improved roosting habitat	Year 1 and Year 5
Big Marsh (within the Spit Nature Conservation Reserve)	Improve the quality of salt marsh vegetation	Floristic surveys Weed control	Area surveyed Actions/changes/ recommendations from survey Area of weed treatment	Annual (or on delivery)
			Change in area degraded by weeds Area of salt marsh with improved quality	Year 1 and Year 5
Mud Islands	Maintain breeding habitat for the Australian fairy tern (*Sternula nereis nereis*)	Behaviour modification Weed control (box thorn)	Actions taken to change behaviour to reduce access Area of weed treatment	Annual (or on delivery)

INVESTMENT PRIORITY	OBJECTIVE	PRIORITY ACTIONS	MONITORING	TIME
		Community education (weed control method and timing)	Community weed education activities held, number of participants	
			Change in area degraded by weeds Area of improved breeding habitat	Year 1 and Year 5
Western Port:				
Observation Point/ Rhyll Inlet	Enhance roosting habitat and improve the survival rate of waterbirds	Predator control (foxes, cats) Weed control	Area of predator control 'Catch and effort' data on predator control Area of weed treatment Change in area degraded by weeds	Annual (or on delivery)
			Area of enhanced roosting habitat Change in survival rates for waterbirds	Year 1 and Year 5
Stockyard Point	Improve the quality of waterbird habitat (roosting, foraging)	Predator control (foxes) Weed control Behaviour modification	Area of predator control 'Catch and effort' data on predator control Actions taken to change behaviour to reduce access Area of weed treatment	Annual (or on delivery)
			Change in area degraded by weeds Area of the site where disturbance has been reduced Area of improved foraging and roosting habitat	Year 1 and Year 5
Rams Island (including Bird Island)	Improve the quality of waterbird habitat (roosting, foraging)	Predator control (cats) Weed control	Area of predator control 'Catch and effort' data on predator control Area of weed treatment	Annual (or on delivery)

INVESTMENT PRIORITY	OBJECTIVE	PRIORITY ACTIONS	MONITORING	TIME
			Change in area degraded by weeds	
			Change in area degraded by weeds Area of improved foraging and roosting habitat	Year 1 and Year 5
Tortoise Head	Improve the quality of waterbird habitat (roosting, foraging)	Predator control (cats) Weed control	Area of predator control 'Catch and effort' data on predator control Area of weed treatment Change in area degraded by weeds	Annual (or on delivery)
			Change in area degraded by weeds Area of improved foraging and roosting habitat	Year 1 and Year 5
North-west French Island	Reinstate natural hydrological regime to improve the quality of coastal saltmarsh vegetation	Investigative study	Study completed Actions/changes/ recommendations from study to improve hydrology	Annual (or on delivery)
			Area with improved quality of coastal saltmarsh vegetation	Year 1 and Year 5
French Island	Enhance roosting habitat and improve the survival rate of waterbirds	Predator control (cats)	Area of predator control 'Catch and effort' data on predator control	Annual (or on delivery)
			Area of improved roosting habitat Change in survival rates for waterbirds	Year 1 and Year 5
Northern Shoreline (French Island)	Maintain the quality of suitable roosting/foraging habitat for waterbird populations	Predator control (cats) Weed control Behaviour modification Habitat improvement	Area of predator control 'Catch and effort' data on predator control Area of weed treatment Change in area degraded by weeds	Annual (or on delivery)

INVESTMENT PRIORITY	OBJECTIVE	PRIORITY ACTIONS	MONITORING	TIME
			Actions taken to change behaviour to reduce access Area affected and type of habitat improvement actions taken	
			Change in area degraded by weeds Area of suitable roosting/foraging habitat	Year 1 and Year 5
Edithvale-Seaford Wetlands: Edithvale South Wetland	Improve the foraging and roosting habitat for waterbirds	Predator proof fencing Investigative study	Area protected by predator proof fencing Study completed Actions/changes/ recommendations from study	Annual (or on delivery)
			Area of improved foraging and roosting habitat	Year 1 and Year 5

Table 9-2: Monitoring plan for priority assets – biodiversity

INVESTMENT PRIORITY	OBJECTIVE	PRIORITY ACTIONS	MONITORING	TIME
Threatened species				
Orange-bellied Parrot (*Neophema chrysogaster*)	Maintain the extent of quality habitat	Behaviour modification Identification of suitable habitat Pilot study (systematic monitoring to detect OBP)	Actions taken to change behaviour to reduce access Study of suitable completed Pilot study on monitoring completed Actions/changes/recommendations from studies	Annual (or on delivery)
			Area of habitat Area of improved habitat quality	Year 1 and Year 5
Leadbeater's Possum (*Gymnobelideus leadbeateri*)	Maintain extent and improve the quality of habitat	Land buyback Habitat improvement (connectivity, biolinks) Habitat protection (retention of hollow stag trees/fallen logs) Predator control (cats)	Area of land subject to buy back Actions taken to improve retention of hollow stag trees/fallen logs Area of predator control 'Catch and effort' data on predator control	Annual (or on delivery)
			Area of habitat improved by increased connectivity Area of habitat protected by retention of features Area of improved habitat quality	Year 1 and Year 5
Helmeted Honeyeater (*Lichenostomus melanops cassidix*)	Maintain the extent and improve the quality of habitat	Improved hydrological regime Predator control (feral cats, foxes, competing birds) Modified fire regimes (strategic fuel breaks) Habitat improvement (revegetation)	Area with improved hydrology Area of predator control 'Catch and effort' data on predator control Area with improved fire regimes Area revegetated	Annual (or on delivery)
			Area of habitat Area of improved habitat quality	Year 1 and Year 5

INVESTMENT PRIORITY	OBJECTIVE	PRIORITY ACTIONS	MONITORING	TIME
Spiny Rice-flower (*Pimelea spinescens subsp. spinescens*)	Maintain the extent and viability of existing populations	Seed collection Identification of suitable habitat (existing and potential) Herbivore control (rabbits, hare) Weed and biomass control Improved fire and grazing regimes	Weight of seed collected Study identifying suitable habitat completed Actions/changes/recommendations from study Area of herbivore control 'Catch and effort' data on herbivore control Area of weed treatment Change in area degraded by weeds Area with improved fire regimes Area with improved grazing regimes	Annual (or on delivery)
			Area of existing population Area with improved viability	Year 1 and Year 5
Round-leaf Pomaderris (*Pomaderris vacciniifolia*)	Maintain the extent and quality of habitat	Identification of suitable habitat (existing and potential) Herbivore control (rabbits, dear, hare) Weed control	Study identifying suitable habitat completed Actions/changes/recommendations from study Area of herbivore control 'Catch and effort' data on herbivore control Area of weed treatment Change in area degraded by weeds	Annual (or on delivery)
			Area of habitat Quality of habitat	Year 1 and Year 5
Threatened Ecological Communities				
Victorian Volcanic Plains Grassland	Maintain the existing extent of this ecological community within the region	Weed and biomass control Fencing to prevent access Pest animal control (herbivores) Revegetation	Area of weed or biomass treatment Change in area degraded by weeds Additional area protected via fencing Area of the site where disturbance has been reduced Area of herbivore control	Annual (or on delivery)

INVESTMENT PRIORITY	OBJECTIVE	PRIORITY ACTIONS	MONITORING	TIME
			‘Catch and effort’ data on herbivore control Area revegetated	
			Area of ecological community	Year 1 and Year 5
Seasonal Herbaceous Wetlands	Maintain the existing extent of this ecological community within the region	Land buyback Fencing to manage access	Area of land subject to buy back Additional area protected via fencing Area of the site where disturbance has been reduced	Annual (or on delivery)
			Area of ecological community	Year 1 and Year 5

Table 9-3: Monitoring plan for priority assets – Agriculture

INVESTMENT PRIORITY	OBJECTIVES	PRIORITY ACTIONS	MONITORING	TIME
Tier 1 areas				
Mornington Peninsula Yarra Valley	1. Increase on-farm native vegetation as insectaries (functional biodiversity) to support biological control of insect pests and reduce damage to vegetable crops and viticulture 2. Increase groundcover to reduce erosion risk and increase organic carbon 3. Increase the capacity of perennial horticulturalists to adapt to a changing climate 4. Increase capacity to plan and implement change to business models to respond to urbanisation pressures	Cover cropping on fallow areas or inter-row ground cover Reduced tillage Native vegetation insectaries (functional biodiversity) Perennial horticulture variety selection and adaptation measures (e.g. protectants, shade netting) Use alternative water sources for irrigation (e.g. recycled water) Investigate feasibility of business model changes to manage the pressures of urbanisation (e.g. diversification, use of multiple farm locations, niche products, alternative production systems)	Activities delivered to support changes in land management practices: – Cover cropping – Reduced tillage – Use of insectaries (functional biodiversity) Activities delivered to support adoption of adaptive measures among horticulturalists: – Variety selection – Protectants, shade netting – Alternative water sources Activities to support adaptation of business models	Annual (or on delivery)
			Among project participants: – Change in on-farm native vegetation – Change in groundcover – Change in capacity of horticulturalists to adapt to a changing climate – Change in capacity of farm businesses to adapt to urbanisation pressures	Year 1 and Year 5
Werribee	1. Increase groundcover to reduce erosion risk 2. Increase organic carbon and promote a circular economy through resource recovery 3. Reduce the impacts of water quality constraints 4. Increase on-farm native vegetation as insectaries (functional biodiversity) to support biological control of insect pests and reduce damage to vegetable crops	Cover cropping on fallow areas Reduced tillage Use soil ameliorants (e.g. compost) Use soil testing and emerging decision support tools (e.g. QUT compost calculator) to inform soil nutrient management (e.g. calcium thiophosphate, gypsum) Shandy recycled water with other sources (e.g. river, potable, storm)	Activities delivered to support changes in land management practices: – Cover cropping – Reduced tillage – Use of soil ameliorants – Soil testing for soil nutrient management – Use of insectaries (functional biodiversity) Activities delivered to support use of alternative water sources (e.g. soil moisture monitoring)	Annual (or on delivery)

INVESTMENT PRIORITY	OBJECTIVES	PRIORITY ACTIONS	MONITORING	TIME
	5. Increase capacity to plan and implement change to business models to respond to urbanisation pressures	Native vegetation insectaries (functional biodiversity) Investigate feasibility of business model changes to manage the pressures of urbanisation (e.g. diversification, use of multiple farm locations, niche products, alternative production systems)	Activities to support adaptation of business models	
			Among project participants: – Change in on-farm native vegetation – Change in groundcover – Change in soil management practices – Change in water management practices – Change in capacity of farm businesses to adapt to urbanisation pressures	Year 1 and Year 5
Drouin	Increase the efficiency and sustainability of fertiliser use on farms to improve soil health Increase the use of effluent reuse systems to reduce nutrient run-off and improve water use efficiency on dairy farms	Soil and fertiliser management Effluent management systems	Activities delivered to support improvements in: – Fertiliser management (soil testing, fertiliser regimes) – Effluent management (re-use systems)	Annual (or on delivery)
			Among project participants: – Changes in fertiliser use – Improvements in dairy effluent management	Year 1 and Year 5
Tier 2 areas				
Cranbourne	1. Increase ground cover to reduce erosion risk and increase organic matter 2. Increase capacity to plan and implement change to business models to respond to urbanisation pressures	Cover cropping on fallow areas Reduced tillage Use soil ameliorants (e.g. compost) Use alternative water sources for irrigation (e.g. recycled water) Investigate feasibility of business model changes to manage the pressures of urbanisation (e.g. diversification, use of multiple farm locations, niche products, alternative production systems)	Activities delivered to support changes in land management practices: – Cover cropping – Reduced tillage – Use of soil ameliorants Activities delivered to support use of alternative water sources Activities to support adaptation of business models	Annual (or on delivery)
			Among project participants: – Change in groundcover – Change in soil management practices – Change in water management practices	Year 1 and Year 5

INVESTMENT PRIORITY	OBJECTIVES	PRIORITY ACTIONS	MONITORING	TIME
			– Change in capacity of farm businesses to adapt to urbanisation pressures	
Bacchus Marsh	Increase ground cover to reduce erosion risk and increase soil organic matter Increase the capacity of perennial horticulturalists to adapt to a change in climate	Cover cropping on fallow areas Reduced tillage Use soil ameliorants (e.g. compost) Perennial horticulture variety selection and adaptation measures (e.g. protectants, shade netting)	Activities delivered to support changes in land management practices: – Cover cropping – Reduced tillage – Use of soil ameliorants Activities delivered to support adoption of adaptive measures among horticulturalists: – Variety selection – Protectants, shade netting	Annual (or on delivery)
			Among project participants: – Change in groundcover – Change in soil management practices – Change in capacity of horticulturalists to adapt to a changing climate	Year 1 and Year 5
Pakenham / Koo Wee Rup	Increase ground cover to reduce erosion risk and increase soil organic matter	Cover cropping on fallow areas Reduced tillage Use soil ameliorants (e.g. compost) Use alternative water sources for irrigation (e.g. recycle water) Pasture management Grazing management	Activities delivered to support changes in land management practices: – Cover cropping – Reduced tillage – Use of soil ameliorants Activities delivered to support use of alternative water sources Activities to support adoption of new pasture and or grazing management	Annual (or on delivery)
			Among project participants: – Change in groundcover – Change in soil management practices – Change in water management practices – Change in pasture or grazing management practices	Year 1 and Year 5

INVESTMENT PRIORITY	OBJECTIVES	PRIORITY ACTIONS	MONITORING	TIME
Priority soils	Increase ground cover to reduce erosion risk Increase soil organic carbon and promote a circular economy through resource recovery	Cover cropping Reduced tillage Use soil ameliorants (e.g. lime, gypsum, nutrients, compost, manure, biosolids) Stubble retention Pasture management Grazing management	Activities delivered to support changes in land management practices: – Cover cropping – Reduced tillage – Use of soil ameliorants (non-synthetic) – Stubble retention Activities to support adoption of new pasture and or grazing management	Annual (or on delivery)
			Among project participants: – Change in groundcover – Change in soil management practices – Change in water management practices – Change in pasture or grazing management practices	Year 1 and Year 5

Appendix 1: Stakeholders, partners, and collaborators

A list of stakeholders, partners and collaborators that are known to be or have been involved in previous NRM and RLP projects across the PPW region are shown in Table A1-1. Those organisations that are *italicised* were consulted as part of developing this plan. Those that are not italicised are known to have been involved in the delivery RLP projects in the region. There are likely to be additional organisations added in future iterations or that have been previously involved however were not identified during the development of this plan.

