

Conservation Action Plan:
**Western Port and
South-east Melbourne**
parks and reserves managed by Parks Victoria



September 2021

Authorised and published by Parks Victoria

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This plan is prepared without prejudice to any negotiated or litigated outcome of any native title determination applications covering land or waters within the plan's area. It is acknowledged that any future outcomes of native title determination applications may necessitate amendment of this plan; and the implementation of this plan may require further notifications under the procedures in Division 3 of Part 2 of the *Native Title Act 1993* (Cwlth).

The plan is also prepared without prejudice to any future negotiated outcomes between the Government/s and Traditional Owner Communities. It is acknowledged that such negotiated outcomes may necessitate amendment of this plan.

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Cover: Point Nepean National Park (Genevieve Matthews)

Foreword

Parks Victoria recognises the diversity of cultures, deep connections, rights and responsibilities that Traditional Owners have over the lands and waters covered by the Western Port and South-east Melbourne Conservation Action Plan. We recognise that the ancient landscape we see today has been modified over many thousands of years of occupation and influenced by the skills, knowledge and activities of generations of Aboriginal land managers. We also acknowledge the impacts of more recent land use and the impacts that introduced threats, climate change and urbanisation continue to have on this unique cultural landscape. The plan is a starting place for conversations with Traditional Owners on the importance of the nature and wildlife of this Country.

Parks Victoria acknowledges, respects and works closely with Traditional Owners and other Aboriginal communities and organisations across Victoria. We pay our respects to Elders past and present, and to emerging Aboriginal leaders.

The Western Port and South-east Melbourne Conservation Action Plan focuses primarily on the first of Parks Victoria's three strategic themes:

- Caring for Country
- Connecting People and Nature
- Contributing to Healthy, Livable Communities.

The goal for Caring for Country is to sustainably manage, protect and conserve Victoria's natural and cultural landscapes. It is our primary responsibility to ensure parks are healthy and resilient for current and future generations.

It is guided by *Protecting Victoria's Environment – Biodiversity 2037*, Victoria's plan to stop the decline of our native plants and animals. It is also guided by the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) and the *Flora and Fauna Guarantee Act 1988* (Vic.), which are the key pieces of Commonwealth and State legislation for the conservation of significant places, species and communities, and for the management of ecologically threatening processes.

The impacts of climate change, and the uncertainty it brings, will be considered in all conservation decisions and will significantly influence what can be achieved. The plan outlines Parks Victoria's understanding of the major threats to nature and wildlife in this ancient and unique cultural landscape, the impact of a changing climate, and the potential actions that we can take together with Traditional Owners and other partners in caring for and improving the health of the Western Port and South-east Melbourne Parks Landscape.



Matthew Jackson
Chief Executive Officer
Parks Victoria



Red gum woodland,
Braeside Park

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Nudibranchs,
San Remo



Growling Grass Frog

Summary

The Western Port and South-east Melbourne Parks Landscape encompasses marine and terrestrial values set within, and to the south-eastern periphery of, metropolitan Melbourne. In managing these areas protecting significant conservation and biodiversity values of the landscape is balanced with visitation and recreational opportunities, and community safety objectives. The proximity of the landscape to the demographic centre of Melbourne means that the Parks Landscape has an important role for Parks Victoria's strategic theme of 'connecting people with parks'.

Although this Parks Landscape is one of the smallest, it encompasses a large number of ecosystems in varied degrees of condition and integrity. The Parks Landscape is a network of fragmented small to medium sized conservation areas but also includes larger areas such as Point Nepean and the relatively intact French Island national parks.

This Conservation Action Plan defines and prioritises conservation strategies for the Western Port and South-east Melbourne Parks Landscape for the period to 2026, and broadly describes the expected outcomes of these strategies. The plan outlines what can be realistically achieved to tackle the threats that pose the most risk to conservation assets. The Conservation Action Plan will direct the achievement of the conservation vision:

The resilience of natural assets in the Western Port and South-east Melbourne Parks Landscape is increased and ecosystem services are maintained in the face of climate change and other stressors

Parks Victoria is responsible for managing over four million hectares of Victoria's most intact natural habitats, and recognises the critical importance of working with Australia's First Peoples to manage parks and reserves in a culturally sensitive and ecologically sympathetic way. Parks Victoria appreciates the importance of long-term, respectful and meaningful partnerships with Traditional Owners, the opportunity to understand, share and celebrate Aboriginal cultural values, and the need for greater accountability and responsibility for managing risks to Aboriginal cultural heritage. Parks Victoria's Managing Country Together Framework outlines a robust agency-wide approach that provides a strong foundation for partnerships to grow and evolve, and become integrated into the way the organisation works.

The development, implementation and review of the plan follows Parks Victoria's cyclical 10-step conservation action planning and adaptive management process. The plan describes the first seven steps in this process, which includes scoping, identifying conservation assets and their condition, assessing threats to asset condition, developing strategies and actions to mitigate them, and articulating performance measures.

Four terrestrial, and seven coastal and marine conservation assets have been identified in the Western Port and South-east Melbourne Parks Landscape. Within each of these assets a range of nested assets, such as threatened species and important ecological assemblages, have also been identified.

The plan also identifies a range of key ecological attributes (components that are believed to best reflect the health of the asset). The plan describes their current condition (very good, good, fair, poor) and the trend in condition (improving, stable, declining), and sets the anticipated future condition of each key ecological attribute. These measures then allow the overall condition of each asset to be assessed:

- Heathland; Saltmarsh and Mangrove; Intertidal Reef; Soft Sediment (mudflats); Subtidal Reef; Seagrass are in good condition.
- Coastal; Dry Forest and Woodland; Riverine Forest and Woodland; Wetland and Waterbodies; Water Column (pelagic) are in fair condition.

The trends in condition are mostly declining/stable, except in Heathlands, Wetland and Waterbodies, and Water Column conservation assets, which are improving. The desired future status of the majority of assets is good to very good, but is dependent on the implementation of all the listed strategies.

Thirteen key threats to the conservation assets in the Parks Landscape are identified in the plan. In assessing risks, the compounding effects of climate change have been considered. Seven of these threats are considered to pose extreme or high risk and are therefore the priority threats considered in this plan. They are:

- Inappropriate fire regimes and management
- Poor water quality inputs (freshwater and marine) and altered hydrology
- Weed invasion
- Terrestrial grazing, browsing and trampling
- Terrestrial predation
- Marine predation/competition
- Habitat degradation/loss (encroaching urbanisation and visitor impacts)

The ability of species and ecosystems to persist in a changing climate will be determined by their capacity to adapt to those changes. Some conservation assets and the nested assets within them will be more resilient than others and be better able to withstand the impacts of climate change. Conservation strategies have been developed to build resilience within natural systems by mitigating threats and stressors to improve the assets' capacity to adapt. Coastal and freshwater aquatic ecosystems are particularly vulnerable to the impacts of climate change, and specific adaptation strategies have been designed to facilitate the movement of vegetation communities and/or support their transition into functional ecosystems of altered compositions.

The following conservation strategies will be undertaken to tackle these threats. They have been selected for their impact, feasibility and cost in achieving the desired conservation outcome.

- **Fire management for ecological health** – incorporate ecological fire objectives into strategic fire plans to increase floristic diversity in key areas, particularly in the Heathland conservation asset.
- **Supporting partnerships to address threats to water-dependent assets** – communicate human impacts on water quality and hydrology to reduce pollutant input and improve flows to marine and freshwater ecosystems, and allow for landward retreat of saltmarsh and mangrove as sea levels rise.
- **Environmental weed control using a biosecurity approach** – contain high risk species in high value parks, prioritising new and emergent species not yet established. Eradicate new and emerging weed species to prevent their establishment in the landscape.
- **Terrestrial herbivore management** – implement targeted control of rabbits, goats, pigs, stock, deer and overabundant native fauna at priority sites for threatened vegetation, integrating available methods of control to achieve acceptable densities.
- **Sustained control and monitoring of introduced terrestrial predators to support native fauna populations** – implement targeted control of foxes and cats at priority and potential future sites for threatened and migratory fauna. Where feasible, undertake eradication of target species on island habitats and monitor for re-incursions.
- **Managing marine pests for healthy marine protected areas** – implement targeted marine pest monitoring, seek to prevent new incursions through communication and partnerships and seek to control new incursions in parks where feasible.
- **Reducing the impacts of recreation, illegal activities and resource extraction on natural values** – identify and promote visitation to areas of low conservation value, maximise PV involvement in decision making in adjacent land planning and undertake communication and compliance activities to promote sustainable resource extraction.

For each strategy, a results chain has been developed to help guide implementation and identify monitoring indicators. These chains test the ability of Parks Victoria management to achieve the conservation outcomes defined for each of the assets.

This particular version of the Western Port and South-east Melbourne Parks Landscape Conservation Action Plan may be revised before its scheduled review period to integrate traditional ecological knowledge and input from Traditional Owners, and to further capture their role in managing this highly biodiverse and culturally significant landscape in future conservation strategies. It may also be reviewed in the event of a landscape scale perturbation such as bushfire.



Sunset over Quail Island

1 Background

1.1 Adaptive management

Conservation action planning is an important component of Parks Victoria’s approach to adaptive management and evidence-based decision making. It uses a collaborative approach to identify conservation priorities and develop strategies to address those priorities. These strategies are designed to achieve defined and measurable conservation outcomes.

Through conservation action planning, Parks Victoria identifies and focuses on strategies that target clearly defined elements of the natural environment (conservation assets) for which threats have been identified and for which the success of strategies can be measured. Understanding how to best use the resources available for conservation to achieve the greatest improvement in the overall health of ecosystems is a complex challenge for land managers.

Conservation experience, scientific understanding, local environmental knowledge, traditional ecological knowledge, and strategic thinking are all key components of successful conservation action planning.

Conservation strategies have been developed and prioritised using the best available knowledge and will enable specific operational activities to be implemented, monitored for success, and further refined. The plan complements existing park management plans, and may be used to guide the development of future joint management plans. Conservation strategies detailed in park management plans have been reviewed during the conservation action planning process, and updated for inclusion where relevant.

The plan’s purpose is to guide the management of conservation values and to articulate Parks Victoria’s conservation priorities and strategies to stakeholders, land management partners and the public.

1.2 Parks landscapes

Parks landscapes are classified according to a combination of ecological attributes, landforms and administrative boundaries. There are 18 parks landscapes across Victoria (Figure 1.1). They form a logical unit for applying conservation action planning and delivering specific operational activities to parks and reserves in these landscapes.

1.3 Planning method

Parks Victoria is using the conservation action planning methodology developed by The Nature Conservancy. This methodology is based on the Open Standards for the Practice of Conservation developed by Conservation Measures Partnership, an international partnership of conservation organisations (CMP 2020).

Parks Victoria’s approach to conservation action planning is suitable for planning conservation projects with joint management partners, in partnership with all stakeholders, for land that it manages. It is consistent with the approach used by numerous other agencies in Victoria managing conservation lands.

The emphasis is on identifying strategies that tackle the high-risk threats to priority conservation assets and their key ecological attributes, and that will contribute most to achieving the best conservation outcomes that can be expected, taking into account the vulnerabilities of conservation assets to climate change. The impacts of climate change on threatening processes, and adaptation measures to mitigate them, are considered in the planning process.

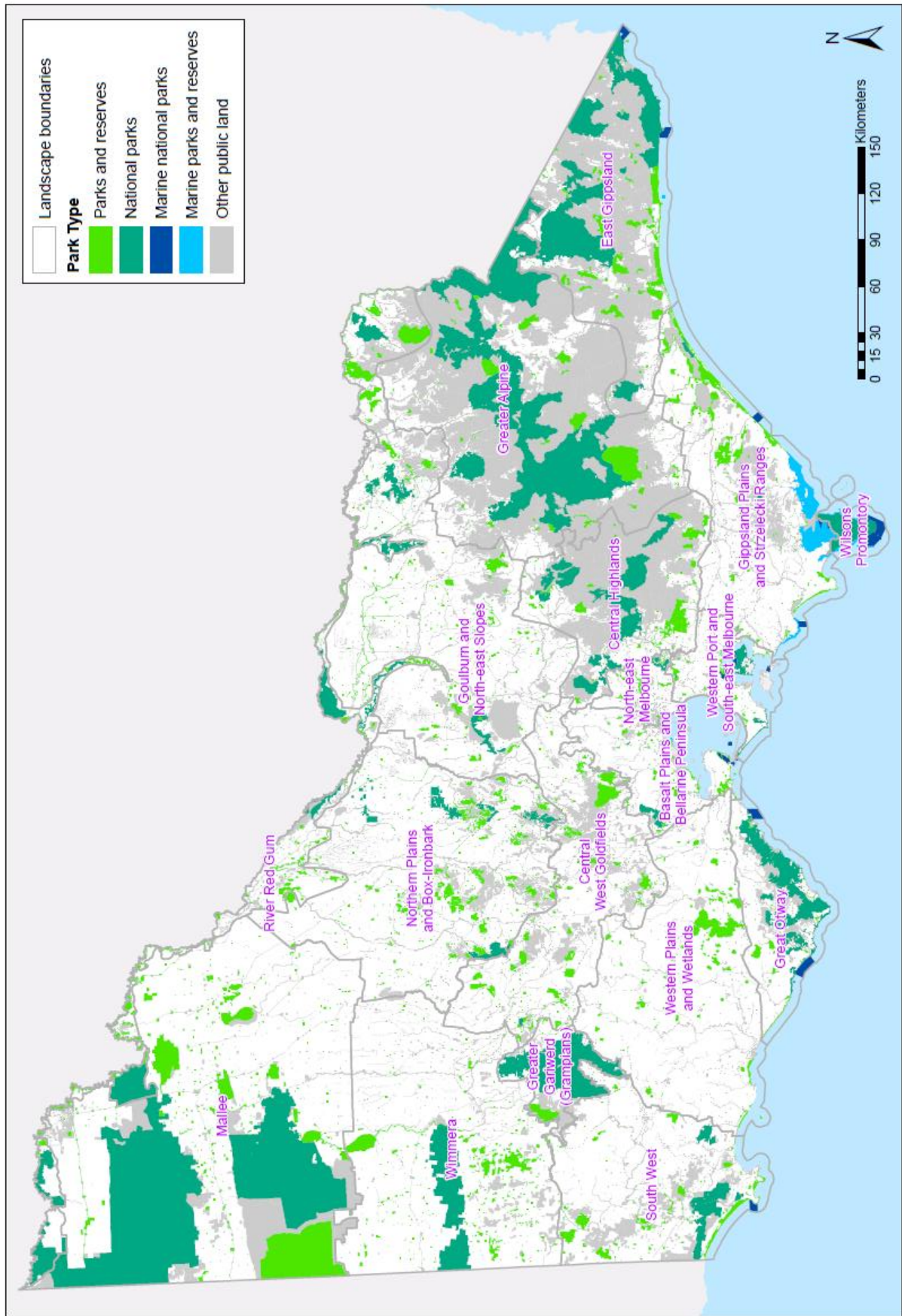


Figure 1.1 Parks Victoria's Parks Landscapes

Parks Victoria’s conservation action planning process involves a series of conservation action planning workshops, with participants from Parks Victoria and other organisations, and follows 10 sequential steps (Figure 1.2):

- Scope planning, people and resources.
- Identify conservation assets.
- Assess the viability of conservation assets and set conservation outcomes.
- Identify and assess threats to conservation outcomes.
- Develop action options from situational analysis.
- Prioritise conservation strategies.
- Set performance measures
- Plan work.
- Implement operational plans.
- Evaluate and adapt the conservation action plan and operational activities.

This Conservation Action Plan is an output of steps 1 to 7, and will provide directions for environmental conservation management for the next 15 years. The implementation of the conservation strategies (steps 8 and 9) is undertaken by regional staff at the operational level.

After 5 years the plan will be reviewed (step 10), and progress will be evaluated against outcomes identified for the conservation assets, threat mitigation objectives and implementation of identified priority actions, in order to revise the plan.

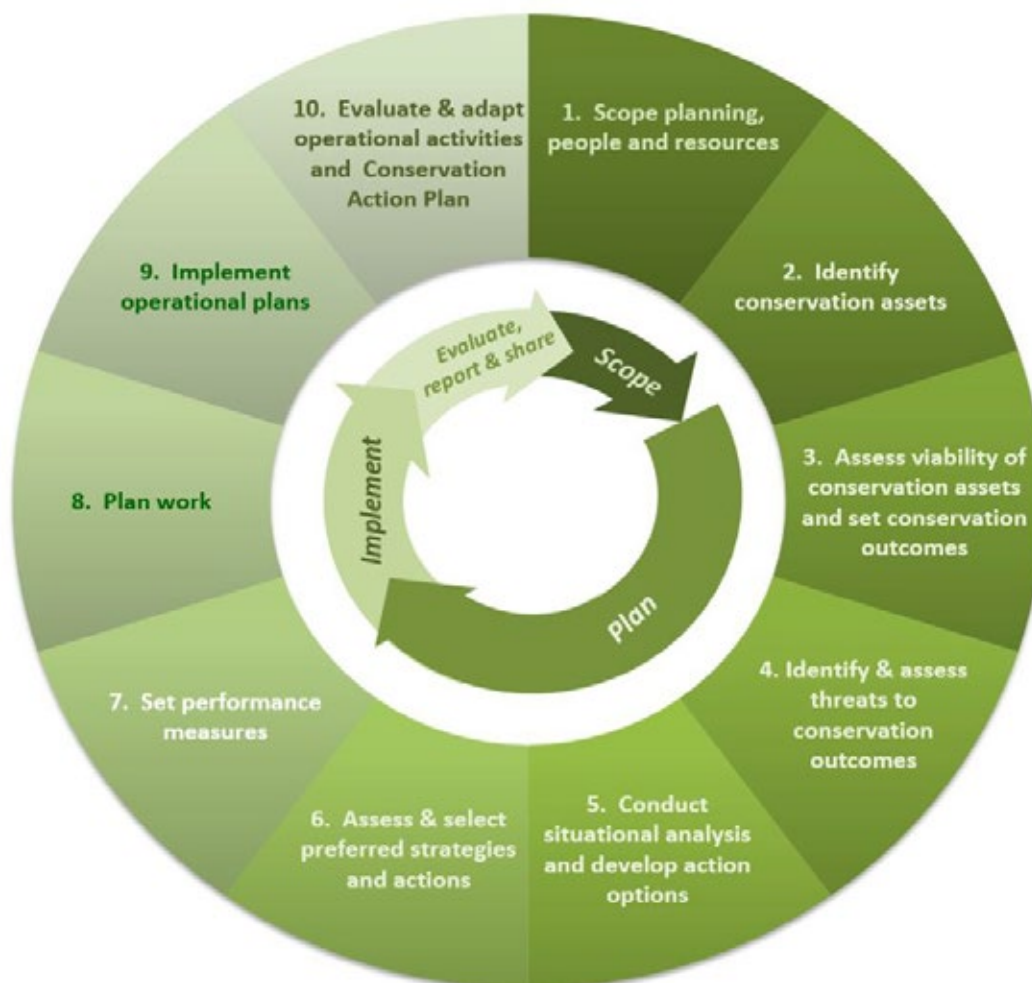


Figure 1.2 The 10-step conservation action planning process



Sulphur-crested Cockatoo,
Braeside Park

2 Scope

2.1 Geographic scope

Each of the three parks landscapes with Greater Melbourne at their centre have a high level of social complexity, diversity and a degree of fragmentation. For these reasons, the Western Port and South-east Melbourne; North-east Melbourne; and Basalt Plains and Bellarine Peninsula Parks Landscapes are smaller than the other parks landscapes (Fig. 1.1).

This Plan is for the Western Port and South-east Melbourne Parks Landscape. The landscape conforms closely to the Parks Victoria South-east Melbourne District, but also includes the marine protected areas associated with Western Port, and terrestrial reserves on the eastern shoreline of Western Port. It does not include the waters of Western Port or Port Phillip Bay outside the marine protected areas, or Philip Island Nature Park. Below the high tide mark, the Western Port and South-east Melbourne Parks Landscape incorporates four marine protected areas. Notable parks and reserves include:

Park/reserve name	Area (hectares)	IUCN Protected Areas Category
French Island National Park	10 326	2 - National Park
Mornington Peninsula National Park	2686	2 - National Park
Point Nepean National Park	543	2 - National Park
North Western Port Nature Conservation Reserve	2077	1a - Strict Nature Reserve
Lysterfield Park	1435	Not an IUCN protected area
Langwarrin Flora and Fauna Reserve	216	1a - Strict Nature Reserve
Arthurs Seat State Park	566	3 - Natural Monument or Feature
Churchill National Park	272	3 - Natural Monument or Feature
Devilbend Natural Features Reserve	1006	4 - Habitat/Species Management Area
Braeside Park	310	Not an IUCN protected area
French Island Marine National Park	2980	2 - National Park
Yaringa Marine National Park	777	2 - National Park
Churchill Island Marine National Park	670	2 - National Park
Mushroom Reef Marine Sanctuary	57	3 - Natural Monument or Feature

2.2 Significant natural values

The natural values of significance identified in this Parks Landscape are:

- One area listed under the Ramsar Convention on Wetlands to protect habitat for migratory birds (Western Port).
- Five vegetation communities of State significance (listed under the *Flora and Fauna Guarantee Act 1988* (Vic.) (FFG Act)).
- One fauna community of State significance, the San Remo community (listed under the FFG Act).
- Twenty-eight wetlands of national or State significance.
- Current occurrence of five nationally critically endangered flora and fauna species, and 46 nationally endangered or vulnerable flora and fauna species. Eighty-two flora and fauna species that currently occur in the Parks Landscape are listed under the FFG Act.

- Forty-six species listed under international conventions (JAMBA, CAMBA, ROKAMBA and Bonn) – including the Killer Whale, Southern Right Whale, Humpback Whale, and 43 migratory bird species.

The Victorian Biodiversity Atlas includes records of more than 2850 species from the Western Port and South-east Melbourne Parks Landscape, including:

- 2074 plants and algae
- 92 mammals
- 283 birds
- 23 amphibians
- 40 reptiles
- 118 fish
- 18 insects

Commonly used terms and abbreviations

Bonn Convention	<i>The Convention on the Conservation of Migratory Species of Wild Animals</i> is an international agreement that aims to conserve migratory species within their migratory range
CAMBA	China-Australia Migratory Bird Agreement
CMA	Catchment Management Authority (this landscape is within the Port Phillip and Western Port Catchment)
DELWP	Victorian Department of Environment, Land, Water and Planning
EPBC	The <i>Environment Protection and Biodiversity Conservation Act 1999</i> , under which threatened species, communities and locations can be listed for protection. Administered by the Federal Department of the Environment and Energy.
EVC	An Ecological Vegetation Class, a vegetation classification system based on floristic species composition, structural features, and ecological traits of the community
FFG	The Victorian <i>Flora and Fauna Guarantee Act 1988</i> , under which threatened species and communities can be listed for protection against potentially threatening processes.
IUCN	International Union for the Conservation of Nature

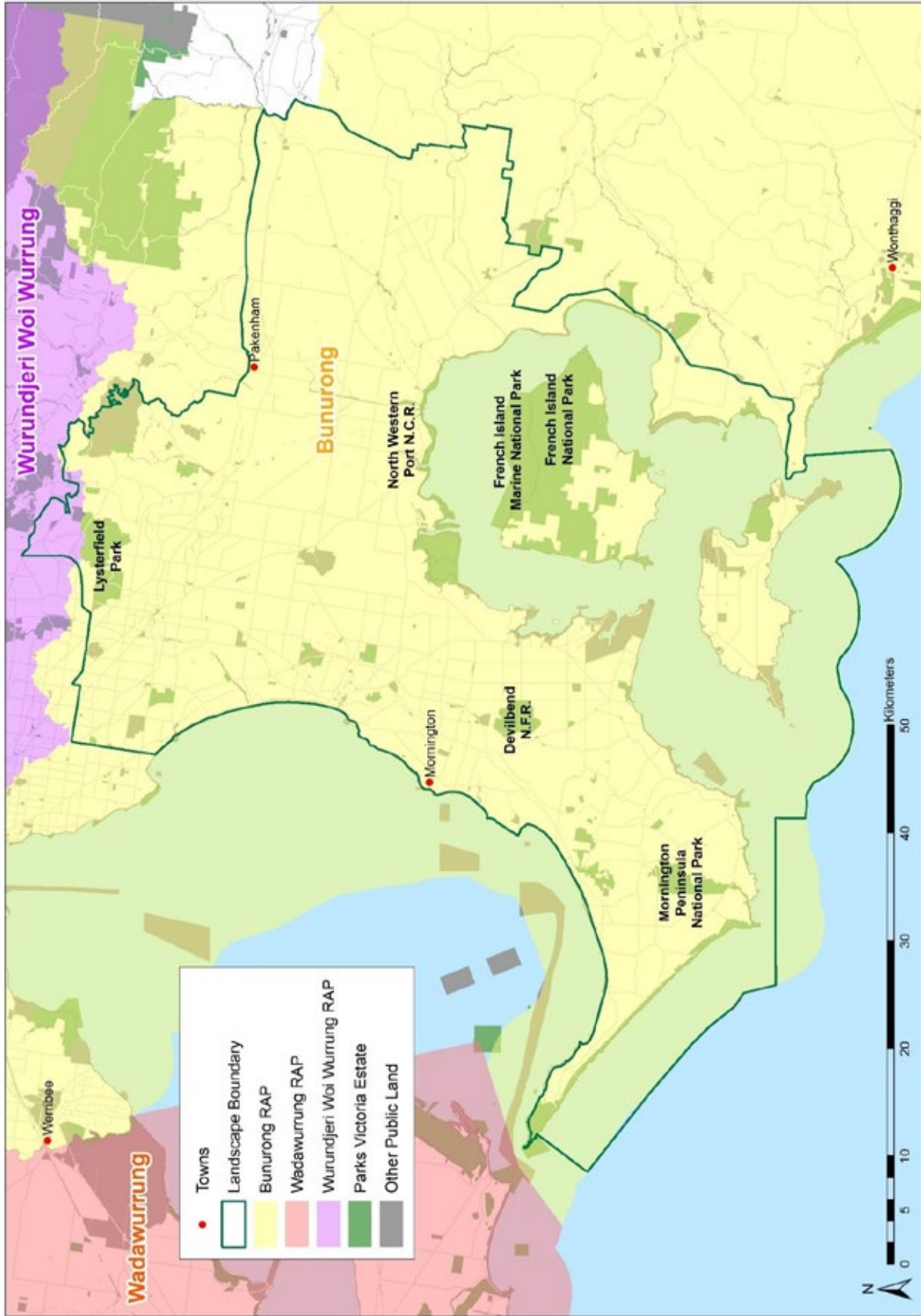


Figure 2.1 Geographic scope of conservation planning for the Western Port and South-east Melbourne Parks Landscape, showing Registered Aboriginal Party (RAP) boundaries

2.3 Cultural significance

Aboriginal People have lived in the planning area referred to here as the Western Port and South-east Melbourne Parks Landscape for many thousands of years. During this time, they maintained complex societies with languages, kinship systems, laws and customs.

Land forms the basis of Aboriginal existence and identity, which along with water and natural resources were sustainably managed according to traditional laws and customs. Careful modification of the environment using fire was an important land management tool, used to regenerate vegetation attracting game species such as kangaroo and wallaby. It was also used to clear shrubs and tussocks allowing food plant species to thrive.

Physical evidence of countless generations of Aboriginal people who occupied this landscape can be seen in the artefacts and significant middens that still exist along the coast. There are also important natural heritage components that occur in the Parks Landscape, including the very old River Red Gums at the entrance of Point Nepean National Park which predate European arrival.

The Bunurong Land Council Aboriginal Corporation is the recognised Registered Aboriginal Party for most of the lands and waters within the Western Port and South-east Melbourne Parks Landscape, with the exception of the northern part of Lysterfield Park and Selby G190 Bushland Reserve. The Wurundjeri Woiwurrung Cultural Heritage Aboriginal Corporation is the recognised Registered Aboriginal Party for these areas (see Figure 2.1).

Under the *Aboriginal Heritage Act 2006 (Vic)*, Registered Aboriginal Parties have responsibilities for the protection and management of Aboriginal cultural heritage. One of Parks Victoria's objects, under the *Parks Victoria Act 2018* (Section 7(1)), is to recognise and support traditional owner knowledge of and interests in Parks Victoria managed land.

Contemporary Aboriginal people are proud of their ancestry and maintain a very strong spiritual connection with the Western Port and South-east Melbourne Parks Landscape today. As Traditional Owners, the Bunurong People continue to be involved in the care and collaborative management of Country in this Parks Landscape.

2.4 Legislative and planning context

The management of land and water resources, cultural heritage, flora and fauna in the Western Port and South-east Melbourne Parks Landscape is guided by many pieces of federal and state legislation, as well as Victorian Government policies and priorities. This domestic legislation is also the instrument for implementing a number of Australia's international treaty obligations.

Parks Victoria's management and planning context is broadly illustrated in Figure 2.2.

Parks Victoria's objective is to protect, conserve and enhance Parks Victoria managed land, including its natural and cultural values, for the benefit of the environment and current and future generations (*Parks Victoria Act 2018*, Section 7(1)). Parks Victoria also contributes to the achievement of State and regional land management outcomes as far as is consistent with the effective protection and management of Parks Victoria managed land. Conservation action planning provides a framework for delivering on these objectives, as well as supporting a variety of community and cultural objectives.

Australia, as a signatory to the Convention on Biological Diversity, is compelled to establish a network of protected areas for the purpose of maintaining biodiversity. This Conservation Action Plan will guide the management of Parks Victoria's protected areas and contribute to the delivery of Victoria's biodiversity strategy *Protecting Victoria's Environment – Biodiversity 2037*, which establishes a 20-year framework for the protection of biodiversity in Victoria (DELWP 2017).

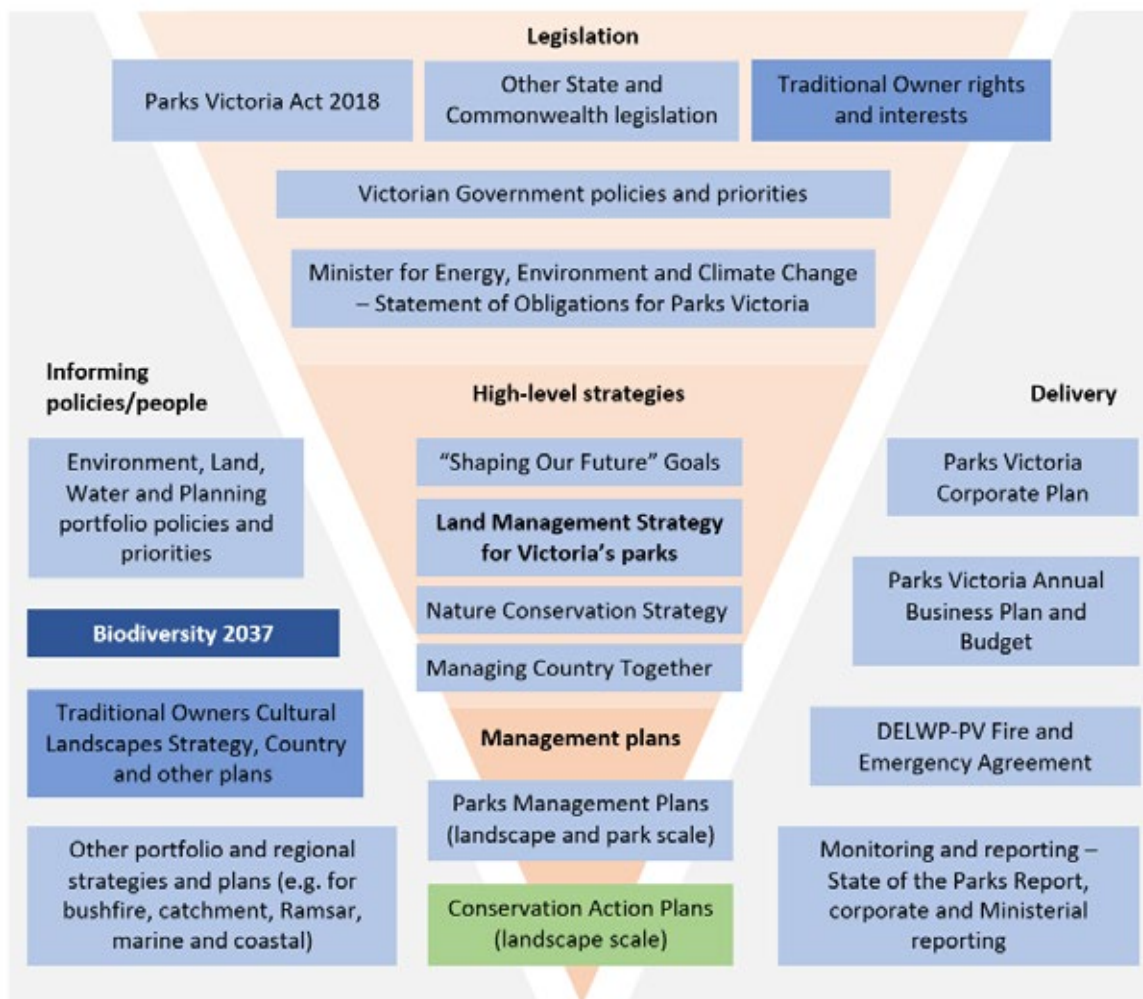


Figure 2.2 Parks Victoria’s planning and management context

A subset of the Western Port and South-east Melbourne Parks Landscape is recognised as a site of international significance under the *Convention of Wetlands of International Importance especially as Waterfowl Habitat (1971)* (Ramsar Convention). The convention obliges contracting parties to manage Ramsar sites in such a way as to maintain their ecological character equivalent to that at the time of listing. The primary purpose of management of a declared Ramsar wetland (as outlined in Australia’s Environment Protection and Biodiversity Conservation Regulations 2000) must be:

- To describe and maintain the ecological character of the wetland; and
- To formulate and implement planning that promotes:
 - conservation of the wetland; and
 - wise and sustainable use of the wetland for the benefit of humanity in a way that is compatible with maintenance of the natural properties of the ecosystem.

While the Ramsar Convention recognises that “waterfowl in their seasonal migrations may transcend frontiers and so should be regarded as an international resource”, Australia is additionally a signatory to bilateral migratory bird agreements with South Korea, Japan and China, and the *Convention on the Conservation of Migratory Species of Wild animals (1979)* (Bonn Convention).

The Western Port and South-east Melbourne Parks Landscape comprises a total of 63 parks and reserves (covering around 23,660 hectares), managed under various acts including the *National Parks Act (1975)* and the *Crown Lands (Reserves) Act (1978)*. The majority of the parks area is reserved and managed under the provisions of the *National Parks Act (19,952 hectares)*, the most significant of these being French Island,

which as an island provides an opportunity to potentially achieve complete eradication of target pest species.

The remainder of the Parks Landscape is managed under various acts including the *Crown Lands (Reserves) Act* (1978). The most significant of these for biodiversity conservation include North Western Port Nature Conservation Reserve, Langwarrin Flora and Fauna Reserve, and Braeside Park.