Table A1-1: Stakeholder list

ORGANISATION
Across all themes
Australian Government Department of Agriculture, Water and Environment
Bunurong Land Council Aboriginal Corporation
Department of Environment, Land, Water and Planning
Melbourne Water
Parks Victoria
Wadawurrung Traditional Owners Aboriginal Corporation
Wurundjeri Woi wurrung Cultural Heritage Aboriginal Corporation
Ramsar Wetlands
BirdLife Australia
Bass Coast Landcare Network
City of Casey
Conservation Volunteers Australia
Corangamite CMA
Friends of French Island
French Island Landcare
Friends of Mud Islands
Hobsons Bay City Council
Mornington Peninsula Shire Council
Phillip Island Nature Park
Western Port Biosphere

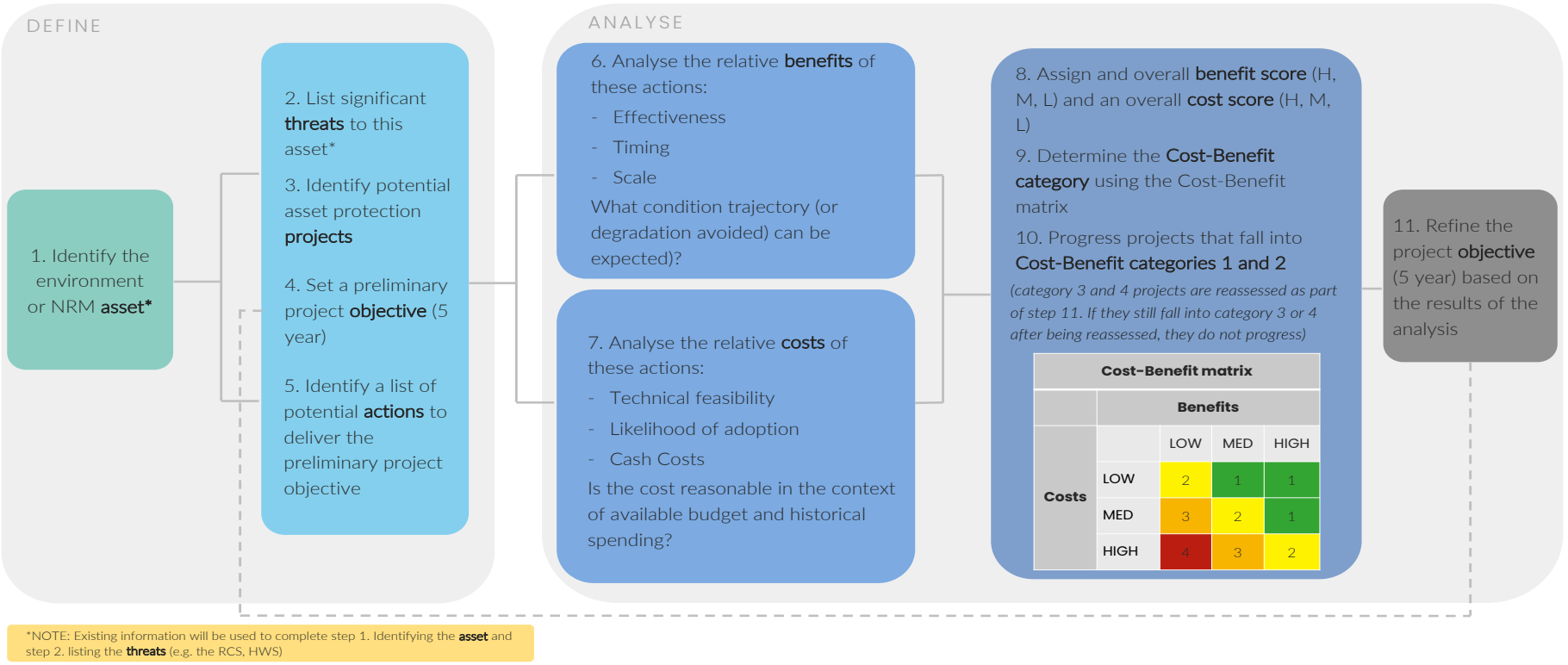
ORGANISATION
Wyndham City Council
Biodiversity (Threatened Species and Threatened Ecological Communities)
BirdLife Australia
Gidja Walker (Ecologist)
Hume City Council
Macedon Ranges Shire Council
Mornington Peninsula Shire Council
Phillip Island Nature Park
Trust for Nature
Yarra Ranges Shire Council
Zoos Victoria
Agriculture
Agriculture Victoria
AusVeg
FoodPrint (Melbourne University Research Hub)
Berries Australia
GippsDairy
Meat and Livestock Australia
Macedon Ranges Shire Council
Mornington Peninsula Shire Council
Mornington Peninsula Vignerons Association
Regen Soils Pty Ltd (Agricultural Consultant)
Southern Rural Water
Western Catchment Landcare Network

Appendix 2: Priority-setting process

PRIORITISATION PROCESS

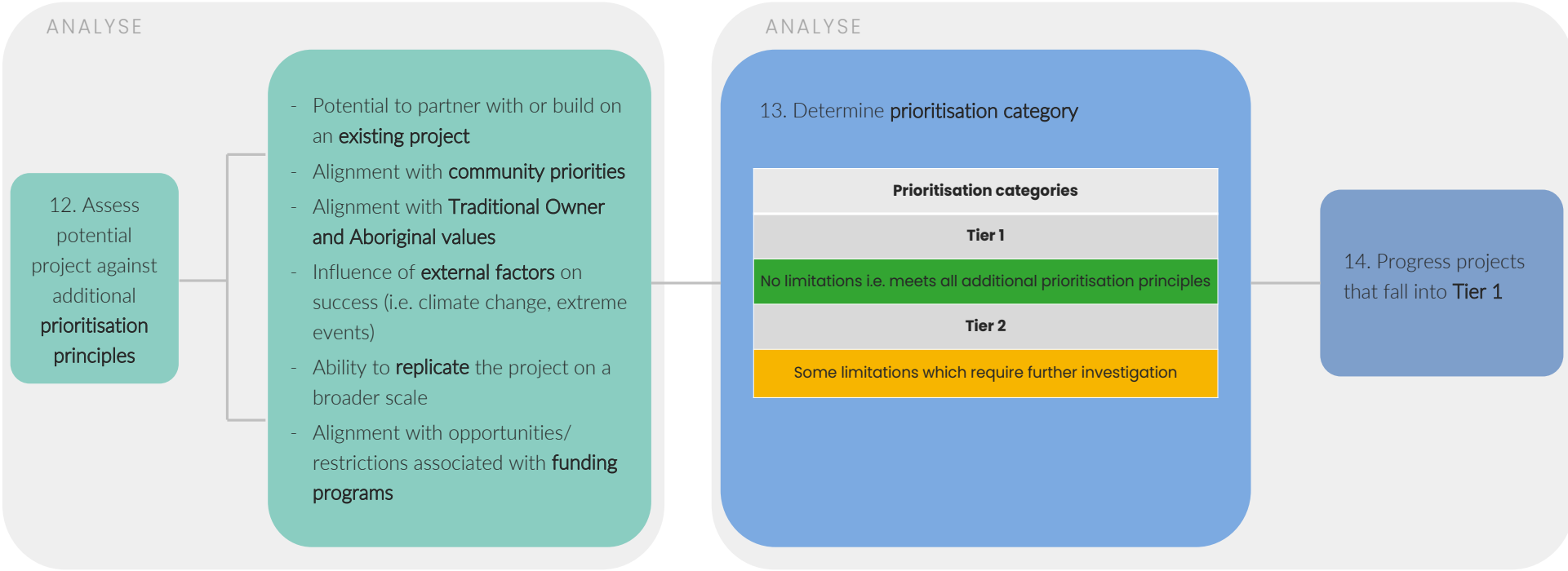
NRM Action Plan

Part 1: Quantitative Analysis



*NOTE: Existing information will be used to complete step 1. Identifying the **asset** and step 2. listing the **threats** (e.g. the RCS, HWS)

Part 2: Qualitative Analysis



Appendix 3: Previous priority-setting work

Relevant prioritisation setting processes known to be used to determine NRM priorities across the PPW region are summarised in Table A3-1.

Table A3-1: Summary of NRM prioritisation processes used in the PPW region

DESCRIPTION	PURPOSE	PRIORITIES
Healthy Waterways Strategy The *Healthy Waterways Strategy*[25] outlines Melbourne Water's overarching long-term (50 year) plan for managing rivers, estuaries and wetlands in the PPW region.	To identify community priorities and aspirations across Melbourne Water's five catchments	▪ Waterways ▪ Wetlands ▪ Estuaries
Sites of Biodiversity Significance Sites on Melbourne Water land that support important biodiversity values may be considered a Site of Biodiversity Significance (SoBS). The Sites of *Biodiversity Significance Program Plan 2020*[26] gives directions on how SoBS should be managed in accordance with Melbourne Water's obligations under environmental legislation, and to achieve the objectives of the Healthy Waterways Strategy 2018-28.	To meet Melbourne Water's legislative land management obligations under the Catchment and Land Protection Act 1994 and the EPBC Act 1999	36 sites across the PPW region
Biodiversity Fact Sheets DELWP have developed a set of biodiversity fact sheets under the Biodiversity Response Planning program (BRP). The BRP program is a long term, area-based planning approach to biodiversity conservation being implemented across Victoria. It is designed to strengthen alignment, engagement and participation between government, Traditional Owners, non-government agencies (NGOs) and the community. As part of this program several information resources are being developed to support stakeholders in planning biodiversity programs and projects in their region. The biodiversity fact sheets are one of these resources.	▪ To capture a point in time, reflecting current data and knowledge ▪ Provide information for many (but not all) landscapes across Victoria ▪ Contain general information on the key values and threats in each area ▪ Identify the higher-level priority cost-effective actions that provide the best protection of biodiversity ▪ To provide useful biodiversity information for the community, non-government and government organisations during project planning and development	▪ Central Grassy Woodlands Plain ▪ Devilbend Reservoir ▪ Eastern Yarra Ranges ▪ French Island ▪ Grasslands of Western Melbourne ▪ Maribyrnong Valley ▪ Melbourne – inner urban, north and east ▪ Melbourne – south east ▪ Mornington Peninsula ▪ North East Region ▪ Peninsula Wetlands and Bay Coast ▪ Point Nepean and Mornington Peninsula NP ▪ Port Phillip and Western Shoreline Ramsar ▪ Southern Ranges ▪ Toolern Vale ▪ Upper Yarra Valley ▪ Western Port Ramsar ▪ Western Port flats ▪ Yarra River South West
Strategic Management Prospects, DELWP Uses the Victorian State's strategic biodiversity conservation summary	▪ Regional Property Prioritisation for Biodiversity Planning ▪ Assigns a score based on biodiversity value	Modelled priorities for biodiversity investment across flora and fauna

[25] Melbourne Water (2018). Healthy Waterway Strategy. Melbourne Water Corporation.
[26] Sites of Biodiversity Significance Program Plan 2020.

DESCRIPTION	PURPOSE	PRIORITIES
(NaturePrint) to identify focus area's for biodiversity management. The project results in a robust methodology and an information resource that will be used for strategic priority and planning.		
Liveable Communities, Liveable Waterways The Rural Land Program and Stream Frontage Management Program have transitioned to Melbourne Water's new streamlined and flexible incentives program Liveable Communities, Liveable Waterways.	This incentive program offers private landowners (within a certain distance to a waterway) to apply for funding for works that focus on waterway and biodiversity protection aligned with one or more of Melbourne Water's strategies. Through this program landholders can seek assistance to keep soil and nutrients on their farm and out of waterways, improve water security and improve the condition of a river or creek throughout the catchment.	Previously funded projects which are relevant to agricultural priorities have included the following activities: ▪ Erosion control ▪ Revegetation ▪ Fencing ▪ Sediment and nutrient control systems ▪ Grazing management ▪ Irrigation and drainage plans or improvements ▪ Dam decommissioning ▪ Farm layout and design and farm track design and construction, and ▪ Effluent management

Appendix 4: Ramsar prioritisation analysis results

The results from the detailed analysis of Ramsar priorities is shown in Table A4-1.