Reference Areas have been set aside under the *Reference Areas Act 1978* (Vic) in French Island National Park; French Island (East) Reference Area and French Island (North) Reference Area, covering 280 hectares and 202 hectares respectively – note these are subsets of other areas.

The protected area management categories of the International Union for Conservation of Nature (IUCN) classify protected areas according to their management purpose. A description of this classification system is given in Appendix A, and the reserve type of the parks and reserves in this landscape is given in Appendix E.

Parks Victoria's planning framework

Conservation action plans contribute to park management plans and provide a more detailed review of natural values and their condition. Conservation action plans also provide a more robust framework for evaluating the health of the landscape and include targeted goals based on condition of ecosystems which complement actions in the park management plans. Conservation action planning does not specifically address visitor management or cultural asset management, and as such, a conservation action plan does not constitute a plan of management in the context of Section 17(2)(d) of the *National Parks Act 1975* or a land management plan under Division 4 of the *Parks Victoria Act 2018*.

2.5 Alignment with other strategies and plans

Strategic Management Prospects

Information sources that have informed the preparation of this plan include the Victorian Government's *Protecting Victoria's Environment – Biodiversity 2037 Plan* (DELWP 2017). Under this, the Strategic Management Prospects (SMP) tool is a component of the Department of Environment, Land, Water and Planning's *NatureKit* (DELWP 2019). These spatial databases have been used as a decision support tool, together with field-based evidence, to assist in identifying the relative priority of threats and actions. SMP outputs are focused on modelled biodiversity outcomes and may need to be balanced with organisational and community priorities when implementing Conservation Strategies.

Regional Catchment Strategies

This plan addresses a number of objectives and actions from the Port Phillip and Westernport Catchment Management Authority's 2015 Regional Catchment Strategy (RCS), in relation to the following assets:

- Native Vegetation
- Native Animals
- Waterways and Wetlands
- Hinterland
- Coasts
- Western Port.

This plan will support the RCS objectives for these assets by:

- Maintaining the quality and extent of coastal features and wetlands
- Limiting impacts to the marine environment
- Protecting habitat-forming native vegetation

-
- Keeping waterways healthy by increasing the resilience of resident native flora and fauna.

The renewal of the 2015 Regional Catchment Strategy will be finalised towards the end of 2021. From 1 January 2022, the Port Phillip and Westernport Catchment Management Authority (PPWCMA) will be integrated into Melbourne Water, which will assume the PPWCMA's catchment management and waterway management responsibilities for the Port Phillip and Western Port region.

Other information sources

Other plans and documents that have informed this CAP include (but are not limited to):

- Western Port Ramsar Site Management Plan (DELWP 2017)
- Westernport Priority Zone Plan (Trust for Nature 2017)
- Westernport Mornington Priority Zone Plan (Trust for Nature 2017)
- French Island Fire Ecology Strategy (Parks Victoria 2020)

This plan also aligns with Goal 2 of the Victorian Government's *Protecting Victoria's Environment – Biodiversity 2037 Plan* (DELWP 2017) (i.e., Victoria's natural environment is healthy) as well as several of the plan's priorities, particularly:

- **Priority 8** – Better care for and showcase Victoria's environmental assets as world-class natural and cultural tourism attractions align with conservation strategy 'Reducing the impacts of recreation, illegal activities and resource extraction on natural values'.
- **Priority 11** – Increase incentives and explore market opportunities for private landholders to conserve biodiversity aligns with conservation strategy 'Supporting partnerships to address hydrological threats to water-dependent assets'.
- **Priority 17** - Deliver excellence in management of all land and waters aligns with objectives of the CAP planning and evaluation process.
- **Priority 18** - Maintain and enhance a world-class system of protected areas which is achieved through improving the representativeness and adequacy of the reserve system and general habitat quality improvement.

Conservation action planning also contributes towards **Priority 9 – establish sustained funding for biodiversity** – in providing long term objectives and measurable goals, demonstrating value for investment in conservation across the Parks Landscape.

This plan also broadly aligns to national and international strategies, meeting several of Australia's national targets under the Convention on Biological Diversity (1992) by contributing to objectives and associated Sustainable Development Goals in Australia's strategy for nature 2019-2030.

2.6 Participation

A series of conservation action planning workshops were held in April and July 2019, and May 2021 to support the planning process for the Western Port and South-east Melbourne Parks Landscape plan. Conservation action planning is undertaken collaboratively between corporate and regional staff.

The success of the workshops drew from the depth of knowledge and experience of participants, including staff from the Department of Environment, Land, Water and Planning, Melbourne Water and the Port Phillip Catchment Management Authority.



Sunrise at Braeside Park

3 Conservation assets

3.1 Identifying conservation assets

For planning and managing the terrestrial environment, Parks Victoria has classified conservation assets in its parks landscapes according to similarities in biodiversity and natural values, and natural processes. The classification is based on the eight terrestrial ecosystem groups (DNRE 1997):

- Alps
- Coastal
- Dry Forest and Woodland
- Grassland
- Heathland
- Inland Waters and Wetlands
- Mallee
- Wet Forest and Rainforest.

Within each of these ecosystem groups, a number of sub-ecosystems have also been identified, defined by groupings of Ecological Vegetation Classes and Divisions (EVCs and EVDs) (White 2012).

Parks Victoria have identified seven key marine habitats across Victoria (Pocklington et al. 2012). The classification of marine assets is based on these groupings:

- Estuary
- Intertidal Rocky Reef
- Mangroves and Saltmarsh (Fringing Marshes)
- Seagrass
- Soft Sediments
- Subtidal Rocky Reef
- Water Column (Pelagic)

Conservation assets within the parks landscapes have been identified by assigning ecosystems, sub-ecosystems and habitats from Parks Victoria's classification system, on the basis that they have similar ecological processes and threats.

Finer-scale assets that are an important focus of conservation have also been identified, to help define each conservation asset more completely. These 'nested' assets are mostly species assemblages and communities but may also include habitat features and ecosystem services. Individual species are aggregated with others if they occur together across the landscape and have similar attributes that are important in determining their persistence in the landscape. Keystone species and rare, threatened or endemic species may also be included as nested assets if they have unique conservation requirements. Species or communities of cultural importance to Traditional Owners may also be included.

3.2 Assessing condition of conservation assets

Conservation outcomes are derived from a comparison of the current and desired condition of the conservation asset overall (Where are we now? Where do we want to be?) and are articulated as SMART goals: **S**pecific, **M**easurable, **A**chievable, **R**elevant and **T**ime-bound.

Assessing the overall health of a conservation asset involves identifying the critical factors required for its long-term viability, which are called the *key ecological attributes*. These include attributes of structure, composition and process related to the assets. An important characteristic of a key ecological attribute is that it must be readily measurable using one or more indicators. The current and desired condition of the attribute can then be assessed, and the overall viability of the asset can be assigned to a defined category.

The assessment of the viability (or overall health) of a conservation asset is a five-step process utilising key ecological attributes:

1. **Identify a small number of key ecological attributes (typically 3–5) for each conservation asset.** Some common key ecological attributes are structure (e.g. remnant size or population abundance, distribution of communities, and configuration of patches or age class), composition (e.g. species diversity), and interactions and biotic and abiotic processes (e.g. hydrological regime or water quality).
2. **Identify appropriate indicators for each key ecological attribute.** An indicator is a readily measurable parameter that can be used to assess the condition of the key ecological attributes. For example, the presence or absence of a particular habitat-sensitive species may be an appropriate indicator for species diversity or habitat condition.
3. **Develop criteria for rating the current value of each indicator.** The development of criteria for rating the value of each indicator is an iterative process. It typically starts with a simplified qualitative assessment (e.g. many, some, few) and is progressively developed into more refined and measurable numeric values (e.g. 1000 megalitres of water for 3 months during late spring). A value range for the indicator is defined to correspond with a ranking for poor, fair, good, and very good.
4. **Rank the current and desired condition of each indicator to determine the overall viability of the conservation assets.** The final step in assessing the viability of the conservation assets is to rank the current condition of each indicator. The rankings used are poor, fair, good, and very good. Desired condition is assessed over a 15-year period and considers the impact of climate change over that period, and the role, if any, of management intervention to maintain long term viability. Trend in condition is evaluated over the preceding 15 years.
5. **Determine the overall viability of conservation assets.** The overall current and desired condition is determined for each conservation asset, using the condition rankings for key ecological attributes and their associated indicators. Each conservation asset is rated for the current and desired condition of its key ecological attributes and overall condition.

These key ecological attributes for each asset, including conservation outcomes and asset descriptions, are presented in the following pages, along with assessments of the current and desired status of each asset and its key ecological attributes. The current condition and trend, and the likely condition under desired management, have been assessed using available literature and the expert knowledge of interviewed experts or participants in the conservation action planning workshops. The condition of each asset is considered across its occurrence in the landscape's parks and reserves. These attributes and outcomes have been used to guide the development and prioritisation of conservation strategies.

3.3 Western Port and South-east Melbourne conservation assets

Eleven ecosystems were identified for the Western Port and South-east Melbourne Parks Landscape. Each conservation asset was also associated with numerous nested assets. The distribution of these eleven conservation assets is presented below (Figure 3.1). The component Ecological Vegetation Classes and Ecological Vegetation Divisions are listed in Appendix B.

Conservation Asset	Area (hectares)
Coastal	1835
Dry Forest and Woodland	4246
Heathland	8503
Wetland and Waterbodies	586
Riverine Forest and Woodland	1735
Saltmarsh and Mangrove	3369
Intertidal Reef	19
Soft Sediment (mudflats)	1554
Subtidal Reef	35
Water Column (Pelagic) †	NA
Seagrass	1772

† Water Column overlaps other marine assets, so an area figure is not provided.

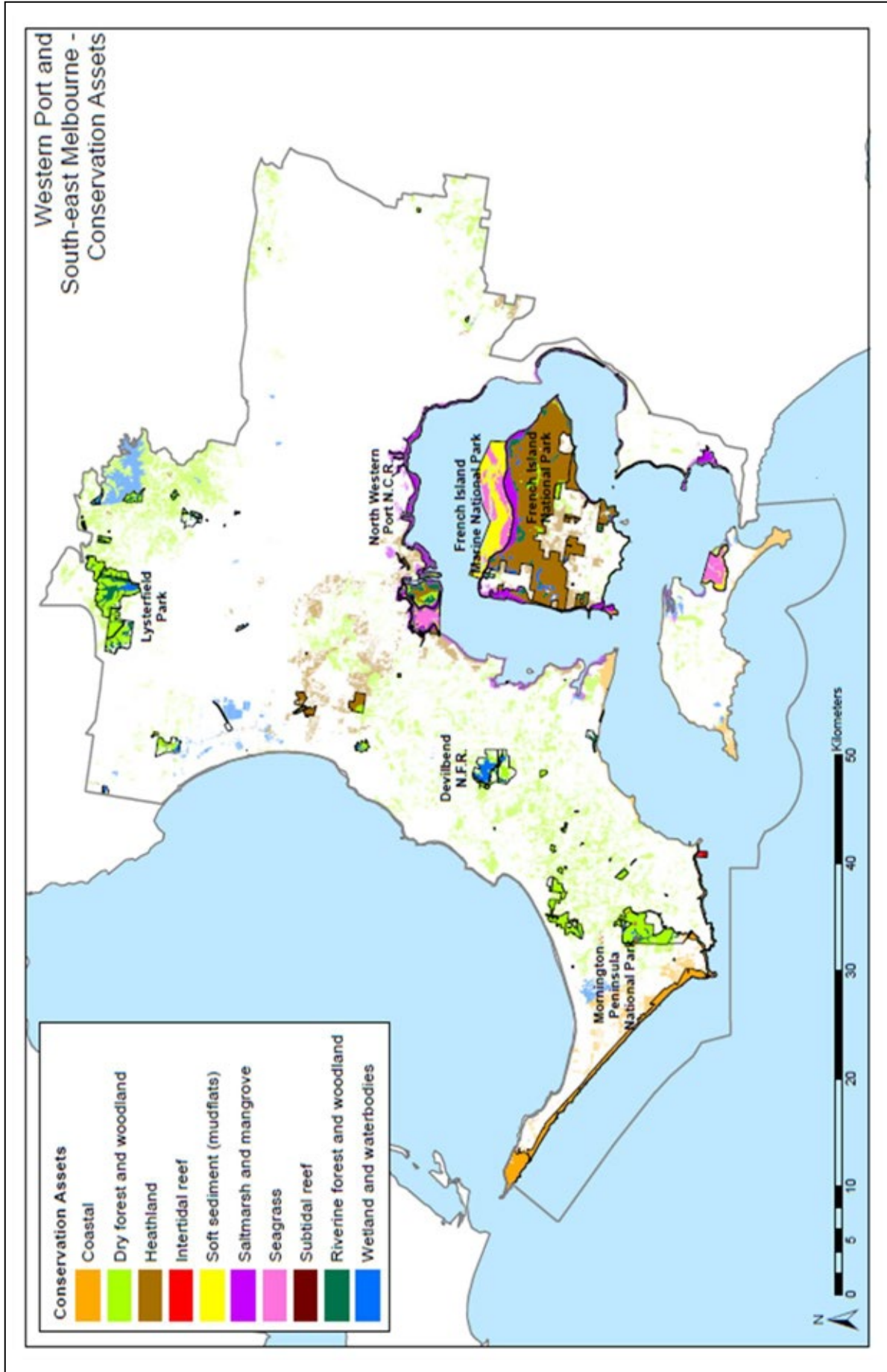


Figure 3.1 Conservation assets in the Western Port and South-east Melbourne Parks Landscape (Crown land not managed by Parks Victoria is shown in lighter shading)

3.4 Conservation vision

Setting conservation outcomes involves defining a conservation vision and conservation outcomes for each asset (as described in Section 4). The conservation vision, based on Parks Victoria's Shaping our Future goal for conserving its special places, is an aspirational statement that describes the intended outcome of management and the future state of the Western Port and South-east Melbourne Parks Landscape:

The resilience of natural assets in the Western Port and South-east Melbourne Parks Landscape is increased and ecosystem services are maintained in the face of climate change and other stressors

The Western Port and South-east Melbourne Parks Landscape is highly fragmented yet retains significant environmental values. This area provides important habitats essential to the life cycles of migratory birds and threatened species. The condition of the Parks Landscape is highly variable throughout, and the conservation of its natural values must be appropriately balanced with providing the visitor opportunities for recreation that meet the community expectations of an urban and peri-urban landscape.

The coastal habitat of the Parks Landscape is vulnerable to climate change, and planning to buffer coastal systems by re-instating native vegetation and providing for movement and changes in habitats is essential to maintaining its values. Urbanisation has had a profound impact on the parks in this landscape, particularly smaller reserves, both from human activity and the flow on effects of expanding infrastructure. Parks are currently and will increasingly be impacted by freshwater availability and changes to hydrological regimes due to rainfall run-off on hard surfaces which is redirected from low lying areas into stormwater infrastructure to prevent flooding.

The aim is therefore to stabilise and improve the structure and composition of coastal vegetation, growth stage diversity in dry forests and woodlands and heathlands for the flora and fauna they support; to improve hydrology and increase water quality in riverine and wetland habitats and in Western Port to create refugia and maintain the species assemblages they support; to maintain saltmarsh and mangrove extent by negotiating its landward retreat from sea level rise; and to maintain mudflat extent, seagrass extent and connectivity, and the algal and faunal assemblages in subtidal and intertidal reefs. A key focus across this landscape is cross-tenure management to reduce visitor and urbanisation impacts on urban and peri-urban parks while improving overall condition of park ecosystems for a sustainable visitor experience for current and future generations.



French Island National Park

4 Conservation asset descriptions

Conservation asset description format

The following pages provide a description of the conservation assets within the landscape along with the outcomes sought from management. The descriptions are set out in the following format, and definitions for the terms used for attributes and indicators are provided below.

Conservation asset name



The ecosystem or habitat type considered to be the overarching value to be managed, including a description of key components, condition, predominant drivers of condition, and their effect on component nested assets.

Nested assets

Nested assets are a series of values that are present within the asset, or that rely on the asset for their health. These are often iconic components of the asset and may include threatened species, ecological (faunal) assemblages, vegetation communities, or species or communities of cultural importance. Comprehensive lists of species held on national and Victorian databases are used to inform the selection of nested assets.


Condition




This sets out the key ecological attributes, indicators for those attributes, the current condition and trends in condition of the attribute, and the anticipated goal. The anticipated goal represents a 15-year outcome based on the application of the strategies presented in this plan. Finally, the relevant strategy (abbreviated) is listed, for which the full strategy name and performance measures can be found in Table 7.1.

Key ecological attributes	Indicator	Current condition	Current trend	Key ecological attribute goal	Strategy abbrev.
Woodland bird diversity	Species richness	Fair		Over xx% of surveyed sites have a richness of bird species representative of the vegetation age-class and expected bird community	Predation
Canopy recruitment	Seedling recruitment	Good		Overstorey recruitment present at more than xx% of surveyed sites	Fire Herbivores

Conservation outcome

This statement reflects the key ecological attributes of the asset and includes key improvements in asset viability that will achieve the desired conservation outcome (as in the example below).

Riparian	Current condition	Desired trend	Desired condition
By 2031, maintain critical habitat features (e.g. vegetation structure), functions (e.g. hydrology, water quality and quantity) and connectivity of riparian and in-stream ecosystems to provide habitat and refugia.	Good		Very Good

Trends are indicated as follows: Improving  Stable  Declining 

The assessment of current condition and desired future status is represented by the following categories. Measures to assess this classification are documented in the Monitoring, Evaluation and Reporting Plan.

VERY GOOD (optimal integrity)	The attribute is functioning at an ecologically desirable status, and requires little human intervention to maintain or improve health.
GOOD (minimum integrity)	The attribute is functioning within its range of acceptable variation; it may require some human intervention.
FAIR (vulnerable)	The attribute is outside its range of acceptable variation and requires human intervention to recover or be restored. If unchecked, the target will be vulnerable to serious degradation.
POOR (imminent loss)	Allowing the attribute to remain in this condition for an extended period of time will make restoration or preventing extinction practically impossible.

Definition of terms (attributes, indicators)

Indicator	Description
Abundance	The number of individuals of a particular species or functional group present in an ecosystem
Assemblage	The variety of species which occur together in a particular habitat
Attributes	The characteristics of a habitat that may affect a species such as its condition and structure
Composition	The identity of all the different species that make up a community and the relative proportion of each species
Connectivity	The degree to which a landscape facilitates or impedes movement between suitable habitat sites for different species
CWR	Critical Weight Range (mammals)
Demography	Identifies the age class of individuals as a surrogate measure of recruitment success over time (e.g. presence of young-of-year fish and turtles through to mature age; identification of eggs or fledgling birds in nesting colonies)
EVC Benchmark	EVC benchmarks relate to an EVC within a bioregion which has been developed to assess the vegetation quality of the EVC at the site scale in comparison to a 'benchmark' condition. These benchmarks have been developed to assess native vegetation and contain a subset of lists of species for each EVC in a bioregion
Extent	Area of cover of a particular species or functional group, attribute (e.g. vegetation community) or area subjected to particular conditions (e.g. flooding, salinity)
Functional Groups	Group of species which share similar characteristics and perform similar ecosystem functions (e.g. colonial nesting birds, riverine/wetland specialist fish)
Function and connectivity	The components needed to support ecosystem processes and facilitate movement from a species perspective (e.g. flow regime, water quality, barriers to connectivity)
Growth stage	The stages of a vegetation life cycle from seedling through to maturity
Health	Measured for long-lived flora and fauna that require certain conditions to maintain health. This indicator can be used to identify whether those conditions are achieved, and repeat surveys can detect change over time. A key example is riverine tree health, which is maintained through an appropriate flooding and drying regime

Index of wetland condition (IWC) score	An assessment procedure used in Victoria to assess the condition of wetlands to assist in management decisions and prioritisation of sites
Intactness	An indicator of human modification within a habitat. Landscapes with a higher level of intactness will have less human interference and greater ecological structure, composition and function
Morphology	Measurement of the form, shape or structure of an organism used as a key ecological indicator
Nutrient levels	A measure of the movement and exchange of organic and inorganic matter within an ecosystem
Percentage cover	Compares the cover of a particular species or functional group to another. Can be used to identify change in dominance of species or functional groups over time. Particularly important in wetlands in which flora composition changes in response to wetland phases (e.g. wet/receding/dry) or changed hydrological conditions
Recruitment	The process by which new individuals establish a population or add to an existing population
Representativeness	Compares the type and/or number of species, or presence of a particular representative indicator species, identified within a defined benchmark such as a functional group or EVC
Site occupancy	The presence of a particular species or functional group at a site. Repeated surveys provide greater confidence in data, particularly for mobile fauna, and seasonal flora. Key examples are waterbird surveys and the emergence of aquatic flora in wetlands during floods
Spatial distribution	Identifies presence and cover of species or functional groups across the landscape. Can be used to detect movement of species between habitats, or change in habitat qualities that may favour different, rather than expected, species. A key example here is the progression of terrestrial dominant flora into typically wetter environments, suggesting a change in flooding regime
Species diversity	The number of different species that are represented in a community and the relative abundance of each species
Species richness	Identifies how many different species are present at a particular location or across a landscape area



Coastal

The Coastal conservation asset encompasses 1835 hectares of coastal scrubs, grasslands and woodlands on exposed coastal cliffs and headlands of the Western Port and South-east Melbourne Parks Landscape and are characterised by low fertility, sandy soils (White 2012). Major drivers of Coastal asset health are intactness (level of weed infestation) and recreational impacts. Historic clearing of coastal vegetation was widespread for settlement, grazing and recreation. Almost all of the remaining coastal vegetation in the Parks Landscape is protected in coastal reserves, with major occurrences in Point Nepean National Park, Mornington Peninsula National Park, French Island National Park, and North Western Port Nature Conservation Reserve.

The only occurrences of the marine component of sandy beaches (sandy soft sediments) that fall into the scope of the Western Port and South-east Melbourne Parks Landscape are between Point Nepean and Cape Schanck, and along the shoreline of Mushroom Reef, which is an important breeding ground for resident shorebirds such as the Hooded Plover. Beyond the reach of the tide, hardy salt-tolerant coastal scrubs grow in exposed areas subject to sea winds and salt spray. Coastal scrubs (Coastal Alkaline Scrub (EVC 858), Coastal Headland Scrub (EVC 161) and Coastal Dune Scrub (EVC 160)) occur in Point Nepean and Mornington Peninsula National Parks, where the coast meets the open ocean. Other occurrences are scattered along the eastern coast of Western Port. Dominant structural species include Coast Tea-tree, Drooping Sheoak and Coast Beard-heath. Coastal scrubs are considered Depleted or Vulnerable in the Gippsland Plain bioregion (DSE 2005).

Woodlands emerge beyond the immediate reach of the tide in more sheltered areas. Coast Banksia Woodlands (EVC 2), present along much of the sheltered coastlines of the southern Mornington Peninsula, have an overstorey of Coast Banksia and Rough-barked Manna-gum with an understorey of hardy shrubs such as Coast Beard-heath and Seaberry Saltbush with herbs, sedges and scramblers below (DSE 2005). Coastal Moonah Woodland (listed under the FFG Act) has a very restricted distribution in the Parks Landscape, found only in scattered remnants on the Mornington Peninsula (DSE 2003), however it is thought to have once occurred throughout the present-day distribution of Coastal Alkaline Scrub (EVC 858). Historically, the Moonah overstorey was removed extensively for firewood and fuelling lime kilns. In the present day, Coastal Moonah Woodland is usually found amongst Coastal Alkaline Scrub and the dominant midstorey and understorey species are shared. Isolated pockets of other restricted EVCs are also present in coastal reserves, such as Calcareous Swale Grasslands (EVC 309), Coastal Tussock Grassland (EVC 163), Berm

Grassy Shrubland (EVC 311) and Coastal Dune Grassland (EVC 879).

Significant species found in this conservation asset include the Leafy Greenhood, Late Helmet-orchid, White-footed Dunnart and Hooded Plover. A *Strategic Management Prospects* analysis (DELWP 2019) has identified the following species as having a high proportion of their state distribution in the Coastal asset of this Parks Landscape: Rare bitter-bush, Coast bitter-bush (pubescent form), Beaded Glasswort, Coast Saltwort, Late Helmet-orchid, Peninsula Daisy-bush, Coast Helmet-orchid, Coast Wirilda, Coast Bush-pea, Coast Colobanth, Sooty Oystercatcher and Metallic Skink.

Drivers of condition in the remaining remnants include the ongoing effects of vegetation fragmentation, and changes to floristic composition resulting from weed invasion by Bridal Creeper and Myrtle-leaf Milkwort (DSE 2003). Currently considered to be in fair to poor condition, populations of small mammals, beach nesting birds and threatened orchid assemblages are all declining. Coastal vegetation is also at future risk of sea-level rise, and anecdotal evidence suggests that the warming, drying climate may already be impacting on Banksia Woodlands.

Nested assets

Nested assets	Examples of components
Shorebirds	Hooded Plover, Red-capped Plover, Sooty Oystercatcher, Migratory Shorebirds; Sanderling, Fairy tern
Rare and depleted EVCs and flora species	Coastal Moonah Woodlands, Calcareous Swale Grasslands, Leafy Greenhood, Coast Helmet-orchid, Dark Helmet-orchid (Wilson's Promontory), Peninsula Daisy-bush, Coast Colobanth, Coast Bush-pea, Coast Wirilda, Coast Saltwort, Beaded Glasswort, Rare Bitter-bush (glabrous form and pubescent form), Late Helmet-orchid (Coastal), Slaty Helmet-orchid, Veined Helmet-orchid
Dune formations	Stabilising vegetation coverage
Small and CWR mammals	White-footed Dunnart, Long-nosed Bandicoot
Reptiles	Metallic Skink, Jacky Dragon, White-lipped Snake

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Coastal Moonah Woodland	Percentage cover	Fair	→	Less than 25% cover of introduced species	Weeds
Calcareous Swale grassland	EVC benchmark	Fair	→	Composition and structure of Calcareous Swale Grassland is representative of benchmark condition	Recreation Weeds
Beach nesting birds	Hooded plover demography	Good	↘	No. of breeding pairs maintained at 31 Annual fledgling success is at 0.5/ pair	Recreation Predation
	Pied Oystercatcher abundance	Good	→	Maintain abundance and occupancy at current levels (particularly on French Is.)	Predation
Threatened orchids	Extent and abundance	Poor	↘	Extent and abundance of Leafy Greenhood and Coast Helmet-orchid is maintained/improved from 2019 levels*	Recreation Weeds
Small and CWR mammals at Mornington Peninsula and Point Nepean NP	Site occupancy	Poor	↘	Maintain White-footed Dunnart site occupancy at 7% (2016 level) of surveyed trap sites Maintain Long-nosed Bandicoot site occupancy at 11% (2016 level)	Predation

*requires monitoring program to establish baseline data

Conservation outcome

Coastal	Current condition	Desired trend	Desired condition
Over the 15 years to 2036, stabilise and improve the structure and composition of coastal vegetation communities and ensure persistence of endangered plant communities, threatened orchid species, beach-nesting birds and small and CWR mammals.	Fair	→	Fair



Dry Forest and Woodland

Approximately 4200 hectares of Dry Forest and Woodland occur throughout the Western Port and South-east Melbourne Parks Landscape, with extensive areas of coverage in Mornington Peninsula National Park, French Island National Park, and Lysterfield Park. Other significant occurrences are at Langwarrin Flora and Fauna Reserve, Churchill National Park, Arthurs Seat State Park, Braeside Park, Dandenong Police Paddocks Reserve and North Western Port NCR at Quail Island. The distribution of this conservation asset is driven primarily by fire frequency (variable according to EVC), the presence of clay-loam, sandy-loam or shallow rocky soils, moderate rainfall and the absence of past clearing (White 2012). Dry Forest and Woodlands span both Victorian Bioregions that dissect this Parks Landscape (Gippsland Plain and Highlands - Southern Fall). Damp Sands Herb-rich Woodland (EVC 3), Herb-rich Foothill Forest (EVC 23), Lowland Forest (EVC 16) and Grassy Forest (EVC 128) are the most common EVCs in this conservation asset. Indicators of health include weed cover, vegetation growth stage structure and the presence of habitat features such as shrub cover for woodland bird species and small mammals. Dry Forest and Woodlands are currently considered to be in fair condition across the Western Port and South-east Melbourne Parks Landscape, mainly due to fragmentation and weed invasion.

In the south of the Parks Landscape, Damp Sands Herb-rich Woodland, Herb-rich Foothill Forest and Lowland Forest are the dominant communities. The canopy species are typically Rough-barked Manna-gum, Narrow-leaf Peppermint and Messmate Stringybark (DSE 2005). Southern Brown Bandicoots persist in isolated areas but populations of this species are declining, as are many other mammal and bird species. Towards the north, Grassy Woodlands (EVC 175) and Lowland Forest become more common, with a low canopy of species such as Bundy, Narrow-leaf Peppermint and a grassy understorey with small and medium shrubs. Here, White-footed Dunnarts, Dusky Antechinus and Agile Antechinus are found. Around 100 hectares of the bioregionally listed Plains Grassy Woodland (EVC 55) community are found in this conservation asset, most of which is found at Braeside Park. River Red-gums are the main canopy species over grasses and other grassland herbaceous flora.

Large, high quality remnants of Dry Forest and Woodland are protected in French Island National Park, providing habitat for important species such as French Island Spider-orchid, Green-striped Greenhood and Maroon Leek-orchid. This is where much of the heathy forest and woodlands are found in the Parks Landscape. This part of the conservation asset also supports a large, important population of Long-nosed

Potoroos and Koalas. In addition, Eastern Barred Bandicoots were released onto French Island in October 2019 in partnership with Zoos Victoria.





Other significant species in Dry Forest and Woodland areas include Clover Glycine, Frankston Spider-orchid, Purple Eyebright and Venus-hair Fern. Strategic Management Prospects analysis (DELWP 2019) has identified Grass Triggerplant as having a high proportion of their state distribution in the Dry Forests and Woodlands of this Parks Landscape. While not listed as threatened, the Black Rock Skink is considered locally important and occurs in Lysterfield Park.

While not considered a priority threat in the Parks Landscape, there is evidence of canopy dieback in the north east of this asset. Canopy dieback has disproportionately impacted Peppermint eucalypts in the Cardinia Catchment which includes Lysterfield Park and Churchill National Park. The primary driver of dieback is thought to be drought but may be compounded by other environmental impacts.

Nested assets

Nested assets	Examples of components
Terrestrial mammals	Southern Brown Bandicoot, Long-nosed Bandicoot, White-footed Dunnart, Eastern Grey Kangaroo, Swamp Wallaby, Agile Antechinus, Dusky Antechinus, Short-beaked Echidna, Long-nosed Potoroo
Arboreal mammals	Yellow-bellied Glider, Eastern Pygmy-possum, Koala
Ground Dwelling Birds	Lewin’s Rail, Painted Button-quail
Woodland Birds	
Forest Owls	Powerful Owl
Microbats	Little Forest Bat, Gould’s Wattled Bat, Chocolate Wattled Bat
Flora	Purple Diuris, Purple Eyebright, Emerald Star-bush, Snow Gum, Grass Triggerplant, Common Triggerplant
Depleted EVCs	Grassy Woodland, Damp Heathy Woodland
Grass-tree Forests	Where Grass-trees predominantly comprise the upper vegetation strata occurring in Greens Bush

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Habitat features	Growth stage	Fair	Unknown	No decrease in the extent of mature vegetation including hollow-bearing trees and coarse woody debris	Recreation Fire
Vegetation quality	Intactness	Fair		5% weed cover in priority areas (refer to environmental weed conservation strategy)	Weeds
Orchid abundance	Site occupancy Species richness	Fair		Species presence and richness maintained at 2019 levels	Recreation Weeds Herbivores
Small and CWR Mammals	Site occupancy	Fair		Maintain/increase small and critical weight range mammals at survey sites compared with 2019 levels	Recreation Predation
Woodland bird community	Species richness	Unknown		Establish baseline for species richness	Recreation

Conservation outcome

Dry Forest and Woodland	Current condition	Desired trend	Desired condition
Over the 15 years to 2036, maintain or improve the heterogeneity of vegetation structure and growth stage distribution to stabilise or improve occupancy and richness of woodland birds, mammals and orchid species.	Fair	→	Fair



Riverine Forest and Woodland

The Riverine Forest and Woodland conservation asset covers a small area of the Western Port and South-east Melbourne Parks Landscape and is predominantly damp scrubby vegetation. The distribution of this conservation asset is driven by low fire frequency (variable according to EVC), the presence of deep, fertile soils with a deep litter layer and relatively high rainfall. Riparian Forests and Woodlands typically grow along drainage lines in areas with a high water table. Climate change is likely to be a driver of health in this asset into the future, with an overall decrease of freshwater availability impacting the connectivity between riparian habitats, and an increased intensity of rainfall events contributing to increased flow velocity resulting in streambed erosion and the transportation of nutrients and sediments to aquatic ecosystems. This asset will likely provide important habitat refugia for wildlife in the future, and managing water for connectivity in freshwater ecosystems will be increasingly important as water availability decreases and urban developments expand.

A history of land clearing and altered hydrology has restricted the distribution of Riverine Forests and Woodlands. Within the Parks Landscape the upper reaches of the Port Phillip and Westernport catchment are largely cleared and grazed with minimal native vegetation remaining and the lower reaches are highly modified due to residential developments. This has resulted in very low vegetation and hydrological connectivity, subject to water quality impacts from surrounding agriculture and urbanised landscape. The hydrology of the landscape has also undergone significant modification as a result of irrigation and drainage control. In total, just over 1700 hectares of Riverine Forests and Woodlands remain across the Parks Landscape. The asset is considered to be in fair condition because much of the extent is immature vegetation that has regenerated after historic clearing, but as yet lacks structural complexity and habitat features.

In this area, Riverine Forest and Woodland are characterised mainly by Swamp Scrub (EVC 53) - a dense, mostly treeless scrub of Swamp Paperbark growing on waterlogged soils in association with waterways and drainage lines. The understorey is sparse, with moisture-adapted ferns, sedges, herbs and small shrubs (DSE 2005). Where an overstorey of Swamp Gum is present, Swampy Riparian Woodland (EVC 83) and Swampy Woodland (EVC 937) occur. A number of other EVCs associated with drainage lines make up smaller components of this conservation asset including Gully Woodland (EVC 902) and Riparian Forest (EVC 18) and Damp Forest (EVC 29). Included also in this asset is a very small amount of the bioregionally Endangered Plains Grassland/Plains Grassy Woodland Mosaic (EVC 897), occurring at Braeside Park.



Major waterways in the Parks Landscape are the Bass River, Lang Lang River, Bunyip River, Cardinia Creek, Balcombe Creek, Main Creek, Merricks Creek, Lightwood Creek, Waterfall Creek and Devil Bend Creek. Significant occurrences of Riverine Forests and Woodlands are found in French Island National Park, North Western Port NCR, Lysterfield Park and Dandenong Paddocks Police Reserve.

Riverine Forest and Woodland is habitat for threatened fauna species such as the Powerful Owl, Swamp Skink, Southern Toadlet, Swift Parrot and Southern Brown Bandicoot. The conservation asset supports potential habitat and release sites for the Critically Endangered Helmeted Honeyeater.


Nested Assets

Nested assets	Examples of components
Threatened fauna	White-bellied Sea-eagle, Peregrine Falcon, Helmeted Honeyeater (potential release sites), Latham’s Snipe, Lewin’s Rail, Powerful Owl, Swamp Skink, Southern Toadlet
Arboreal mammals	Microbats, Sugar glider, Yellow-bellied Glider, Feathertail Glider
Other mammals	Platypus, Echidna, Dusky Antechinus, Water Rat, Common Wombat, Swamp Rat
Mature vegetation	Hollow-bearing River Red Gums, Melaleuca
Water quality and quantity	Environmental water allocation for Cardinia Creek

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Vegetation structure and habitat features	Growth stage, spatial distribution	Fair		An increase in mature vegetation across the extent of asset, including hollow-bearing trees and coarse woody debris	Recreation Fire
Vegetation condition	Weed cover & EVC Benchmark	Good	Unknown	Reduce weed cover to <5% at priority sites. Maintain species diversity to EVC Benchmark	Weeds Herbivores
Freshwater invertebrates	Species richness	Unknown		Maintain or improve the diversity of sensitive indicator species (SIGNAL score > 5)	Water
Hydrological function and connectivity	Function and connectivity	Unknown	Unknown	Buffer zone and water sensitive urban design integrated into new adjoining urban developments Seasonal and perennial flows support riparian habitats Maintain integrity and condition of associated riparian and in-stream vegetation	Water

Conservation outcome

Riverine Forest and Woodland	Current condition	Desired trend	Desired condition
Over the 15 years to 2036, improve hydrology in Riverine Forest and Woodland and maintain the health, extent and habitat features to support stable populations of dependent vertebrate and invertebrate fauna.	Fair		Fair



Heathland

This asset spans around 8500 hectares of the Parks Landscape and is mostly clustered in two areas, French Island and northern Mornington Peninsula down to the northern coastline of Western Port. Reserves with large areas of heathland include French Island National Park, The Pines Flora and Fauna Reserve, North Western Port NCR and Langwarrin Flora and Fauna Reserve, but smaller remnants also provide important urban oases in areas such as Braeside Park. Heathlands occur where soil is sandy and extremely low in nutrients and where fire is frequent. Where fire is excluded from heathlands for extended periods, vegetation transitions to other vegetation types.

Sand Heathland (EVC 6) and Wet Heathland (EVC 8) make up the majority of this conservation asset. These communities have a very high plant diversity and are also known for their diversity of small mammals and birds. Species indicative of this conservation asset include structural species such as Woolly Tea-tree, Sheoaks, Prickly Tea-tree and Austral Grass-tree, with an understorey of species such as Broom Spurge, Guinea Flowers, ericoid shrubs and a diversity of orchids (DSE 2005). Heathy Woodlands (EVC 48) are also common in the Parks Landscape, growing with a low overstorey of Rough-barked Manna Gum, Narrow-leaf Peppermint and Silver Banksia. A small but significant occurrence of EPBC-listed Plains Grassland (EVC 132) is found in French Island National Park and is also included in this conservation asset.





Significant species found in heathlands include the French Island Spider-orchid, Orange-tip Finger-orchid and Blotched Sun-orchid, Southern Emu-Wren, Eastern Pygmy Possum, Long-nosed Potoroo and White-footed Dunnart. Strategic Management Prospects analysis (DELWP 2019) has identified King Quail as having a high proportion of its state distribution in the Heathlands and Heathy Woodlands of this Parks Landscape.

The condition of Heathland and Heathy Woodland is influenced by the time between fires, the extent of invasion of overabundant native flora (e.g. Coast Tea-tree and Sallow Wattle) and vegetation dieback caused by the soil pathogen Cinnamon Fungus (also known as *Phytophthora*). The condition of the eucalypt canopy in the Heathy Woodland EVC on French Island is also impacted by koala browsing. The current condition of Heathlands across the Parks Landscape is considered to be good, but could decline if fire is excluded from large areas of the asset. Fire is also required to maintain treeless heathland as it prevents tree colonisation which would alter treeless environments such as Damp Heathland (EVC 710) into Heathy Woodland.

Nested Assets


Nested assets	Examples of components
Birds	Southern Emu-wren (Quail Is.), Lewin's Rail (Langwarrin FFR, Quail Is.), Painted Button-quail (Langwarrin FFR, Quail Is), King Quail (French Is.), White-bellied Sea Eagle
Flora	Coast Manna-gum, Woolly Tea-tree, Prickly Tea-tree, Sweet Wattle, Silver Banksia, Swamp Sheoak, Dwarf Sheoak
Reptiles	Tiger snake, Lowland Copperhead
Ground-dwelling mammals	Long-nosed Potoroo, Swamp Rat, Bush Rat, Water Rat, Eastern Barred Bandicoot, Southern Brown Bandicoot
Orchids	French Island Spider-orchid, Purple Diuris
Aboriginal cultural sites	French Island artefact scatters

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Growth stage of Heathy Woodland	Growth stage distribution	Good		Establish and maintain a diversity of growth stage distribution*	Fire
Structure and composition of Heathland	EVC benchmark, shrub species diversity	Fair		Over 80% of sampled sites have structural elements, successional stages and composition at benchmark condition	Weeds Herbivores Fire
Heathland Ground-dwelling mammals	Site occupancy, species richness	Good		Increased occupancy of suitable habitat by ground dwelling mammals from 2019 levels	Predation
Heathland bird diversity	Site occupancy, species richness	Good		No decline in occupancy of suitable habitat by heathland birds from 2019 levels	Predation

*as defined in the French Island Fire Ecology Strategy 2020

Conservation outcome

Heathland	Current condition	Desired trend	Desired condition
Over the 15 years to 2036, establish diversity of growth stages to maintain floristic diversity, including orchids, and provide high quality habitat and conditions for ground dwelling mammals and heathland birds.	Good		Very Good



Wetland and Waterbodies

Once widespread, the draining of the Carrum Carrum, Tootgarook and Koo Wee Rup Swamps for agriculture and urban development has reduced the extent of wetlands in the Western Port and South-east Melbourne Parks Landscape to just under 600 hectares, a fraction of their former range (e.g. the Koo Wee Rup Swamp was previously one of the largest Wetlands in Victoria). The remaining natural permanent and seasonal freshwater wetlands occur in areas with low fire frequency, relatively fertile soil and inundation every 5-10 years. Climate change is likely to be a driver of the distribution and health of this asset into the future, which is currently considered to be fair but declining. Sedge Wetland (EVC 136), Wetland Formation (EVC 74), Aquatic Herbland/Swamp Scrub Mosaic (EVC 915) and a small amount of Plains Grassy Wetland (EVC 125) are present in this landscape. These wetland communities are largely treeless, characterised by sedges such as Common Reed, Broad-leaf Cumbungi, Floating Club-sedge and various Sword Sedges, and sometimes fringed by shrubs such as Slender/Green Sheoak (DSE 2005).

In the present day, the majority of the extent of wetlands in this Parks Landscape are constructed water bodies, notably those at Cardinia Reservoir Park, Lysterfield Park, Coolart HA, Braeside Park and Devilbend NFR. These constructed wetlands have replaced what would have been natural waterways or wetlands, and are now 'constructed' - deepened and contained by higher banks to create impoundments. Though no longer natural, they are retained for ornamental, environmental and water storage values, and are considered valuable recreation sites, as well as providing habitat for wetland-dependent fauna. However, some of these systems are no longer well connected to their natural catchments due to development of the surrounding landscape and waterway diversions, and now rely on infrastructure to receive water such as via the urban drainage network. As isolation from catchment flows and climate change decrease the amount of water entering these systems, they will need to be managed into the future as drier, less permanent bodies of water. Where the surrounding urban developments drain stormwater into the wetland, this can improve hydrology but brings with it the risk of poor water quality and weed invasion.

Despite their reduced range, there are a number of significant natural wetlands in the Parks Landscape. The best examples are found in northwest French Island National Park which has a large, remarkably intact network of freshwater wetlands including Clump Lagoon, Long Swamp, Duscher Swamp and Heifer Swamp. The park is an important bird breeding habitat, particularly for Royal Spoonbill, Blue-billed Duck, Lewin's Rail, Musk Duck, Australasian Bittern and Freckled Duck. Cranbourne Wetlands NCR has some significant wetland values, including EPBC listed species (Swamp Everlasting, Eastern Great Egret and Latham's Snipe);

however, urbanisation has left the reserve disconnected from a natural water source and congested with Phalaris.



In addition, a number of smaller but high-value wetland sites are found throughout the Parks Landscape, such as those within Braeside Park and Greens Bush. Nine hectares of Plains Grassy Wetland occurs at Braeside Park - this EVC forms part of the EPBC-listed Seasonally Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains. These smaller ecosystems, while in reasonable condition, are under threat from the impacts of nearby housing developments and infrastructure and are isolated in terms of hydrology and vegetation connectivity.

A number of rare or threatened flora and fauna species occur in association with Wetlands and Waterways in the Parks Landscape, including Galaxias species, Southern Pygmy Perch, Blue-billed Duck, Growling Grass-frog, Southern Toadlet and Swamp Skink.

Nested Assets

Nested assets	Examples of components
Native fish	Dwarf Galaxias, Southern Pygmy Perch, Spotted Galaxias
Drought refuges (water holding capacity)	Devilbend NFR, Lysterfield Park, Cardinia Creek Parklands, Dandenong Police Paddocks
Threatened plant species and EVCs	Swamp Scrub, Freshwater Marsh, Marsh Saltbush, Swamp Everlasting
Waterbirds	Blue-billed Duck, Pink-eared Duck, Nankeen Night Heron, Long-toed Stint, White-bellied Sea-eagle, Freckled Duck, Australasian Bittern, Musk Duck, Black Swan, Spotless Crake, Australasian Shoveler, Royal Spoonbill, Ibis colonies
Waterbird breeding habitat	French Island NP: Clump Lagoon, Long Swamp, Duscher Swamp, Heifer Swamp
Aquatic invertebrates	
Herpetofauna	Growling Grass-frog, Southern Toadlet, Swamp Skink
Migratory birds	Eastern Great Egret, Latham's Snipe

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Function and connectivity (hydraulic)	Hydrology	Good		Increase hydrological connectivity between priority wetlands* and catchment inflows Water quality indicators maintained within SEPP (Waters) guidelines Buffer zone and water sensitive urban design integrated into new adjoining urban developments	Recreation Water
	Water quality				
Bird assemblages	Species diversity	Poor		Maintain bird species diversity at 2019 levels	Predation Water
Water dependent vertebrates (fish, herpetofauna)	Site occupancy	Fair	Unknown	Common native species are detected during sample period	Predation Water

Vegetation structure and composition	Species richness EVC benchmark	Fair	→	Increase the quality (EVC benchmark score) of wetland vegetation communities Supported transition to drier vegetation community structure	Weeds, Herbivores Water
Aquatic invertebrates	Species diversity	Poor	↘	Improve the condition of macro-invertebrates to a moderate-high level**	Water

* Frankston, Devilbend, Lysterfield and Karkarook Reservoirs (formerly managed as permanent waterbodies for storage) have been decommissioned and will now function as ephemeral wetlands, subject to hydraulic connectivity with the surrounding landscape.

** Based on Melbourne Water river health and monitoring 20-year goals for the Western Port catchment.

Conservation outcome

Wetland and Waterbodies	Current condition	Desired trend	Desired condition
Over the 15 years to 2036, halt the declining trend in wetland condition and maintain current extent to provide natural refugia for flora and fauna. Maintain the cover of native species and habitat features of ecosystems where hydrology is changing or flows decreasing.	Fair	↗	Good



Saltmarsh and Mangrove

Saltmarsh and Mangrove co-occur along the soft sediments of the sheltered intertidal coast and estuary margins around Western Port and French Island. Some of the most intact and extensive areas of Saltmarsh and Mangrove in Victoria occur within Western Port's Yaringa, French Island, and Churchill Island Marine National Parks. Although large areas of Mangrove and Saltmarsh also occur in French Island National Park and North Western Port NCR, historical clearing has reduced their extent around Western Port (Sinclair & Boon 2012).

Victoria is one of the few places in the world where mangroves that are largely tropical species coexist with temperate saltmarshes. In Victoria there is only one species of mangrove, the Grey Mangrove which is found from Queensland, where they are large trees, to the southernmost mangroves in the world at Corner Inlet, Victoria, where they grow much smaller. Temperate saltmarshes in contrast are very restricted in their distribution and contain a large number of different plant species some of which are rare and threatened.

Mangroves require regular tidal inundation whilst Saltmarsh areas are only inundated occasionally by extreme tides or storm surge. Saltmarsh and Mangrove play an important role in stabilising foreshore areas, and the loss of this asset is thought to have contributed to coastal erosion in some areas, particularly along the eastern coastline of Western Port.

The Saltmarsh and Mangrove habitats in the Parks Landscape are recognised as having state significance and international significant, with the whole of Western Port (including the Eastern coastline of the Mornington Peninsula as far south as Point Leo) listed under the Ramsar Convention on Wetlands to protect habitat for migratory birds. This is considered one of the top three most important areas in Australia for migratory shorebirds (Kellogg Brown & Root 2010). On French Island in particular, these habitats have supported significant breeding areas for the Australian Pelican, Black Swan, Australian Shelduck, and Pied Cormorant, although pelicans may have deserted these sites in recent years (Hansen et al. 2011). In addition, Coastal Saltmarsh (EVC 9) is recognised as nationally endangered, forming a component of the EPBC-listed vegetation community, 'Subtropical and Temperate Coastal Saltmarsh'. Other components of this asset include Estuarine Flats Grasslands (EVC 914) and Estuarine Wetlands (EVC 10), but these ecological vegetation classes are less prevalent.

The Mangrove Shrubland (EVC 140) community is structured around the dominant Grey Mangrove. Mangroves are important habitat for crustaceans, birds and juvenile fish, and provide water filtration and

stability to coastlines. Efforts are currently underway to revegetate mangroves in areas where they have been lost in the north and east coastlines of Western Port, such as sections of the Lang Lang, Grantville and Corinella coastlines. In some areas where Mangroves have been lost, marked coastal erosion is occurring and has been mapped.

The dominant species in Coastal Saltmarsh are usually Beaded Glasswort and Shrubby Glasswort (DSE 2005). Saltmarsh is notably the primary overwintering habitat of the critically endangered Orange-bellied Parrot. Other rare or threatened species that occur in this habitat are the Swift Parrot and Swamp Skink. Marsh Saltbush has a high proportion of its state-wide distribution in the Coastal Saltmarshes of this Parks Landscape.

Saltmarsh and Mangrove ecosystems are recognised for being important for sequestering carbon. Though these ecosystems are less prevalent than other forested vegetation communities known for storing carbon, Saltmarsh and Mangrove are markedly more efficient at sequestration, due to their ability to trap organic matter, and therefore carbon, when inundated (McLeod et al. 2011). Australian ‘blue carbon’ sinks, made up of coastal vegetated ecosystems such as saltmarsh, mangrove, and seagrass beds, represent important areas for the overall minimisation of the concentration of global atmospheric carbon (Macreadie et al. 2017).

Currently, Saltmarsh and Mangrove ecosystems are considered to be in good condition across the Parks Landscape. Climate change, particularly the predicted sea level rise, is likely to cause the landward migration of this conservation asset where suitable habitat remains and if there are no barriers to restrict its movement. Significant invasion of saltmarsh habitats by mangroves has already been measured in this landscape and this trend is likely to increase with warming temperatures due to climate change and rising sea levels advantaging the tropical mangroves over temperate saltmarsh (Whitt et al. 2020). Monitoring of mangrove encroachment in saltmarsh habitat is required to inform any future decision by Parks Victoria in undertaking management intervention to prevent or slow the intrusion.


Nested Assets

Nested assets	Examples of components
Herpetofauna	Swamp Skink
Migratory parrots	Orange-bellied Parrot
Wetland birds and Waders	Little Egret, Lewin’s Rail, Eastern Curlew, Marsh Sandpiper, Pied Oystercatcher
Fish nurseries	Juvenile Pale Mangrove Goby and Australian Grayling
Saltmarsh flora	Beaded Glasswort, Shrubby Glasswort, Salt Lawrenca, Marsh Saltbush

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Saltmarsh vegetation	Extent	Good	➔	Maintain or improve 2016 extent of saltmarsh vegetation in areas at suitable sea level	Water
	Diversity	Good	➔	Maintain diversity to EVC benchmark	
Mangroves	Extent	Good	➔	Maintain 2016 extent of mangroves in areas at suitable sea level Maintain the extent of Mangroves in Yaringa NP at 320 ha (or 33% of park area) and French Island MNP at 228 ha (or 8% of park area)	Water

Conservation outcome

Saltmarsh and Mangrove	Current condition	Desired trend	Desired condition
<p>Over the 15 years to 2036, maintain the combined extent of Saltmarsh and Mangrove, current structure, composition, condition and distribution at current levels, and maximise the potential for the landward expansion of mangrove and saltmarsh communities resulting from sea level rise.</p>	<p>Good</p>		<p>Good</p>



Soft Sediment (mudflats)

Over 1500 hectares of the Soft Sediment (mudflats) conservation asset is distributed across the three Marine National Parks in the Western Port and South-east Melbourne Parks Landscape. The Soft Sediment asset includes both intertidal and subtidal soft sediments in the Western Port Bay. Intertidal mudflats often occur in association with the Seagrass and surrounding Saltmarsh and Mangrove assets. Subtidal soft sediments form extensive areas in deeper waters and include some unusual fauna within channels. This is a significant asset across all three Marine National Parks in Western Port with the most extensive intertidal areas found in the French Island Marine National Park, smaller occurrences are also found in the Churchill Island and Yaringa Marine National Parks.

Intertidal Mudflats are areas of soft sediments that at low tide are exposed in the intertidal zone and form the shallow waters along the shoreline in the subtidal zone. This unique landscape is also an extensive component of the Western Port Ramsar site. The grain size and physical structure of the nutrient rich sediment substrate influence the composition of species that occur throughout this asset, providing habitat in the spaces between the grains for numerous species of meiofaunal invertebrates such as polychaetes, crustaceans, bivalves, and gastropods. Larger burrowing invertebrates, notably Australian and Sandy Ghost Shrimp and many polychaete worms, create complex burrows in the sediment. These invertebrate assemblages provide a rich source of food for fish, including a range of ray species at high tide, and are extremely important feeding grounds for migratory shorebirds at low tide (Kellogg et al. 2010). The subtidal component of the Mudflats asset is important habitat for Elephant Sharks that come into Western Port from deeper waters to lay eggs in the soft sediment.

The Soft Sediment found in the Parks Landscape is currently in good condition. As is the case with other marine conservation assets, climate is the primary driver of condition in this conservation asset. The increased water temperatures predicted under current climate change models (CSIRO 2020) may affect species assemblages, while higher storm activity may increase erosion and sediment transport, potentially altering habitats. Redistribution of sediment caused by the dredging of channels in Western Port outside of marine protected areas has the potential to affect water quality and the condition of reserved soft sediments.

Nested Assets

Nested assets	Examples of components
Invertebrate biota	Australian Ghost Shrimp, Sandy Ghost Shrimp and polychaete worms
Shorebirds and Waterbirds	Black Swan, Pied and Sooty Oystercatchers, Greater Sand Plover, Lesser Sand Plover, Far Eastern Curlew, Royal Spoonbill, Terek Sandpiper, Red-necked Stint, Lesser Golden Plover, Double-banded Plover, Grey-tailed Tattler
Habitat forming species	Burrowing crustaceans like Australian and Sandy Ghost Shrimp
Fish breeding habitat	Elephant Shark egg laying habitat

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Intertidal benthic communities	Abundance and diversity of key invertebrate species	Good	→	Abundance and diversity of key invertebrate species is maintained at or above levels outside park	Water Marine
Subtidal benthic communities	Abundance of key invertebrate species	Good	→	Abundance and diversity of key invertebrate families is maintained at or above levels outside park	Water Marine
Resident shorebirds	Abundance of key species	Fair	Unknown	Abundance (rolling five-year average of maximum annual count) of waterbirds will not decline below the following: Australasian shorebirds (800) and large wading birds (980)	Condition*
Migratory shorebirds	Abundance of key species	Good	Unknown	Abundance (rolling five-year average of maximum annual count) of waterbirds will not decline below the following: migratory shorebirds (5300) Abundance of Eastern Curlew, Curlew Sandpiper and Fairy Tern will not decline below 1% of the Ramsar site population Presence of Bar-tailed Godwit, Lesser Sand Plover and Red Knot in at least three out of every five years	Condition*

* These KEA Goals are indicators of general condition, rather than an outcome representative of a specific strategy

Conservation outcome

Soft Sediment (mudflats)	Current condition	Desired trend	Desired condition
Over the 15 years to 2036, maintain the extent and condition of mudflats as suitable habitat for benthic invertebrates, shorebirds and other dependent species.	Good	→	Good



Seagrass

Approximately 1800 hectares of Seagrass are distributed across the coastal estuaries, bays and inlets of the Western Port and South-east Melbourne Parks Landscape. While the majority of seagrasses are located in French Island, Churchill Island and Yaringa Marine National Parks, smaller patches of an open coast seagrass species are also found within the Mushroom Reef Marine Sanctuary. Seagrass beds in Western Port declined by approximately 70 percent between 1971 and 1985 (DSE 2003), however, a survey in 1995 indicated that between 20 to 30 percent of the degraded areas had been revegetated (EPA 1995). The remaining seagrass in the Parks Landscape is rated as being in good condition, with a currently stable extent. Seagrass in Parks Victoria managed areas represent some of the best seagrass habitats in the broader Western Port landscape compared with areas outside of the marine national parks that are in far poorer condition.

Seagrass beds arise through the gradual accumulation of a nutrient-rich organic substrate in shallow, low wave energy waters that provide favourable conditions for Australian Grass-wrack and Eelgrass, the predominant seagrass species in the Parks Landscape. Two small patches of the less common Paddle Weed are also found in French Island MNP (Barton et al. 2012). Seagrass beds are complex and extremely productive environments which stabilise the sediment and trap sunlight to make food that contributes significantly to food chains. Seagrass beds provide habitat for epiphytic algae, hydroids, ascidians, diatoms, sponges, and grazing invertebrates including many molluscs, whilst detritus formed from decaying leaves is a major food source for many crustaceans like crabs and shrimp as well as burrowing polychaete worms. Seagrass beds provide shelter and protection for juvenile fish and are important nursery areas for many fish including pipefish, Yellow Eye Mullet, leatherjackets, and King George Whiting. They are also important foraging habitat for shorebirds and waders and as such make a significant contribution to the Western Port Ramsar site.

Most fauna associated with Seagrass are heavily reliant on the extent and cover of the predominant marine seagrass species. Sensitive seagrass communities are easily damaged by vessels operating in shallow waters. Other key threatening processes for seagrass communities are changes in sediment deposition patterns, water flow and water quality, in particular, increases in nutrient levels, herbicides, and pollution. For example, excessive nutrients can increase epiphytic algae cover, contributing to seagrass die-off by

reducing light availability. Climate is also considered a driver of Seagrass bed condition, with changes to air and water temperature, water quality and depth all factors that may impact seagrass health into the future.

Seagrass, along with Saltmarsh and Mangrove assets, can be considered ‘blue carbon’ sinks, owing to their tendency to sequester carbon in sediment (Lavery et al. 2013). In addition to the habitat they provide, the ability of Seagrass to reduce atmospheric carbon concentrations is an important consideration for their continued conservation.

Nested Assets

Nested assets	Examples of components
Foraging habitat	Shorebirds, Black Swans, invertebrates
Seagrass bed types	Intertidal seagrass beds, subtidal seagrass beds
Fish nursery habitat	Nurseries for fish including commercially/recreationally important species (King George Whiting, Elephant Shark)
Fish and invertebrate communities	Pipefish, brachiopods, amphipods, gastropods, Ghost Shrimp

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Subtidal seagrass beds	Extent	Good	→	Subtidal Seagrass beds are maintained at current extent of 241ha (or 25%) of Yaringa MNP and 749ha (or 25%) of French Island MNP and are improved in other areas of Western Port	Water Marine Recreation
Intertidal seagrass beds	Extent	Good	→	Intertidal Seagrass beds are maintained at current extent in Yaringa MNP and are improved in other areas of Western Port	Water Marine Recreation
Seagrass cover	Morphology (shoot length)	Good	Unknown	Shoot length of seagrass in Yaringa MNP is maintained at an average of 13.6 cm	Water Marine Recreation
	Percentage cover and connectivity	Good	Unknown	Cover and connectivity of Seagrass beds is maintained at current extent	Water Marine Recreation

Conservation outcome

Seagrass	Current condition	Desired trend	Desired condition
Over the 15 years to 2036, maintain the extent, connectivity and cover of intertidal and subtidal seagrass communities.	Good	→	Good



Intertidal Reef

Within the Western Port and South-east Melbourne Parks Landscape, the Intertidal Reef conservation asset is almost entirely restricted to the Mushroom Reef Marine Sanctuary. Located off the coast of Flinders near the western entrance to Western Port, Intertidal Reef covers approximately 20 hectares of this 80-hectare sanctuary. Due to its proximity to Melbourne, Mushroom Reef is a popular destination for education groups to learn about intertidal ecology. One hectare of Intertidal Reef also occurs at Churchill Island Marine National Park amongst a larger area of seagrass and mudflats.




Intertidal Reefs occur in rocky areas that are exposed by falling tides and are regularly exposed to both marine and terrestrial conditions. Intertidal reefs are typically structured around boulders, rock and reef platforms, rock walls and breakwaters and are heavily influenced by strong wave energy originating from the Bass Strait. They support highly diverse ecosystems including Neptune's Necklace dominated communities and macroinvertebrate communities including limpets and other herbivorous snails, whelks, Seastars, Anemones, Ascidians, Cunjevoi, and Shore Crabs. A diverse range of fish use the reef during periods of higher tide, and at low tide shorebirds such as Sooty and Pied Oystercatchers and Ruddy Turnstone use intertidal reefs for both feeding and roosting.

The condition of the Intertidal Reefs within the Parks Landscape is currently considered to be good, and is largely driven by interactions between tides, and patterns of use. Easy access to the reef and proximity to Melbourne means the Mushroom Reef MS is the target for illegal collection of marine life particularly for molluscs like Abalone. Impact of trampling on intertidal reef communities, disturbance from fossicking, and dogs affecting shorebirds are also recognised threats to Intertidal Reefs. Climate change is predicted to cause an increase in sea level rise, decreasing the currently available area for intertidal species.

Nested Assets


Nested assets	Examples of components
Habitat forming species	Neptune’s Necklace, Tube Worms, Little Black Horse Mussel
Intertidal fauna	Limpets, herbivorous snails, Whelks, Seastars, Anemones, Cunjevoi, and Shore Crabs
Migratory and resident shorebirds	Ruddy Turnstone, Pied and Sooty Oystercatchers

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Migratory and resident shorebirds	Abundance, occupancy	Fair		Maintain abundance and occupancy at current levels (from Birdlife Australia survey of beach nesting birds)	Condition*
Brown algae (including kelp) and sessile invertebrate dominated communities	Spatial extent of habitat forming algae, % cover and connectivity	Good		Maintain at minimum 35% cover of macroalgae in suitable habitat (low-zone) or 10% cover across intertidal asset Maintain connectivity between suitable habitat throughout intertidal asset	Water Marine Recreation
	Percentage cover of mussels	Good		Maintain mussels above 20% cover in suitable habitat (mid-zone) based on Sea Search cover data collected to date	Water Marine Recreation

*These KEA Goals are indicators of general condition, rather than an outcome representative of a specific strategy

Conservation outcome

Intertidal Reef	Current condition	Desired trend	Desired condition
Over the 15 years to 2036, maintain the shorebird, algal, invertebrate and fish assemblages that inhabit Intertidal Reefs.	Good		Good



Subtidal Reef

The Subtidal Reef conservation asset within the Western Port and South-east Melbourne Parks Landscape is restricted to around 35 hectares across both Mushroom Reef Marine Sanctuary and Churchill Island Marine National Park. Subtidal Reef is also a component of the Western Port Ramsar site.

Subtidal Reefs are found deeper than 2 metres below sea level and include shallow (i.e. 2-20 metres) and deep reefs. They can be highly complex with gutters, arches, crevices and overhangs providing multiple sub-habitats for reef associated species. Macroalgae is abundant on shallow Subtidal Reefs while sessile invertebrates such as ascidians and sponges are typical of deep Subtidal Reefs, although only four known species of sessile invertebrates occur in the Subtidal Reefs of Western Port. More broadly, Subtidal Reefs support diverse invertebrate assemblages including seastars and urchins, crabs and Rock Lobster, molluscs, marine worms, and cnidarians. These, in turn, support diverse fish assemblages, including morwong, leatherjackets, Southern Hulafish and Blue-throat Wrasse.

The condition of Subtidal Reefs is good and is considered stable. Most components of this asset are dependent on the health and abundance of macroalgae, the condition of which is affected by interactions between water regimes, climate, patterns of use and invasive species. Illegal fishing activity, particularly for Abalone, Rock Lobsters, and fish remains a concern for Subtidal Reef communities in parks. Climate related increases in extreme rainfall events could increase sediment load within the water column, which may affect algae beds and decrease the light availability at lower depths of the reef.

Occurring outside of Parks Victoria managed reserves, but still in areas where the waters of Western Port are managed by Parks Victoria, are significant Subtidal Reef values including a unique Bryozoan subtidal reef community off Rhyll, Crawfish Rock, and Honeysuckle Reef. The threats and conservation strategies for the Subtidal Reef asset apply to these significant areas despite falling outside the conservation asset footprint.

Nested Assets

Nested assets	Examples of components
Mobile invertebrate biota	Seastars and urchins, crabs and Rock Lobster, molluscs, Endemic Sea-cucumber
Sessile invertebrate biota	Brachiopod species (<i>Magellania flavescens</i> and <i>Sarcoptilus grandis</i>) Sea Anemone species (<i>Actinia tenebrosa</i> and <i>Aulactinia veratra</i>)
Habitat forming species	Mixed Brown Algae including Crayweed and Bull Kelp, Sea Nymph seagrass
Western Port vertebrate biota	Fish species

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Brown Algae dominated communities	Connectivity	Good	→	A fragmentation metric needs to be designed (knowledge gap)	Marine Recreation
	Percent cover	Good	→	Maintain percentage cover of red/green/small brown algae from 2020 levels	Marine Recreation
	Spatial extent	Good	→	Maintain spatial extent of red/green/small brown algae from 2020 levels	Marine Recreation
Subtidal fauna	Invertebrate species abundance	Good	↗	Maintain abundance of key mobile invertebrate species particularly Abalone and Rock Lobster	Marine Recreation
	Fish species richness	Good	Unknown	Fish species richness of 24 species maintained or improved at Mushroom Reef Data for Churchill Island MNP is a current knowledge gap	Recreation
Amphibolis (Sea Nymph)	Connectivity	Very Good	→	Maintain extent, percent cover and connectivity of Amphibolis (key knowledge gap)	Marine Recreation
	Spatial extent	Very Good	→	Requires benchmarking data (knowledge gap)	Marine Recreation
	Percentage cover	Very Good	→	Requires benchmarking data (knowledge gap)	Marine Recreation

Conservation outcome

Subtidal Reef	Current condition	Desired trend	Desired condition
Over the 15 years to 2036, maintain the algal, invertebrate and fish assemblages that inhabit the Subtidal Reefs.	Good	→	Good



Water Column (pelagic)

The Water Column (pelagic) asset incorporates non-vegetated zones of open water found above any subtidal areas. It is populated by a range of drifting planktonic species: tiny phytoplankton such as diatoms, and zooplankton including copepods, jellyfish, and ctenophores; through to fish, sharks, marine mammals such as seals, dolphins, and whales, and is used extensively by seabirds including Little Penguins as a foraging area. Plankton provide a food source for filter-feeding fauna like bivalve molluscs, and ascidians, as well as many small fish. These species in turn are a food source for larger fish, including mullet, snapper, tailor, King George Whiting, and Gummy and School Sharks. Many marine species spend the early stage of their life in the water column environment and currents assist the distribution of recruits back to intertidal and subtidal habitats.

Within this Parks Landscape, the open waters of the Water Column also provide habitat for pelagic marine mammals that feed upon fish and plankton, including Bottlenose and Common Dolphins, Southern Right, Humpback and Killer Whales, and Australian Fur Seals.

Climate is an important driver of condition in the Water Column asset, specifically via changes to water temperature and wind conditions. Water quality, light penetration and history of adjacent land use can also affect the condition of this asset. The Water Column is currently considered to be in fair condition, mainly because of excessive nutrients and sediments entering northern and eastern Western Port from the catchment. Under certain circumstances, nutrients can cause algal blooms in the Water Column, which when breaking down deplete oxygen levels and lead to faunal die off, whilst high sediment loads block light penetration to the sea floor and any submerged aquatic vegetation like seagrass.

Nested Assets

Nested assets	Examples of components
Iconic species	Large fish, dolphins, seals, whales, sharks
Seabirds	Gannets, terns, gulls, penguins
Primary productivity	Phytoplankton
Schooling fishes	Bait fishes

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Water quality (open water)	Nutrient levels, dissolved oxygen, chlorophyll A, turbidity /light attenuation, pH and salinity	Good	→	Maintain water quality at 'Good' (water quality index score)	Water
Water quality (Northern and Eastern Western Port)	Nutrient levels, dissolved oxygen, chlorophyll A, turbidity/ light attenuation, pH and salinity	Poor	→	Improve water quality (currently 'Poor', water quality index score)	Water
Fishes	Species richness	Unknown	Unknown	Knowledge gap	Recreation

Conservation outcome

Water Column (pelagic)	Current condition	Desired trend	Desired condition
Over the 15 years to 2036, maintain water quality in the open ocean and improve water quality in Western Port in order to provide suitable habitat for pelagic communities.	Fair	↗	Good



Koala,
French Island National Park

5 Threats

Identifying priority threats to conservation outcomes

A broad range of key threats to the conservation assets of the Western Port and South-east Melbourne Parks Landscape were identified by experts including participants in the conservation action planning workshops. These threats have been assessed and classified using the methodology described below. The highest-ranked threats identified from this process are discussed in the following sections and will be addressed directly through this plan.

The key threats to the conservation assets relate to impacts on the key ecological attributes and are generally considered to be those with the greatest impact on the regeneration, recruitment and restoration of species and ecological communities. The outcome of mitigating these threats is to ensure that habitats and ecological communities are functioning within acceptable bounds to maintain key species and threatened flora and fauna populations.

Methodology

Parks Victoria uses a method for assessing the risk posed by environmental threats that was developed by associates of the Australian Centre of Excellence for Risk Analysis, broadly following the process outlined in the Australian Standard for Risk Management (Carey et al. 2007). Threats to conservation assets are assessed against their impact on achieving the defined conservation outcome for each asset and their direct impact on key ecological attributes. The assessment is a three-step process.

- 1 Identify threats to conservation outcomes.