Table A4-1: Detailed prioritisation analysis for Ramsar priorities

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
PORT PHILLIP BAY (WESTERN SHORELINE) AND BELLARINE PENINSULA RAMSAR SITE						
Altona Coastal Park including Jawbone Reserve and Skeleton	Enhance the quality of suitable roosting/ foraging habitat for waterbird populations over the next five years	▪ Human disturbance (recreation) ▪ Cat predation ▪ Fox predation ▪ Predation/ disturbance by dogs ▪ Invasive animal impact on habitat ▪ Weed invasion	▪ Behaviour modification ▪ Fencing to manage access ▪ Weed control	1	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** High - based on continued management of weeds by Hobson's Bay City Council, actions have contributory benefit to Ramsar, location in landscape (connectivity to Jawbone Flora & Fauna Reserve) ▪ **Time lags until benefits are realised:** 3 years ▪ **Can works be 'scaled up':** Yes, can be applied to adjacent areas managed by Local Council and Parks Vic ▪ **Condition trajectory**: Improving, condition is improving based on previous investment (focus on habitat improvement) ▪ **Technical feasibility:** High - **t**he potential actions have been implemented at this site through previous programs; land managers have the capability and capacity to undertake these works ▪ **Likelihood of adoption:** Medium - these management actions are implemented by public land managers, however, will require community compliance ▪ **Cash costs (relative to historical spending on RLP outcome area):** Low **Qualitative assessment notes:** ▪ Strong collaborative partnerships (Hobsons Bay City Council, Parks Victoria); located adjacent to Jawbone Flora and Fauna Reserve, previous investment through RLP now maintained by Hobsons Bay City Council (weed control)	Tier 1
Point Cook/ Cheetham Wetlands	Enhance the quality of suitable	▪ Predation/ disturbance by dogs	▪ Weed control Fox control Rabbit control	1	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** High - long-term and on-going management by Parks Victoria to maintain saltwater	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
including Truganina	roosting/ foraging habitat for waterbird populations over the next five years	▪ Weed invasion	Behaviour modification		levels across ponds at Cheetham Wetlands (waterbird habitat). Complimentary actions will further support protection of waterbird populations ▪ **Time lags until benefits are realised:** 3 years ▪ **Can works be 'scaled up':** Yes, connectivity to Altona Coastal Park, Jawbone Flora & Fauna Reserve, Point Cook Coastal Park ▪ **Condition trajectory**: Stable, a key management focus for this asset is management of the saltwater ponds to maintain bird habitat, this is ongoing (focus on habitat protection) ▪ **Technical feasibility:** High - the potential actions have been implemented at this site through previous programs; Land managers have the capability and capacity to undertake these works ▪ **Likelihood of adoption:** High - these management actions are implemented by public land managers ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** Requires grater level of co-investment from Parks Victoria, long-term viability of site uncertain (risk of pump failure possible)	
The Spit Nature Conservation Reserve (Big Marsh)	Improve the quality of saltmarsh vegetation	▪ Invasive animal impact on habitat ▪ Weed invasion ▪ Hydrology change/ altered flow regime	▪ Rabbit control ▪ Flow regime/ hydrology management ▪ Fencing to manage grazing	1	*Source: expert opinion (INFFER analysis 2019); Eco-hydrological Investigation and Restoration Planning for Big Marsh, Nature Trust Glenelg, 2020* ▪ **Effectiveness of management actions:** High - management recommendations (NTG, 2020), expert opinion ▪ **Time lags until benefits are realised:** Within 5 years ▪ **Can works be 'scaled up':** Yes, adjacent to Melbourne Water and Parks Victoria managed land and also shares a boundary with private landowners (Barro Group and Fox Group) ▪ **Condition trajectory**: Improving (previous hydrological works are effective – anecdotal evidence) ▪ **Technical feasibility:** Medium - management interventions require various degrees and forms of hydrological and ecological monitoring to inform our understanding and/or their design and implementation. This in turn will also provide vital feedback to inform future management decision	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					▪ **Likelihood of adoption:** Medium - these management actions are implemented by public land managers, however, will require cooperation with private landowners (Fox Group and Barro Group) ▪ **Cash costs (relative to historical spending on RLP outcome area):** High **Qualitative assessment notes:** ▪ Floristic surveys will provide data to inform the next steps to building on improved hydrology, collaborative land managers	
Mud Islands	Maintain breeding habitat for Australian fairy terns	▪ Human disturbance (recreation) ▪ Weed invasion	▪ Weed control ▪ Behaviour modification	2	*Source: expert opinion (workshop, 2, NRM Action Plan; targeted follow up)* ▪ **Effectiveness of management actions:** Medium - Island is eroding in dynamic coastal location, impacted by channel deepening; Safe mooring to undertake patrols and management an issue; risk taking volunteers to island given dynamic water movement/ tidal flow ▪ **Time lags until benefits are realised:** Within 5 years - Annual works required to maintain suitable breeding area ▪ **Can works be 'scaled up':** No - Stand-alone set of three islands ▪ **Condition trajectory**: Declining, Islands are eroding as a result of the channel deepening ▪ **Technical feasibility:** Medium – Due to location it can be difficult to access the island due to weather/ tidal constraints ▪ **Likelihood of adoption:** Medium - access to island difficult at times - resourcing and logistics ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ Active passionate friends group: on-going commitment from Parks Victoria to undertake weed and patrol work	Tier 1
Western Treatment Plant (Western Lagoon)	Enhance roosting habitat for waterbirds populations	▪ Climate change/ sea level rise ▪ Hydrological change/ altered flow regime	▪ Habitat improvement	2	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** Medium ▪ **Time lags until benefits are realised:** Within 5 years ▪ **Can works be 'scaled up':** No	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					▪ **Condition trajectory:** Declining, climate change/ sea-level rise and altered hydrological regimes continue to degrade the site (focus on habitat enhancement) ▪ **Technical feasibility:** Medium – Anecdotal evidence suggests the potential actions would be effective, foundational study/ investigation report required ▪ **Likelihood of adoption:** High - these management actions are implemented by public land managers ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ Potential for co-investment	
WESTERN PORT RAMSAR SITE						
Rams Island (including Bird Island)	Maintain the extent and quality of suitable roosting/ foraging habitat for waterbird populations over the next five years	▪ Human disturbance (recreation) ▪ Cat predation	▪ Cat control Weed control	1	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** Medium - expert opinion, effectiveness of weed management uncertain; cat control part of broader French Island Feral Cat Eradication Program ▪ **Time lags until benefits are realised:** 2 years ▪ **Can works be 'scaled up':** Yes, part of French Island Cat Eradication Program (island wide) ▪ **Condition trajectory**: Stable, in good condition (focus on habitat protection) ▪ **Technical feasibility:** High - the potential actions have been implemented at this site through previous programs; Land managers have the capability and capacity to undertake these works ▪ **Likelihood of adoption:** High - these management actions are implemented by public land managers ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ Co-investment opportunity for RLP with Parks Victoria; low cost, high potential benefit; commitment to on-going cat control	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
Tortoise Head	Maintain the quality of suitable roosting/ foraging habitat for waterbird populations over the next five years	▪ Cat predation	▪ Cat control Weed control	1	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** Medium - expert opinion, effectiveness of weed management and revegetation uncertain; cat control part of broader French Island Feral Cat Eradication Program ▪ **Time lags until benefits are realised:** 3 years ▪ **Can works be 'scaled up':** Yes, part of French Island Cat Eradication Program (island wide) ▪ **Condition trajectory**: Stable, in good condition (focus on habitat protection) ▪ **Technical feasibility:** High - the potential actions have been implemented at this site through previous programs; Land managers have the capability and capacity to undertake these works ▪ **Likelihood of adoption:** High - these management actions are implemented by public land managers and there is strong community support for the French Island Cat Eradication Program **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ This site will benefit from the broader French Island cat eradication program; be active on-going investment (time and money) by FOFI and Parks Victoria	Tier 1
Stockyard point (French Island)	Maintain the quality of suitable roosting/ foraging habitat for waterbird populations over the next five years	▪ Human disturbance (recreation) ▪ Fox predation	▪ Fox control Weed control	1	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** Medium - expert opinion, high costs associated with weed control which may have limited benefit to waterbird values. Need greater clarity around site management (PV and Foreshore Committee). Benefits of proposed fox control actions are questionable. ▪ **Time lags until benefits are realised:** 3 years ▪ **Can works be 'scaled up':** Yes, forms part of Pioneer/Stockyard–Bunyip/Yallock–Barrallier and Tortoise Head– Observation Point–Rams Island–Reef Island complex encompassing probably the most productive regions of the bay ▪ **Condition trajectory**: Stable, in good condition (focus on habitat protection)	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					▪ **Technical feasibility:** High - the potential actions have been implemented at this site through previous programs; Land managers have the capability and capacity to undertake these works ▪ **Likelihood of adoption:** Medium - these management actions are implemented by public land managers, however it is not clear how management responsibility is 'shared' between foreshore committee and PV ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ Important waterbirds roosting/ foraging site; further work with community required - change in membership of foreshore committee (risk adverse - pulled back on 1080 baiting, large landholder supportive of 1080 baiting; focus on weed control and continue to work with the community around fox control	
French Island	Enhance roosting habitat and improve the survival rate of waterbirds	▪ Cat predation	▪ Cat control	1	*Source: expert opinion (Workshop 2, NRM Action Plan)* ▪ **Effectiveness of management actions:** High - Scat analysis and camera monitoring indicate the continued presence of cats on the island ▪ **Time lags until benefits are realised:** Within 5 years – expert opinion ▪ **Can works be 'scaled up':** Yes - Is currently being rolled out across French Island ▪ **Condition trajectory**: Stable - Determined by waterbird monitoring data ▪ **Technical feasibility:** High - Based on previous rollout of the program - continued success working with the community on French Island ▪ **Likelihood of adoption:** Medium - Strong community support. The cat trapping Program has been running over successive years on the Island - French Island Landcare, Friends of French Island ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium - An Island wide program is more effective than targeting small areas. **Qualitative assessment notes:**	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					▪ Build on previous RLP investment; benefit a wider suite of EBPC listed species across French Island	
Observation Point/ Rhyll Inlet	Enhance roosting habitat and improve the survival rate of waterbirds	▪ Cat predation ▪ Fox predation ▪ Weed invasion	▪ Fox control ▪ Cat control ▪ Weed control	1	*Source: expert opinion (Workshop 2, NRM Action Plan)* ▪ **Effectiveness of management actions:** High - Operates as an island, can restrict access good chance of 'eradication' with continual monitoring ▪ **Time lags until benefits are realised:** Within 5 years – expert opinion ▪ **Can works be 'scaled up':** Yes - Fox and cat control could be expanded to cover a larger area and would complement existing work ▪ **Condition trajectory**: Stable - Based on current actions being implemented ▪ **Technical feasibility:** Medium - Current works underway related to cat control **Likelihood of adoption:** High - Phillip Island Nature Park are committed to continual investment at this site and are currently implementing priority actions at this site ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium - Based on delivery of actions through previous RLP funding at this site **Qualitative assessment notes:** ▪ High chance of success - co funding with PINP	Tier 1
North-West (French Island)	Reinstate natural hydrological regime to improve the quality of coastal saltmarsh vegetation	▪ Hydrological change/ altered flow regime	▪ Flow regime/ hydrology management	2	*Source: expert opinion (Workshop 2, NRM Action Plan)* ▪ **Effectiveness of management actions:** Medium - Expert opinion (Wetlands Workshop May 2022); Preliminary study required to scope approach for improving flow regime ▪ **Time lags until benefits are realised:** Within 5 years – expert opinion ▪ **Can works be 'scaled up':** No ▪ **Condition trajectory**: Declining (If left the saltmarsh vegetation quality and extent will decline) ▪ **Technical feasibility:** Medium - Based on current understanding of hydrological requirements of saltmarsh ▪ **Likelihood of adoption:** Medium - Actions will be implemented by qualified contractors	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium - Based on previous hydrological works to restore saltmarsh (Big Marsh, Glenelg Nature Trust) **Qualitative assessment notes:** ▪ Preliminary work required to scope out method and design to improve hydrology; relatively small area - important connection to foraging/ roosting habitat across the north of French Island	
Northern Shore (French Island)	Maintain the quality of suitable roosting/ foraging habitat for waterbird populations	▪ Cat predation ▪ Weed invasion ▪ Human disturbance (recreation)	▪ Cat control ▪ Weed control ▪ Behaviour modification ▪ Habitat improvement	1	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** High - Expert opinion (INFFER analysis 2019); based on previous on-ground works on asset**Time lags until benefits are realised:** Within 5 years ▪ **Can works be 'scaled up':** Yes, can be applied at key locations across the Ramsar site ▪ **Condition trajectory**: Stable, in good condition (focus on habitat protection) ▪ **Technical feasibility:** High - the potential actions have been implemented at this site through previous programs; Land managers have the capability and capacity to undertake these works ▪ **Likelihood of adoption:** High - these management actions are implemented by public land managers ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium - Based on delivery of actions through previous RLP funding at this site **Qualitative assessment notes:** ▪ Combines Barralier Islands/ Chicory Reef and Fairhaven into one priority. More efficient and effective management over a larger area.	Tier 1
Barrallier Island/Chicory Lane Reef/ (Northwest French Island	Maintain the quality of suitable roosting/ foraging habitat for waterbird populations over the next five years	▪ Invasive animal impact on habitat ▪ Weed invasion	▪ Cat control	1	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** High - expert opinion, based on previous on-ground works on asset ▪ **Time lags until benefits are realised:** 2 years ▪ **Can works be 'scaled up':** Yes, can be applied at key locations across the Ramsar site ▪ **Condition trajectory**: Stable, in good condition (focus on habitat protection)	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					▪ **Technical feasibility:** High - the potential actions have been implemented at this site through previous programs; Land managers have the capability and capacity to undertake these works ▪ **Likelihood of adoption:** High - these management actions are implemented by public land managers ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ Will benefit from broader French Island cat eradication program; Parks Victoria to manage the outcomes of previous RLP investment at the site	
Fairhaven	Maintain the quality of suitable roosting/ foraging habitat for waterbird populations over the next five years	▪ Cat predation	▪ Cat control	1	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** High - expert opinion, cat control part of broader French Island Feral Cat Eradication Program ▪ **Time lags until benefits are realised:** 3 years ▪ **Can works be 'scaled up':** Yes, part of French Island Cat Eradication Program (island wide) ▪ **Condition trajectory**: Stable, in good condition (focus on habitat protection) ▪ **Technical feasibility:** High - the potential actions have been implemented at this site through previous programs; Land managers have the capability and capacity to undertake these works ▪ **Likelihood of adoption:** High - these management actions are implemented by public land managers and there is strong community support for the French Island Cat Eradication Program ▪ **Cash costs (relative to historical spending on RLP outcome area):** Low **Qualitative assessment notes:** ▪ Will benefit from broader French Island cat eradication program; Parks Victoria to manage the outcomes of previous RLP investment in the site	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
Quail and Chinaman Island	Restore the area of suitable roosting/ foraging habitat for waterbird populations over the next five years	▪ Human disturbance (recreation) ▪ Urban development ▪ Fox predation ▪ Cat predation ▪ Fragmentation ▪ Weed invasion	▪ Weed control Pig control	2	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** High - expert opinion, appears that pig eradication is feasible with significant benefits for coastal saltmarsh. Fox control is potentially warranted at this site (coordinated with adjacent mainland areas) but needs to demonstrate reduction in fox impacts through monitoring. ▪ **Time lags until benefits are realised:** 2 years ▪ **Can works be 'scaled up':** Yes, part of connected complex of mudflats/ islands (Fairhaven, Tortoise Head) ▪ **Condition trajectory**: Improving, condition is improving based on previous investment (INFFER analysis 2019) ▪ Focus on habitat improvement ▪ **Technical feasibility:** High - the potential actions have been implemented at this site through previous programs; Land managers have the capability and capacity to undertake these works ▪ **Likelihood of adoption:** Medium - these management actions are implemented by public land managers, however, will require community compliance (to ensure pigs are not reintroduced) ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ Previous RLP investment is maintained by land manager Parks Victoria (on going weed maintenance, monitoring for reintroduction of feral pigs)	Tier 2
Mudflats	Enhance the quality of suitable roosting/ foraging habitat for waterbird populations over the next five years	▪ Human disturbance (recreation) ▪ Weed invasion	▪ Weed control Behaviour modification	3	*Source: expert opinion (INFFER analysis 2019)* ▪ **Effectiveness of management actions:** Low - expert opinion, behaviour modification actions need to be better specified. Spartina control is likely to require ongoing investment and it is doubtful that $5K/year will be enough to control anything other than localised infestations. ▪ **Time lags until benefits are realised:** Unknown ▪ **Can works be 'scaled up':** No, lack of information about the effectiveness of management actions ▪ **Condition trajectory:** Stable, in good condition (focus on habitat protection)	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					▪ **Technical feasibility:** Low - the potential actions have been implemented at this site through previous programs; Land managers have the capability and capacity to undertake these works ▪ **Likelihood of adoption:** Medium - these management actions are likely to be implemented by public land managers, however, will require community compliance ▪ **Cash costs (relative to historical spending on RLP outcome area):** High **Qualitative assessment notes:** ▪ Broad area, five-year outcome not well defined; no feasible. effective management actions identified; focus on a smaller sub-set of key islands across French Island that provide significant roosting/ foraging area	
EDITHVALE-SEAFORD WETLANDS RAMSAR SITE						
Edithvale South Wetland	Improve the foraging and roosting habitat for waterbirds	▪ Fox predation ▪ Hydrological change/ altered flow regime ▪ Weed invasion	▪ Flow regime/ hydrology management ▪ Fox control	2	*Source: expert opinion (workshop 2, NRM Action Plan)* ▪ **Effectiveness of management actions:** Medium - removal of foxes from the wetlands will protect breeding populations of birds and has a high chance of reducing disturbance during foraging/ nesting ▪ **Time lags until benefits are realised:** Within 5 years - Area is relatively small, fence could be installed in first 2 years and likely to see reduced predation pressure b year 3 ▪ **Can works be 'scaled up':** No ▪ **Condition trajectory:** Declining - complex interaction of factors - key threat is change to hydrology ▪ **Technical feasibility:** Medium - predator proof fencing is a proven concept and the underpinning research around design and effectiveness is solid. ▪ **Likelihood of adoption:** High - these management actions are implemented by public land managers (Melbourne Water) ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium – estimate **Qualitative assessment notes:** ▪ Potential co-investment opportunity	Tier 1

Appendix 5: List of threatened species

A full list of the threatened ecological communities recorded in the region and their listing status is shown in Table A5-1 (Source: Port Phillip and Westernport RCS – data tables extracted from the Victorian Biodiversity Atlas).

Table A5-1: List of threatened ecological communities known to occur in the region

COMMON NAME	SCIENTIFIC NAME	FFG ACT STATUS	EPBC ACT STATUS
Australian Fairy Tern	*Sternula nereis nereis*	Critically Endangered	VU cr
Australasian Bittern	*Botaurus poiciloptilus*	Critically Endangered	EN cr
Australian Grayling	*Prototroctes maraena*	Endangered	VU en
Australian Painted-snipe	*Rostratula australis*	Critically Endangered	EN cr
Bar-tailed Godwit	*Limosa lapponica*	Vulnerable	VU vu
Basalt Peppercress	*Lepidium hyssopifolium s.s.*	Endangered	EN en
Ben Major Grevillea	*Grevillea floripendula*	Critically Endangered	VU cr
Black Gum	*Eucalyptus aggregata*	Vulnerable	VU vu
Black-browed Albatross	*Thalassarche melanophris*		VU
Blue Petrel	*Halobaena caerulea*		VU
Bog Willow-herb	*Epilobium brunnescens subsp. beaugleholei*	Critically Endangered	VU cr
Broad-toothed Rat	*Mastacomys fuscus mordicus*	Vulnerable	VU vu
Button Wrinklewort	*Rutidosis leptorhynchoides*	Endangered	EN en
Buxton Gum	*Eucalyptus crenulata*	Endangered	EN en #
Camden Woollybutt	*Eucalyptus macarthurii*		EN*
Charming Spider-orchid	*Caladenia amoena*	Critically Endangered	EN cr
Chef's Cap Correa	*Correa baeuerlenii*		VU*
Clover Glycine	*Glycine latrobeana*	Vulnerable	VU vu
Crimson Spider-orchid	*Caladenia concolor*	Endangered	VU en
Curlew Sandpiper	*Calidris ferruginea*	Critically Endangered	CR cr
Dense Leek-orchid	*Prasophyllum spicatum*	Critically Endangered	VU cr
Dwarf Cypress-pine	*Callitris oblonga subsp. oblonga*		EN *

COMMON NAME	SCIENTIFIC NAME	FFG ACT STATUS	EPBC ACT STATUS
Dwarf Galaxias	*Galaxiella pusilla*	Endangered	VU en
Eastern Barred Bandicoot	*Perameles gunnii*	Endangered	EN en
Eastern Curlew	*Numenius madagascariensis*	Critically Endangered	CR cr
Eltham Copper Butterfly	*Paralucia pyrodiscus lucida*	Critically Endangered	EN cr
Fragrant Leek-orchid	*Prasophyllum suaveolens*	Critically Endangered	EN cr
Frankston Spider-orchid	*Caladenia robinsonii*	Critically Endangered	EN cr
French Island Spider-orchid	*Caladenia insularis*	Endangered	VU en
Fringed Spider-orchid	*Caladenia thysanochila*	Extinct	EN ex
Gang-gang Cockatoo	*Callocephalon fimbriatum*		EN
Giant Gippsland Earthworm	*Megascolides australis*	Endangered	VU en
Glenelg Spiny Crayfish	*Euastacus bispinosus*	Endangered	EN en
Golden Sun Moth	*Synemon plana*	Vulnerable	VU vu
Great Knot	*Calidris tenuirostris*	Critically Endangered	CR cr
Greater Sand Plover	*Charadrius leschenaultii*	Vulnerable	VU vu
Green Turtle	*Chelonia mydas*		VU
Green-striped Greenhood	*Pterostylis chlorogramma*	Endangered	VU en
Grey Falcon	*Falco hypoleucos*	Vulnerable	VU vu
Grey-headed Flying-fox	*Pteropus poliocephalus*	Vulnerable	VU vu
Growling Grass Frog	*Litoria raniformis*	Vulnerable	VU vu
Hairy-pod Wattle	*Acacia glandulicarpa*	Endangered	VU en
Helmeted Honeyeater	*Lichenostomus melanops cassidix*	Critically Endangered	CR cr
Hooded Plover	*Thinornis cucullatus*	Vulnerable	VU vu
Indian Yellow-nosed Albatross	*Thalassarche carteri*	Endangered	VU en
Kilsyth South Spider-orchid	*Caladenia sp. aff. venusta (Kilsyth South)*	Critically Endangered	CR cr
Large-headed Fireweed	*Senecio macrocarpus*	Critically Endangered	VU cr
Leadbeater's Possum	*Gymnobelideus leadbeateri*	Critically Endangered	CR cr
Leafy Greenhood	*Pterostylis cucullata*		VU

COMMON NAME	SCIENTIFIC NAME	FFG ACT STATUS	EPBC ACT STATUS
Leathery Turtle	*Dermochelys coriacea*	Critically Endangered	EN cr
Lesser Sand Plover	*Charadrius mongolus*	Endangered	EN en
Little Pink Spider-orchid	*Caladenia rosella*	Critically Endangered	EN cr
Loggerhead Turtle	*Caretta*		EN
Long-nosed Potoroo	*Potorous tridactylus trisulcatus*	Vulnerable	VU vu
Macquarie Perch	*Macquaria australasica*	Endangered	EN en
Magenta Cherry	*Syzygium paniculatum*		VU *
Mallee Emu-wren	*Stipiturus mallee*	Endangered	EN en
Maroon Leek-orchid	*Prasophyllum frenchii*	Endangered	EN en
Matted Flax-lily	*Dianella amoena*	Critically Endangered	EN cr
Murray Cod	*Maccullochella peelii*	Endangered	VU en
Narrow Curved-leaf Grevillea	*Grevillea curviloba subsp. incurva*		EN *
New Holland Mouse	*Pseudomys novaehollandiae*	Endangered	VU en
Northern Giant-Petrel	*Macronectes halli*	Endangered	VU en
Orange-bellied Parrot	*Neophema chrysogaster*	Critically Endangered	CR cr
Ornate Pink-fingers	*Caladenia ornata*	Endangered	VU en
Painted Honeyeater	*Grantiella picta*	Vulnerable	VU vu
Pilotbird	*Pycnoptilus floccosus*		VU
Plains-wanderer	*Pedionomus torquatus*	Critically Endangered	CR cr
Purple Eyebright	*Euphrasia collina subsp. muelleri*	Endangered	EN en
Red Knot	*Calidris canutus*	Endangered	EN en
Regent Honeyeater	*Anthochaera phrygia*	Critically Endangered	CR cr
Regent Parrot	*Polytelis anthopeplus monarchoides*	Vulnerable	VU vu
River Swamp Wallaby-grass	*Amphibromus fluitans*		VU
Round-leaf Pomaderris	*Pomaderris vacciniifolia*	Critically Endangered	CR cr
Sea-lion	*Neophoca cinerea*	Endangered	EN en
Shiny Nematolepis	*Nematolepis wilsonii*	Critically Endangered	VU cr

COMMON NAME	SCIENTIFIC NAME	FFG ACT STATUS	EPBC ACT STATUS
Shy Albatross	*Thalassarche cauta*	Endangered	EN en
Silver Perch	*Bidyanus bidyanus*	Endangered	CR en
Small Golden Moths	*Diuris basaltica*	Critically Endangered	EN cr
Smoky Mouse	*Pseudomys fumeus*	Endangered	EN en
Southern Brown Bandicoot	*Isoodon obesulus*	Endangered	EN en
Southern Elephant Seal	*Mirounga leonina*		VU
Southern Giant-Petrel	*Macronectes giganteus*	Endangered	EN en
Southern Greater Glider	*Petauroides volans*	Vulnerable	VU vu
Southern Right Whale	*Eubalaena australis*	Endangered	EN en
Spiny Rice-flower	*Pimelea spinescens subsp. spinescens*	Critically Endangered	CR cr
Spot-tailed Quoll	*Dasyurus maculatus*	Endangered	EN en
Striped Legless Lizard	*Delma impar*	Endangered	VU en
Strzelecki Gum	*Eucalyptus strzeleckii*	Critically Endangered	VU cr
Subantarctic Fur Seal	*Arctophoca tropicalis*		EN
Sunshine Diuris	*Diuris fragrantissima*	Critically Endangered	EN cr
Superb Parrot	*Polytelis swainsonii*	Endangered	VU en
Swamp Antechinus	*Antechinus minimus maritimus*	Vulnerable	VU vu
Swamp Everlasting	*Xerochrysum palustre*	Critically Endangered	VU cr
Swamp Fireweed	*Senecio psilocarpus*		VU
Swift Parrot	*Lathamus discolor*	Critically Endangered	CR cr
Tall Astelia	*Astelia australiana*	Endangered	VU en
Trailing Hop-bush	*Dodonaea procumbens*		VU #
Trout Cod	*Maccullochella macquariensis*	Endangered	EN en
Victorian Grassland Earless Dragon	*Tympanocryptis pinguiolla*	Threatened	EN en
White Sunray	*Leucochrysum albicans subsp. tricolor*	Endangered	EN en
White-throated Needletail	*Hirundapus caudacutus*	Vulnerable	VU vu
Yarra Pygmy Perch	*Nannoperca obscura*	Vulnerable	VU vu
Yellow-lip Spider-orchid	*Caladenia xanthochila*	Endangered	EN en

Appendix 6: List of threatened ecological communities

A full list of threatened ecological communities and their listing status in the region is shown in Table A6-1 (Source: Port Phillip and Western Port RCS – data tables extracted from the Victorian Biodiversity Atlas)

Table A6-1: Threatened ecological communities in the PPW region

ECOLOGICAL COMMUNITY	FFG ACT STATUS	EPBC ACT STATUS
Alpine Sphagnum Bogs and Associated Fens		Endangered
Giant Kelp Marine Forests of South East Australia		Endangered
Grassy Eucalypt Woodland of the Victorian Volcanic Plain		Critically endangered
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia		Endangered
Natural Damp Grassland of the Victorian Coastal Plains		Critically endangered
Natural Temperate Grassland of the Victorian Volcanic Plain		Critically endangered
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains		Critically endangered
Subtropical and Temperate Coastal Saltmarsh		Vulnerable
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		Critically endangered
Central Gippsland Plains Grassland	Threatened	
Coastal Moonah Woodland	Threatened	
Cool Temperate Mixed Forest	Threatened	
Cool Temperate Rainforest	Threatened	
Forest Red Gum Grassy Woodland	Threatened	
Grey Box - Buloke Grassy Woodland Community	Threatened	
Herb-rich Plains Grassy Wetland (West Gippsland)	Threatened	
Limestone Grassy Woodland	Threatened	
Port Phillip Bay Entrance Deep Canyon Marine Community	Threatened	

ECOLOGICAL COMMUNITY	FFG ACT STATUS	EPBC ACT STATUS
Rocky Chenopod Open Scrub	Threatened	
San Remo Marine Community	Threatened	
Sedge-rich Eucalyptus camphora Swamp	Threatened	
South Gippsland Plains Grassland	Threatened	
Western (Basalt) Plains Grasslands	Threatened	
Western Basalt Plains (River Red Gum) Grassy Woodland	Threatened	

Appendix 7: Biodiversity prioritisation analysis results

The results from the detailed analysis of biodiversity priorities is shown in Table A7-1.