Threats to conservation assets are identified by assessing the threat agents as well as the impact of the threatening process on key ecological attributes. For example, the effect of foxes (agent) is predation (process), which reduces the abundance and diversity of small ground-dwelling fauna (impact).

- 2 Classify threats.

Threats are classified according to a risk assessment matrix that defines both the likelihood and ecological consequence of the identified threats impacting on key ecological attributes (Carey et al. 2007) over a defined period of 15 years. Threats are assessed assuming the absence of any ongoing mitigation activity. This is to ensure that priorities are not biased towards threats that do not have any current mitigation action. Threats are ranked as extreme, high, moderate or low risk. Priority areas for the risk abatement of threats are mapped.

- 3 Develop threat management objectives.

Threat management objectives are developed to mitigate the impact of the threats that are the greatest risk to conservation assets. Threat management objectives specify the change in high risk threats required to achieve a particular conservation outcome for a conservation asset.

Identifying and addressing threats associated with climate change

While there are likely to be many negative aspects of climate change across Victoria's environments, protected areas play a significant role in climate change adaptation and mitigation. Parks and reserves sequester and store carbon while well-managed protected areas are essential to the ability of biodiversity to adapt to future conditions. Climate change impacts the ability of ecosystems to function (e.g. through the reduction in availability of fresh water, and rising ocean levels) as well as causing shifts in species ranges to follow movements in suitable climatic ranges. It can also influence the success of project delivery (e.g. where the increased severity of drought or flood provides sub-optimal conditions for pest control) and project outcomes. Victoria's parks and reserves stand to be particularly affected by climate change because they offer cool climate refuge for many species which already have relict distributions and because the legacy of land degradation and fragmentation precludes many mitigating processes such as migration and clinal adaptation.

Threatening processes associated with climate change have been considered in the way that they compound other anthropogenic threats such as invasive species, or through their direct impacts on habitats through drying, warming or sea-level rise. Identifying and mitigating compounded threats will increase the resilience of ecosystems to climate change and improve their capacity to adapt. In some cases, particularly where climate-vulnerable landscapes are impacted such as coastal and freshwater ecosystems, climate change will have a profound impact on the functioning of these ecosystems to the extent that these ecosystems may shift or be permanently altered.

The threat table below (Table 5.1) identifies threatening processes and agents and their relative risk. These threats were considered in the context of key climate projections developed by CSIRO for Southern Slopes Victoria West sub-cluster (CSIRO 2020). Impacts of future climatic conditions projected with a high or very high degree of confidence were considered as part of the threat identification and analysis process. These include:

Increased average temperatures in all seasons; more hot days and warm spells with fewer frosts; reduced cool season rainfall and possible warm season changes in rainfall; increased intensity of rainfall events; continue sea level rise and an increased height of extreme sea-level events; and harsher fire-weather climate.

Priority threatening processes

Of the threatening processes that were assessed in the Western Port and South-east Melbourne Parks Landscape (in Table 5.1), those posing high or very-high risk to conservation assets or their component key ecological attributes are considered priority threatening processes and are described in this section of the plan. Human induced threatening processes such as visitor and recreation management have been assessed separately for marine and terrestrial environments, but are described under a singular threat description due to the related agents and impacts in these environments.

The characteristics and impacts of these priority threats are described in the following pages, together with an objective for the level of threat reduction required over a 5-year period to effectively reduce the impacts on achieving conservation outcomes.

Table 5.1 Key threats to the conservation assets of the Western Port and South-east Melbourne Parks Landscape and their relative risk

Threatening process	Threat agent and impact	Coastal	Riverine Forest and Woodland	Wetland and Waterbodies	Dry Forest and Woodland	Heathland	Saltmarsh and Mangrove	Seagrass	Water Column (pelagic)	Intertidal Reef	Soft Sediment (mudflats)	Subtidal Reef
Habitat degradation / loss	Fragmentation due to encroaching urbanisation and establishment of fire breaks isolates areas of habitat preventing species dispersal and impacting genetic diversity and population viability.	Low	Very High		Very High	Moderate						
	Visitor impacts such as the creation of informal tracks for trail running, mountain biking, horse riding, trail bike riding and geocaching cause disturbance to habitat, erosion and facilitate the movement of weeds and pathogens.	Moderate	Very High		Very High	Very High	High			High	High	
Terrestrial predation	Decline in population abundance and diversity of native mammals due to fox, cat and black rat predation.	Very High	High	High	High	Very high	High					
Weed invasion – terrestrial and aquatic	Weeds displace native species, alter vegetation structure and impact fire regimes. Overabundant native species displace existing flora and congest streams.	Very High	High	Moderate	High	Moderate / High at disturbed sites	High			High		
Diseases	Pathogens associated with increased density of waterbirds (e.g. botulism). Phytophthora causing dieback in heathlands.			Low		High						
Terrestrial grazing, browsing and trampling	Introduced herbivores and overabundant macropods impact on the regeneration and recruitment of native species resulting in simplification of vegetation structure and reduced floral diversity.		High	High	High	Moderate	High					
Fire regimes & management	Too frequent, infrequent, wrong season / severity / scale, causing the degradation of habitat, landscape functioning and connectivity. Reduced capacity for landscape to support biodiversity.		Low		Moderate	High						

Threat agent and impact		Coastal	Rivine Forest and Woodland	Wetland and Waterbodies	Dry Forest and Woodland	Heathland	Saltmarsh and Mangrove	Seagrass	Water Column (pelagic)	Intertidal Reef	Soft Sediment (mudflats)	Subtidal Reef
Marine pests	Introduced aquatic pest plants and animals and overabundant natives disrupt marine ecosystems by competing for available resources.						High	Moderate		High	Moderate	High
Marine resource extraction	Legal and illegal harvesting of shellfish, crayfish, abalone and fishing impacts populations.							Moderate	High	High		High
Marine recreation	Boat anchors and propeller scars destroy reefs and informal access points for boats remove or damage habitat. Littering and microplastics pollute habitat and are ingested by fauna. Fishing refuse in particular has the ability to cause entanglement.						Moderate	Moderate	Moderate		Moderate	
Storm surge / coastal erosion	Climate change impacts such as storm surge/coastal erosion, changes to the distribution of native vegetation species (creating invasive overabundance), and reduced rainfall deplete available habitat for coastal and freshwater species.	High					High	Moderate		Moderate		
Water quality (Freshwater and Marine)	Nutrients and sediments impact catchment water quality, impacting algae abundance and light availability due to turbidity. Other pollutants such as oil spills also impact on water quality.						Moderate	High	Moderate	Moderate	High	
Alteration to natural hydrology / Freshwater availability	Reduced rainfall and extreme rainfall events exacerbated by climate change impacts water availability. Urbanisation diverts stormwater runoff so that wetlands don't receive water.		Moderate	Moderate / High at disturbed sites								
Aquatic predation	Carp and stocked predatory fish (trout etc.), impact native fish and frog populations.			High								



5.1 Inappropriate fire regimes and management

Threat description

Inappropriate fire regimes are patterns of burning vegetation that are of the wrong intensity, interval, or time of year for optimum diversity and health of ecosystems. When fire is too infrequent, contributing factors include the absence of indigenous cultural burning practices, logistical challenges of burning parks and reserves close to built assets and a low return on investment of burning small, urban reserves like many on the Mornington Peninsula. When fire is too frequent, factors include the invasion of flammable weeds (e.g. Sallow Wattle and Boneseed), post-fire colonist species (e.g. Polygala), arson and the logistical challenges of burning remote areas such as French Island. Inappropriate fire regimes are a high threat to the health of Heathland and Dry Forest and Woodland, and a moderate threat to Riverine Forest and Woodland. The threat is widespread, affecting all parks that contain these conservation assets.

Some vegetation types will benefit from fire at an appropriate intensity, interval, and time of year. Heathland and Dry Forest and Woodland are both fire-prone and fire-adapted. Areas of Dry Forest in the Parks Landscape are subject to asset protection overlays and burnt frequently. Other areas such as Greens Bush in Mornington Peninsula National Park, remain long unburnt because of the logistical challenges of prescribing burns in close proximity to populated areas. In these areas, the delineated burn units (parcels of land for fire management) are limited, and to make fire management possible these would require additional slashing or fuel breaks to be constructed to create discrete areas where fire can be managed safely, presenting additional vegetation and habitat fragmentation issues. Large areas of Heathlands and Heathy Woodlands on French Island and Quail Island are also outside of their maximum Tolerable Fire Interval (TFI), because of the cost and logistical difficulties of applying fire to islands with little transport and infrastructure.

Generally, fire is unlikely to burn into the damper ecosystems such as Riverine Forests and Woodlands and mangroves even under extreme bushfire events. However, bushfire in these ecosystems may be increasingly likely due to the drying effects of climate change with fires having occurred for the first time in mangroves on the eastern shoreline of Western Port in recent years. Parks and reserves that may be affected include Greens Bush in Mornington Peninsula National Park, Cardinia Creek Parklands and Quail

Island NCR. Fire can also be a contributing factor to the expansion of other biological threats in the landscape. It may favour the expansion and impact of exotic plant species such as Boneseed by triggering the germination of seed or may facilitate the spread of weed species such as Toowoomba Canary-grass as competition is reduced. Regenerating vegetation in the post-fire landscape may also be more susceptible to over-grazing, when both exotic and native fauna graze and browse heavily upon the reduced vegetation available and are attracted to palatable new growth. In turn, this can reduce the capacity of fire-affected vegetation, habitat, and local populations of flora and fauna to recover. Native animals can also be increasingly exposed to predators in post-fire vegetation where there is less shelter available.

Other drivers such as drought and other climate driven extreme weather events can also have adverse outcomes when combined with planned fire or bushfire. This will become more prevalent under future climate conditions which have projected harsher fire weather conditions. Threats to the recovery of conservation assets post fire are linked to pressures from other threats such as weed invasion, terrestrial grazing and water quality in freshwater and estuarine ecosystems.

Threat objective(s)

By 2026, deliver ecological burning to diversify age class and structure of vegetation. Identify specific natural values for protection within asset protection zones to reduce negative impacts of burning for risk reduction.

This threat is addressed through the Conservation Strategy: **6.1 Fire management for ecological health.**



5.2 Poor water quality inputs (freshwater and marine) and altered hydrology

Threat description

Freshwater ecosystems

Since European settlement, the hydrology of the wetlands and waterways of the Western Port and South-east Melbourne Parks Landscape has changed markedly. Large swampy areas have been drained (now remaining in small areas such as Tootgarook Swamp and the Edithvale-Seaford Wetlands) and damming and diversion of waterways and substantial urban growth with associated drainage networks, have significantly changed the hydrological pattern and quality of water that enters them.

Many of the wetlands that remain are isolated and the natural catchment that feeds them now consumed by urban sprawl and waterways converted to drains. An example of this is Cranbourne Wetlands Nature Conservation Reserve, where an assessment in 2010 identified wetland EVCs with very high conservation significance, but that these were threatened by weed invasion and altered hydrology (Australian Ecosystems 2010). Since this time, on-going urban growth and diversion of natural wetland inflows to stormwater drainage systems have significantly altered the flow pattern and the health of this wetland, and it has become dominated by exotic species, particularly *Phalaris*.

Urbanisation also increases the area covered by hard impervious surfaces, such as roads, carparks and concrete driveways which can lead to a higher velocity and larger volume of water being delivered to the bay through the drainage network, carrying nutrients and sediment, and impacting marine protected areas such as Yaringa Marine National Park.

Reduced water quality impacting on aquatic ecosystems mainly originates from private land. High rainfall events and storms cause erosion and the washing of nutrients and sediments through the catchments and into waterways and wetlands, resulting in poor water quality further downstream in the Parks Victoria estate. Pollutants such as biocides, fertilisers, oils, other chemicals and organic effluent originate from farmland, industrial and residential areas and spread via aquatic pathways such as waterways and drains upstream. Sediment enters these ecosystems as a result of bushfires, storm events and erosion caused by

historic clearing, urban developments and farming practices. Poor condition of waterways including instream erosion and lack of riparian vegetation, and lack of wetlands to treat stormwater, also contribute to sediment loads downstream. The presence of deer and feral pigs pugging and wallowing in waterways is an additional contributing factor to poor water quality.

Water quality and altered hydrology is considered a moderate threat to the Wetland and Waterbodies and Riverine Forest and Woodland in Devilbend NFR, Frankston NCR, Lysterfield Park, Coolart HA, French Island National Park, Braeside Park, Cardinia Reservoir Park and Cranbourne NCR.

Marine and estuarine ecosystems

Water quality in marine environments is dependent on the level of nutrient loading and pollutants from terrestrial run-off entering via riparian freshwater ecosystems, as well as the amount of sediment suspended in the water column. Nutrients enter Western Port via waterway discharge from catchments, seepage from unsewered townships, stormwater run-off from urban areas, and agricultural run-off. Stormwater carries pollutant inputs such as litter, sediments, nutrients, micro-organisms, toxic organics, heavy metals, oils, and surfactants, and is likely to increase with the development of the South-eastern Growth Corridor. Stormwater is discharged directly into Yaringa Marine National Park via tributaries that enter Watsons Creek and into waters adjacent to Churchill Island Marine National Park and may impact on the water quality and natural values of these parks.

In rural areas of the Western Port catchment, eroding hillsides and streams caused by loss of vegetation results in large volumes of sediment being transferred down the slope into the bay. The erosion of coastlines is also a major source of sediment in Western Port which in some cases, have receded more than 50 metres in the last decade. Highly dispersible clays in the low cliffs in the north eastern sections of the bay are readily mobilised by waves and remain suspended in the water creating high turbidity and significantly reducing light penetration. Climate change-predicted increases in storm surge activity in Western Port suggest that this problem is likely to increase over time.

High nutrient inputs from agricultural runoff provide conditions conducive to algal blooms and increased epiphyte growth on seagrass. Epiphytic growth, along with increased turbidity from suspended sediments increases light attenuation, and settled sediments can smother seagrass beds. However, because of the flushing tides within Western Port, nutrient retention in mudflats is not thought to be high (Evrard & Glud 2013). Because most of Western Port is sheltered and shallow, sediment entering the ecosystem remains suspended in the water column and has been implicated in the decline in extent of Seagrass Beds (Boon et al. 2011) and may also threaten the health of Intertidal and Subtidal Reefs.

Sea level rise

As a consequence of climate change-predicted sea level rise and an increase in storm surge, coastal reserves will be increasingly inundated with seawater, particularly around the low-lying areas of Western Port, including the North Western Port Nature Conservation Reserve. These factors will also continue to cause erosion of the shoreline, further reducing the width of reserves and release of more sediments into the bay.

Consequently, the existing network of coastal protected areas will be insufficient to maintain the current area of saltmarsh and mangroves or facilitate the retreat of these ecosystems inland. As many coastal reserves are linear strips of crown land, their inundation will result in fragmentation of coastal parks with many sections disappearing completely underwater around the Western Port.

Coastlines exposed to the Southern Ocean in the Mornington Peninsula and Point Nepean National Parks are impacted by increased frequency of landslides and cliff collapse due to rising sea levels, resulting in the loss of available habitat and nesting sites in these areas.

Threat objective(s)

By 2026:

- Increase knowledge of vulnerable habitats and increase ability to adapt to storm events
- Improve the quality of freshwater flows via measures such as water re-use/purification in urban and agricultural systems
- Manage adaptation to unplanned changes to hydrology in artificially inundated wetlands
- Reduce the impact of changes to the hydrological regime as a consequence of urban development and water saving measures
- Saltmarsh and mangrove extent are maintained or improved allowing for retreat as sea-level rises.

This threat is addressed through the Conservation Strategy: **6.2 Supporting partnerships to address threats to water-dependent assets.**



5.3 Weed invasion

Threat description

Weeds are widespread throughout the Western Port and South-east Melbourne Parks Landscape. Invasive plants are damaging to areas of native vegetation because they outcompete native plants, change vegetation structure and fire regimes, and alter ecosystem functions such as hydrological regimes and nutrient cycling. Many weeds colonise open or disturbed ground, which is created by vegetation removal, pest animal activity (such as rabbit warrens), fire, and edge effects associated with vegetation fragmentation. Weed material is dispersed by vectors including wind, water, vehicles, footwear, and animals (especially through bird droppings). The source of these weeds is often established infestations on nearby land, home gardens, dumping of green waste in parks and reserves as well as nurseries selling invasive plants. Detection of new infestations and broadscale control of weeds is very difficult in the highly fragmented Western Port and South-east Melbourne Parks Landscape.

Wandering Creeper and Blackberry are highly invasive weeds that occur along the riparian zones of Riverine Forest and Woodlands. In Arthurs Seat State Park, Langwarrin FFR, Frankston NCR, Churchill National Park, Lysterfield Park, Point Nepean National Park and The Pines FFR, woody, transformative weeds such as Boneseed, Bluebell Creeper and Sweet Pittosporum are changing the structure and function of the Dry Forest and Woodland asset. Although weeds are found throughout Heathlands and Heathy Woodlands, the density is generally low. Weeds can be abundant in disturbed areas, but these infestations do not usually invade the intact areas of vegetation.

Weeds are a very high threat to the Coastal conservation asset, particularly in Mornington Peninsula National Park and Point Nepean National Park. Weeds such as Boneseed, Bridal Creeper, African Boxthorn, One-leaf Tulip, Spiny Rush, Montbretia and Myrtle-leaf Milkwort can become very dense in the understorey, significantly modifying the ecosystem.

In these coastal areas there are also issues of overabundant native species such as Coast Tea-tree and Sallow Wattle which can displace other flora. In coastal grasslands, native Hairy Spinifex is outcompeted in some areas by the introduced Marram Grass.

The highly invasive aquatic grass *Spartina* (Common Cord-grass) is a significant threat in small estuaries and on sheltered mudflats in Western Port. Significant infestations which spanned over 100 hectares have been managed in partnership with Melbourne Water since 2005, with a few acres of infestation remaining in the Bass River estuary and “The Inlets” near Tooradin. Melbourne Water is on-track with its Management Plan to meet *Spartina* eradication objectives in Western Port by 2026. This weed can significantly alter and transform the Intertidal Mudflats ecosystem as it grows very fast, consolidates and traps soft sediments and takes over feeding and roosting sites needed by shorebirds for foraging, can quickly alter natural drainage patterns and likely alters infauna composition and diversity.

Threat objective(s)

By 2026, contain or eradicate new and emerging weeds, contain the spread of identified established populations, and control high priority species at high value locations.

This threat is addressed through the Conservation Strategy: **6.3 Environmental weed control using a biosecurity approach.**



5.4 Terrestrial grazing, browsing and trampling

Threat description

Herbivores that graze and browse on native vegetation are a moderate threat to the terrestrial conservation assets. Overgrazing and browsing degrades vegetation by lowering native plant diversity, altering the structure and reducing the complexity of vegetation, and reducing habitat resilience to disturbances such as fire. Grazing can cause severe damage to populations of rare and threatened plants, notably threatened orchids such as the French Island Spider-orchid and the Leafy Greenhood as well as species that are highly palatable and preferred by grazers. Grazing animals are also known to cause erosion damage to cultural heritage sites, wetlands and waterways.

Introduced herbivores

Sambar and Fallow Deer are common in the northern foothills of the Western Port and South-east Melbourne Parks Landscape, inhabiting the Riverine Forest and Woodlands as well as the Dry Forest and Woodlands. Sambar are also present in the Heathy Woodlands and Saltmarsh and Mangrove on French Island. As well as grazing, rubbing, trampling and browsing, deer degrade the water quality of wetlands and waterways by pugging, excreting and wallowing in shallow water. Fallow Deer are present in Greens Bush and Devilbend Nature Conservation Reserve.

The sandy soils of the Coastal asset are favoured habitat for rabbits, which are also present in the Dry Forest and Woodland, and Heathland conservation assets. Without active management, seedlings and saplings can be severely compromised by selective grazing. Understorey species also suffer from grazing and browsing pressure, compounded by competition with weedy plant species. Because rabbits are an abundant prey species, predator control needs to be undertaken alongside rabbit control to both avoid native animals becoming more heavily preyed on by foxes and cats ('prey switching'), and avoid increased rabbit impacts due to decreased predation pressure.

Feral Goats have been subject to targeted control on French Island, where they threaten the population of endangered French Island Spider-orchids. They remain in relatively low numbers and their eradication is a priority management objective. Pigs were illegally released on Quail Island within North Western Port Nature Conservation Reserve for hunting but have recently been eradicated there. Pigs are restricted in

their distribution, occurring in Lysterfield Park and the Gurdies NCR, which is directly adjacent to the Parks Landscape. As well as grazing, the hard hoofs of pigs pug soils that are soft or damp such as in heathlands and saltmarsh vegetation.

While there are no feral cattle populations established in the Parks Landscape, some neighbouring landowners are using parks and reserves to graze livestock, particularly in North Western Port NCR and French Island National Park. In some areas where fencing has not been maintained, the boundaries between coastal reserves and private property are unknown. In other cases, private landowners are deliberately introducing stock into known reserves.

Native herbivores

In the late 1800s, Koalas were introduced onto French Island where they had not previously occurred naturally. Unlike mainland populations, the island Koalas are free of the disease Chlamydia and have a high reproductive rate. Despite relocation and fertility control programs, a large population remains. Over-browsing has caused serious degradation and tree death in Manna Gum woodlands and an increase in the mortality rate of koalas due to starvation. High Koala numbers have the potential to put pressure on Dry Forest and Woodlands where they occur on French Island, and populations and habitat should be continually monitored.

Similarly, native species that are not endemic to French Island, such as Eastern Grey Kangaroos and Brushtail possums, have been introduced by visitors, adding grazing pressure to that of goats and deer.

Large numbers of Kangaroos inhabit Greens Bush in Mornington Peninsula National Park. Populations are high because of the number of artificial watering points in the landscape, such as dams, and the absence of natural predators. Kangaroo grazing impact on ground flora diversity is also a potential issue within Churchill National Park, Lysterfield Park and Dandenong Police Paddocks. Data is required to better understand kangaroo abundance and impacts in these areas to determine if a control response is required.

Threat objective(s)

By 2026, reduce grazing, browsing and trampling pressure on priority vegetation communities from rabbits, goats, pigs, deer, livestock and native herbivores, including by eradicating island pest populations and the exclusion of livestock.

This threat is addressed through the Conservation Strategy: **6.4 Terrestrial herbivore management.**



5.5 Terrestrial predation

Threat description

Predation due to European Foxes and stray or feral cats continues to cause decline in both the number of native fauna populations and their overall numbers across the terrestrial conservation assets. Predation affects most small and medium-sized mammals, reptiles and birds, exerting particular pressure on endangered species in the Western Port and South-east Melbourne Parks Landscape such as the Swamp Skink, Hooded Plover, Southern Brown Bandicoot and White-footed Dunnart. While there is no fox population on French Island, predation by feral cats alone is a very high threat to native fauna, such as Long-nosed Potoroo, that use the Heathlands and Heathy Woodlands that the National Park supports. Feral pigs, though less widespread, are omnivores and also prey on native animals.

Controlling invasive predators in the peri-urban environment can be challenging due to the limitations of control measures in close proximity to residential properties. An integrated approach consisting of a mix of baiting and leg hold traps to control foxes is utilised to increase the success of programs as well as managing risks to domestic animals.

Domestic cats that are allowed to roam outside private property have also been implicated in native fauna declines Australia-wide (Doherty et al. 2015). Limited resources are available for compliance activities in priority areas, such as Hooded Plover habitat in Mornington Peninsula National Park.

Predation is a major threat to the fauna dependent on the Intertidal Reef marine conservation asset. In coastal areas (such as Point Nepean National Park, Mornington Peninsula National Park and Reef Island and Bass River Mouth Nature Conservation Reserve) predation by Black Rats and pet dogs (in addition to foxes and cats) causes decline in overall population abundance of the beach nesting, EPBC Act-listed Hooded Plover, and may cause localised extinction. Red-capped Plovers and other shorebirds are also taken by feral cats and foxes.

With the exception of islands, eradication of invasive predators within this landscape is unachievable due to reinvasion rates. In island habitats, the threat objective is eradication of predators and ongoing monitoring for re-incursion. Predator control programs on mainland areas have less permanency and are therefore targeted to focus on the protection of specific threatened species.

Threat objective(s)

By 2026, reduce cat, fox, pig and domestic dog predation to levels low enough to support increasing populations of priority native animal species at priority locations.

This threat is addressed through the Conservation Strategy: **6.5 Sustained control and monitoring of introduced terrestrial predators to support resilient native fauna populations.**



5.6 Marine predation and competition

Threat description

Marine invasive and native overabundant species pose a moderate to high risk threat to the marine assets across the coastline of the Western Port and South-east Melbourne Parks Landscape. The introduction of marine pests into Victorian waters is listed as a potentially threatening process under the FFG Act. Pests colonise new areas through natural dispersal currents and storm events, on fishing equipment, the hulls of boats and in the ballast water of larger vessels. Pest algae species impede the growth of native species such as large Brown Kelp on Rocky Reefs, whilst pest animals can prey on native marine species and occupy habitat to the exclusion of native species dependent on Subtidal Reefs, Intertidal Reefs and Seagrass.

At present there are limited numbers of marine pest species established in Western Port despite close proximity to Port Phillip where more than 100 known introduced species are well established including all known marine pests. Serious marine invasive species that are well established in Port Phillip Bay to the west of the landscape include Northern Pacific Seastars, which modify Subtidal Reefs, Soft Sediment (mudflats) and Seagrass by feeding on native marine species including pipis, mussels, crabs, barnacles and fish eggs; and the invasive algae Japanese kelp (*Undaria*), that outcompetes native algae and is listed as one of the top 100 most invasive species in the world (Global Invasive Species Database 2000). These have both been previously recorded in Western Port at San Remo and Flinders respectively.

The Pacific Oyster was originally introduced into Australian waters for aquaculture and has become established in the Soft Sediments and Intertidal Reef assets around French Island, Churchill Island Marine National Park and throughout Western Port. The species outcompetes other native molluscs and it is thought that this species could increase in number as a response to climate change.

Threat objective(s)

By 2026, continue to support efforts to prevent new incursions of marine pests from establishing, respond rapidly to new incursions in parks, and reduce the impact of established marine pests where feasible.

This threat is addressed through the Conservation Strategy: **6.6 Managing marine pests for healthy marine protected areas.**



5.7 Human-mediated habitat degradation/loss

Threat description

There are three broad ways that human-mediated habitat degradation and loss threaten the health of the conservation assets in the Western Port and South-east Melbourne Parks Landscape: encroaching urbanisation, the impact of legal visitor activities, and the impacts of illegal activities to parks and reserves.

Encroaching urbanisation

Urban development is active in areas such as Rye, Rosebud and north beyond Dromana. Although clearing for development is restricted to private land, there are flow on effects to parks and reserves, especially on the Mornington Peninsula where habitat fragmentation is already high. Clearing for development continues to cause the loss of vegetation communities, plant species and fauna habitat, reducing habitat connectivity and species dispersal between parks and reserves. In turn, this can result in declines in population abundance and genetic diversity of species in the Parks Landscape. New developments can also necessitate the establishment of fire breaks on parks and reserves, further isolating areas of habitat. The development of these areas has facilitated the need for major transport infrastructure, which further fragments the landscape.

Removing vegetation on private land also reduces habitat availability for species across the Parks Landscape as a whole, which is likely to have contributed to the loss of habitat viability of the Mornington Peninsula for species such as the Grey-crowned Babbler and Southern Brown Bandicoot. Habitat clearing is also a direct cause of mortality and displacement of fauna species with already low numbers, such as the Long-nosed Bandicoot and White-footed Dunnart.

The impacts of urbanisation are apparent across the terrestrial conservation assets and are considered a very high risk in Riverine Forest and Woodland, and Dry Forest and Woodland. The parks and reserves most affected include Mornington Peninsula National Park, Point Nepean National Park, Langwarrin FFR, The Pines FFR, and North Western Port NCR. Hydrological impacts from increasing urbanisation and development are described in section 5.2.

Visitor impacts, recreation and commercial operations

Visitor impacts are a very high risk to the Riverine Forest and Woodland, the Dry Forest and Woodland, and Heathland terrestrial conservation assets, and a high risk to the Intertidal Reef and Soft Sediment (mudflats) marine conservation assets.

The parks and reserves of Western Port and South-east Melbourne have very high visitation rates from tourists, Melbourne residents and locals alike. Permissible activities such as bushwalking and trail bike riding can compromise the health of terrestrial conservation assets and need to be managed and restricted to appropriate areas. Coastal areas are particularly impacted by high visitation where coastal dune habitats are trampled and degraded by walkers wandering through the dunes in parks such as Mornington Peninsula National Park or cutting through these areas to access beaches.

Trampling of biota, anchor damage to seagrass beds, mudflats, and reefs, and disturbance of fauna by vessels, are all significant threats to marine values. In the intertidal soft sediment and seagrass beds, boaters can cause anchor damage and propeller scars. This is a particular risk for the Western Port Bryozoan subtidal reef community, and the threatened San Remo Marine Community, both occurring outside marine protected areas. School groups visiting Intertidal Reefs may cause trampling damage, particularly to Neptune's Necklace (Addison et al. 2008).

Activities run by Licenced Tour Operators also need to be carefully administered and monitored to ensure that commercial operations are environmentally sustainable and not degrading parks and reserves.

Illegal and unregulated activities

In terrestrial reserves such as Churchill National Park, Lysterfield Park and Arthurs Seat SP, informal tracks have been created illegally for trail running, mountain biking, dirt biking and geocaching. This causes disturbance and damage to habitat, soil erosion and facilitates weeds and pathogens spreading through parks. Other illegal activities include arson, rubbish dumping, taking plants and wildlife, introducing drug crops and vandalising facilities. Human waste management is also a challenge for park management.

Domestic dogs being walked illegally (both off lead or in areas where they are entirely prohibited) disrupt shorebird breeding, cause a notable number of injuries to wildlife (Holderness-Roddam & McQuillan 2014), and are a particular threat to nesting shorebirds on coastal parks and reserves. A published study of dog walking and the impacts on birds undertaken by Banks and Bryant in 2007 found that even on-leash dog walking in natural areas reduced bird abundance and species richness.

In the marine conservation assets illegal activities such as fishing in no-take areas and shellfish poaching cause removal of some key species and reduce populations of native fauna.

Threat objective(s)

By 2026:

- Ensure opportunities for recreational activities in parks are undertaken in ecologically appropriate areas with low/no impact on natural values.
- Reduce impacts of trampling and other physical disturbances by visitors and commercial operators at priority sites and reduce illegal activities, including fishing and shellfish collection at priority sites.

This threat is addressed through the Conservation Strategy: **6.7 Reducing the impacts of recreation, illegal activities and resource extraction on natural values.**



Swamp Skink,
Mornington Peninsular



Hooded Plover management,
Point Nepean

6 Conservation strategies

Priority conservation strategies

A broad range of conservation strategies have been considered, including those in existing park management plans and regional catchment strategies as well as additional actions identified by regional staff and conservation partners. The following strategies and their component actions have been designed to achieve the desired conservation outcomes identified in this plan. The DELWP Strategic Management Prospects (SMP) decision support tool will be used to help determine the priority areas for implementing these strategies along with other assessments of impact, feasibility and cost. Each strategy description is accompanied by a table of priority areas and/or actions. Where the SMP tool has been used to determine these priorities, the threshold of cost-effectiveness is included. For example, 'SMP 3' indicates that a park contains some of the top 3 values (on a scale of 0-100) of cost-effectiveness according to the SMP tool.

Where appropriate, adaptations to climate change have been considered in developing these strategies. These strategies will support the persistence of conservation assets in this landscape by mitigating priority threats, thereby strengthening the capacity of ecosystems to absorb the impacts of long-term climatic change. In some assets, such as coastal and freshwater, where climate change will have a profound impact on the function and composition of these ecosystems, proposed adaptation measures have the aim of managing ecosystems to a changed state and function, and facilitating movement of communities such as saltmarsh and mangrove communities due to sea-level rise.

Strategies for this landscape have been developed considering a range of recognised climate adaptation strategies such as:

- **Ensuring functional connectivity** – ensuring connectivity of coastal vegetation by supporting the landward retreat of coast marsh (Gross et al. 2016).
- **Protecting key ecosystem features** – such as mangroves and seagrass beds which provide important fish nurseries and spawning areas.
- **Supporting ex-situ conservation and relocating organisms** – such as the Eastern Barred Bandicoot release program on French Island.
- **Reducing non-climate stressors** – including controlling pest plants and animals which hinder the ability of ecosystems to withstand or adjust to changing climate.

Priority strategies have been further developed to establish guiding statements around the key implementation components of each strategy. These were tested through the development of results chains, which test the logic of the strategy in a stepwise manner for delivering the desired outcomes. These results chains were used to develop key implementation milestones for each strategy, which include measurable outputs and outcomes that help managers to understand the impacts of management on improving the viability of conservation assets and managing threats.

Each strategy may be suitable for further refinement or development with conservation partners and stakeholders who wish to further support conservation outcomes in the Western Port and South-east Melbourne Parks Landscape.

Strategies prioritised and developed through this process are:

- Fire management for ecological health
- Supporting partnerships to address threats to water-dependent assets
- Environmental weed control using a biosecurity approach

- Terrestrial herbivore management
- Sustained control and monitoring of introduced terrestrial predators to support native fauna populations
- Managing marine pests for healthy marine protected areas
- Reducing the impacts of recreation, illegal activities and resource extraction on natural values

Strategy description format

Conservation strategies are detailed on the following pages in the format described below.

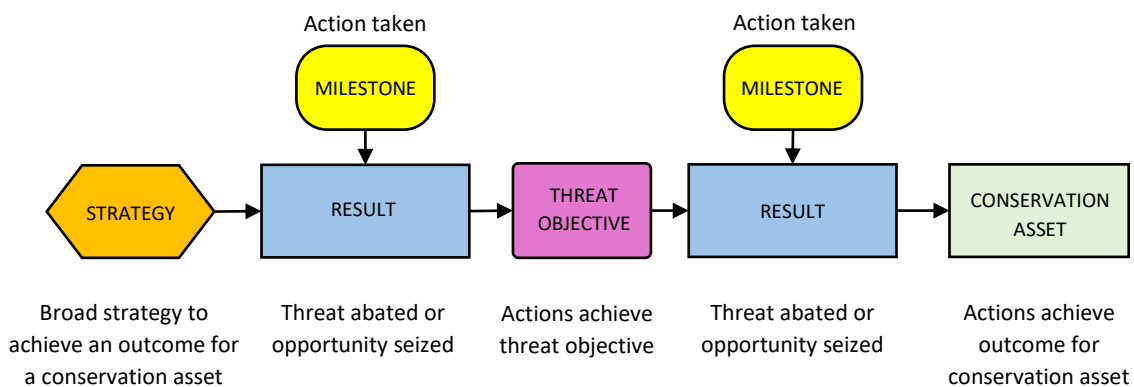
Conservation strategy

Conservation strategy development has focused on either addressing key threats or improving the health of key conservation assets or both. The development of these priority strategies has been undertaken using results chains to ensure that the actions that are defined within the strategy are those that will lead directly to addressing the objectives and conservation outcomes of this plan. Each strategy is captured in a statement which defines:

- the impacts of the strategy on key threats
- the approaches to be applied
- the measures of success
- the impact of the strategy on conservation outcomes.

Results chain

Results chains have been developed for all conservation strategies. They express the relationship between the conservation strategy, identified threats and an improvement in the desired state of conservation assets, as well as the assumptions that underpin how we think a conservation strategy will contribute to maintaining one or more conservation assets. The results chain helps visualise and identify some initial monitoring indicators and milestones. Below is a simple example of a results chain.



Implementation milestones

Result	Action
Statement of what implementation success looks like	<ul style="list-style-type: none"> • Milestone from results chain, with locational and other detail •
	<ul style="list-style-type: none"> •
	<ul style="list-style-type: none"> •
Threat objective	<ul style="list-style-type: none"> •



6.1 Fire management for ecological health

This strategy aims to improve the ecological and cultural health of the Western Port and South-east Melbourne Parks Landscape through managing the threat of inappropriate fire regimes and the threats associated with fire prevention, management and recovery. Cross-tenure management is key to protecting important sites with specific fire requirements and for preventing landscape-scale bushfires, so fire planning and management will be carried out in partnership with DELWP and in consultation with the CFA, Traditional Owners, neighbours and the community.

Application of ecological fire

A significant area of the Parks Landscape is affected by Asset Protection Zones (APZs), where the primary aim is to prevent bushfire from threatening life and property. Beyond APZs, Parks Victoria will work with fire management partners to include ecological fire objectives into strategic fire plans, including maintaining vegetation within Tolerable Fire Intervals (TFIs) and an appropriate arrangement (spatial matrix and appropriate age classes) of vegetation growth stages. An important initial task will be to develop fire ecology strategies to document the desired ecological growth stage structure for key areas in the Parks Landscape.

The highest priority areas for developing fire ecology strategies and carry out ecological burning are the Heathland conservation assets of French Island National Park and Quail Island NCR, where conservation values are high and asset protection zones affect a relatively small proportion of the area. Within Heathland EVCs, species richness of shrubs, graminoids and forbs increases after burning (Moxham and Kennedy 2012). The aim of ecological fire management on French Island is to protect significant flora and fauna, restore koala habitat, control weeds, pest animals and disease, and to protect assets (PV 2020). In areas where Heathland co-occurs with Heathy Woodland and or Lowland Forest, areas will be excluded from burning to maintain older growth stages of Lowland Forest and Heathy Woodland. Planning burning is also excluded from Koala habitat, Long-nosed Potoroo habitat, bird nesting and roosting habitat, and Eastern Barred Bandicoot release sites and their surrounds will also be excluded from planned burns.

Arthurs Seat SP, Greens Bush in Mornington Peninsula National Park, grassland communities in Point Nepean National Park, The Pines FFR and Lysterfield Park are additional areas where a fire ecology strategy may be beneficial to asset health. Coastal vegetation in areas such as Mornington Peninsula National Park,

Flinders-Somers CR and North Western Port NCR present a risk management challenge as it occurs in populated areas and requires burning under hot and windy conditions, presenting an increased risk of fire escaping control. A component of this strategy is to investigate alternative techniques to safely burn coastal vegetation in these areas, or to provide analogous disturbance to stimulate habitat regeneration and create the habitat structure required by coastal plants and animals.

There are also areas within the Parks Landscape where the application of fire should be minimised and actively suppressed. The retention of old growth vegetation in forests and woodlands will be promoted by protecting existing old-growth areas from fire and setting aside areas of mid growth stage to mature in the future. In APZs, alternative fuel treatments such as slashing will be trialled to reduce the threat of bushfire. Trials will also be carried out in areas where fire has been too frequent (such as areas with heavy Coast Tea-tree invasion in the Coastal conservation asset) to investigate the feasibility of alternative fuel management techniques in place of fuel reduction burns.

Fire preparation and recovery

Parks Victoria will work with the CFA and DELWP to minimise the negative impacts of planned burns and fire prevention and suppression activities. This will be achieved by land managers providing work instructions for key species and priority areas in the Parks Landscape to Incident Management Teams (IMTs) during bushfires, and providing the CFA with mapped conservation values to exclude or protect from fire ahead of time. Parks Victoria will also work with adjacent landowners and the CFA to minimise the footprint of fire breaks.

Threatening processes that can be compounded by fire management activities and bushfires will be considered in burn plans so that recovery activities are well-timed to support the rehabilitation of conservation assets and cultural sites. As fires can trigger increases in weeds and pest animals and reduce shelter for fauna, fire management must be carried out in conjunction with the other strategies that address these threats. For example, burning on French Island exposes Long-nosed Potoroos to an increased predation risk (Frankham et al. 2011), so burn plans must incorporate predator control and where possible, be conducted in a way that retains cover or as a mosaic burn so that some areas remain unburnt. Achieving mosaic burns is not practical to achieve in the Heathland asset and inconsistent with asset protection objectives within the APZs.

Conservation outcomes

- Ecological burning diversifies age classes and structure in bushfire moderation and landscape management zones.
- Reduced negative impacts of risk reduction burning.

Strategy summary

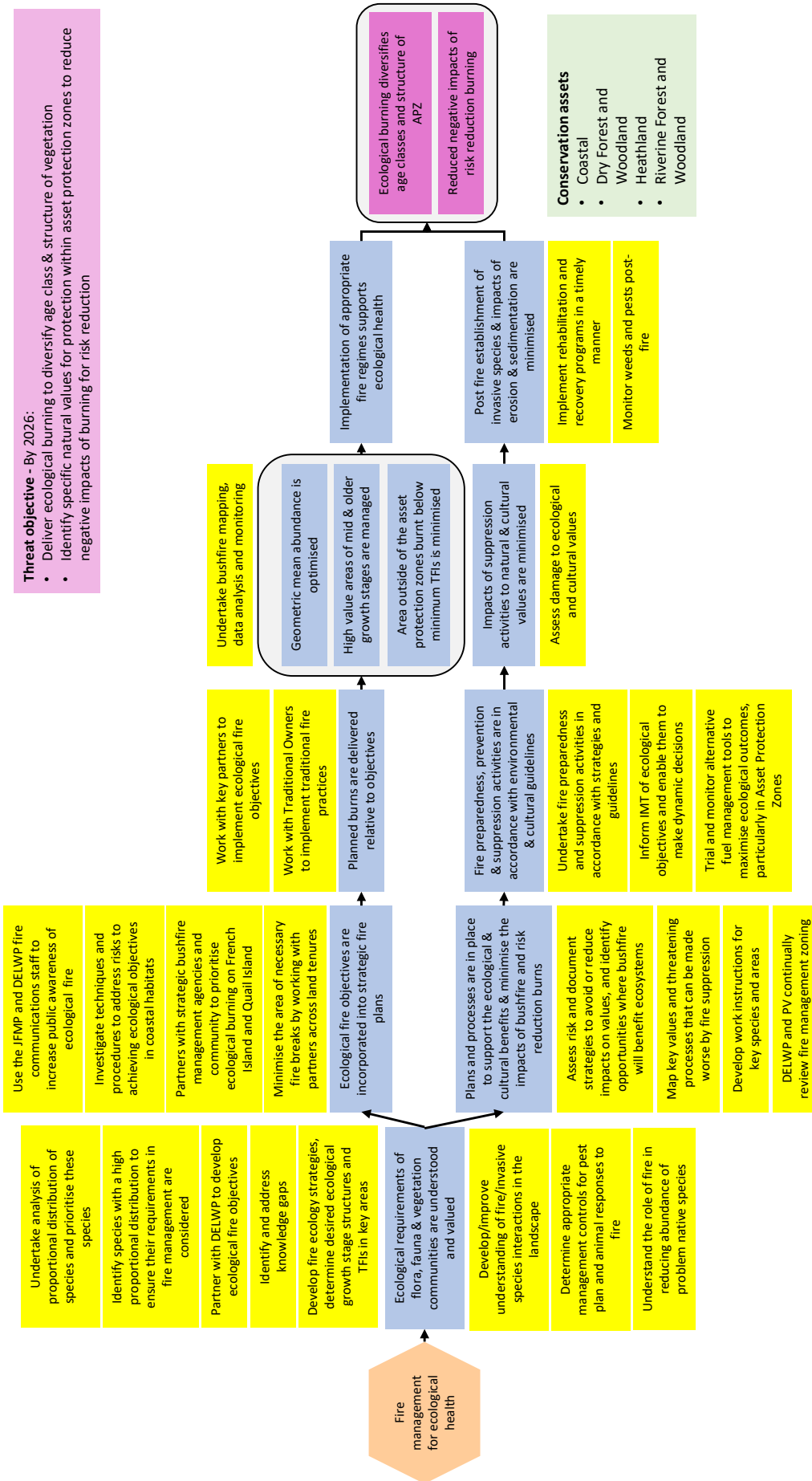
Incorporate ecological fire objectives into strategic fire plans to diversify age classes and structure in key areas, particularly in the Heathland conservation asset.

Table 6.1 Priority areas for ecological fire management planning.

Priority areas	Conservation Assets to benefit*
French Island	Coastal, Dry Forest and Woodland, Heathland
Quail Island	Dry Forest and Woodland, Heathland
Arthurs Seat State Park	Dry Forest and Woodland
Greens Bush	Dry Forest and Woodland
Point Nepean National Park	Coastal
The Pines FFR	Heathland
Lysterfield Park	Dry Forest and Woodland

*For the specific KEA Goals associated with this strategy, see the Condition table in the relevant Conservation Asset description

Results chain



Implementation milestones

Result	Action
Ecological requirements of flora, fauna and vegetation communities are understood and valued	<ul style="list-style-type: none"> • Undertake analysis of proportional distribution of species in the Parks Landscape and prioritise these species • Identify species with a high proportional distribution in the Parks Landscape, to ensure their requirements in fire management are considered • Partner with DELWP to develop ecological fire objectives • Identify and address knowledge gaps • Develop fire ecology strategies, determine desired ecological growth stage structures and TFIs in key areas • Develop/improve understanding of fire/invasive species interactions in the landscape • Determine appropriate management controls for pest plan and animal responses to fire • Understand the role of fire in reducing abundance of problem native vegetation species
Application of ecological fire	
Ecological fire objectives are incorporated into strategic fire plans	<ul style="list-style-type: none"> • Use the Joint Fuel Management Plan and DELWP fire communications staff to increase public awareness of ecological fire • Investigate techniques and procedures to address risks to achieving ecological objectives in coastal habitats • PV partners with strategic bushfire management agencies and undertakes community engagement to prioritise ecological burning on French Island and Quail Island • Minimise the area of necessary fire breaks by working with partners across land tenures
Planned burns are delivered relative to objectives	<ul style="list-style-type: none"> • Work with key partners to implement ecological fire objectives • Work with TOs to build capability and implement traditional fire practices
Geometric mean abundance is optimised High value areas of mid and older growth stages are managed Area outside of the asset protection zones burnt below minimum TFIs is minimised	<ul style="list-style-type: none"> • Undertake bushfire mapping, data analysis and monitoring
Implementation of appropriate fire regimes supports ecological health	
Ecological burning diversifies age classes and structure of asset protection zones.	
Fire preparation and recovery	
Plans and processes are in place to support the ecological and cultural benefits and minimise the impacts of bushfire and risk reduction burns	<ul style="list-style-type: none"> • Assess risk and document strategies to avoid or reduce fire impacts on values • Map key values and threatening processes that can be made worse by fire suppression and ensure these values are recorded in the VBA

Result	Action
	<ul style="list-style-type: none"> • Develop work instructions for key species and areas • DELWP and PV continually review fire management zoning
Fire preparedness, prevention and suppression activities are in accordance with environmental and cultural guidelines	<ul style="list-style-type: none"> • Undertake fire preparedness and suppression activities in accordance with strategies and guidelines • Inform IMT of ecological objectives and enable them to make dynamic decisions • Trial and monitor alternative fuel management tools to maximise ecological outcomes, particularly in Asset Protection Zones
Impacts of suppression activities to natural and cultural values are minimised	<ul style="list-style-type: none"> • Assess damage to ecological and cultural values
Post-fire establishment of invasive species and impacts of erosion and sedimentation are minimised	<ul style="list-style-type: none"> • Implement rehabilitation and recovery programs in a timely manner • Monitor weeds and pests post fire
Reduced negative impacts of risk reduction burning	



6.2 Supporting partnerships to address hydrological threats to water-dependent assets

Water-dependent assets are freshwater and marine environments that require permanent or periodic inundation to persist in the landscape. The purpose of this strategy is to increase the health of these environments by working with partners to reduce the threats of altered hydrology and poor water quality caused by water diversion, erosion, sedimentation and nutrient input. Increased health of freshwater environments is likely to bolster the resilience of water-dependent assets to withstand climate change and extreme weather events.

Freshwater environments

To remediate significant changes to the natural flow pattern of our water-dependant assets, Parks Victoria will work closely with Melbourne Water, Port Phillip and Westernport CMA, VicRoads and Local Government to identify priority waterways and wetlands, establish hydrological requirements and develop strategic plans to enable these to recover or be restored, or transition to a drier state. For most, these will be longer term projects, with many stakeholders and significant change to surrounding land and associated challenges to be overcome. However, the values that remain in freshwater habitats such as Frankston NCR, Lysterfield Park, Braeside Park and Cardinia Reservoir Park will benefit from a planned approach.

These plans will also be developed to improve water quality by identifying new or emerging impacts on water quality, supporting water sensitive urban development and establishing monitoring of water quality, nutrient and toxicant loads and changes to wetland inputs. Additionally, engaging the community on climate change and human impacts on freshwater ecosystems will introduce broader understanding and awareness around water quality issues.

Where the drying effects of climate change reduce water inputs to wetlands, Parks Victoria will support the transition of permanent wetlands to ephemeral, seasonally inundated or terrestrial ecosystem by developing site specific plans for the management of vegetation communities and hydrology, and investigate operational arrangements for stormwater flows to these wetlands.

Parks Victoria will also take action to improve water quality through works on waterways within the Parks Landscape, such as Main Creek and its tributaries (Mornington Peninsula National Park), Dandenong Creek

(Dandenong Police Paddocks Reserve) and Cardinia Creek (Cardinia Creek Parklands). Works will aim to increase the quality and extent of riparian vegetation through actions such as revegetation, weed control, herbivore management and timely post-fire land rehabilitation.

Benefiting marine environments

The quality of water flowing into parks and reserves in the Western Port Ramsar site including French Island MNP, North Western Port NCR, Yaringa MNP, and Churchill Island MNP is dependent on the health of upstream freshwater environments. Water flowing into these parks originates as drainage from private land and land owned by other public organisations.

In partnership with Melbourne Water and Port Phillip and Westernport CMA, the impact of nutrient inputs, erosion and sedimentation on habitats downstream will be communicated to private landholders throughout the catchment to encourage sympathetic private land management. Parks Victoria will also seek to support these organisations to carry out projects assisting landowners to shift to lower impact practices, particularly for the Watsons Creek catchment, as this is the main waterway flowing into Yaringa Marine National Park, and Watsons Inlet has been reported to have the highest nutrient concentrations in Western Port (DELWP 2017). There may also be opportunities to support the establishment of Waterwatch monitoring sites along waterways that drain into priority marine protected areas.

Reserves and habitats most vulnerable to sea level rise will be identified using predictive modelling. Vulnerable areas are likely to include freshwater ecosystems at risk of saltwater inundation and coastal assets such as mangroves and saltmarsh that will need to retreat inland.

Saltmarsh and Mangrove reclamation

The objective of this strategy is to proactively maintain the extent of saltmarsh and mangrove by restoring disturbed vegetation on existing reserves and facilitating the retreat of coastal saltmarsh landward where this can be achieved, through government led responses to sea level rise in Western Port.

Saltmarsh and mangrove occur on the coastal edge of Western Port, and in some areas within narrow reserves that are being actively eroded by increases in storm surge. Some boundaries with the adjacent private land are not well defined or understood, and as a result, there are areas of saltmarsh habitat in reserves being used by adjacent landowners, notably for cattle grazing. The landward migration of coastal saltmarsh that may be required to maintain the extent of this community as sea level rises can also be limited by earthen structures such as berms and levees or ad hoc infrastructure placed to try and limit tidal sea water inundation of private land. In some instances, this infrastructure has been placed on protected reserves.

The first step in this strategy will be to establish the current extent of saltmarsh and mangrove in the Western Port and South-east Melbourne Parks Landscape. Using this information and sea level rise projections, models will be built to illustrate the current potential habitat for saltmarsh and future extent of saltmarsh and mangroves under predicted sea level rise scenarios. This will assist in determining where the best opportunities that allow for landward retreat of these communities are located.

In order to maintain the extent of coastal saltmarsh habitat into the future, partnerships will need to be developed with private landowners. Where the boundary between the reserve and private land is unclear, Parks Victoria will work with DELWP, Land Use Victoria and neighbouring landowners to map accurate boundaries. Once a common understanding of boundaries is reached, they can be clearly demarcated and fences erected to protect saltmarsh from grazing, or moved where necessary to reclaim any land that has been encroached.

Where erosion is not a primary concern at specific locations and restoring tidal inundation for saltmarsh and mangroves is feasible, levees can also be removed from the Parks Victoria estate. Parks Victoria can then facilitate the re-establishment of saltmarsh or mangrove communities in reclaimed areas through the protection of natural regeneration and active revegetation where necessary.

To achieve the saltmarsh conservation outcomes under predicted climate change scenarios, owners of private land that will become the new coastline would need to be encouraged to allow tidal processes to move inland as sea levels rise and to create suitable habitat for Saltmarsh and Mangrove to colonise. DELWP's *Victoria's Resilient Coast* framework could provide the basis for planning this work. This could take the form of economic incentives (Trust for Nature 2018) including market-based instruments such as tender programs or carbon offsets, incentive schemes through (funded) management agreements or covenants, and land purchase/acquisition to maintain the extent of coastal reserves. Where possible, Parks Victoria may seek to enter into agreements with landowners to move existing bunds on private property further inland and to restrict running cattle below the high-tide mark.

Another option is to partner with Trust for Nature to negotiate the protection of near-coastal properties as private nature reserves under a conservation covenant (Trust for Nature 2017). Agreements would require the removal of any bunds present in order to restore natural tidal processes and allow the expansion and retreat of coastal saltmarsh vegetation.

Conservation outcomes

- Increased knowledge and ability to adapt vulnerable habitats to storm events
- Successful adaptation to unplanned changes to hydrology in artificially inundated wetlands
- Water sensitive design in urban developments will reduce impacts on the hydrological regime of marine and freshwater environments
- Improved water quality (reduced nutrients and sediments) inputs to the marine environment through mitigation of the impacts of urban development and agricultural runoff
- Saltmarsh and Mangrove extent is maintained or improved, allowing for retreat inland where possible as the sea-level rises

Strategy summary

Communicate human impacts on water quality and hydrology and build partnerships with agencies and community to reduce pollutant input and improve flows to marine and freshwater ecosystems. Understand tenure boundaries in Saltmarsh and Mangrove habitats to improve management, restoring disturbed vegetation and allowing for landward retreat as sea levels rise.

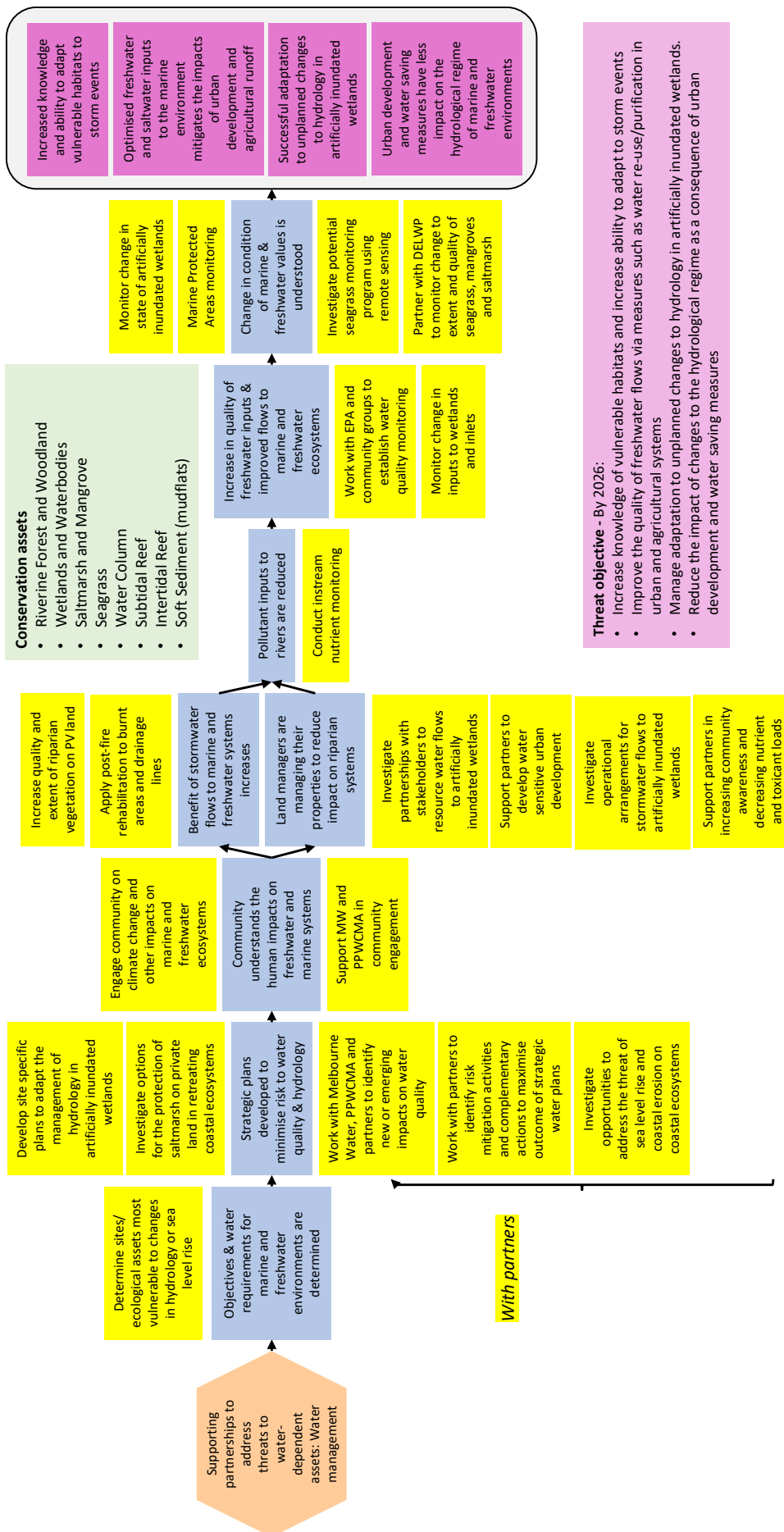
Results chains for this strategy have been developed separately for water management and Saltmarsh and Mangrove reclamation.

Table 6.2 Priority water management areas in the Western Port and South-east Melbourne Parks Landscape.

Action type	Priority areas	Conservation Assets to benefit*
Riparian restoration	Main Creek (Mornington Peninsula NP) and tributaries, Dandenong Creek (Dandenong Police Paddocks Reserve) and Cardinia Creek (Cardinia Creek Parklands)	Riverine Forest and Woodlands
Hydrological assessment and planning	Lysterfield Park, Devilbend NFR Small parks and reserves (including Frankston NCR, Karkarook Park, Braeside Park and Cranbourne Wetlands NCR)	Wetland and Waterbodies
Supporting partner agencies to reduce nutrient, sediment and toxicant inflows to marine protected areas	Watsons Creek	Seagrass, Soft Sediment (mudflats)
Protect habitats subject to inundation through cooperative arrangements with landholders to allow saltmarsh to migrate	North Western Port NCR, Western Port Intertidal Coastal Reserve, Churchill Marine National Park, French Island	Saltmarsh and Mangrove

*For the specific KEA Goals associated with this strategy, see the Condition table in the relevant Conservation Asset description

Results chain: Water management



Implementation milestones: Water management

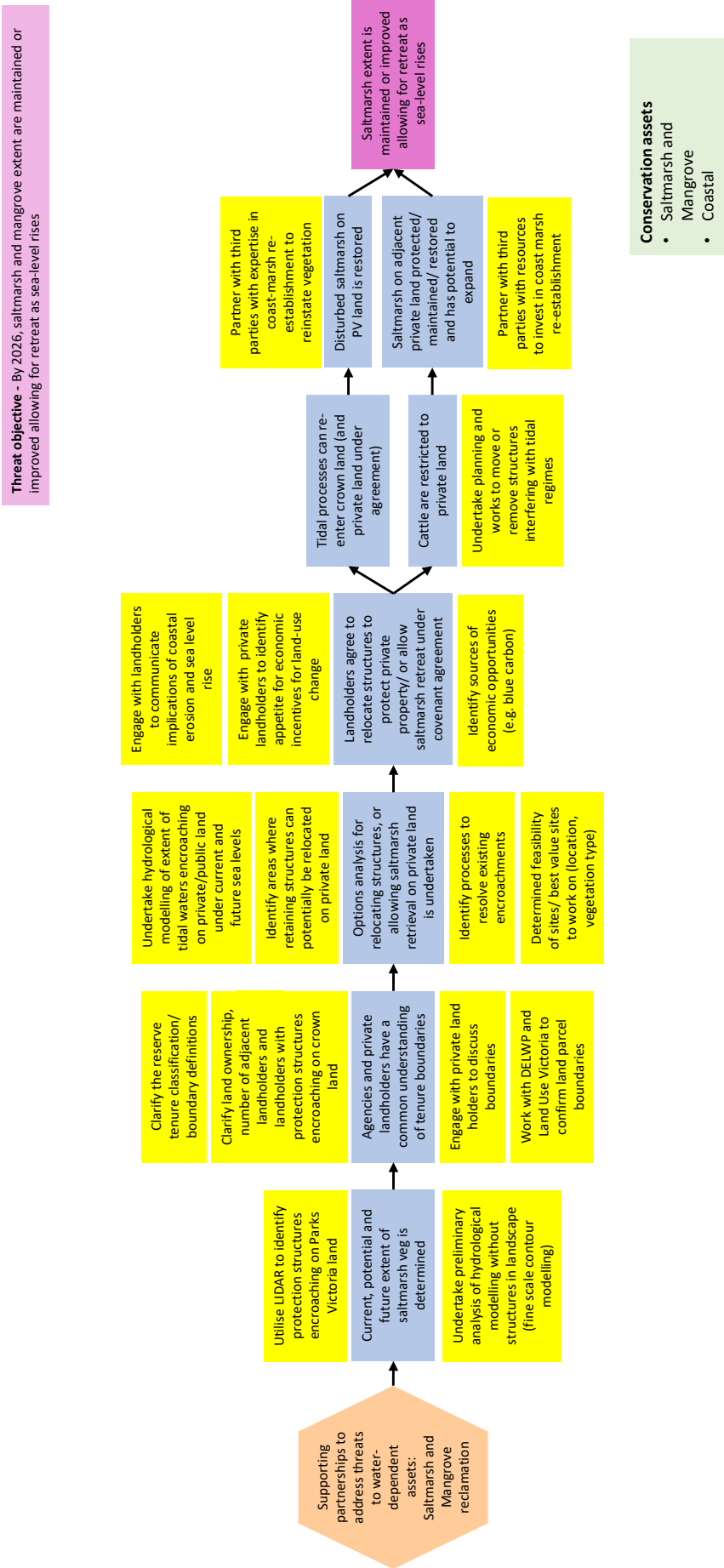
Result	Action
Objectives and water requirements for marine and freshwater environments are determined	<ul style="list-style-type: none"> Determine sites/ecological assets most vulnerable to changes in hydrology or sea level rise
Strategic plans developed to minimise risk to water quality and hydrology	<ul style="list-style-type: none"> Develop site specific plans to adapt the management of hydrology in artificially inundated wetlands Investigate options for the protection of saltmarsh on private land in retreating coastal ecosystems <p><i>With partners</i></p> <ul style="list-style-type: none"> Work with Melbourne Water, PPWCMA and partners to identify new or emerging impacts on water quality Work with partners to identify risk mitigation activities and complementary actions to maximise outcome of strategic water plans Investigate opportunities to address the threat of sea level rise and coastal erosion on coastal ecosystems
Community understands the human impacts on freshwater and marine ecosystems	<ul style="list-style-type: none"> Engage community on climate change and other impacts on marine and freshwater ecosystems <p><i>With partners</i></p> <ul style="list-style-type: none"> Support MW and PPWCMA in community engagement
Benefit of stormwater flows to marine and freshwater ecosystems increases Land managers are managing their properties to reduce impact on riparian ecosystems	<ul style="list-style-type: none"> Increase quality and extent of riparian vegetation on PV land Apply post-fire rehabilitation to burnt areas and drainage lines <p><i>With partners</i></p> <ul style="list-style-type: none"> Investigate partnerships with stakeholders to resource water flows to artificially inundated wetlands Support partners to develop water sensitive urban development Investigate operational arrangements for stormwater flows to artificially inundated wetlands Support partners in increasing community awareness and decreasing nutrient and toxicant loads
Pollutant inputs to rivers are reduced	<p><i>With partners</i></p> <ul style="list-style-type: none"> Conduct instream nutrient and sediment monitoring
Increase in quality of freshwater inputs and improved flows to marine and freshwater ecosystems	<ul style="list-style-type: none"> <i>With partners</i> Work with EPA and community groups to establish water quality monitoring Monitor change in inputs to wetlands and inlets
Change in condition of marine and freshwater values is understood	<ul style="list-style-type: none"> Monitor change in state of artificially inundated wetlands Marine Protected Areas monitoring <p><i>With partners</i></p> <ul style="list-style-type: none"> Investigate potential seagrass monitoring program using remote sensing Partner with DELWP to monitor change to extent and quality of seagrass, mangroves and saltmarsh
Increased knowledge and ability to adapt vulnerable habitats to storm events	

Optimised freshwater and saltwater inputs to the marine environment mitigates the impacts of urban development and agricultural runoff

Successful adaptation to unplanned changes to hydrology in artificially inundated wetlands

Urban development and water saving measures have less impact on the hydrological regime of marine and freshwater environments

Results chain: Saltmarsh and Mangrove reclamation



Implementation milestones: Saltmarsh and Mangrove reclamation

Result	Action
Current, potential and future extent of saltmarsh vegetation is determined	<ul style="list-style-type: none"> • Undertake vegetation mapping of existing and potential coastal saltmarsh extent • Utilise LIDAR to identify protection structures encroaching on Parks Victoria land • Undertake preliminary analysis of hydrological modelling without structures in landscape (fine scale contour modelling)
Agencies and private landholders have a common understanding of tenure boundaries	<ul style="list-style-type: none"> • Clarify the reserve tenure classification/ boundary definitions • Clarify land ownership, number of adjacent landholders and landholders with protection structures encroaching on crown land • Engage with private land holders to discuss boundaries • Work with DELWP and Land Use Victoria to confirm land parcel boundaries
Options analysis for relocating structures, or allowing saltmarsh retrieval on private land is undertaken	<ul style="list-style-type: none"> • Undertake hydrological modelling of extent of tidal waters encroaching on private/public land under current and future sea levels • Identify areas where retaining structures can potentially be relocated on private land • Identify processes to resolve existing encroachments. • Determine feasibility of sites/ best value sites to work on (location, vegetation type)
Landholders agree to relocate structures to protect private property/ or agree to allow saltmarsh retreat under covenant agreement	<ul style="list-style-type: none"> • Engage with landholders to communicate implications of coastal erosion and sea-level rise • Engage with private landholders to identify appetite for economic incentives for land-use change • Identify sources of economic opportunities (e.g. blue carbon)
Tidal processes can re-enter crown land (and private land under agreement) Cattle are restricted to private land	<ul style="list-style-type: none"> • Undertake planning and works to move or remove structures interfering with tidal regimes
Disturbed saltmarsh on PV land is restored Saltmarsh on adjacent private land protected/ maintained/ restored and has potential to expand	<ul style="list-style-type: none"> • Partner with third parties with expertise in coast-marsh re-establishment to reinstate vegetation • Partner with third parties with resources to invest in coast marsh re-establishment
Saltmarsh extent is maintained or improved allowing for retreat as sea-level rises	



6.3 Environmental weed control using a biosecurity approach

This strategy provides a strategic framework for analysing and prioritising weed management at a landscape scale. It guides the management of weeds to reduce their spread, establishment and impact. The strategy focuses on species that have or are likely to have significant impacts on the health of conservation assets and ecological processes in the Western Port and South-east Melbourne Parks Landscape. It is guided by the overarching Invasive Plants and Animals Policy Framework that represents the Victorian Government's approach to managing existing and potential invasive species across the whole of Victoria. This framework sits within the context of the whole-of-government Biosecurity Strategy for Victoria.

Priorities for management have been determined using a methodology which aims to prioritise management of the highest risk species in the highest value parks. It also directs management effort according to the level of establishment of the species in the landscape, with priority given to eradicating occurrences of new and emerging species which are not yet well established. Where possible, weed control will be undertaken in partnership with Port Phillip and Westernport Catchment Management Authority, Melbourne Water, Traditional Owners and neighbouring landholders.

Level of infestation using the biosecurity approach

The Victorian Government biosecurity approach to pest plant management is a standard used to identify the threat of an invasive species and assess its relative risk in order to determine an appropriate intervention. There are four general management responses to controlling weeds: **prevention**, **eradication**, **containment** and **asset protection**. The management responses to weeds in this strategy are based on the current extent of species and the level of risk they present to conservation values in the Parks Landscape. Described below are the management responses to weeds, the control objective of each response and the predominant examples of species in the landscape subject to control types.

Prevention

Prevention is a pre-emptive action to managing the risk of introducing weeds and soil borne pathogens into the Parks Landscape and ensuring works or disturbance events do not provide an opportune environment for weed establishment. This is achieved by identifying the most likely invasion points, which are often vehicle access and parking sites and locations where animals are likely to act as vectors. Pre-emptive action includes measures such as maintaining vehicle and equipment hygiene, avoiding the introduction of soils, gravels and other materials which may carry seed and spores and ensuring that appropriate site preparation

and risk identification is achieved before planned disturbance events such as planned burning and environmental watering is carried out.

Eradication of new and emerging weeds

For weeds at the early stages of invasion, initial control efforts and surveillance are prioritised. The objective of control is generally eradication with new populations eradicated to limit the potential for establishment. The process of addressing new and emerging weed threats should follow the Weeds in Early Stage of Invasion Framework outlined below:

- Search and detect
- Name and notify
- Assess the risk
- Delimit the invasion
- Decide the response
- Implement eradication

This group includes Serrated Tussock in the Coastal conservation asset at Point Nepean National Park, South African Orchid in the Heathland asset at Langwarrin FFR and the Dry Forest and Woodland asset at Arthurs Seat SP, and *Spartina* (Cord-grasses) at Reef Island and Bass River Mouth NCR. Effective eradication is the objective for this group of weeds.