Table A7-1: Detailed prioritisation analysis of biodiversity assets

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
Orange-bellied Parrot	Maintain the extent and quality of habitat for the OBP	▪ Degradation and loss of habitat ▪ Coastal development ▪ Inappropriate grazing and fire management ▪ Inappropriate water regimes ▪ Invasive weeds ▪ Disturbance from humans ▪ Small population	▪ Protect saltmarsh habitat and allow for inland migration ▪ Plant indigenous shrubs and remove weeds ▪ Improve fire management ▪ Visitor management at shoreline sites	1	*Source: National Recovery Plan for the Orange-bellied Parrot, (Neophema chrysogaster), 2016* ▪ **Effectiveness of management actions: H**igh, due to small population & need to forage widely ▪ **Time lags until benefits are realised:** 5-10 years ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory**: Small and vulnerable population, significant decline ▪ **Technical feasibility:** Low – medium, due to adjacent land uses and inability for saltmarsh to migrate inland ▪ **Likelihood of adoption:** Medium, public land, but scale and intensity of interventions ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ Success from captive breeding program, identification of additional sites within region underway, strong collaborative relationships established (Zoos Victoria, DELWP, Parks Victoria, BirdLife Australia)	Tier 1
Leadbeater's Possum	Maintain the extent and quality of habitat for Leadbeater's Possum. Trajectory of species is stabilised or improved.	▪ Degradation and loss of habitat ▪ Loss of hollow bearing trees ▪ Inappropriate fire and regeneration regimes	▪ Improve land and vegetation management ▪ Retention of hollow stag trees/fallen logs ▪ Water flow management	1	*Source: Leadbeater's Possum Recovery Plan (Gymnobelideus leadbeateri), 1997* ▪ **Effectiveness of management actions:** High, critical habitat areas for genetic variants ▪ **Time lags until benefits are realised:** 2-5 years ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory:** Long term population decline ▪ **Technical feasibility:** Medium, works are standard practice	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
		▪ Changes to hydrological regime at Yellingbo			▪ **Likelihood of adoption:** High, iconic species, public land ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ At Yellingbo, Leadbeater's Possum shares critical habitat with the Helmeted Honeyeater, faunal emblem for Victoria	
Helmeted Honeyeater	Maintain the extent and quality of habitat for Helmeted Honeyeater. Trajectory of species is stabilised or improved.	▪ Habitat loss and degradation (caused by changing water regime, weeds, nutrients, siltation) ▪ Competition from other bird species ▪ Predation	▪ Pest control (cats, birds) ▪ Water flow management	1	*Source*: *National Recovery Plan for the Helmeted Honeyeater (Lichenostomus melanops cassidix), 2008* ▪ **Effectiveness of management actions:** High, its critical habitat areas are in this region ▪ **Time lags until benefits are realised:** 5-10 years due to small population base ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory**: Stable, but very low numbers ▪ **Technical feasibility:** Medium, works are standard practice ▪ **Likelihood of adoption:** High, iconic species, public land ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ At Yellingbo, Leadbeater's Possum shares critical habitat with the Helmeted Honeyeater, avian emblem for Victoria	Tier 1
Round-leaf Pomaderris	Maintain the extent and quality of habitat	▪ Inappropriate fire regimes ▪ Weed invasion ▪ Damage by pest species (deer) ▪ Grazing by livestock	▪ Weed control ▪ Pest control ▪ Improve land management (grazing, fires) ▪ Landowner agreements/covenants ▪ visitor management	1	*Source*: *Conservation Advice for Round-leaf Pomaderris (Pomaderris vacciniifolia),2014* ▪ **Effectiveness of management actions:** High, its critical habitat areas are in this region ▪ **Time lags until benefits are realised:** 2-5 years ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory**? ▪ **Technical feasibility:** Low-medium, works are standard practice	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
		▪ Disturbance by humans (road maintenance) ▪ Fire/biomass management			▪ **Likelihood of adoption:** Medium ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ Partnership between Yarra Valley Shire and Nillumbik (revegetation programs), linked to broader bushland conservation programs	
Spiny Rice-flower	Maintain the extent and viability of existing populations Increased awareness and adoption of land management practices that improve habitat and protect the species	▪ Weed invasion ▪ Human disturbance (road /rail maintenance) ▪ Grazing (pest animals & livestock) ▪ Inappropriate fire regimes ▪ Changing land use	▪ Identify habitats (existing & potential) ▪ Weed & biomass management ▪ Control feral animals (hares, rabbits) ▪ Improve grazing and fire regimes	2	*Source*: *National Recovery Plan for the Spiny Rice-flower (Pimelea spinescens, subspecies spinescens), 2006* ▪ **Effectiveness of management actions:** Medium ▪ **Time lags until benefits are realised:** 2-5 years ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory:** Decline ▪ **Technical feasibility:** Medium, works are standard practice ▪ **Likelihood of adoption:** Medium ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** Major population at the Western Treatment Plant (potential link to other investment programs), Many active community groups involved in protection (research partnership Victoria University, Grassy Plains Network, Cairnlea Grassland Group, Imaroo Wildflower Grasslands Group), Potential links with Traditional Owners (Caring for our Grasslands – ecological burning)	Tier 1
Kilsyth South Spider-orchid	Increase in the size of *targeted* wild populations by up to 50% Increased awareness and adoption of land	▪ Grazing by pest animals ▪ Weed invasion ▪ Predation ▪ Ground & drainage disturbance	▪ Improved land management ▪ Weed control ▪ Pest control ▪ Delineation of tracks and recreational signage	1	*Source*: *Recovery Plan for Twenty-Five Threatened Orchid Taxa of Victoria, South Australia And New South Wales, 2003 - 2007* ▪ **Effectiveness of management actions:** High, its critical habitat areas are in this region ▪ **Time lags until benefits are realised:** 2-5 years ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory**: Stable, but limited distribution	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
	management practices that improve habitat and protect the species	▪ Damage from recreational activity ▪ Reduced soil moisture			▪ **Technical feasibility:** Medium, works are standard practice ▪ **Likelihood of adoption:** High, public land ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ Very limited distribution, highly fragmented	
Curlew Sandpiper	Maintain the extent and quality of habitat for Plains-wanderer. Trajectory of species is stabilised or improved.	▪ Human disturbance ▪ Habitat loss and degradation & pollution ▪ Changes to water regime ▪ Invasive plants	▪ Stormwater and waterway management (quality and flows) ▪ Weed control ▪ Visitor management at shoreline sites	2	*Source: Conservation Advice for the Curlew Sandpiper (Calidris ferruginea), 2015* ▪ **Effectiveness of management actions:** Medium, some strongholds in region ▪ **Time lags until benefits are realised:** 2-5 years ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory:** Long term population decline ▪ **Technical feasibility:** Medium-high, public land, works are standard practice ▪ **Likelihood of adoption:** High, already in protected areas ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium, sites are on public land but WQ from catchment water quality works would be more extensive **Qualitative assessment notes:** ▪ Covered under Ramsar priorities	Tier 2
Eastern Curlew	Maintain the extent and quality of habitat for Plains-wanderer. Trajectory of species is stabilised or improved.	▪ Human disturbance ▪ Habitat loss and degradation from pollution, changes to the water regime and invasive plants	▪ Weed control ▪ Upstream water quality management ▪ Visitor management at WTP/Ramsar shorelines	3	*Source: Conservation Advice for the Eastern Curlew (Numenius madagascariensis), 2015* ▪ **Effectiveness of management actions:** Low, not considered a primary site or stronghold ▪ **Time lags until benefits are realised:** 2-5 years ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory**: long term population decline ▪ **Technical feasibility:** Medium-high, public land, works are standard practice ▪ **Likelihood of adoption:** High, already in protected areas	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium, sites are on public land but WQ from catchment water quality works would be more extensive **Qualitative assessment notes:** ▪ Covered under Ramsar priorities	
Great Knot	Maintain the extent and quality of habitat for Plains-wanderer. Trajectory of species is stabilised or improved.	▪ Habitat loss ▪ Habitat degradation & pollution ▪ Disturbance	▪ Stormwater and waterway management (quality and flows) ▪ Visitor management at shoreline sites	3	*Source: Conservation Advice for the Great Knot (Calidris tenuirostris), 2016* ▪ **Effectiveness of management actions:** Low, not considered a primary site or stronghold ▪ **Time lags until benefits are realised:** 2-5 years ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory**: long term population decline ▪ **Technical feasibility:** Medium, public land, works are standard practice, but WQ from catchment water quality works would be more extensive ▪ **Likelihood of adoption:** High, already in protected areas ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium, sites are on public land but WQ from catchment water quality works would be more extensive **Qualitative assessment notes:** ▪ Covered under Ramsar priorities	Tier 2
Swift Parrot	Maintain the extent and quality of habitat for Swift Parrot.	▪ Habitat loss and fragmentation (forestry, dieback, fire, urban development) ▪ Predation by cats ▪ Competition for food and nesting (other	▪ Planting and regeneration of paddock trees ▪ Retention of hollow stag trees and fallen logs in foraging habitat ▪ Improved grazing and fire management ▪ Pest control (cats) ▪ Biosecurity to prevent dieback spread	3	*Source: National Recovery Plan for the Swift Parrot (Lathamus discolor), 2011.* ▪ **Effectiveness of management actions:** Low, not considered a primary site or stronghold ▪ **Time lags until benefits are realised:** Large, due to small reliance of species on the PPW region ▪ **Can works be 'scaled up':** n/a ▪ **Condition trajectory**: Long term population decline ▪ **Technical feasibility:** Medium, works are standard practice	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
		birds and honeybees) ▪ Inappropriate fire management			▪ **Likelihood of adoption:** Medium, due to scale and intensity of interventions and small reliance on region ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ Main breeding location in Tasmania, use the region opportunistically, main foraging area NSW box iron bark forests	
Regent Honeyeater	Maintain the extent and quality of habitat for regent honeyeater.	▪ Population size ▪ Habitat loss, degradation, and fragmentation ▪ Competition for food and nesting (other birds)	▪ Protect and rehabilitate key habitat ▪ Pest control (birds)	3	*Source: National Recovery Plan for the Regent Honeyeater (Anthochaera phrygia), 2016* ▪ **Effectiveness of management actions:** Low, presence in region (?) ▪ **Time lags until benefits are realised:** 5-10 years ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory:** Long term population decline ▪ **Technical feasibility:** Medium, works are standard practice ▪ **Likelihood of adoption:** Medium, due to scale of interventions and relatively small reliance on region ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium **Qualitative assessment notes:** ▪ The region does not provide critical habitat for this species, primary habitat box ironbark forests, occasional records of occurrence within the region	Tier 2
Silver Perch	Maintain or improve the quality of viable habitat Increased awareness and adoption of land management practices that improve habitat and	▪ River regulation, barriers to migration ▪ Habitat/water quality degradation ▪ Pathogens ▪ Alien fish	▪ Install fishways at weirs/barriers ▪ Reduce pollution ▪ Reduce livestock access to waterways ▪ Remove alien species	3	*Source*: *Conservation Advice for the Silver Perch (Bidyanus bidyanus), 2013* ▪ **Effectiveness of management actions:** Unsure of prevalence in PPW region or long-term viability of survival in core Murray-Darling regions – i.e. how critical is this region population - low, not a stronghold of species ▪ **Time lags until benefits are realised:** unknown ▪ **Can works be 'scaled up':** Unknown ▪ **Condition trajectory**: Long term population decline	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
	protect the species				▪ **Technical feasibility:** Unknown ▪ **Likelihood of adoption:** Unknown ▪ **Cash costs (relative to historical spending on RLP outcome area):** Unknown **Qualitative assessment notes:** ▪ The region does not provide critical habitat for this species	
Plains-wanderer	Maintain the extent and quality of habitat for Plains-wanderer. Trajectory of species is stabilised or improved.	▪ Loss of habitat to crops and pasture ▪ Inappropriate grazing and fire management ▪ Small population ▪ Predation by feral species (foxes, cats) ▪ Conversion of grasslands with growth of trees and tall shrubs	▪ Improved grazing and fire management ▪ Fox control ▪ Cat control ▪ Removal of introduced or planted trees and tall shrubs in grassland habitat	4	*Source: National Recovery Plan for the Plains-wanderer (Pedionomus torquatus), 2016* ▪ **Effectiveness of management actions:** Low, not considered a primary site or stronghold ▪ **Time lags until benefits are realised:** 2-5 years ▪ **Can works be 'scaled up':** Yes ▪ **Condition trajectory**: Long term population decline ▪ **Technical feasibility:** Medium – mix of public and private land, works are standard practice ▪ **Likelihood of adoption:** Mix of public and private land, difficult to make progress on private land ▪ **Cash costs (relative to historical spending on RLP outcome area):** High, because of the extent of location and adjacent residential and grazing. **Qualitative assessment notes:** ▪ The region does not support critical habitat for the species, very few records of occurrence in the region	Tier 2

ASSET	COMMENTS	
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Occurrences within the region are not significant for the overall community.	Tier 2
Natural Temperate Grassland of the Victorian Volcanic Plain	Occurrences within the region are significant for the overall community – although fragmented there are opportunities to develop partnership projects (e.g., CCMA, Victoria University, Local Community Groups)	Tier 1
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Potential communities of interest in the region include: ▪ Western plains ▪ Hearns Swamp Opportunities to work in with community groups and other agencies completing works on these ecological communities	Tier 1
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Occurrences within the region are not significant for the overall community (small, degraded patches, outer north-east of region)	Tier 2

Appendix 8: Agriculture prioritisation analysis results

The results from the detailed analysis of agriculture priorities is shown in Table A8-1.

Table A8-1: Detailed prioritisation of agriculture assets

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
Mornington Peninsula	1. Increase on-farm native vegetation as insectaries (functional biodiversity) to support biological control of insect pests and reduce damage to vegetable crops 2. Increase groundcover to reduce erosion risk and increase soil organic carbon 3. Increase the capacity of perennial horticulturalists to adapt to a change in climate 4. Increase capacity to plan and implement change to business models to respond to	**Focus industries:** Wine grapes and vegetables **Practices that cause threat:** ▪ Bare fallow between (in space and time) commercial crops **Other threatening processes:** ▪ Pest and disease inclusions ▪ Urbanisation ▪ Limited availability of water for agriculture ▪ Climate change - perennial horticulture; average temperature increase, extreme heat,	▪ Cover cropping on fallow areas or inter-row ground cover ▪ Reduced tillage ▪ Native vegetation insectaries (functional biodiversity) ▪ Perennial horticulture variety selection and adaptation measures (e.g. protectants, shade netting) ▪ Use alternative water sources for irrigation (e.g. recycled water) ▪ Investigate the feasibility of business model changes to manage the pressures of urbanisation (e.g. diversification,	1	*Source: expert opinion (workshop, 2, NRM Action Plan; targeted follow up)* ▪ **Effectiveness of management actions:** High; agriculture industry best practice guidance with strong evidence base (Sustainable Wine Growing Australia and EnviroVeg/Hort 360) ▪ **Time lags until benefits are realised:** Within 5 years; links to certification/QA schemes, reducing input costs could fast-track uptake, dependent on complexity of proposed action - cover cropping shorter-term, diversification of business model longer-term ▪ **Can works be 'scaled up':** Yes; can be applied on-farm in priority catchment locations (landscape scale) - dependent on existing landholder engagement through MW incentives programs and CMA programs ▪ **Condition trajectory**: Stable; Deakin University Land Suitability Assessment show that this agricultural land has >80% versatility under a climate projection scenario in 2050 ▪ **Technical feasibility:** High; agriculture industry best practice guidance, diversification of business model less feasible due to complexity and capital cost required for private business to implement ▪ **Likelihood of adoption:** Medium; proposed actions are incorporated into agriculture industry best practice guidelines and adopted by private landholders in some instances, diversification of business model has a lower likelihood of adoption due to complexity and capital cost required, adoption will be higher in this location due to existing landholder engagement	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
	urbanisation pressures	reduced cold nights	use of multiple farm locations, niche products, alternative production systems)		through MW SFMP incentives programs and CMA programs ▪ **Cash costs (relative to historical spending on RLP outcome area):** Low; limited capital cost requirement for proposed actions, cost driven by salaries for extension/field staff and on-costs. Will be lower due to existing MW SFMP incentives programs and CMA programs **Qualitative assessment notes:** ▪ Melbourne Water has established strong partnerships with Mornington Peninsula Shire (Agribusiness team), and agriculture industry groups (Mornington Peninsula Vignerons Association and AUSVEG) through the delivery of current and past programs. Melbourne Water also have a long history working with the Mornington Peninsula Landcare Network, Landcare groups and landholders in this location. Opportunities exist to link with other focus areas based on industries to maximise reach and potential impact against desired outcomes e.g. Pakenham / Koo Wee Rup and Cranbourne.	
Yarra Valley	1. Reduce water erosion to prevent soil carbon and nutrient loss off-farm and impacts on surrounding environmental assets 2. Increase the capacity of perennial horticulturalists to adapt to a change in climate	**Focus industries:** Strawberries, blueberries, nurseries, cut flowers, wine grapes and orchards **Practices that cause threat:** ▪ Run-off from paddocks, farm tracks, protected cropping structures and hard surfaces ▪ Exposed soils	▪ Drainage management (e.g. capture and storage) ▪ Soil cover ▪ Remediation ▪ Perennial horticulture variety selection and adaptation measures (e.g. protectants, shade netting) ▪ Use alternative water sources for irrigation (e.g. recycled water)	1	*Source: expert opinion (workshop, 2, NRM Action Plan; targeted follow up)* ▪ **Effectiveness of management actions:** High; agriculture industry best practice guidance with strong evidence base (Strawberry Good Practice Guide, EcoHort Guidelines for Managing the Environment (Nurseries), Sustainable Wine Growing Australia) ▪ **Time lags until benefits are realised:** Within 5 years; links to certification/QA schemes ▪ **Can works be 'scaled up':** Yes; can be applied on-farm in priority catchment locations (landscape scale) - dependent on existing landholder engagement through MW incentives programs and CMA programs ▪ **Condition trajectory**: Stable; Deakin University Land Suitability Assessment show that this agricultural land has >80% versatility under a climate projection scenario in 2050 ▪ **Technical feasibility:** High; agriculture industry best practice guidance	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
		Other threatening processes: ▪ Limited availability of water for agriculture ▪ Climate change - perennial horticulture			▪ **Likelihood of adoption:** High; proposed actions are incorporated into agriculture industry best practice guidelines and adopted by private landholders in some instances, adoption will be higher due to existing landholder engagement through MW licensing function, RLP/SFMP incentives programs and CMA programs ▪ **Cash costs (relative to historical spending on RLP outcome area):** Low; limited capital cost requirement for proposed actions, cost driven by salaries for extension/field staff and on-costs. Will be lower due to existing MW SFMP incentives programs and CMA programs **Qualitative assessment notes:** ▪ Melbourne Water has established strong partnerships with Yarra Ranges Council, Agribusiness Yarra Valley, Berries Australia (Strawberry Industry Development Officer), Nursery and Garden Industry VIC (Industry Policy Officer) and Yarra Valley Wine Growers Association through the delivery of current and past programs. Melbourne Water also have a long history working with the Landcare networks (Yarra Ranges, Northern Yarra, Gnangara), the Yarra 4 Life project, Landcare groups and landholders in this location. Some connections exist with the nursery and cut flower industry but no history of collaborative project delivery.	
Werribee	1. Increase groundcover to reduce erosion risk 2. Increase soil organic carbon and promote a circular economy through resource recovery 3. Reduce the impacts of water quality	**Focus industry:** Vegetables **Practices that cause threat:** ▪ Bare fallow between (in space and time) commercial crops **Other threatening processes:**	▪ Cover cropping on fallow areas ▪ Reduced tillage ▪ Use soil ameliorants (e.g. compost) ▪ Use soil testing and emerging decision support tools (e.g. QUT compost calculator) to inform soil	2	*Source: expert opinion (workshop, 2, NRM Action Plan; targeted follow up)* ▪ **Effectiveness of management actions:** High; agriculture industry best practice guidance with strong evidence base (EnviroVeg/Hort 360) ▪ **Time lags until benefits are realised:** Within 5 years; links to certification/QA schemes, reducing input costs could fast-track uptake, dependent on complexity of proposed action - cover cropping shorter-term, diversification of business model longer-term ▪ **Can works be 'scaled up':** Yes; can be applied on-farm in priority catchment locations (landscape scale) - dependent on existing landholder engagement through MW incentives programs and CMA programs	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
	constraints on crop and soil health 4. Increase on-farm native vegetation as insectaries (functional biodiversity) to support biological control of insect pests and reduce damage to vegetable crops 5. Increase capacity to plan and implement change to business models to respond to urbanisation pressures	▪ Application of recycled water for irrigation (high salt levels) ▪ Pest and disease incursions ▪ Urbanisation – expansion of the regional growth boundary ▪ Climate change - annual horticulture; extreme heat, intense rainfall events, reduced average rainfall	nutrient management (e.g. calcium thiosulfate, gypsum) ▪ Shandy recycled water with other sources (e.g. river, potable, storm) ▪ Native vegetation insectaries (functional biodiversity) ▪ Investigate the feasibility of business model changes to manage the pressures of urbanisation (e.g. diversification, use of multiple farm locations, niche products, alternative production systems)		▪ **Condition trajectory**: Stable; Deakin University Land Suitability Assessment show that this agricultural land has >80% versatility under a climate projection scenario in 2050 ▪ **Technical feasibility:** High; agriculture industry best practice guidance, diversification of business model less feasible due to complexity and capital cost required for private business to implement ▪ **Likelihood of adoption:** Low; proposed actions are incorporated into agriculture industry best practice guidelines and adopted by private landholders in some instances, diversification of business model has a lower likelihood of adoption due to complexity and capital cost required, adoption will be lower due to limited existing landholder engagement (i.e., no MW licensing function, limited MW incentives programs and CMA programs) ▪ **Cash costs (relative to historical spending on RLP outcome area):** High; limited capital cost requirement for proposed actions, cost driven by salaries for extension/field staff and on-costs. Will be higher due to limited historic engagement and presence in the area **Qualitative assessment notes:** ▪ Melbourne Water has established strong partnerships with agriculture industry groups (AUSVEG) through the delivery of current and past programs. Melbourne Water is currently delivering a project in partnership with AUSVEG in this location focused on the establishment of Native Vegetation Insectaries (functional biodiversity). There is a significant opportunity to build on and expand this work in this focus area.	
Drouin	1. Increase the efficiency and sustainability of fertiliser use on farms to improve soil health	**Focus industry:** Dairy **Practices that cause threat:** ▪ Nutrient application poorly matched to	▪ Soil and fertiliser management ▪ Effluent management systems	2	*Source: expert opinion (workshop, 2, NRM Action Plan; targeted follow up)* ▪ **Effectiveness of management actions:** High; agriculture industry best practice guidance with strong evidence base (Dairying for Tomorrow and DairySAT), based on previous on-ground works (Fert$mart)	Tier 1

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
	2. Increase the use of effluent re-use systems to reduce nutrient run-off and improve water use efficiency on dairy farms	pasture and crop nutrient requirements ▪ Effluent run-off and stock access to waterways and drainage lines **Other threatening processes:** ▪ Limited availability of water for agriculture			▪ **Time lags until benefits are realised:** Within 5 years; links to certification/QA schemes, reducing input costs could fast-track uptake ▪ **Can works be 'scaled up':** Yes; can be applied on-farm in priority catchment locations (landscape scale) - dependent on existing landholder engagement through MW incentives programs and CMA programs ▪ **Condition trajectory**: Stable; Deakin University Land Suitability Assessment show that this agricultural land has >80% versatility under a climate projection scenario in 2050 ▪ **Technical feasibility:** High; agriculture industry best practice guidance ▪ **Likelihood of adoption:** Medium; proposed actions are incorporated into agriculture industry best practice guidelines and adopted by private landholders in some instances, adoption will be moderate due to existing landholder engagement through MW RLP incentives program, but no MW licensing function or existing CMA programs ▪ **Cash costs (relative to historical spending on RLP outcome area):** High; higher capital cost requirement for dairy effluent re-use systems, also additional cost for extension/field staff salaries, with some levels of engagement through MW RLP incentives program **Qualitative assessment notes:** ▪ Melbourne Water has established strong partnerships with agriculture industry groups (Gipps Dairy) through the delivery of current and past programs. Melbourne Water has partnered with GippsDairy to delivery Fert$mart in this location. There is a significant opportunity to build on and expand this work in this focus area.	
Cranbourne	1. Increase groundcover to reduce erosion risk and increase soil organic matter 2. Increase capacity to plan	**Focus industry:** Vegetables **Practices that cause threat:** ▪ Bare fallow between (in space and	▪ Cover cropping on fallow areas ▪ Reduced tillage ▪ Use soil ameliorates (e.g. compost)	2	*Source: expert opinion (workshop, 2, NRM Action Plan; targeted follow up)* ▪ **Effectiveness of management actions:** High; agriculture industry best practice guidance with strong evidence base (EnviroVeg/Hort 360) ▪ **Time lags until benefits are realised:** Within 5 years; links to certification/QA schemes, reducing input costs	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
	and implement change to business models to respond to urbanisation pressures	time) commercial crops **Other threatening processes:** ▪ Urbanisation ▪ Limited availability of water for agriculture	▪ Use alternative water sources for irrigation (e.g. recycled water) ▪ Investigate the feasibility of business model changes to manage the pressures of urbanisation (e.g. diversification, use of multiple farm locations, niche products, alternative production systems)		could fast-track uptake, dependent on complexity of proposed action - cover cropping shorter-term, diversification of business model longer-term ▪ **Can works be 'scaled up':** Yes; can be applied on-farm in priority catchment locations (landscape scale) - dependent on existing landholder engagement through MW incentives programs and CMA programs ▪ **Condition trajectory**: Stable; Deakin University Land Suitability Assessment show that this agricultural land has >80% versatility under a climate projection scenario in 2050 ▪ **Technical feasibility:** High; agriculture industry best practice guidance, diversification of business model less feasible due to complexity and capital cost required for private business to implement ▪ **Likelihood of adoption:** Low; proposed actions are incorporated into agriculture industry best practice guidelines and adopted by private landholders in some instances, diversification of business model has a lower likelihood of adoption due to complexity and capital cost required, adoption will be lower due to limited existing landholder engagement (i.e., no MW licensing function, limited MW incentives programs and CMA programs) ▪ **Cash costs (relative to historical spending on RLP outcome area):** Medium; limited capital cost requirement for proposed actions, cost driven by salaries for extension/field staff and on-costs. Will be moderate due to limited historic engagement and presence in the area **Qualitative assessment notes:** ▪ Melbourne Water has established strong partnerships with agriculture industry groups (AUSVEG) through the delivery of current and past programs. Pressure from urbanisation brings the long-term viability of investing in the vegetable industry in location into question. This is a direct result of the uncertainty related to the location of the urban growth boundary. Vegetable growers are already taking steps to move production out of this focus area. However, opportunities exist to link with other focus areas based on industries to maximise reach and potential impact	