Containment

Containment is an ongoing maintenance approach to manage the spread of established weeds. Management tracks, ridgelines and other landscape features are useful in defining containment boundaries. Containment is used when a species is not considered feasibly eradicable in the short-medium term, however a strategy establishing containment lines and constricting the containment area over time may have a long-term eradication goal. This group includes Sea Spurge in the Coastal conservation asset and Radiata Pine in the Heathland conservation asset.

It is important to inspect a buffer around an established containment area to ensure efforts are effective and new populations are not establishing beyond containment boundaries. Where there are pathways of spread through a containment area (e.g. vehicles, walkers, river corridors) a concerted effort should be made to undertake control works along tracks and waterways to decrease the likelihood of spread. Biological controls can assist with containment efforts for established weeds but are limited to species with an available control agent (biological controls are currently approved for Boneseed, Blackberry, Bridal Creeper, Gorse, Paterson's Curse, Horehound and Ragwort). Containment includes the eradication of satellite or local populations of weeds outside the containment area.

Asset protection

Some weeds are well established and widespread in the Parks Landscape. At this scale, there are limited control options available. Eradication or containment of these species is unlikely to be possible without the development of novel control agents and/or methods, and as such, management of this group of species is generally limited to reducing their impact on high priority assets. Species that are indicative of this group include Boneseed, Sweet Pittosporum and Blackberry in the Dry Forest and Woodlands, and Riverine Forest and Woodlands conservation assets. Native species that are colonising new areas are also included in this approach, such as Coast Tea-tree taking over coastal habitats, and the introduced *Phalaris* species choking up freshwater aquatic ecosystems. Because widespread control is not feasible, the objective for these species is to reduce their abundance and to prevent invasion into priority areas.

Because of the large number of reserves in the landscape, not all infestations are known. Surveying these reserves for the presence of weed infestations is a priority in comprehensively managing this threat. Parks with known significant biodiversity values should be prioritised for pest plant surveillance.

Monitoring

Monitoring sites will be set up at priority locations to ensure that weed control activities are effectively meeting the conservation outcomes below.

Conservation outcomes

- Vegetation structure and quality of habitats in priority locations is maintained or restored
- Priority indigenous species populations are maintained or improving.

Strategy summary

Control high risk species in high value locations, prioritising new and emergent species not yet established, but also preventing new weed introduction and minimising the spread of established species.

Weed species by management priority

The priority parks weed species are listed in the table below. A further level of prioritisation can be given by the SMP rating for the park (e.g. a park with SMP 3 may be a higher priority than a park with SMP 10 or SMP 20). Management of non-listed parks and weeds should be considered using the biosecurity approach described above.

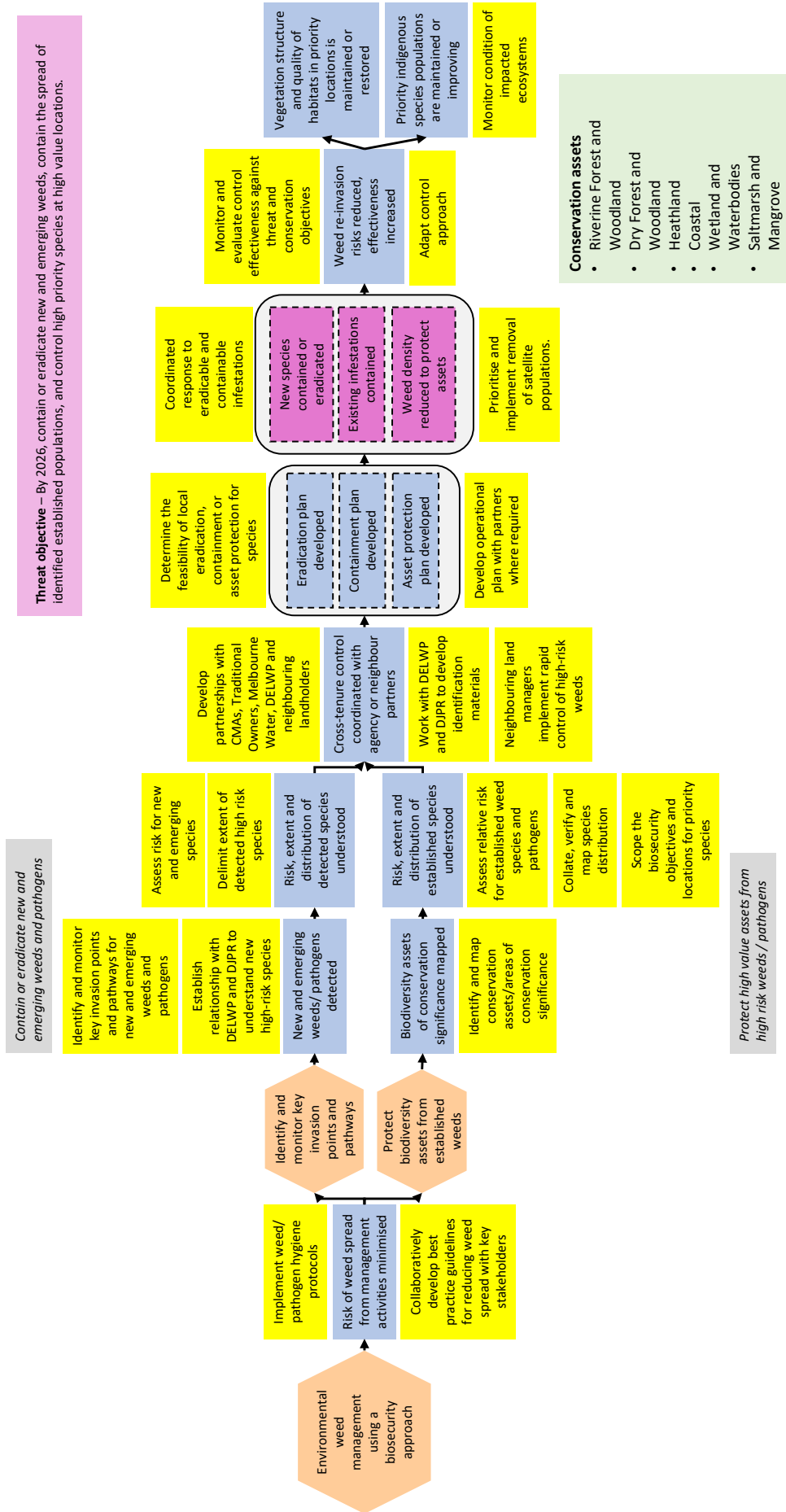
Location	Conservation Assets*	Control objective	Weed species
Arthurs Seat State Park (Priority SMP 20)	Dry Forest and Woodland	Eradication	South African Orchid
		Containment	Blue Psoralea, Paterson's Curse
		Asset Protection	Berry-flower Heath, Bluebell Creeper, Sallow Wattle, Asparagus fern, Sweet Pittosporum, Radiata Pine, Bulbil Watsonia, African Daisy, Spanish Heath, African Boneseed, Angled Onion, Bridal Creeper, Gorse, Pampas Grass, Ragwort
Baluk Willam NCR (Priority SMP 30)	Dry Forest and Woodland	Eradication	Boneseed, Radiata Pine
		Containment	Spanish Heath, Japanese Honeysuckle, Blackberry, English Broom, Montpellier Broom, Jointed Rush, Giant Honey-myrtle
		Asset Protection	Willow-leaf Hakea, Panic Veldt Grass, Wood Forget-me-not, Blue Periwinkle, Quaking Grass
Cardinia Creek Parklands (Priority SMP 30)	Dry Forest and Woodland	Containment	Jerusalem Cherry, Japanese Honeysuckle, Hawthorn
	Wetland and Waterbodies	Asset Protection	Angled Onion, Blackberry, Bridal Creeper, Bulbil Watsonia, Gorse, Ragwort, Sweet Pittosporum, Wandering Creeper
Cardinia Reservoir Parks (Priority SMP 30)	Dry Forest and Woodland	Asset Protection	Bluebell Creeper, Bulbil Watsonia, Gossamer Wattle, Pampas Grass, Sallow Wattle, Ragwort, Spanish Heath, St Peter's Wort, Sweet Pittosporum
Churchill National Park (Priority SMP 30)	Dry Forest and Woodland	Containment	Bluebell Creeper, Gorse
		Asset Protection	African Boneseed, Blackberry, Bridal Creeper, Ragwort, Bulbil Watsonia, Spanish Heath, Sweet Pittosporum

Location	Conservation Assets*	Control objective	Weed species
French Island National Park (Priority SMP 3)	Dry Forest and Woodland Wetland and Waterbodies Heathland Saltmarsh and Mangrove Coastal	Prevention	Bluebell Creeper, Sicilian Sea-lavender, Paterson's Curse, Wild Carrot
		Eradication	Asparagus Fern, Blue Psoralea, Mirror Bush, Spanish Heath, Myrtle-leaf Milkwort, African Boxthorn, Southern Mahogany, Pampas Grass, Hawthorn, Sweet Briar, Apple of Sodom, Greenbush
		Containment	Flax-leaf Broom, Tall Wheat Grass, Common Dipogon, South African Orchid, Montpellier Broom, Cape Wattle, Cedar Wattle, Perennial Veldt-grass, Harding Grass, Sallow Wattle, Sweet Pittosporum, African Boneseed, Gorse, Bridal Creeper, One-leaf Cape-tulip, Sea Spurge, Radiata Pine, Cluster Pine, Perforated St John's Wort, Blue Periwinkle, Ragwort, Spear Thistle, Belladonna Lily, Slender Thistle, Spiny Rush, Variegated Thistle, Drain Flat-sedge, Perennial Thistle
		Asset Protection	Blackberry
Langwarrin FFR (Priority SMP 30)	Dry Forest and Woodland Heathland	Eradication	South African Orchid
		Containment	Common Dipogon, Radiata Pine, Early Black Wattle, Bulbil Watsonia, Southern Mahogany
		Asset Protection	Sallow Wattle, Bluebell Creeper, Coast Tea-tree, Sweet Pittosporum, Blackberry, Boneseed, Pampas Grass, Greenbush
Lysterfield Park (Priority SMP 20)	Dry Forest and Woodland Wetland and Waterbodies	Containment	Bluebell Creeper, Bulbil Watsonia, Paterson's Curse, Gorse, Spanish Heath, Bridal Creeper, Ragwort, Blue Passionflower
		Asset Protection	Sweet Pittosporum, Blackberry, Sallow Wattle, African Boneseed, Angled Onion, St John's Wort
Mornington Peninsula National Park (Priority SMP 10)	Dry Forest and Woodland Wetland and Waterbodies Heathland Coastal	Containment	South African Orchid, Karamu, Hawthorn, Sea Spurge
		Asset Protection	Sweet Pittosporum, Coast Tea-tree, Asparagus Fern, Sallow Wattle, Italian Buckthorn, Blackberry, Common Dipogon, Cape Ivy, Montbretia, Myrtle-leaf Milkwort, Himalayan Cotoneaster, African Boneseed, Blue Periwinkle, African Boxthorn, Bridal Creeper, Rambling Dock, Winter Cherry, Inkweed, Apple of Sodom, Ragwort, Spear Thistle, Hemlock
North Western Port NCR (Priority SMP 10)	Dry Forest and Woodland Heathland Saltmarsh and Mangrove	Containment	Sallow Wattle, Bluebell Creeper, Common Dipogon, Blackberry, Bridal Creeper, Bulbil Watsonia, Spartina, Gorse, Ragwort
		Asset Protection	Pampas Grass, Sweet Pittosporum
Point Nepean National Park (Priority SMP 10)	Coastal	Eradication	Serrated Tussock
		Containment	Coast Tea-Tree
		Asset Protection	Italian Buckthorn, Common Dipogon, Cape Ivy, Myrtle-leaf Milkwort, Boneseed, African Box-thorn, Bridal Creeper
The Pines FFR (Priority SMP 30)	Heathland	Eradication	Mexican Feather-grass, Paterson's Curse
		Asset Protection	Sallow Wattle, Coast Tea-tree, Bluebell Creeper, Boneseed, Blackberry, Radiata Pine, African Love-grass, Bridal Creeper, Giant Honey-myrtle

Location	Conservation Assets*	Control objective	Weed species
Reef Island and Bass River Mouth NCR (Priority SMP 20)	Saltmarsh and Mangrove	Eradication	African Box-thorn, Blackberry, Sea Spurge, Townsend's Cord-grass, Common Cord-grass
		Containment	One-leaf Cape-tulip, Spiny Rush, Wild Gladiolus, Thistle
Western Port Intertidal Coastal Reserve (Priority SMP 20)	Saltmarsh and Mangrove Coastal	Containment	Wild Gladiolus, Blackberry, Gorse, Sea Spurge, Capeweed, Spiny Rush, One-leaf Cape-tulip, African Box-thorn, Thistle

*For the specific KEA Goals associated with this strategy, see the Condition table in the relevant Conservation Asset description

Results chain



Implementation milestones

Result	Action
Risk of weed spread from management activities minimised	<ul style="list-style-type: none"> • Implement weed/ pathogen hygiene protocols • Collaboratively develop best practice guidelines for reducing weed spread with key stakeholders
Identify and monitor key invasion points and pathways	
New and emerging weeds/ pathogens detected	<ul style="list-style-type: none"> • Identify and monitor key invasion points and pathways for new and emerging weeds and pathogens • Establish relationship with DELWP and DJPR to understand new high-risk species
Risk, extent and distribution of detected species understood	<ul style="list-style-type: none"> • Assess risk for new and emerging species • Delimit extent of detected high risk species
Protect biodiversity assets from established weeds	
Biodiversity assets of conservation significance mapped	<ul style="list-style-type: none"> • Identify and map conservation assets/areas of conservation significance
Risk, extent and distribution of established species understood	<ul style="list-style-type: none"> • Assess relative risk for established weed species and pathogens • Collate, verify and map species distribution • Scope the biosecurity objectives and locations for priority species
Cross-tenure control coordinated with agency or neighbouring partners	<ul style="list-style-type: none"> • Develop partnerships with CMAs, Traditional Owners, Melbourne Water, DELWP and neighbouring landholders • Work with DELWP and DJPR to develop identification materials • Neighbouring land managers implement rapid control of high-risk weeds
Eradication plan developed Containment plan developed Asset protection plan developed	<ul style="list-style-type: none"> • Determine the feasibility of local eradication, containment or asset protection for species • Develop operational plan with partners where required
New species contained or eradicated Existing infestations contained Weed density reduced to protect assets	<ul style="list-style-type: none"> • Coordinated response to eradicable and containable infestations • Prioritise and implement removal of satellite populations
Weed re-invasion risks reduced, effectiveness increased	<ul style="list-style-type: none"> • Monitor and evaluate control effectiveness against threat and conservation objectives • Adapt control approach
Vegetation structure and quality of habitats in priority locations is maintained or restored Priority indigenous species populations are maintained or improving	<ul style="list-style-type: none"> • Monitor condition of impacted ecosystems



6.4 Terrestrial herbivore management

The aim of herbivore management is to increase the health of all terrestrial habitats by decreasing grazing, browsing and trampling by terrestrial herbivores. Grazing and browsing species will be managed concurrently to reduce degradation of conservation assets and to reduce habitat alteration and competition with native herbivores for food.

Management of grazing and browsing pest animals

The peri-urban character of the Western Port and South-east Melbourne Parks Landscape creates increased costs and logistical challenges associated with broadscale herbivore control, such as the restricted use of firearms in populated areas and delivering effective control across numerous fragmented reserves. Because of these limitations, broadscale control is limited across most of the Parks Landscape and herbivore control must be prioritised to vulnerable areas that would most benefit from reduced grazing, browsing and trampling. Significant areas of habitat most at risk will be identified and prioritised for herbivore control works. Priority habitats and species include the EPBC-listed Plains Grassy Woodland in Braeside Park currently being degraded by rabbit grazing, and sites with significant orchid populations such as the Purple Diuris. High quality habitat where new populations of introduced herbivores are establishing will also be prioritised for control.

Current research and population modelling can support the establishment of target measures for rabbit, pig, goat, and deer population activity, density or impact, under which the habitat will function acceptably in the priority areas identified. Once targets are established, herbivore management will focus on meeting these targets. Data will be collected about herbivore habitat use, movement patterns and the pathways used to enter priority areas. This information will then be used to increase the effectiveness of herbivore control in significant areas and identify neighbours that Parks Victoria will partner with to achieve effective control.

Parks Victoria will continue to carry out humane and safe rabbit control, partnering with neighbours, reputable contractors and shooting organisations. Because population numbers can increase quickly after predators are removed from an area, rabbit control will be carried out in association with the introduced predator control strategy.

A combination of integrated control methods will be used to control deer, pigs and goats, including building community awareness of impacts, engaging specialist contractors and where feasible, utilising volunteer hunters, particularly in high conservation value areas. Parks Victoria has successfully eradicated feral pigs from Quail Island within North Westernport Nature Conservation Reserve, and ongoing monitoring is required to ensure there is no reinvasion. Eradication is also the objective for feral goats from French Island National Park, and to reduce or eliminate deer populations at French Island National Park and Cardinia Creek Parklands and the surrounding landscape.

There is no acceptable density of livestock in parks and reserves, and any occurring grazing is unauthorised. In some areas of coastal reserve adjacent to farmland, such as areas of North Western Port NCR, cattle are not adequately contained to private property and enter the park, degrading coastal saltmarsh and mangrove. This threat will be addressed through Saltmarsh and Mangrove reclamation under the 'Supporting partnerships to address hydrological threats to water-dependent assets' strategy.

Native herbivore management

In areas where native herbivores are overabundant (such as Koalas in French Island National Park), population abundance and vegetation condition assessments are used to set thresholds determining the conditions under which native herbivore populations will be actively controlled. Ongoing monitoring of kangaroo populations and their impacts in Greens Bush in Mornington Peninsula National Park, Lysterfield Park, Churchill National Park and Dandenong Police Paddocks Reserve is recommended to determine if a control response is required.

Communications

Public cooperation is essential for successful herbivore management. Deer populations are valued by hunters as game species, so particular care must be taken to communicate the need for and benefits of deer management.

Neighbouring landowners and other agencies will be consulted to determine the impact and behaviour of herbivore species. The logistics and rationale for control works will be communicated with relevant land managers, who will be encouraged to partner in the works. More broadly, the public will be made aware of the benefit of herbivore management and informed of restricted visitor access to areas where control is being carried out.

Conservation outcomes

- Reduced grazing, browsing and trampling from rabbits, goats, pigs, deer and overabundant native herbivores
- Improved condition of ground layer vegetation at priority sites and improved structure and canopy health of woodland communities

Strategy summary

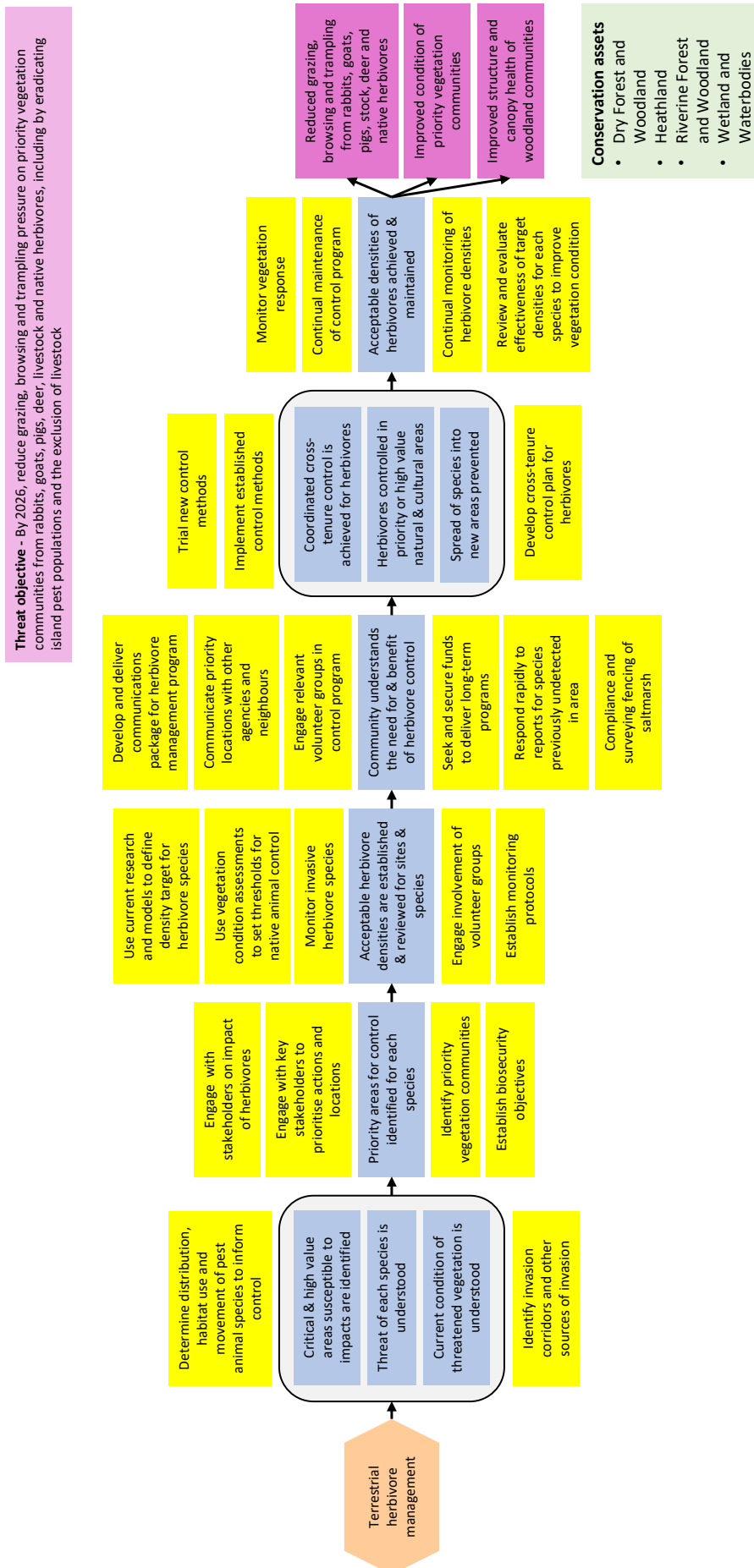
Implement targeted monitoring and control of rabbits, goats, pigs, deer, and native overabundant fauna at priority sites for threatened vegetation, integrating available methods of control to achieve acceptable herbivore densities.

Table 6.4 Priority herbivore management in the Western Port and South-east Melbourne Parks Landscape.

Location	Conservation Assets to benefit*	Treatment type	Target species	Priority
French Island National Park	Dry Forest and Woodland, Riverine Forest and Woodland, Heathland	Lethal control	Goats	SMP 10
	Dry Forest and Woodland, Heathland, Saltmarsh and Mangrove	Lethal control	Deer	SMP 10
	Dry Forest and Woodland, Heathland	Lethal control, fencing	Rabbits (Blue Gums)	SMP 10
	Dry Forest and Woodland, Riverine Forest and Woodland, Heathland	Fertility control, translocation	Koalas	High
Mornington Peninsula National Park (Greens Bush)	Dry Forest and Woodland, Heathland	Lethal control, fencing	Rabbits	SMP 3
	Dry Forest and Woodland	Monitoring, planning	Kangaroos	SMP 3
	Dry Forest and Woodland, Wetland and Waterbodies	Lethal control	Deer	SMP >20
North Western Port NCR	Saltmarsh and Mangrove, Dry Forest and Woodland, Wetland and Waterbodies	Monitoring for reintroduction	Pigs (Quail Island)	SMP 3
	Dry Forest and Woodland, Riverine Forest and Woodland, Heathland, Saltmarsh and Mangrove	Compliance	Domestic cattle	Low
Western Port Intertidal Coastal Reserve	Heathland	Lethal control, fencing	Rabbits	SMP 10
Reef Island and Bass River Mouth NCR	Heathland	Lethal control, fencing	Rabbits	SMP 10
	Saltmarsh and Mangrove	Lethal control	Deer (establishing)	SMP >20
Braeside Park	Dry Forest and Woodland, Heathland	Lethal control, fencing	Rabbits	SMP 20
Cardinia Reservoir Parks	Dry Forest and Woodland	Lethal control, fencing	Rabbits	SMP 20
Langwarrin FFR	Heathland	Lethal control, fencing	Rabbits	SMP >20
Baluk Willam NCR	Dry Forest and Woodland	Lethal control, fencing	Rabbits	SMP >20
Cardinia Creek Parklands	Dry Forest and Woodland	Lethal control	Deer	SMP >20
Devilbend NFR	Dry Forest and Woodland, Wetland and Waterbodies	Lethal control	Deer	SMP >20
Lysterfield Park	Dry Forest and Woodland, Wetland and Waterbodies	Monitoring, planning	Kangaroos	SMP 20
Churchill National Park	Dry Forest and Woodland	Monitoring, planning	Kangaroos	SMP >30
Dandenong Police Paddocks Reserve	Dry Forest and Woodland	Monitoring, planning	Kangaroos	SMP >30

*For the specific KEA Goals associated with this strategy, see the Condition table in the relevant Conservation Asset description

Results chain



Implementation milestones

Result	Action
Critical and high value areas susceptible to impacts are identified Threat of each species is understood Current condition of threatened vegetation is understood	<ul style="list-style-type: none"> Determine density, distribution, habitat use and movement of pest animal species to inform control Identify invasion corridors and other sources of invasion
Priority areas for control identified for each species	<ul style="list-style-type: none"> Engage with stakeholders on impact of herbivores Engage with key stakeholders to prioritise actions and locations Identify priority vegetation communities Establish biosecurity objectives
Acceptable herbivore densities are established and reviewed for sites and species	<ul style="list-style-type: none"> Use current research and models to define density target for herbivore species Use vegetation condition assessments to set thresholds for native animal control Monitor invasive herbivore species Engage involvement of volunteer groups Establish monitoring protocols
Community understands the need for and benefit of herbivore control	<ul style="list-style-type: none"> Develop and deliver communications package for herbivore management program Communicate priority locations with other agencies and neighbours Engage relevant volunteer groups in control program Seek and secure funds to deliver long-term programs Respond rapidly to reports for species previously undetected in area Compliance and fencing of saltmarsh
Coordinated cross-tenure control is achieved for herbivores Herbivores controlled in priority or high value natural and cultural areas Spread of species into new areas prevented	<ul style="list-style-type: none"> Trial new control methods Implement established control methods <ul style="list-style-type: none"> Eradicate goats at French Island and maintain eradication of pigs at Quail Island Develop cross-tenure control plan for herbivores
Acceptable densities of herbivores achieved and maintained	<ul style="list-style-type: none"> Monitor vegetation response Continual maintenance of control program Continual monitoring of herbivore densities Review and evaluate effectiveness of target densities for each species to improve vegetation condition
Reduced grazing, browsing and trampling from rabbits, goats, pigs, deer and native herbivores Improved condition of ground layer vegetation at priority sites Improved structure and canopy health of woodland communities	



6.5 Sustained control and monitoring of introduced terrestrial predators to support resilient native fauna populations

The aim of ongoing introduced predator control is to support vulnerable native animal species (such as Southern Brown Bandicoot, Long-nosed Potoroo, Hooded Plover and other migratory shorebirds) to persist, increase in number and recolonise suitable habitat in the Western Port and South-east Melbourne Parks Landscape. Additionally, controlling predators may have the secondary benefit of reducing the spread of some weed species such as Blackberry.

Control

Because much of the Parks Landscape is a highly fragmented network of reserves, it is crucial to establish cooperation with neighbouring landowners and natural resource managers to achieve effective reduction of introduced predator numbers that will support native animal populations. Opportunities to collaborate with neighbours and other natural resource managers will be sought as a priority. Pilot cross-tenure fox and cat control programs will be trialled at Coolart HA and Greens Bush in Mornington Peninsula National Park to support resident waterbirds, small-medium mammals and reptiles. Monitoring will be carried out to gauge the benefit to native fauna populations.

Broad scale predator control is not feasible across much of the Parks Landscape due to the fragmentation of parks and reserves. For these reasons, vulnerable native prey species and habitats must be the priority for intensive predator control efforts. These species and areas will be identified by carrying out surveys, identifying fauna refugia, considering available species distribution data and models. The feasibility of predator control will also be a factor in determining priority areas. In urban and peri-urban environments, the risks of control techniques such as baiting and shooting can limit their application, and reinvasion of small controlled areas (such as nesting or roosting sites) can limit control effectiveness.

Priority areas for predator control have been identified, including:

- the Western Port Ramsar site to protect breeding migratory and resident shorebirds,
- targeted fox, feral cat and black rat control around Hooded Plover populations during their breeding season,

-
- ongoing fox and feral cat control at Point Nepean National Park to support Long-nosed Bandicoot and White-footed Dunnart populations,
 - feral cat eradication on French Island to protect Long-nosed Potoroos and the introduced Eastern Barred Bandicoot population, and
 - Black Rat eradication from Reef Island for the protection of avian fauna such as Fairy Terns and the Grey-tailed Tattler.

In areas such as French Island National Park and Quail Island NCR, isolation presents logistical barriers to predator control, but also allows the possibility of eradicating target species. As foxes are absent and cat eradication is feasible, native species vulnerable to predation and with limited mainland distributions may be considered for reintroduction on French Island to provide insurance populations, such as the Eastern Barred Bandicoot, and others that may be considered as part of the Safe Havens investigation.

In some cases, control programs focused on reducing numbers of one predator species have corresponded to increasing numbers of another due to competitive release. For this reason, integrated control of key predator species will be carried out to best support populations of prey species. Predator control can also lead to increased numbers of feral herbivores, such as rabbits, so herbivore control and predator control strategies will be carried out concurrently. The terrestrial control strategy will also be implemented in close conjunction with other strategies that aim to improve the quality and extent of available habitat for fauna, such as fire management, terrestrial herbivore management and coastal marsh reclamation.

Monitoring and research

To evaluate the success of predator control, a number of native prey species will be selected and monitored as indicators of predation pressure, such as the Long-nosed Bandicoot and White-footed Dunnart, Hooded Plover or Red-capped Plover which are ground nesting species. This is already currently occurring in Mornington Peninsula and Point Nepean National Parks using camera trapping. The presence and population sizes of introduced predators will also be monitored and control programs adapted accordingly.

Conservation outcomes

- Predation is reduced to levels low enough to support increasing populations of priority native animal species at priority locations.

Strategy summary

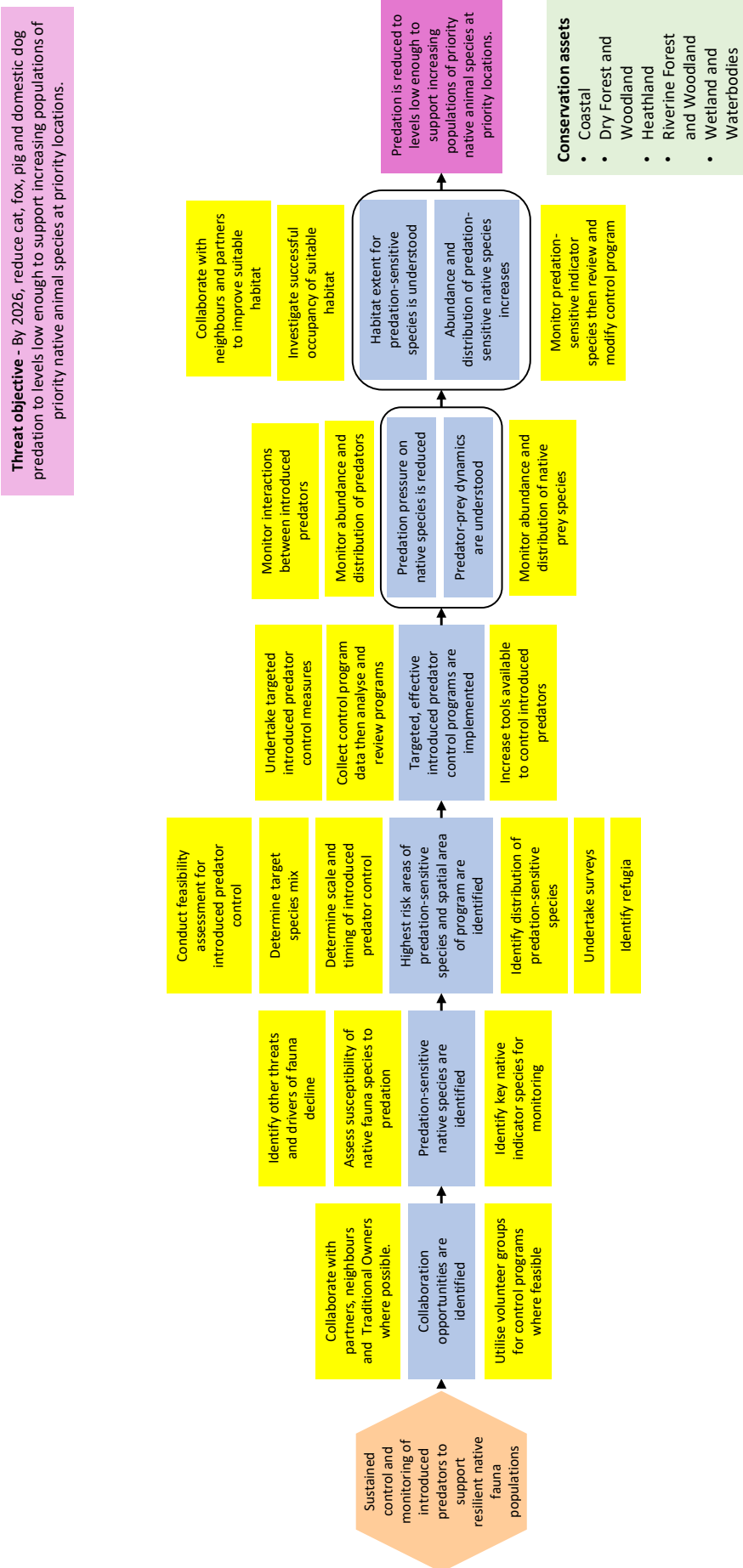
Implement targeted control of foxes and cats at priority and potential future sites for threatened and migratory fauna.

Table 6.5 Priority introduced predator (fox/cat) management areas and significant species to benefit.

Priority locations	Conservation Assets to benefit*	Nested assets	Priority
Mornington Peninsula National Park (including Greens Bush) and Point Nepean National Park	Coastal, Heathland, Dry Forest and Woodland	Hooded Plover, White-footed Dunnart, Swamp Skink, Long-nosed bandicoot	SMP 10
French Island	Coastal, Heathland, Dry Forest and Woodland, Saltmarsh and Mangrove, Wetland and Waterbodies	Bandicoot spp., Long-nosed Potoroo, Swamp Skink, Orange-bellied Parrot, resident and migratory waders and shorebirds, Growling Grass Frog, Glossy Grass Skink	SMP 10
Quail Island	Dry Forest and Woodland, Heathland, Saltmarsh and Mangrove	Bandicoot sp., resident and migratory waders and shorebirds	SMP 10
North Western Port NCR	Saltmarsh and Mangrove, Wetland and Waterbodies	Swamp Skink, Orange-bellied Parrot, Growling Grass Frog	SMP 10
Reef Island and Bass River Mouth NCR	Saltmarsh and Mangrove	Resident and migratory waders and shorebirds (Red-capped Plover, Pied Oystercatcher, Fairy Tern, Grey-tailed Tattler), Swamp Skink	SMP 10
Coolart HA	Wetland and Waterbodies	Wetland waterbirds	SMP >20

*For the specific KEA Goals associated with this strategy, see the Condition table in the relevant Conservation Asset description

Results chain



Implementation milestones

Result	Action
Collaboration opportunities are identified	<ul style="list-style-type: none"> • Collaborate with partners, neighbours and Traditional Owners where possible • Utilise volunteer groups for control programs where feasible
Predation-sensitive native species are identified	<ul style="list-style-type: none"> • Identify other threats and drivers of fauna decline • Assess susceptibility of native fauna species to predation • Identify key native indicator species for monitoring
Highest risk areas of predation-sensitive species and spatial area of program are identified	<ul style="list-style-type: none"> • Conduct feasibility assessment for introduced predator control • Determine target species mix • Determine scale and timing of introduced predator control • Identify distribution of predation-sensitive species • Undertake surveys • Identify refugia
Targeted, effective introduced predator control programs are implemented	<ul style="list-style-type: none"> • Undertake targeted introduced predator control measures • Collect control program data then analyse and review programs • Increase tools available to control introduced predators
Predation pressure on native species is reduced Predator-prey dynamics are understood	<ul style="list-style-type: none"> • Monitor interactions between introduced predators • Monitor abundance and distribution of predators • Monitor abundance and distribution of native prey species
Habitat extent for predation-sensitive species is understood Abundance and distribution of predation-sensitive native species increases	<ul style="list-style-type: none"> • Collaborate with neighbours and partners to improve suitable habitat • Investigate changes in or successful occupancy of suitable habitat • Monitor predation-sensitive indicator species then review and modify control program
Predation is reduced to levels low enough to support increasing populations of priority native animal species at priority locations	



6.6 Managing marine pests for healthy marine protected areas

Once established, populations of marine pests are very difficult to reduce or eliminate. The goal of this strategy is to utilise a biosecurity approach to prevent new species incursions as a priority as well as contain the extent and density of existing populations of marine pests. At present, the known distribution of pests in the marine protected areas of the Western Port and South-east Melbourne Parks Landscape is limited. However, marine pests pose a significant threat to marine values due to the proximity of Port Phillip Bay which is known to have many established marine pest species. In order to improve existing data, surveys to identify the presence and distribution of pest species in the marine protected areas and the surrounding waters of Western Port will be undertaken. In partnership with the Department of Jobs, Precincts and Regions (DJPR), vectors by which pest species are transported in this area will also be investigated and managed.

Preventing new infestations

Boat hulls and fishing equipment are known vectors that introduce and spread marine pests. Parks Victoria will work with partners such as DJPR, DELWP, Victorian Fisheries Authority and VR Fish to increase public awareness of marine pests and good boat and equipment hygiene practices ('check, clean, dry') in high-use areas such as boat ramps. Hygiene guidelines will continue to be included in the new Western Port boating guide and in media released.

The discharge of ballast water from ships also has the potential to transport marine pests into Western Port. Parks Victoria will continue to work with EPA and Port Managers to ensure that ballast water is not discharged where it is likely to affect marine protected areas and the bay.

Surveillance and response

Marine pests are not presently known to be a major threat in Western Port. However, modelling indicates a high likelihood of marine pest invasion in Western Port (given its proximity to Port Phillip Bay where many pest species are well-established), and current gaps in surveillance and monitoring could result in the late detection of marine pest incursions. To address this risk, existing partnerships will be maintained and new ones established to carry out marine pest surveillance, focusing on areas at high risk of pest invasion such as jetties, moorings and areas of existing infestations within tidal areas where pests could be washed

away/spread. Emerging technology such as e-DNA may be useful in early detection of new infestations before they can establish.

Once a new incursion of a species known to be a significant threat has been detected, the priority is to respond quickly before the infestation has become established. The response may include the removal of pests and the delimitation of the infestation to assess whether the infestation is at a sufficiently early stage to eradicate. This approach would apply to the Northern Pacific Seastar which has been observed and controlled in Western Port, or to *Undaria* which has been detected by e-DNA at Mushroom Reef MS.

For incursions of marine pest species considered to be of national concern, the National Emergency Marine Pest Plan (EMPPPlan) Rapid Response Manuals provide guidance for response (AG 2019).

Managing existing infestations

Once established, populations of marine pests are very difficult to reduce or eliminate, and it will not always be feasible to treat infestations of marine pests in the Parks Landscape where they do occur. Where pest populations are understood to impose a significant risk to identified values and management action is assessed to be able to cost-effectively reduce impacts, a planned approach to site-scale control or species removal may be adopted and monitored for success. Pacific Oysters are being regularly controlled in Barrallier Island in French Island MNP to contain this habitat-transforming pest.

Conservation outcomes

- Through prevention of marine pests and management of new incursions the health of marine protected areas is maintained or increased.

Strategy summary

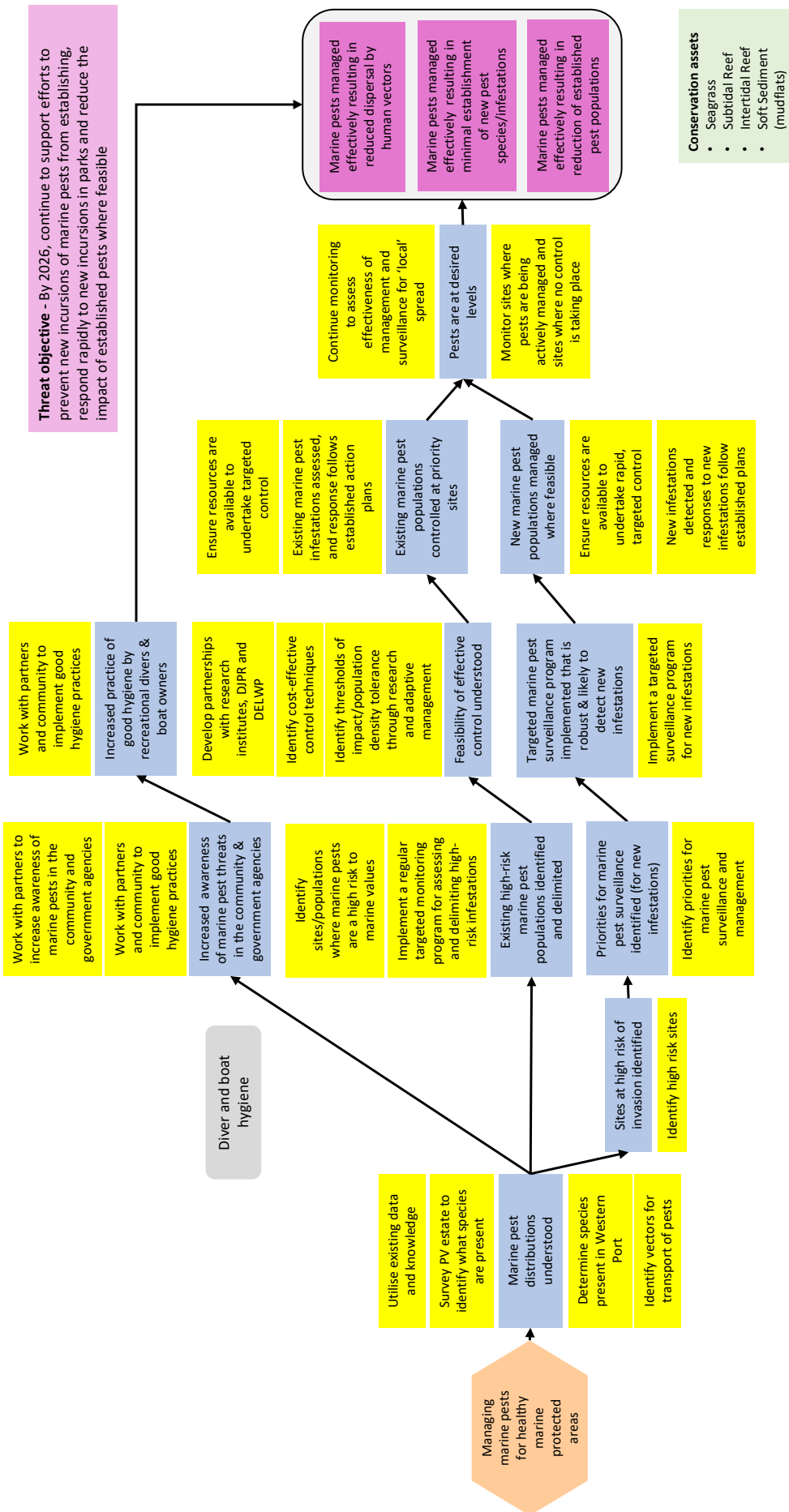
Prevent establishment of new pests through communication and partnerships, and respond to new incursions where feasible. Preventative actions should have a particular focus on high risk areas (i.e. jetties and moorings). Where feasible, assess and control impacts of established marine pests on identified values.

Table 6.6 Priority marine pest management in the Western Port and South-east Melbourne Parks Landscape.

Target species	Action type	Conservation Assets to benefit*	Priority locations
Northern Pacific Seastar	Monitoring, adaptive management	Soft Sediment (mudflats)	Western Port
<i>Undaria</i>	Surveillance, adaptive management	Intertidal Reef, Subtidal Reef	Mushroom Reef Marine Sanctuary
Pacific Oyster	Monitoring, adaptive management	Soft Sediment (mudflats)	Barrallier Island

*For the specific KEA Goals associated with this strategy, see the Condition table in the relevant Conservation Asset description

Results chain



Implementation milestones

Result	Action
Marine pest distributions understood	<ul style="list-style-type: none"> Utilise existing data and knowledge Survey PV estate to identify what species are present Determine species present in Western Port Identify vectors for transport of pests
Diver and boat hygiene	
Increased awareness of marine pest threats in the community and government agencies	<ul style="list-style-type: none"> Work with partners to increase awareness of marine pests in the community and government agencies Work with partners and community to implement good hygiene practices
Increased practice of good hygiene by recreational divers and boat owners	<ul style="list-style-type: none"> Work with partners and community to continue to implement good hygiene practices
Surveillance and response	
Sites at high risk of invasion identified	<ul style="list-style-type: none"> Identify high risk sites
Priorities for marine pest surveillance identified (for new infestations)	<ul style="list-style-type: none"> Identify priorities for marine pest surveillance and management
Targeted marine pest surveillance program implemented that is robust and likely to detect new infestations	<ul style="list-style-type: none"> Implement a targeted surveillance program for new infestations
New marine pest populations managed where feasible	<ul style="list-style-type: none"> Ensure resources are available to undertake rapid, targeted control New infestations detected and responses to new infestations follow established plans
Managing existing infestations	
Existing high-risk marine pest populations identified and delimited	<ul style="list-style-type: none"> Identify sites or populations where marine pests are a high risk to marine values and control may be feasible Implement a regular targeted monitoring program for assessing and delimiting existing high-risk infestations
Feasibility of effective control understood	<ul style="list-style-type: none"> Develop partnerships with DJPR, DELWP and research institutes Identify cost-effective control techniques Identify thresholds of impact or population density tolerance through research or adaptive experimental management
Existing marine pest populations controlled at priority sites	<ul style="list-style-type: none"> Ensure resources are available to undertake targeted control Existing marine pest infestations assessed, and response follows established action plans
Pests are at desired levels	<ul style="list-style-type: none"> Continue monitoring to assess effectiveness of management and surveillance for 'local' spread Monitor sites where pests are being actively managed and sites where no control is taking place
Reduced dispersal by human vectors Minimal establishment of new pest species/ infestations Reduction of targeted established pest populations	



6.7 Reducing the impacts of recreation, illegal activities and resource extraction on natural values

Urban parks face a different suite of human induced pressures to regional and remote parks. Specifically, these pressures stem from high usage given their close proximity to high density housing and the impacts of surrounding urbanisation. Similarly, marine parks are subject to high volumes of visitors participating in permissible recreational activities including rock pooling, bird watching, diving/snorkelling and boating, but also illegal activities such as illegal fishing and shellfish poaching, which can result in habitat degradation.

The aim of this strategy is to encourage the public to enjoy nature-based tourism activities and take pride in the reserve system, while reducing the impacts of recreation on areas of high conservation value within conservation assets.

Terrestrial parks and reserves

Managing the impacts of visitor recreation

Threats to terrestrial assets include vegetation trampling, soil erosion, damage to cultural values, spread of weeds, propagules and pathogens through protected areas and firewood collection. Targeted compliance programs for the protection of shorebirds from the impacts of off-lead dog walking are a focus of local area management in conjunction with monitoring surveys in partnership with Birdlife Australia.

A number of parks and reserves in the Western Port and South-east Melbourne Parks Landscape are popular, high use destinations for locals and visitors from Melbourne and further afield. While some recreational activities are established and well understood, such as bushwalking, there are emerging uses such as trail running and mountain bike riding that are not yet captured in existing park management plans. For this reason, the update and amendment of park management plans will require the delineation of internal zones within parks and reserves based on environmental values assessments and suitability for existing and emerging visitor-based activities. Using this process, areas that are of low conservation value but have high suitability for recreation, existing and emerging, will be identified and assigned for recreation. The Victorian State Public Land Mountain Bike Guidelines (PV & DELWP 2020) enable public land managers

to make informed and transparent decisions on the track networks that will form part of a sustainable network and highlight those that will be targeted for rehabilitation and closure.

Avoiding illegal activities

Together with permitted recreational activities, illegal activities in urban parks can cause habitat degradation and include threats such as illegal campfires causing bushfires, illegal access, damage to cultural assets, unregulated hunting and rubbish dumping, facilitating further weed invasion.

Public awareness of hunting restrictions and the penalties that apply for infringements will be increased by working with user groups and partner agencies such as recreational hunting groups, Game Management Authority and DELWP. The conservation and cultural values of the Parks Landscape, as well as the consequences of unregulated collection and off-target take will also be communicated, encouraging responsible behaviour and fostering community ownership of local reserves. Compliance activities will be prioritised at high-infringement and sensitive areas, in particular to control illegal release of pest species for hunting, which can leave long-term impacts on native vegetation through trampling and grazing in addition to the impact of the hunting itself.

Increased urbanisation

As the Parks Landscape area continues to become more urbanised, Parks Victoria will identify opportunities to have active input into the planning and decision-making for land that neighbours parks and reserves. Increased collaboration and engagement with Local Government Authorities will enable Parks Victoria to receive and provide input into applications for developments near parks and reserves, make submissions into land use planning and development plans, and discuss the future impacts of urbanisation and infrastructure with commercial stakeholders.

Parks Victoria also actively seek to influence the ‘ethos’ of residential developments in their planning stages, such as encouraging developments that are cat-free, have compulsory native gardens or prohibiting invasive garden species, and to use native vegetation plantings in public spaces. Similarly, Parks Victoria will also seek to increase communication and consultation with state and local governments to advocate for the alignment of new developments to achieve minimal impact or provide benefits to proximate Parks Victoria managed land.

Marine parks and reserves

Managing the impacts of visitor recreation

Marine parks and assets face similar issues to terrestrial assets with regards to the impacts of visitors. Where permissible recreation is causing habitat degradation, environmental messaging will be integrated into existing guides (such as the Western Port boating guide), promoted through the Park Connect portal and dispersed through partner organisations such as the Victorian Fisheries Authority and Victorian Recreational Fishing Peak Body (VRFish).

Minimal impact statements will be updated as a priority to ensure that user groups have the smallest negative effect on marine conservation assets possible. High use, sensitive areas will be prioritised for updated statements, such as Mushroom Reef MS where large school groups can cause trampling damage to the intertidal reef if guidelines are not considered. In addition, user groups will be engaged to seek solutions to prevent habitat degradation while continuing to allow for recreation. The promotion of similar areas for these kinds of activities outside of the Marine Sanctuary may also be a viable option to minimise the intensity of the damage.

Reducing the impact of commercial operators in marine conservation assets

To minimise the impacts of authorised commercial operators on marine protected areas, a standard set of work conditions will be prepared for operators working in the Parks Landscape. Monitoring of the strengthened conditions will be carried out in priority areas such as Yaringa MNP, in conjunction with

compliance activities where necessary. In high use, high environmental value areas, Parks Victoria will investigate solutions to reduce damage to sensitive subtidal marine communities of conservation significance, while continuing to facilitate recreation. One option is to investigate installing environmentally friendly destination moorings in suitable locations.

In order to understand the impacts of visitors and commercial operators on marine natural values, Parks Victoria will establish the location of marine habitats in marine protected areas by carrying out seabed mapping, beginning with Yaringa MNP and Churchill Island MNP as priorities. Together with ongoing monitoring, this information will be used to gauge the level of impact caused by park users. The impacts of authorised commercial resource collection (such as collection areas for Ghost Shrimp on Reef Island and other locations around Western Port) is not well understood. Monitoring data will be collected and used to indicate if collection is degrading the marine environment unacceptably.

Avoiding illegal resource extraction

The extent of illegal resource extraction on marine conservation assets is not well understood. An initial task is to review areas that have reports of illegal activity degrading the natural values of the marine protected area, such as illegal fishing in French Island MNP and abalone poaching at Mushroom Reef MS. In this way, the groups causing impacts will be identified, and rules, regulations and penalties will be communicated to them. Parks Victoria, alongside partners such as Victorian Fisheries Authority and the VRFish, will target communication to user groups about the environmental cost of off-target take, unregulated or illegal collection and exceeding bag limits.

Compliance activities targeting illegal activities and resource extraction will be included in Parks Victoria's Regional Enforcement Plan. Enforcement will be coordinated in partnership with DELWP and the Victorian Fisheries Authority and prioritised in areas of significant natural value with high infringement rates, particularly coastal and marine reserves where shellfish poaching and illegal fishing is a high threat.

In particular, French Island MNP (illegal fishing), Mushroom Reef MS (abalone poaching) and Reef Island (limited authorised Ghost shrimp collection) will be priority locations for compliance activities.

Conservation outcomes

- Significant marine and terrestrial conservation values are protected through minimised impacts of permissible and illegal activities on priority areas
- Sustainable permissible natural resource extraction

Strategy summary

Identify and promote visitation to areas of low conservation value and maximise involvement in decision making in adjacent land planning. Undertake communications and compliance activities to reduce degradation of marine and terrestrial assets and promote activities and resource extraction that minimises impacts on natural values.

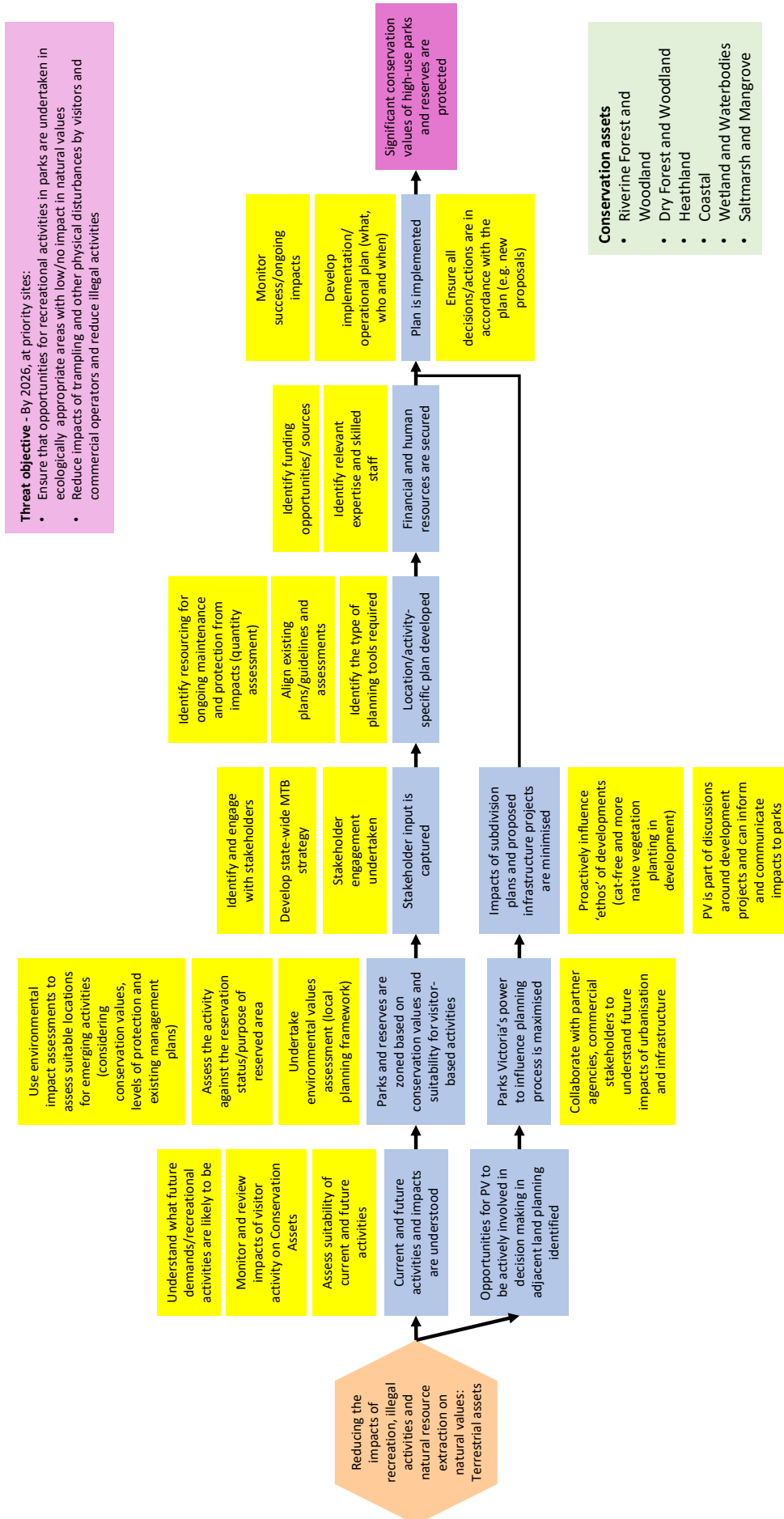
Results chains for this strategy have been developed separately for terrestrial and marine conservation assets.

Table 6.7 Priority areas for managing human impacts on terrestrial and marine conservation values.

Impact managed	Conservation Assets to benefit*	Management action	Priority locations	Priority
Illegal mountain bike and trailbike riding/ trail running	Dry Forest and Woodland, Riverine Forest and Woodland	Compliance, planning for legal trails	Churchill National Park, Lysterfield Park, Arthurs Seat State Park	High
Domestic dogs	Coastal	Compliance	Reef Island, Mornington Peninsula National Park, Point Nepean National Park	High
Urban development, population growth	Dry Forest and Woodland, Riverine Forest and Woodland, Wetland and Waterbodies	Planning, visitor management	Mornington Peninsula National Park, Point Nepean National Park, Langwarrin FFR, The Pines FFR, North Western Port NCR, Braeside Park	High
Hunting (introducing pest species to hunt, dog impacts)	Dry Forest and Woodland, Riverine Forest and Woodland	Compliance	North Western Port NCR (Quail Island), French Island, Devilbend NFR	Med
Horse riding	Coastal, Soft Sediment (mudflats)	Compliance	Western Port Intertidal Coastal Reserve, Reef Island	Med
Firewood collection	Dry Forest and Woodland, Riverine Forest and Woodland	Compliance	Dandenong Police Paddocks Reserve	Low
Commercial fishing	Seagrass, Water Column (pelagic)	Compliance	Yaringa Marine National Park, Reef Island	High
Illegal fishing	Seagrass, Water Column (pelagic)	Compliance	French Island Marine National Park	High
Abalone and shellfish poaching	Soft Sediment (mudflats), Intertidal Reef, Subtidal Reef	Compliance	Mushroom Reef Marine Sanctuary	High
Boating	Saltmarsh and Mangrove, Soft Sediment (mudflats), Seagrass, Water Column (pelagic)	Compliance, visitor management	Yaringa Marine National Park	Med
Rock pooling	Intertidal Reef	Visitor management	Mushroom Reef Marine Sanctuary	Low

*For the specific KEA Goals associated with this strategy, see the Condition table in the relevant Conservation Asset description

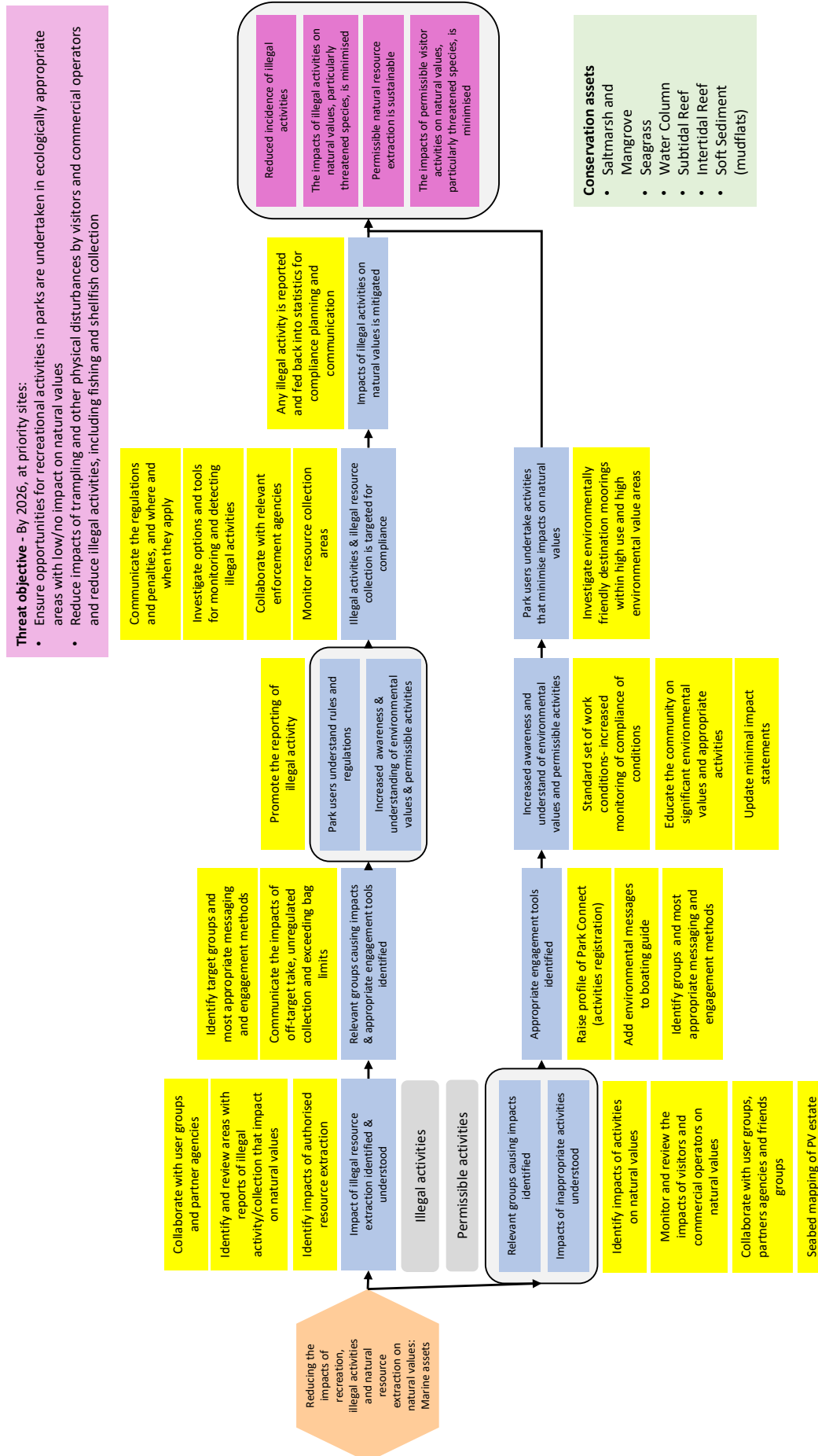
Results chain: Terrestrial assets



Implementation milestones: Terrestrial assets

Result	Action
Recreation	
Current and future activities and impacts are understood	<ul style="list-style-type: none"> Understand what future demands and recreational activities are likely to be Monitor and review impacts of visitor activity on Conservation Assets Assess suitability of current and future activities
Parks and reserves are zoned based on conservation values and suitability for visitor-based activities	<ul style="list-style-type: none"> Assess the activity against the reservation status and purpose of reserved area Undertake environmental values assessment (local planning framework) Use environmental impact assessments to assess suitable locations for emerging activities (considering conservation values, levels of protection and existing management plans)
Stakeholder input is captured	<ul style="list-style-type: none"> Identify and engage with stakeholders Develop state-wide recreational framework, state-wide MTB strategy Stakeholder engagement undertaken
Location/activity-specific plan developed	<ul style="list-style-type: none"> Identify resourcing for ongoing maintenance and protection from impacts (quantity assessment) Align existing plans/guidelines and assessments Identify the type of planning tools required
Financial and human resources are secured	<ul style="list-style-type: none"> Identify funding opportunities/sources Identify relevant expertise and skilled staff
Urbanisation	
PV identified opportunities to actively be involved in decision making in adjacent land planning	
PV's ability to influence planning process is maximised	<ul style="list-style-type: none"> Collaborate with partner agencies and commercial stakeholders to understand future impacts of urbanisation and infrastructure
Impacts of subdivision plans and proposed infrastructure projects are minimised	<ul style="list-style-type: none"> Proactively influence 'ethos' of developments (cat-free and more native vegetation planting in development) PV is part of discussions around development projects and can inform and communicate impacts to parks
Recreation and Urbanisation	
Plan is implemented	<ul style="list-style-type: none"> Develop implementation/operational plan (what, who and when) Ensure all decisions/actions are in accordance with the plan (e.g. new proposals) Undertake education/compliance activities as necessary Monitor success/ongoing impacts
Significant conservation values of high-use and urban parks and reserves are protected	

Results chain: Marine assets



Implementation milestones: Marine assets

Result	Action
Illegal activities	
Impact of illegal resource extraction identified and understood	<ul style="list-style-type: none"> Collaborate with user groups and partner agencies Identify and review areas with reports of illegal activity/collection that impact on natural values Identify impacts of authorised resource extraction
Relevant groups causing impacts and appropriate engagement tools identified	<ul style="list-style-type: none"> Identify target groups and most appropriate messaging and engagement methods Communicate the impacts of off-target take, unregulated or illegal collection and exceeding bag limits
Park users understand rules and regulations Increased awareness and understanding of environmental values and permissible activities	<ul style="list-style-type: none"> Promote the reporting of illegal activity
Illegal activities and illegal resource collection are targeted for compliance	<ul style="list-style-type: none"> Communicate the regulations and penalties, and where and when they apply Investigate options and tools for monitoring and detecting illegal activities Collaborate with relevant enforcement agencies Monitor resource collection areas
Impacts of illegal activities on natural values is mitigated	<ul style="list-style-type: none"> Any illegal activity is reported and fed back into statistics for compliance planning and communication
Reduced incidence of illegal activities The impacts of illegal activities on natural values, particularly threatened species, is minimised	
Permissible activities	
Relevant groups causing impacts identified Impacts of inappropriate activities understood	<ul style="list-style-type: none"> Identify impacts of activities on natural values Monitor and review the impacts of visitors and commercial operators on natural values Collaborate with user groups, partner agencies and friends groups Seabed mapping of Parks Victoria estate is undertaken
Appropriate engagement tools identified	<ul style="list-style-type: none"> Raise profile of Park Connect (activities registration) Work with VFA to produce environmental messages for boating guides Identify user groups and most appropriate messaging and engagement methods
Increased awareness and understanding of environmental values and permissible activities	<ul style="list-style-type: none"> Standard set of work conditions- increased monitoring of compliance with conditions Educate the community on significant environmental values and appropriate activities Update minimal impact statements
Park users undertake activities that minimise impacts on natural values	<ul style="list-style-type: none"> Investigate environmentally friendly destination moorings within high use and high environmental value areas
Permissible natural resource extraction is sustainable The impacts of permissible visitor activities on natural values, particularly threatened species, is minimised	



Tiger Orchid,
Braeside Park



Perching Ibis,
Coolart Historic Area

7 Measuring performance

Monitoring, evaluation and reporting allows Parks Victoria to quantify the effectiveness of implementing the prioritised conservation strategies, and supports continuous improvement through value-based and evidence-informed decision-making.

Measuring performance in conservation action planning involves the assessment of the effects of management actions in relation to the desired state of key ecological attributes and conservation assets. In developing an effective Conservation Action Plan, agreeing on what will be measured and how measurement will be made before works are implemented is a critical step. Performance measures enable an integrated assessment of:

- the quantity and quality of management actions (activity measures)
- the impacts of an activity on threats (threat measures)
- the results of management on the conservation asset (outcome measures).

The following performance measures, developed in collaboration with experts in this field, provide a useful starting point for developing a Monitoring, Evaluation and Reporting Plan for the Western Port and South-east Melbourne Parks Landscape (see Table 7.1). This can be used to guide interim assessments of performance until a detailed plan is established.

Table 7.1 Performance measures for each strategy developed for the Western Port and South-east Melbourne Parks Landscape.