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					against desired outcomes e.g. Mornington Peninsula and Pakenham / Koo Wee Rup.	
Bacchus Marsh	1. Increase groundcover to reduce erosion risk and increase soil organic matter 2. Increase the capacity of perennial horticulturalists to adapt to a change in climate	**Focus industry:** Vegetables, strawberries, turf and orchards **Practices that cause threat:** ▪ Bare fallow between (in space and time) commercial crops **Other threatening processes:** ▪ Limited availability of water for agriculture	▪ Cover cropping on fallow areas ▪ Reduced tillage ▪ Use soil ameliorates (e.g. compost) ▪ Perennial horticulture variety selection and adaptation measures (e.g. protectants, shade netting)	3	*Source: expert opinion (workshop, 2, NRM Action Plan; targeted follow up)* ▪ **Effectiveness of management actions:** Medium; agriculture industry best practice guidance with strong evidence base (EnviroVeg/Hort 360), climate change impacts long-term viability of agricultural land in this location and therefore the effectiveness of actions to protect it ▪ **Time lags until benefits are realised:** Within 5 years; links to certification/QA schemes, reducing input costs could fast-track uptake ▪ **Can works be 'scaled up':** Yes; can be applied on-farm in priority catchment locations (landscape scale) - dependent on existing landholder engagement through MW incentives programs and CMA programs ▪ **Condition trajectory**: Declining; Deakin University Land Suitability Assessment show that this agricultural land is 'temporarily not suitable or 'permanently not suitable' under a climate projection scenario in 2050 ▪ **Technical feasibility:** High; agriculture industry best practice guidance ▪ **Likelihood of adoption:** Low; proposed actions are incorporated into agriculture industry best practice guidelines and adopted by private landholders in some instances, adoption will be lower due to limited existing landholder engagement (i.e., no MW licensing function, limited MW incentives programs and CMA programs) ▪ **Cash costs (relative to historical spending on RLP outcome area):** High; limited capital cost requirement for proposed actions, cost driven by salaries for extension/field staff and on-costs. Will be higher due to limited historic engagement and presence in the area **Qualitative assessment notes:** ▪ This focus area has limited versatility under 2050 climate projections (Access 1.0 – RCP 8.5) and its suitability for agriculture is likely to be significantly	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					impacted in the future, especially if the availability of water for agriculture becomes limited. Melbourne Water has established strong partnerships with agriculture industry groups (AUSVEG). However, there are no projects being delivered in this focus area currently.	
Pakenham / Koo Wee Rup	1. Increase groundcover to reduce erosion risk and increase soil organic matter	**Focus industry:** Vegetables, grazing (beef cattle) **Practices that cause threat:** ▪ Bare fallow between (in space and time) commercial crops **Other threatening processes:** ▪ Limited availability of water for agriculture	▪ Cover cropping on fallow areas ▪ Reduced tillage ▪ Use soil ameliorates (e.g. compost) ▪ Use alternative water sources for irrigation (e.g. recycled water) ▪ Pasture management ▪ Grazing management	3	*Source: expert opinion (workshop, 2, NRM Action Plan; targeted follow up)* ▪ **Effectiveness of management actions:** High; agriculture industry best practice guidance with strong evidence base (EnviroVeg/Hort 360), climate change impacts long-term viability of agricultural land in this location and therefore the effectiveness of actions to protect it ▪ **Time lags until benefits are realised:** Within 5 years; links to certification/QA schemes, reducing input costs could fast-track uptake ▪ **Can works be 'scaled up':** Yes; can be applied on-farm in priority catchment locations (landscape scale) - dependent on existing landholder engagement through MW incentives programs and CMA programs ▪ **Condition trajectory**: Declining; Deakin University Land Suitability Assessment show that this agricultural land is 'temporarily not suitable or 'permanently not suitable' under a climate projection scenario in 2050 ▪ **Technical feasibility:** High; agriculture industry best practice guidance ▪ **Likelihood of adoption:** Low; proposed actions are incorporated into agriculture industry best practice guidelines and adopted by private landholders in some instances, adoption will be lower due to limited existing landholder engagement (i.e., no MW licensing function, limited MW incentives programs and CMA programs) ▪ **Cash costs (relative to historical spending on RLP outcome area): Medium**; limited capital cost requirement for proposed actions, cost driven by salaries for extension/field staff and on-costs. Will be moderate due to limited historic engagement and presence in the area	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					Qualitative assessment notes: ▪ This focus area has limited versatility under 2050 climate projections (Access 1.0 – RCP 8.5) and its suitability for agriculture is likely to be significantly impacted in the future, especially if the availability of water for agriculture becomes limited. Melbourne Water has established strong partnerships with agriculture industry groups (AUSVEG) through the delivery of current and past programs. Melbourne Water also have a long history working with the Westernport Catchment Landcare Network who have strong links with grazing industry in this location. The Westernport Catchment Landcare Network is currently delivering a project in partnership with Melbourne Water, South Gippsland Landcare Network, Bass Coast Landcare Network, Latrobe Catchment Network and Mornington Peninsula Shire in this location focused on the links between soil health, farm productivity and profitability. Opportunities exist to link with other focus areas based on industries to maximise reach and potential impact against desired outcomes e.g. Mornington Peninsula and Cranbourne.	
Priority soils	1. Increase groundcover to reduce erosion risk 2. Increase soil organic carbon and promote a circular economy through resource recovery	▪ Declining carbon stocks under current land management	▪ Pasture management ▪ Grazing management ▪ Cover cropping ▪ Use soil ameliorants (e.g. lime, gypsum, nutrients, compost, manure, biosolids) ▪ Reduced tillage ▪ Stubble retention	3	*Source: expert opinion (workshop, 2, NRM Action Plan; targeted follow up)* ▪ **Effectiveness of management actions:** High; evidence based approaches for building soil carbon under different management conditions ▪ **Time lags until benefits are realised:** 5-10 years; time to build soil carbon ▪ **Can works be 'scaled up':** Yes; but more difficult given the dispersed nature of the asset across the region ▪ **Condition trajectory**: Declining; soils classified as 'High potential soils' are soils where carbon stocks are declining under current land management ▪ **Technical feasibility:** High; agriculture industry best practice guidance ▪ **Likelihood of adoption:** Medium; may already be implemented in areas where erosion affects agricultural productivity, with limited adoption elsewhere	Tier 2

PRIORITY ASSET	FIVE YEAR OUTCOME	LIST OF SIGNIFICANT THREATS TO THE ASSET	POTENTIAL MANAGEMENT ACTIONS	COST BENEFIT-SCORE	JUSTIFICATON (COST-BENEFIT SCORE)	QUALITATIVE ASSESSMENT
					▪ **Cash costs (relative to historical spending on RLP outcome area):** High; could be higher cost engaging remaining landholders not covered through existing programs or agriculture industry groups **Qualitative assessment notes:** ▪ The priority soils focus area cuts across all agricultural industries in the Melbourne water catchment. Melbourne Water has established strong partnerships with local government and agriculture industry groups (horticulture, dairy, grazing) through the delivery of current and past programs. Melbourne Water also have a long history working with the Landcare Networks, Landcare groups and landholders across the region. The Westernport Catchment Landcare Network is currently delivering a project in partnership with Melbourne Water, South Gippsland Landcare Network, Bass Coast Landcare Network, Latrobe Catchment Network and Mornington Peninsula Shire focused on the links between soil health, farm productivity and profitability. This project is being delivered in the Drouin, Cranbourne and Pakenham / Koo Wee Rup agriculture focus areas. Opportunities exist to link with other focus areas based on industries to maximise reach and potential impact against desired outcomes.	

Appendix 9: List of additional EPBC listed species that occur in priority areas

Species listed as either endangered or vulnerable under the EPBC Act that also occur within the broad habitat range of the priority threatened species and ecological communities identified in this plan (Figure A9-1). A list of the species and their conservation status is shown in Table A9-1.

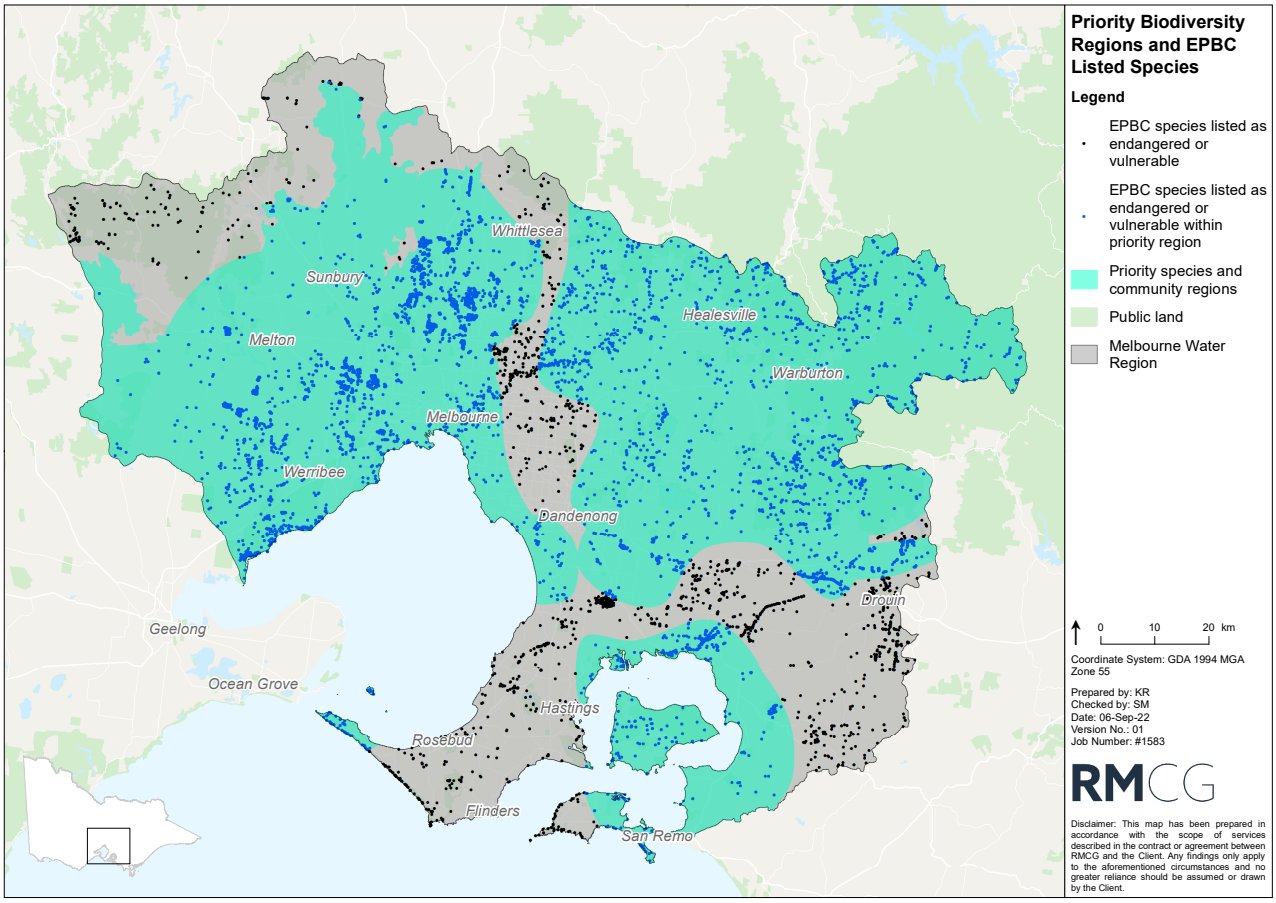


Figure A9-1: EPBC listed species (endangered, vulnerable) that occur within the range of distribution of priority threatened species and threatened ecological communities identified in this plan.

Table A9-1: Flora and fauna listed as endangered and vulnerable recorded within the habitat range of threatened species and ecological communities identified as priorities in this plan

COMMON NAME	SCIENTIFIC NAME	EPBC ACT STATUS
Fauna		
Australian Fairy Tern	*Sternula nereis nereis*	Vulnerable
Australasian Bittern	*Botaurus poiciloptilus*	Endangered
Australian Painted-snipe	*Rostratula australis*	Endangered
Eastern Barred Bandicoot	*Perameles gunnii*	Endangered
Eastern Quoll	*Dasyurus viverrinus*	Endangered
Eltham Copper Butterfly	*Paralucia pyrodiscus lucida*	Endangered
Gang-gang Cockatoo	*Callocephalon fimbriatum*	Endangered
Glenelg Spiny Crayfish	*Euastacus bispinosus*	Endangered
Grassland Earless Dragon	*Tympanocryptis pinguicolla*	Endangered
Leathery Turtle	*Dermochelys coriacea*	Endangered
Lesser Sand Plover	*Charadrius mongolus*	Endangered
Macquarie Perch	*Macquaria australasica*	Endangered
Murray Hardyhead	*Craterocephalus fluviatilis*	Endangered
Red Knot	*Calidris canutus*	Endangered
Sea-lion	*Neophoca cinerea*	Endangered
Shy Albatross	*Thalassarche cauta*	Endangered
Smoky Mouse	*Pseudomys fumeus*	Endangered
Southern Brown Bandicoot	*Isoodon obesulus*	Endangered
Southern Giant-Petrel	*Macronectes giganteus*	Endangered
Spot-tailed Quoll	*Dasyurus maculatus*	Endangered
Subantarctic Fur Seal	*Arctophoca tropicalis*	Endangered
Trout Cod	*Maccullochella macquariensis*	Endangered
Australian Grayling	*Prototroctes maraena*	Vulnerable
Bar-tailed Godwit	*Limosa lapponica*	Vulnerable
Black-browed Albatross	*Thalassarche melanophris*	Vulnerable
Blue Petrel	*Halobaena caerulea*	Vulnerable
Broad-toothed Rat	*Mastacomys fuscus mordicus*	Vulnerable

COMMON NAME	SCIENTIFIC NAME	EPBC ACT STATUS
Dwarf Galaxias	*Galaxiella pusilla*	Vulnerable
Giant Gippsland Earthworm	*Megascolides australis*	Vulnerable
Golden Sun Moth	*Synemon plana*	Vulnerable
Greater Sand Plover	*Charadrius leschenaultii*	Vulnerable
Grey-headed Flying-fox	*Pteropus poliocephalus*	Vulnerable
Growling Grass Frog	*Litoria raniformis*	Vulnerable
Hooded Plover	*Thinornis cucullatus*	Vulnerable
Indian Yellow-nosed Albatross	*Thalassarche carteri*	Vulnerable
Long-nosed Potoroo	*Potorous tridactylus trisulcatus*	Vulnerable
Murray Cod	*Maccullochella peelii*	Vulnerable
New Holland Mouse	*Pseudomys novaehollandiae*	Vulnerable
Northern Giant-Petrel	*Macronectes halli*	Vulnerable
Painted Honeyeater	*Grantiella picta*	Vulnerable
Pilotbird	*Pycnoptilus floccosus*	Vulnerable
Regent Parrot	*Polytelis anthopeplus monarchoides*	Vulnerable
Southern Elephant Seal	*Mirounga leonina*	Vulnerable
Southern Greater Glider	*Petauroides volans*	Vulnerable
Striped Legless Lizard	*Delma impar*	Vulnerable
Superb Parrot	*Polytelis swainsonii*	Vulnerable
Swamp Antechinus	*Antechinus minimus maritimus*	Vulnerable
Wandering Albatross	*Diomedea exulans*	Vulnerable
White-throated Needletail	*Hirundapus caudacutus*	Vulnerable
Yarra Pygmy Perch	*Nannoperca obscura*	Vulnerable
Australian Fairy Tern	*Sternula nereis nereis*	Vulnerable
Australasian Bittern	*Botaurus poiciloptilus*	Endangered
Australian Painted-snipe	*Rostratula australis*	Endangered
Eastern Barred Bandicoot	*Perameles gunnii*	Endangered
Eastern Quoll	*Dasyurus viverrinus*	Endangered
Eltham Copper Butterfly	*Paralucia pyrodiscus lucida*	Endangered
Gang-gang Cockatoo	*Callocephalon fimbriatum*	Endangered

COMMON NAME	SCIENTIFIC NAME	EPBC ACT STATUS
Glenelg Spiny Crayfish	*Euastacus bispinosus*	Endangered
Grassland Earless Dragon	*Tympanocryptis pinguicolla*	Endangered
Leathery Turtle	*Dermochelys coriacea*	Endangered
Lesser Sand Plover	*Charadrius mongolus*	Endangered
Macquarie Perch	*Macquaria australasica*	Endangered
Murray Hardyhead	*Craterocephalus fluviatilis*	Endangered
Red Knot	*Calidris canutus*	Endangered
Sea-lion	*Neophoca cinerea*	Endangered
Shy Albatross	*Thalassarche cauta*	Endangered
Smoky Mouse	*Pseudomys fumeus*	Endangered
Southern Brown Bandicoot	*Isoodon obesulus*	Endangered
Southern Giant-Petrel	*Macronectes giganteus*	Endangered
Spot-tailed Quoll	*Dasyurus maculatus*	Endangered
Subantarctic Fur Seal	*Arctophoca tropicalis*	Endangered
Trout Cod	*Maccullochella macquariensis*	Endangered
Australian Grayling	*Prototroctes maraena*	Vulnerable
Bar-tailed Godwit	*Limosa lapponica*	Vulnerable
Black-browed Albatross	*Thalassarche melanophris*	Vulnerable
Blue Petrel	*Halobaena caerulea*	Vulnerable
Broad-toothed Rat	*Mastacomys fuscus mordicus*	Vulnerable
Dwarf Galaxias	*Galaxiella pusilla*	Vulnerable
Giant Gippsland Earthworm	*Megascolides australis*	Vulnerable
Golden Sun Moth	*Synemon plana*	Vulnerable
Greater Sand Plover	*Charadrius leschenaultii*	Vulnerable
Grey-headed Flying-fox	*Pteropus poliocephalus*	Vulnerable
Growling Grass Frog	*Litoria raniformis*	Vulnerable
Hooded Plover	*Thinornis cucullatus*	Vulnerable
Indian Yellow-nosed Albatross	*Thalassarche carteri*	Vulnerable
Long-nosed Potoroo	*Potorous tridactylus trisulcatus*	Vulnerable
Murray Cod	*Maccullochella peelii*	Vulnerable

COMMON NAME	SCIENTIFIC NAME	EPBC ACT STATUS
New Holland Mouse	*Pseudomys novaehollandiae*	Vulnerable
Northern Giant-Petrel	*Macronectes halli*	Vulnerable
Painted Honeyeater	*Grantiella picta*	Vulnerable
Pilotbird	*Pycnoptilus floccosus*	Vulnerable
Regent Parrot	*Polytelis anthopeplus monarchoides*	Vulnerable
Southern Elephant Seal	*Mirounga leonina*	Vulnerable
Southern Greater Glider	*Petauroides volans*	Vulnerable
Striped Legless Lizard	*Delma impar*	Vulnerable
Superb Parrot	*Polytelis swainsonii*	Vulnerable
Swamp Antechinus	*Antechinus minimus maritimus*	Vulnerable
Wandering Albatross	*Diomedea exulans*	Vulnerable
White-throated Needletail	*Hirundapus caudacutus*	Vulnerable
Yarra Pygmy Perch	*Nannoperca obscura*	Vulnerable
Flora		
Basalt Peppercress	*Lepidium hyssopifolium s.s.*	Endangered
Button Wrinklewort	*Rutidosis leptorhynchoides*	Endangered
Buxton Gum	*Eucalyptus crenulata*	Endangered
Camden Woollybutt	*Eucalyptus macarthurii*	Endangered
Matted Flax-lily	*Dianella amoena*	Endangered
White Sunray	*Leucochrysum albicans subsp. tricolor*	Endangered
Ben Major Grevillea	*Grevillea floripendula*	Vulnerable
Bog Willow-herb	*Epilobium brunnescens subsp. beaugleholei*	Vulnerable
Chef's Cap Correa	*Correa baeuerlenii*	Vulnerable
Clover Glycine	*Glycine latrobeana*	Vulnerable
French Island Spider-orchid	*Caladenia insularis*	Vulnerable
Green-striped Greenhood	*Pterostylis chlorogramma*	Vulnerable
Large-headed Fireweed	*Senecio macrocarpus*	Vulnerable
Leafy Greenhood	*Pterostylis cucullata*	Vulnerable
Magenta Cherry	*Syzygium paniculatum*	Vulnerable

COMMON NAME	SCIENTIFIC NAME	EPBC ACT STATUS
Ornate Pink-fingers	*Caladenia ornata*	Vulnerable
River Swamp Wallaby-grass	*Amphibromus fluitans*	Vulnerable
Shiny Nematolepis	*Nematolepis wilsonii*	Vulnerable
Strzelecki Gum	*Eucalyptus strzeleckii*	Vulnerable
Swamp Everlasting	*Xerochrysum palustre*	Vulnerable
Swamp Fireweed	*Senecio psilocarpus*	Vulnerable
Tall Astelia	*Astelia australiana*	Vulnerable

Appendix 10: EPBC listed species (endangered and vulnerable) that occur within the habitat range of Orange-bellied Parrot

A suite of EPBC listed species with a conservation status of endangered and vulnerable are known to occur within the habitat range of Orange-bellied Parrot (*Neophema chrysogaster*) (Figure A10-1).

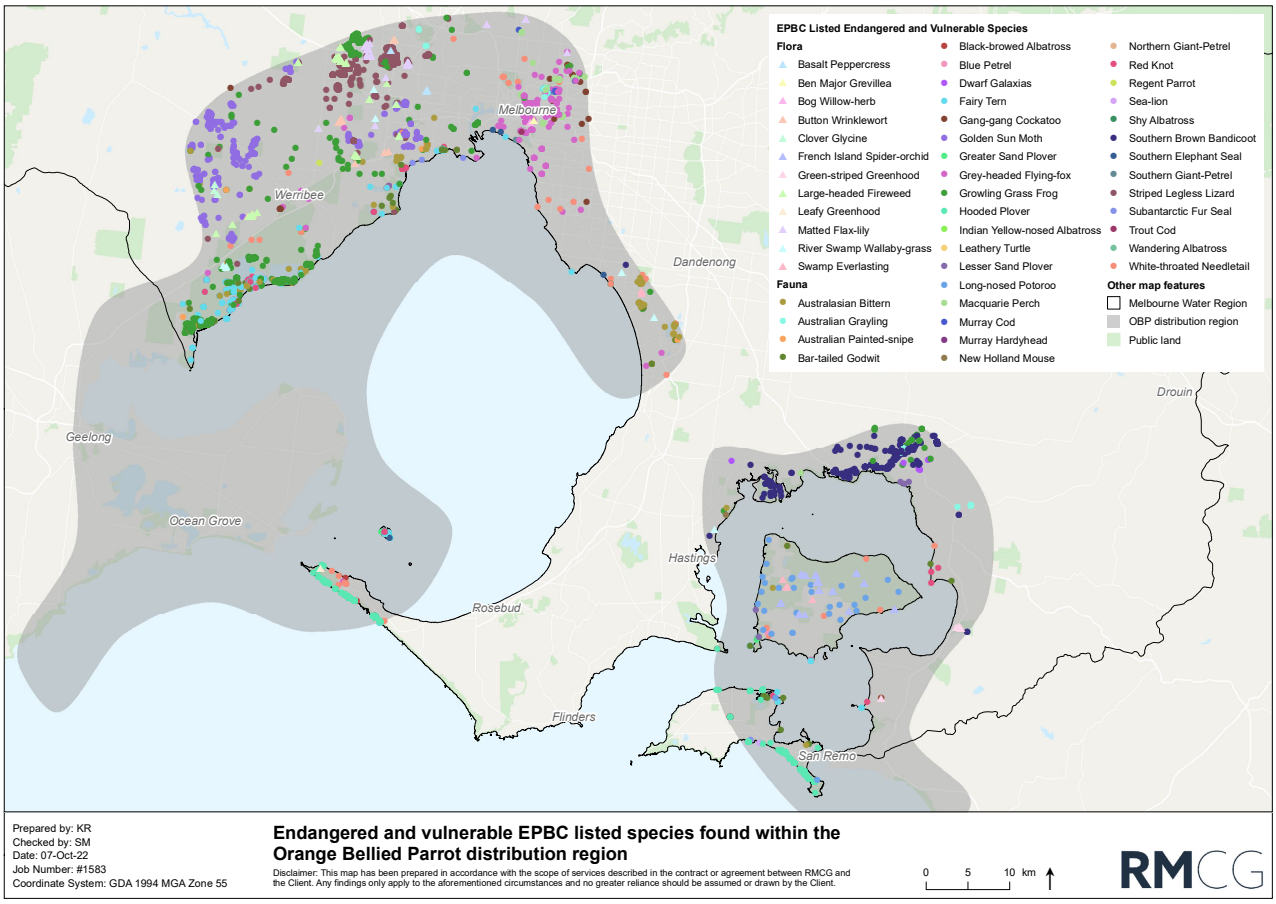


Figure A10-1: EPBC listed species (endangered and vulnerable) that occur within the habitat range of Orange-bellied Parrot (Neophema chrysogaster), a priority threatened species identified in this plan.

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