Activity measures	Threat measures	Outcome measures
FIRE		
STRATEGY: 6.1 Fire management for ecological health		
THREAT ADDRESSED: 5.1 Inappropriate fire regimes and management		
<ul style="list-style-type: none"> • Map of fire history, tolerable fire intervals and vegetation growth-stages prepared • Frequency of engagement with bushfire management agencies (e.g. DELWP) and the community • Timeliness of bushfire recovery and rehabilitation programs 	<ul style="list-style-type: none"> • Extent and timing of all planned burning and bushfires • Percentage of the Parks Landscape burnt below the minimum tolerable fire intervals • Distribution of ecological growth stages of fire-prone ecosystems in the Parks Landscape • Deviation from the ideal growth-stage distributions (data only available for French Island) • Effectiveness (extent and type) of rehabilitation implemented after fire events • Loss of high-value locations of threatened or culturally important species 	<ul style="list-style-type: none"> • Age-class structure of canopy species • Spatial and temporal vegetation growth stage structure • Flora species composition

Activity measures	Threat measures	Outcome measures
WATER		
STRATEGY: 6.2 Supporting partnership to address threats to water-dependent assets		
THREAT ADDRESSED: 5.2 Poor water quality inputs (freshwater and marine) and altered hydrology		
<ul style="list-style-type: none"> • Number of collaborations with user groups and partner agencies • Engagement effort with partners • Water quality monitoring undertaken/supported • Proportion of adjacent private landholders cooperating with Parks Victoria • Hectares of land purchased/protected under conservation covenant • Number of earthen structures (berms) removed 	<ul style="list-style-type: none"> • Area of conservation assets vulnerable to hydrology changes/sea-level rise • Water quality and stream nutrient levels • Height/measure of sea level rise and extent of storm surge events • Hectares of coastal reserves permanently inundated by rising sea levels 	<ul style="list-style-type: none"> • Extent and quality of riparian vegetation • Extent and health of seagrass, mangroves and saltmarsh • Condition of freshwater and marine wetlands • Waterbird diversity and abundance in the Western Port Ramsar site • Resilience to climate change of freshwater and marine wetlands • Hectares of restored tidal regimes • Hectares of saltmarsh and mangrove regeneration
WEEDS		
STRATEGY: 6.3 Environmental weed control using a biosecurity approach		
THREAT ADDRESSED: 5.3 Weed invasion		
<ul style="list-style-type: none"> • Treatment of new and emerging weeds (species, area treated, person-days) • Surveillance effort for new and emerging weeds (species, area treated, person-days) • Percentage of high priority locations with control activities undertaken • Area of woody weeds treated (species, area treated, person-days) • Area of priority weeds treated (species, area treated, person-days) • Area of good neighbour weed projects 	<ul style="list-style-type: none"> • Number of new weed infestations identified • Number of newly identified weed infestations eradicated • Change in extent and cover of locally eradicable weeds • Change in extent and cover of weeds controlled for asset protection or containment 	<ul style="list-style-type: none"> • Vegetation structure and composition at priority locations
HERBIVORES		
STRATEGY: 6.4 Terrestrial herbivore management		
THREAT ADDRESSED: 5.4 Terrestrial grazing, browsing and trampling		
<ul style="list-style-type: none"> • Number of pest animals with impacts, control methods, control levels and high-priority locations identified • Extent, frequency and method of control (number and species removed) • Percentage of priority locations where control activities are undertaken • Effectiveness of control (units of effort per target species) 	<ul style="list-style-type: none"> • Relative herbivore density in areas of high value 	<ul style="list-style-type: none"> • Improved structure and composition of native vegetation communities

Activity measures	Threat measures	Outcome measures
PREDATION		
STRATEGY: 6.5 Sustained control and monitoring of introduced terrestrial predators to support resilient native fauna populations		
THREAT ADDRESSED: 5.5 Terrestrial predation		
<ul style="list-style-type: none"> • Extent, frequency and method of fox control in identified high-risk areas • Extent, frequency and method of cat control in identified high-risk areas • Effectiveness of control (units of effort per target species) 	<ul style="list-style-type: none"> • Fox activity in identified high-risk areas • Cat activity in identified high-risk areas 	<ul style="list-style-type: none"> • Extent of occupancy of predation-sensitive species • Species richness of predation-sensitive species
MARINE		
STRATEGY: 6.6 Managing marine pests for healthy marine protected areas		
THREAT ADDRESSED: 5.6 Marine predation and competition		
<ul style="list-style-type: none"> • Number of person days of surveillance for pests and overabundant species • Number of partners engaged in marine hygiene practices • Area of established marine pest populations being actively managed • Hectares of marine parks surveyed for marine pests 	<ul style="list-style-type: none"> • Change in extent/density of marine pest infestations (hectares, species) • New infestations removed • Number of new pest species/infestations established 	<ul style="list-style-type: none"> • Cover of habitat forming species in reef ecosystems and seagrass beds • Abundance and species richness of key gastropods and other macroinvertebrate groups • Absence of marine invasive species
RECREATION		
STRATEGY: 6.7 Reducing the impact of recreation, illegal activities and resource extraction on natural values		
THREAT ADDRESSED: 5.7 Human-mediated habitat degradation/loss		
<ul style="list-style-type: none"> • Number of compliance operations • Number of collaborations with user groups and partner agencies • Suitability assessments carried out at potential locations for emerging recreational activities • Amount of new communications around illegal activities and marine natural values • Number of compliance operations 	<ul style="list-style-type: none"> • Reports of recreational damage on significant conservation values in high-use parks • Proportion of high-value conservation areas impacted by human activity • Proportion of high-value conservation areas impacted by resource extraction • Incidence of illegal activities 	<ul style="list-style-type: none"> • Improve fledging success at key Hooded Plover breeding sites • Health of communities sensitive to trampling • Population health (abundance) of marine species subject to poaching • Stable populations of species subject to legal extraction • Utilisation of data provided by the Sea Search Program to ascertain species richness



Mangrove recruitment,
Quail Island

8 Plan implementation

8.1 Traditional Owner and cultural heritage considerations

Parks Victoria has organisational commitments and legal obligations to ensure that land management activities are both culturally appropriate and support the capacity and role of Traditional Owners to manage Country. Parks Victoria must work within existing legal frameworks and agreements relevant to each Traditional Owner group and parks landscape. Practically, this means partnering with Traditional Owners to implement conservation strategies in a way that is consistent with their recognised rights and interests under the *Native Title Act 1993* (C'wth), *Traditional Owner Settlement Act 2010* (Vic) and/or *Aboriginal Heritage Act 2006* (Vic).

Parks Victoria conducts or authorises many land management activities that have the potential to harm Aboriginal cultural heritage. Harming Aboriginal heritage without an appropriate authorisation is illegal, and compliance with the provisions of the *Aboriginal Heritage Act 2006* (Vic) is mandated across all activities on land and waters managed by Parks Victoria. Procedures to assist in complying with the Act are available to the organisation (*PRO-819 Compliance with the Aboriginal Heritage Act*).

In accordance with these procedures, it is essential that activities to implement Conservation Strategies are assessed by Parks Victoria Aboriginal heritage specialists prior to commencement of works, as the assessment process will ensure adequate management and protection measures are in place to mitigate the risk of harm to Aboriginal cultural heritage. Depending on the nature of the works and characteristics of the site, the assessment may be undertaken as a desktop analysis or may require a site visit. Where the activity is considered likely to harm Aboriginal heritage, a recommendation may be made to modify the proposed activity or change the location of proposed works. Where adapting the activity is not possible, cultural heritage statutory authorisations, such as a Cultural Heritage Permit or Cultural Heritage Management Plan, will be required. By initiating the assessment early in the planning stages, the risk of time delays will be minimised and resourcing requirements for complying with the *Aboriginal Heritage Act 2006* can be identified and appropriately incorporated into project budgets.

The Bunurong community have expressed a desire to help other people understand that it's not just about legislation, but more a deep connection to Country and why caring for Country plays such a vital role in culture.

Implementation of this Conservation Action Plan through on-ground land management can provide opportunities for Traditional Owner involvement and further sharing of contemporary and traditional land management learnings. Where possible, planning for the implementation of conservation strategies should consider the incorporation of traditional land management techniques by Traditional Owners. This commitment should also promote the cultivation and adaptation of Traditional Owner land management methods to achieve joint environmental and cultural outcomes.

Implementation should also explore opportunities and partnerships to involve Traditional Owners and should consider the nature of individual Traditional Owner agreements in each parks landscape. Procurement of goods and services related to implementing Conservation Strategies must be consistent with PV guidelines for Traditional Owner procurement, which include a first right of refusal for all contracts within a Recognition and Settlement Agreement area. Actively identifying opportunities to incorporate cultural and management services in park management activities, and ensuring the right Traditional Owners are involved, can facilitate effective partnerships which are mutually beneficial and empowering.

8.2 Monitoring, evaluation and reporting

A Monitoring, Evaluation and Reporting Plan will be developed from the interim performance indicators in this Conservation Action Plan. It will include key evaluation questions, more specific monitoring questions, and appropriate metrics, measures and reporting standards. It will be a key component of adaptive management and a more outcomes-focused approach to managing for conservation in parks and reserves. Specifically, the Monitoring, Evaluation and Reporting Plan is essential for:

- Determining whether the combined activities of the conservation strategies have been adequately implemented and whether they are resulting in achieving the desired conservation outcomes
- Monitoring and demonstrating trends in the level of threat and the consequent condition of conservation assets
- Evaluating the effectiveness and efficiency of resources invested in the Conservation Action Plan
- Supporting the review and adaptation of conservation strategies

The plan will address the collection and storage of data as well as its analysis and interpretation. The analysis and interpretation of data is the cornerstone of applying a ‘learning by doing’ approach, in which knowledge gaps are identified and addressed through targeted scientific research. The evaluation of the Conservation Action Plan is an important step in documenting lessons learnt and communicating ideas around the improvement of policy, planning and management within Parks Victoria and to external audiences.

8.3 Implementation steps for priority strategies

Steps 8 to 10 of the 10-step process for conservation action planning follow on from implementing the strategies outlined here, and are beyond the scope of this Conservation Action Plan. Steps 8 and 9 will be carried out at an operational level within the Parks Victoria Region that has responsibility for the Western Port and South-east Melbourne Parks Landscape. Step 10 will involve a review of the Conservation Action Plan in the light of what is learnt during implementation.

Step 8: Plan work

In planning the work program, prioritised conservation strategies will be converted into operational conservation projects in specific locations. Quality maps generated by Parks Victoria in the conservation action planning process are critical for planning on-ground conservation activities and targeting key threats to conservation assets. They provide a greater understanding of the potential spread or overlap of operational conservation activities physically and in terms of their geographic impact. They also support the detailed consideration of logistic issues including access, cultural heritage and areas of high visitation. Engaging with Traditional Owners and investigating opportunities for collaboration will be examined during this phase. During the organisation of work, local and organisation-wide resource allocation processes should be followed. Detailed project planning within the Parks Victoria District and Region, including the refinement of resource requirements, will be undertaken using standard procedures.

Step 9: Implement plan

The Conservation Action Plan will be implemented by a regional team, often in collaboration with other agencies, Friends groups and volunteers. Operational conservation activities will be implemented in accordance with relevant Parks Victoria policies and procedures and legislative obligations.

Step 10: Adapt the Conservation Action Plan and operational activities

In the context of adaptive management, the evaluation of the Conservation Action Plan is important in determining and communicating whether or not the conservation strategies and specific on-ground activities have abated threats and achieved the desired conservation outcomes. The Conservation Action Plan is not a static document. It will be revised in response to the outcomes of the Monitoring, Evaluation and Reporting Plan and in response to emerging issues. Revision of this Conservation Action Plan may lead to a restructure of conservation strategies, including the amendment of results chains and their underlying assumptions, and a refinement of specific on-ground activities. The review and revision of the plan is likely to be undertaken in part through a small workshop process involving a similar representation of people involved in the development of the original plan.



**Sooty Oystercatchers,
Sorrento Back Beach**

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Appendices

Appendix A — Protection categories

The Protected Areas Category System

The protected area management categories of the International Union for Conservation of Nature and Natural Resources (IUCN) classify protected areas according to their management objectives. The categories are recognised by international bodies such as the United Nations and by many national governments as the global standard for defining and recording protected areas, and as such are increasingly being incorporated into government legislation. For further information, see the IUCN website: <https://www.iucn.org/theme/protected-areas/about/protected-area-categories>

Category Ia Strict Nature Reserve — strictly protected area set aside to protect biodiversity and possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited.

Category Ib Wilderness Area — usually large unmodified or slightly modified area, retaining its natural character and influence without permanent or significant human habitation.

Category II National Park — large natural or near natural area set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area.

Category III Natural Monument or Feature — set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove.

Category IV Habitat/Species Management Area — aims to protect particular species or habitats and management reflects this priority.

Category V Protected Landscape/ Seascape — protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value.

Category VI Protected area with sustainable use of natural resources — conserves ecosystems and habitats together with associated cultural values and traditional natural resource management systems.

Appendix B — Conservation assets

This appendix provides an overview of the area of Conservation assets (aligned to EVDs and EVCs) within the Western Port and South-east Melbourne Parks Landscape.

Conservation asset	EVD	EVC	Biodiversity Conservation Status	Total (ha)	
Coastal	Coastal	Berm Grassy Shrubland	Endangered	56.8	
		Coast Banksia Woodland	Vulnerable	104.9	
		Coast Banksia Woodland/Swamp Scrub Mosaic	Vulnerable	8.7	
		Coastal Alkaline Scrub	Vulnerable	933.5	
		Coastal Dune Scrub	Depleted	0.0	
		Coastal Dune Scrub/Coastal Dune Grassland Mosaic	Depleted	8.5	
		Coastal Headland Scrub	Depleted	609.4	
		Coastal Headland Scrub/Coastal Tussock Grassland Mosaic	Depleted	67.4	
		Coastal Saltmarsh/Coastal Dune Grassland/Coastal Dune Scrub/Coastal Headland Scrub Mosaic	Vulnerable	20.3	
		Coastal Tussock Grassland	Vulnerable	29.9	
		Coastal total			1839.4
Dry Forest and Woodland	Foothills Forest	Grassy Forest	Endangered	924.3	
		Valley Grassy Forest	Vulnerable	84.4	
		Foothills Forest EVD total		1008.7	
	Forby Forest	Damp Sands Herb-rich Woodland	Vulnerable	1060.8	
		Grassy Woodland	Depleted	271.4	
		Herb-rich Foothill Forest	Vulnerable	282.7	
		Forby Forest EVD total		1614.9	
	Grassy/Heathy Dry Forest	Damp Heathy Woodland	Vulnerable	123.3	
		Damp Sands Herb-rich Woodland/Heathy Woodland Mosaic	Vulnerable	24.4	
		Grassy Dry Forest	Least Concern	14.7	
		Valley Heathy Forest	Endangered	39.6	
		Grassy/Heathy Dry Forest EVD total		202.1	
	Tall Mixed Forest (Eastern)	Lowland Forest	Vulnerable	1325.3	
	Inland Plains Woodland	Plains Grassy Woodland	Endangered	95.2	
	Dry Forest and Woodland total			4246.2	
	Heathland	Basalt Grassland	Plains Grassland	Endangered	5
		Heathland (sands)	Damp Heathland	Rare	25.6
Heathy Woodland			Least Concern	1419.9	
Sand Heathland			Rare	4963.8	
Sand Heathland/Wet Heathland Mosaic			Depleted	154.3	
Wet Heathland			Depleted	1935.1	
Heathland (sands) EVD total		8498.6			
Heathland total			8503.6		

Saltmarsh and Mangrove	Saline Wetland	Coastal Saltmarsh	Least Concern	1761.1	
		Coastal Saltmarsh/Mangrove Shrubland Mosaic	Vulnerable	248.3	
		Estuarine Flats Grassland	Endangered	32.5	
		Estuarine Wetland/Estuarine Swamp Scrub Mosaic	Depleted	80.1	
		Mangrove Shrubland	Least Concern	1197.6	
		Saline Wetland EVD total			3319.5
	Marine component (no EVC)			49.7	
Saltmarsh and Mangrove total				3369.2	
Riverine Forest and Woodland	Moist Forest	Damp Forest	Endangered	74.2	
		Gully Woodland	Endangered	99.5	
		Moist Forest EVD total			173.7
	Tall Mist Forest	Wet Forest	Least Concern	1	
	Basalt Grassland	Plains Grassland/Plains Grassy Woodland Mosaic	Endangered	0.1	
	Riparian (higher rainfall)	Riparian Forest	Vulnerable	20.4	
	Damp Scrub	Riparian Scrub	Vulnerable	9.3	
		Riparian Scrub/Swampy Riparian Woodland Complex	Vulnerable	106.1	
		Swamp Scrub	Endangered	921.4	
		Swamp Scrub/Wet Heathland Mosaic	Endangered	39.9	
		Damp Scrub EVD total			1076.8
	Treed Swampy Wetland	Creekline Grassy Woodland	Endangered	8.2	
		Swampy Riparian Complex	Endangered	71.4	
		Swampy Riparian Woodland	Endangered	34.8	
		Swampy Riparian Woodland/Swamp Scrub Mosaic	Endangered	5.3	
		Swampy Woodland	Endangered	122.9	
	Treed Swampy Wetland EVD total			463.2	
	Riverine Forest and Woodland total				1735.2
	Wetland and Waterbodies	Freshwater Wetland (ephemeral)	Plains Grassy Wetland	Endangered	9.9
Freshwater Wetland (permanent)		Aquatic Herbland/Swamp Scrub Mosaic	Endangered	37.7	
		Sedge Wetland	Vulnerable	57.4	
		Wetland Formation	Endangered	64.0	
Freshwater Wetland (permanent) EVD total			159		
Waterbodies (no EVC)			417.2		
Wetland and Waterbodies total				586.1	
Intertidal Reef				19.1	
Soft Sediment				1554.3	
Seagrass				1772.3	
Subtidal Reef				34.7	
Landscape total				23 660.1	

Appendix C — Scientific names and conservation status of species mentioned in the plan

Common name	Scientific name
African Box-thorn	<i>Lycium ferocissimum</i>
African Daisy	<i>Senecio pterophorus</i>
African Love-grass	<i>Eragrostis curvula</i>
Agapanthus	<i>Agapanthus spp.</i>
Agile Antechinus	<i>Antechinus agilis</i>
Alligator Weed	<i>Alternanthera philoxeroides</i>
Angled Onion	<i>Allium triquetrum</i>
Apple of Sodom	<i>Solanum linnaeanum</i>
Artichoke Thistle	<i>Cynara cardunculus subsp. flavescens</i>
Asparagus Fern	<i>Asparagus scandens</i>
Austral Grass-tree	<i>Xanthorrhoea australis</i>
Australasian Bittern	<i>Botaurus poiciloptilus</i>
Australasian Shoveler	<i>Anas (Spatula) rhychotis</i>
Australian Fur Seal	<i>Arctocephalus pusillus</i>
Australian Ghost Shrimp	<i>Trypaea australiensis</i>
Australian Grass-wrack	<i>Heterozostera nigricaulis</i>
Australian Grayling	<i>Prototroctes maraena</i>
Australian Pelican	<i>Pelecanus conspicillatus</i>
Australian Shelduck	<i>Tadorna tadornoides</i>
Bar-tailed Godwit	<i>Limosa lapponica</i>
Beaded Glasswort	<i>Sarcocornia quinqueflora</i>
Belladonna Lily	<i>Amaryllis belladonna</i>
Berry-flower Heath	<i>Erica baccans</i>
Black and White Seastar	<i>Smilasterias multipara</i>
Black Rat	<i>Rattus rattus</i>
Black Rock Skink	<i>Egernia saxatilis</i>
Black Swan	<i>Cygnus atratus</i>
Blackberry	<i>Rubus fruticosus subsp. agg.</i>
Blotched Sun-orchid	<i>Thelymitra benthamiana</i>
Blue Passionflower	<i>Passiflora caerulea</i>
Blue Periwinkle	<i>Vinca major</i>
Blue Psoralea	<i>Psoralea pinnata</i>
Blue Rock Whiting	<i>Haletta semifasciata</i>
Bluebell Creeper	<i>Billardiera heterophylla</i>
Blue-billed Duck	<i>Oxyura australis</i>
Blue Throated Wrasse	<i>Notolabrus tetricus</i>
Boneseed	<i>Chrysanthemoides monilifera</i>
Bottlenose Dolphin	<i>Tursiops cf. australis</i>
Bridal Creeper	<i>Asparagus asparagoides</i>
Broad-leaf Cumbungi	<i>Typha orientalis</i>
Broom Spurge	<i>Amperea xiphioclada var. xiphioclada</i>
Bulbil Watsonia	<i>Watsonia meriana var. bulbillifera</i>

Bundy	<i>Eucalyptus goniocalyx</i>
Bush Rat	<i>Rattus fuscipes</i>
Cape Ivy	<i>Delairea odorata</i>
Cape Wattle	<i>Paraserianthes lophantha</i>
Cat	<i>Felis catus</i>
Cedar Wattle	<i>Acacia elata</i>
Chilean Needle-grass	<i>Nassella neesiana</i>
Chocolate Wattled Bat	<i>Chalinolobus morio</i>
Cinnamon Fungus	<i>Phytophthora cinnamomi</i>
Cleavers	<i>Galium aparine</i>
Clover Glycine	<i>Glycine latrobeana</i>
Cluster Pine	<i>Pinus pinaster</i>
Coast Banksia	<i>Banksia intergrifolia</i> subsp. <i>intergrifolia</i>
Coast Beard-heath	<i>Leucopogon parviflorus</i>
Coast Bitter-bush	<i>Adriana quadripartita</i> (pubescent form)
Coast Bush-pea	<i>Pultenaea canaliculata</i>
Coast Colobanth	<i>Colobanthus apetalus</i> var. <i>aperalus</i>
Coast Helmet-orchid	<i>Corybas despectans</i>
Coast Manna Gum	<i>Eucalyptus viminalis</i> subsp. <i>pryoriana</i>
Coast Saltwort	<i>Salsola tragus</i> subsp. <i>pontica</i>
Coast Tea-tree	<i>Leptospermum laevigatum</i>
Coast Wirilda	<i>Acacia uncifolia</i>
Common Cord-grass	<i>Spartina anglica</i>
Common Dipogon	<i>Dipogon lignosus</i>
Common Dolphin	<i>Delphinus delphis</i>
Common Reed	<i>Phragmites australis</i>
Common Saw Shark	<i>Pristiophorus cirratus</i>
Common Triggerplant	<i>Stylidium armeria</i>
Common Vetch	<i>Vicia sativa</i>
Common Wombat	<i>Vombatus ursinus</i>
Cord-grass	<i>Spartina</i> spp.
Crack Willow	<i>Salix fragilis</i>
Crayweed	<i>Phyllospora comosa</i>
Curlew Sandpiper	<i>Calidris ferruginea</i>
Dark Helmet-orchid	<i>Corybas</i> sp. aff. <i>diemenicus</i> (Wilson's Promontory)
Desert Ash	<i>Fraxinus angustifolia</i>
Double-banded Plover	<i>Charadrius bicinctus</i>
Drain Flat-sedge	<i>Cyperus eragrostis</i>
Drooping Sheoak	<i>Allocasuarina verticillata</i>
Dusky Antechinus	<i>Antechinus swainsonii</i>
Dwarf Galaxias	<i>Galaxiella pusilla</i>
Dwarf Sheoak	<i>Allocasuarina pusilla</i>
Early Black Wattle	<i>Acacia decurrens</i>
Eastern Barred Bandicoot	<i>Perameles gunnii</i>
Eastern Gambusia	<i>Gambusia holbrooki</i>
Eastern Great Egret	<i>Ardea alba modesta</i>

Eastern Grey Kangaroo	<i>Macropus giganteus</i>
Eastern Pygmy-possum	<i>Cercartetus nanus</i>
Echidna	<i>Tachyglossus aculeatus</i>
Eelgrass	<i>Heterozostera tasmanica</i>
Elephant shark	<i>Callorhynchus milii</i>
Emerald Star-bush	<i>Asterolasia asteriscophora subsp. albiflora</i>
English Couch	<i>Elytrigia repens</i>
English Broom	<i>Cytisus scoparius</i>
Fairy Tern	<i>Sternula nereis</i>
Fallow Deer	<i>Dama dama</i>
Far Eastern Curlew	<i>Numenius madagascariensis</i>
Feathertail Glider	<i>Acrobates pygmaeus</i>
Flax-leaf Broom	<i>Genista linifolia</i>
Floating Club-sedge	<i>Isolepis fluitans</i>
Fox	<i>Vulpes vulpes</i>
Frankston Spider-orchid	<i>Caladenia robinsonii</i>
Freckled Duck	<i>Stictonetta naevosa</i>
French Island Spider-orchid	<i>Caladenia insularis</i>
Galenia	<i>Galenia pubescens</i>
Giant Honey-myrtle	<i>Melaleuca armillaris subsp. armillaris</i>
Golden Wreath Wattle	<i>Acacia saligna</i>
Gorse	<i>Ulex europaeus</i>
Gossamer Wattle	<i>Acacia floribunda</i>
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>
Grass Triggerplant	<i>Stylidium graminifolium</i>
Greater Sand Plover	<i>Charadrius leschenaultii</i>
Green Sheoak	<i>Allocasuarina paradoxa</i>
Greenbush	<i>Callistachys lanceolata</i>
Green-striped Greenhood	<i>Pterostylis chlorogramma</i>
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>
Grey Mangrove	<i>Avicennia marina subsp. australasica</i>
Grey-tailed Tattler	<i>Tringa brevipes</i>
Growling Grass-frog	<i>Litoria raniformis</i>
Gummy Shark	<i>Mustelus antarcticus</i>
Hairy Spinifex	<i>Spinifex sericeus</i>
Harding Grass	<i>Phalaris aquatica</i>
Hawthorn	<i>Crataegus monogyna</i>
Heath Tea-tree	<i>Leptospermum myrsinoides</i>
Hedge Mustard	<i>Sisymbrium officinale</i>
Helmeted Honeyeater	<i>Lichenostomus melanops cassidix</i>
Hemlock	<i>Conium maculatum</i>
Himalayan Cotoneaster	<i>Cotoneaster simonsii</i>
Hooded Plover	<i>Thinornis cucullatus</i>
Horehound	<i>Marrubium vulgare</i>
Humpback Whale	<i>Megaptera novaeangliae</i>
Italian Buckthorn	<i>Rhamnus alaternus</i>

Jacky Dragon	<i>Amphibolurus muricatus</i>
Japanese Honeysuckle	<i>Lonicera japonica</i>
Japanese Kelp	<i>Undaria pinnatifida</i>
Jerusalem Cherry	<i>Solanum pseudocapsicum</i>
Jointed Rush	<i>Juncus articulatus subsp. articulatus</i>
Karamu	<i>Coprosma robusta</i>
Kikuyu	<i>Cenchrus clandestinus</i>
Killer Whale	<i>Orcinus orca</i>
King George Whiting	<i>Sillaginodes punctatus</i>
King Quail	<i>Coturnix chinensis</i>
Koala	<i>Phascolarctos cinereus</i>
Late Helmet-orchid	<i>Corybas sp. aff. diemenicus (Coastal)</i>
Latham's Snipe	<i>Gallinago hardwickii</i>
Leafy Greenhood	<i>Pterostylis cucullata</i>
Leatherjackets	<i>Oligoplites saurus</i>
Leopard Seal	<i>Hydrurga leptonyx</i>
Lesser Golden Plover	<i>Pluvialis dominica</i>
Lesser Sand Plover	<i>Charadrius mongolus</i>
Lewin's Rail	<i>Lewinia pectoralis</i>
Little Black Horse Mussel	<i>Xenostrobus pulex</i>
Little Egret	<i>Egretta garzetta</i>
Little Forest Bat	<i>Vespadelus vulturnus</i>
Little Penguin	<i>Eudyptula minor</i>
Long-nosed Bandicoot	<i>Perameles nasuta</i>
Long-nosed Potoroo	<i>Potorous tridactylus</i>
Long-toed Stint	<i>Calidris subminuta</i>
Lowland Copperhead	<i>Austrelaps superbus</i>
Maroon Leek-orchid	<i>Prasophyllum frenchii</i>
Marram Grass	<i>Ammophila arenaria</i>
Marsh Saltbush	<i>Atriplex paludosa paludosa</i>
Marsh Sandpiper	<i>Tringa stagnatilis</i>
Messmate Stringybark	<i>Eucalyptus obliqua</i>
Metallic Skink	<i>Carinascincus metallicus</i>
Mexican Feather-grass	<i>Nassella tenuissima</i>
Mirror Bush	<i>Coprosma repens</i>
Montbretia	<i>Crocoshia x crocosmiiflora</i>
Montpellier Broom	<i>Genista monspessulana</i>
Mud Oyster	<i>Ostrea angasi</i>
Musk Duck	<i>Biziura lobata</i>
Myrtle-leaf Milkwort	<i>Polygala myrtifolia</i>
Nankeen Night Heron	<i>Nycticorax caledonicus</i>
Narrow-leaf Peppermint	<i>Eucalyptus radiata</i>
Neptune's Necklace	<i>Hormosira banksii</i>
Northern Pacific Seastar	<i>Asterias amurensis</i>
One-leaf Cape-tulip	<i>Moraea flaccida</i>
Orange-bellied Parrot	<i>Neophema chrysogaster</i>

Orange-tip Finger-orchid	<i>Caladenia aurantiaca</i>
Pacific Oyster	<i>Crassostrea gigas</i>
Paddle Weed	<i>Halophila australis</i>
Painted Button-quail	<i>Turnix varius</i>
Pale Mangrove Goby	<i>Mugilogobius platynotus</i>
Pampas Grass	<i>Cortaderia selloana</i>
Panic Veldt-grass	<i>Ehrharta erecta</i>
Paterson's Curse	<i>Echium plantagineum</i>
Peninsula Daisy-bush	<i>Olearia sp. 2</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Perennial Thistle	<i>Cirsium arvense</i>
Perennial Veldt-grass	<i>Ehrharta calycina</i>
Perforated St John's Wort	<i>Hypericum perforatum subsp. veronense</i>
Pied Cormorant	<i>Phalacrocorax varius</i>
Pied Oystercatcher	<i>Haematopus longirostris</i>
Pink-eared Duck	<i>Malacorhynchus membranaceus</i>
Platypus	<i>Ornithorhynchus anatinus</i>
Powerful Owl	<i>Ninox strenua</i>
Prickly Tea-tree	<i>Leptospermum continentale</i>
Purple Diuris	<i>Diuris punctata var. punctata</i>
Purple Eyebright	<i>Euphrasia collina subsp. muelleri</i>
Quaking Grass	<i>Briza spp.</i>
Rabbit	<i>Oryctolagus cuniculus</i>
Radiata Pine	<i>Pinus radiata</i>
Ragwort	<i>Jacobaea vulgaris</i>
Rambling Dock	<i>Acetosa sagittata</i>
Rare Bitter-bush	<i>Adriana quadripartita s.s. (glabrous form)</i>
Red Knot	<i>Calidris canutus</i>
Red Passionflower	<i>Passiflora cinnabarina</i>
Red-capped Plover	<i>Charadrius ruficapillus</i>
Red-flower Mallow	<i>Modiola caroliniana</i>
Red-ink Weed	<i>Phytolacca octandra</i>
Red-necked Stint	<i>Calidris ruficollis</i>
River Red Gum	<i>Eucalyptus camaldulensis</i>
Rock Flathead	<i>Platycephalus laevigatus</i>
Rough-barked Manna Gum	<i>Eucalyptus viminalis subsp. cygnetensis</i>
Royal Spoonbill	<i>Platalea regia</i>
Ruddy Turnstone	<i>Arenaria interpres</i>
Sallow Wattle	<i>Acacia longifolia subsp. longifolia</i>
Salt Lawrencia	<i>Lawrencia spicata</i>
Sambar Deer	<i>Rusa unicolor</i>
Sanderling	<i>Calidris alba</i>
Sandy Ghost Shrimp	<i>Biffarius arenosus</i>
School Shark	<i>Galeorhinus galeus</i>
Scotch Thistle	<i>Onopordum acanthium</i>
Seaberry Saltbush	<i>Chenopodium candolleanum</i>

Sea Cucumber	<i>Apsolidium densum</i>
Sea Nymph	<i>Amphibolis antarctica</i>
Sea Spurge	<i>Euphorbia paralias</i>
Serrated Tussock	<i>Nassella trichotoma</i>
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>
Shrubby Glasswort	<i>Tecticornia arbuscula</i>
Sicilian Sea-lavender	<i>Limonium hyblaenum</i>
Silver Banksia	<i>Banksia marginata</i>
Slaty Helmet-orchid	<i>Corybas incurvus</i>
Slender Sheoak	<i>Allocasuarina misera</i>
Slender Thistle	<i>Carduus pycnocephalus</i>
Smooth Toadfish	<i>Tetractenos glaber</i>
Snapper	<i>Pagrus auratus</i>
Snow Gum	<i>Eucalyptus pauciflora</i>
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>
Soursob	<i>Oxalis pes-caprae</i>
South African Orchid	<i>Disa bracteata</i>
Southern Brown Bandicoot	<i>Isodon obesulus</i>
Southern Emu-Wren	<i>Stipiturus malachurus</i>
Southern Hulafish	<i>Trachinops caudimaculatus</i>
Southern Mahogany	<i>Eucalyptus botryoides</i>
Southern Right Whale	<i>Eubalaena australis</i>
Southern Saw Shark	<i>Pristiophorus nudipinnis</i>
Southern Toadlet	<i>Pseudophryne semimarmorata</i>
Spanish Heath	<i>Erica lusitanica</i>
Spear Thistle	<i>Cirsium vulgare</i>
Spiny Rush	<i>Juncus acutus subsp. acutus</i>
Spotless Crake	<i>Porzana tabuensis</i>
Spotted Galaxias	<i>Galaxias truttaceus</i>
St John's Wort	<i>Hypericum spp.</i>
St Peter's Wort	<i>Hypericum tetrapterum var. tetrapterum</i>
Sugar glider	<i>Petaurus breviceps</i>
Swamp Everlasting	<i>Xerochrysum palustre</i>
Swamp Gum	<i>Eucalyptus ovata</i>
Swamp Paperbark	<i>Melaleuca ericifolia</i>
Swamp Rat	<i>Rattus lutreolus</i>
Swamp Sheoak	<i>Casuarina glauca</i>
Swamp Skink	<i>Lissolepis coventryi</i>
Swamp Wallaby	<i>Wallabia bicolor</i>
Sweet Briar	<i>Rosa rubiginosa</i>
Sweet Pittosporum	<i>Pittosporum undulatum</i>
Sweet Wattle	<i>Acacia suaveolens</i>
Swift Parrot	<i>Lathamus discolor</i>
Tailor	<i>Pomatomus saltatrix</i>
Tall Wheat Grass	<i>Thinopyrum ponticum</i>
Terek Sandpiper	<i>Xenus cinereus</i>

Tiger snake	<i>Notechis scutatus</i>
Townsend's Cord-grass	<i>Spartina x townsendii</i>
Tree Lucerne	<i>Chamaecytisus palmensis</i>
Tree Mallow	<i>Malva arborea</i>
Variegated Thistle	<i>Silybum marianum</i>
Vained Helmet-orchid	<i>Corybus diemenecus</i>
Venus-hair Fern	<i>Adiantum capillus-veneris</i>
Wakame Japanese Kelp	<i>Undaria pinnatifida</i>
Wall Fumitory	<i>Fumaria muralis subsp. muralis</i>
Wandering Creeper	<i>Tradescantia fluminensis</i>
Water Rat	<i>Hydromys chrysogaster</i>
White Kunzea	<i>Kunzea ambigua</i>
White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>
White-footed Dunnart	<i>Sminthopsis leucopus</i>
White-lipped Snake	<i>Drysdalia coronoides</i>
Wild Carrot	<i>Daucus carota</i>
Wild Oat	<i>Avena fatua</i>
Wild plums and variants	<i>Prunus spp.</i>
Willow-leaf Hakea	<i>Hakea salicifolia</i>
Winter Cherry	<i>Withania somnifera</i>
Wood Forget-me-not	<i>Myosotis sylvatica</i>
Woolly Tea-tree	<i>Leptospermum lanigerum</i>
Yellow Eye Mullet	<i>Aldrichetta forsteri</i>
Yellow-bellied Glider	<i>Petaurus australis</i>

Appendix D — Biosecurity principles

Prevention

Prevention is a pre-emptive action to manage the risk of introducing weeds into the Western Port and South-east Melbourne Parks Landscape and ensuring works or disturbance events do not provide an opportune environment for weed establishment. This is achieved by identifying the most likely invasion points, which are often vehicle access and parking sites and locations where animals are likely to act as vectors. Pre-emptive action includes measures such as maintaining vehicle and equipment hygiene, avoiding the introduction of soils, gravels and other materials which may carry seed and ensuring that appropriate site preparation and risk identification before planned disturbance events such as planned burning and environmental watering.

Eradication of new and emerging weeds

The initial part of the strategy is to ensure that resources are available to address the threat of new and emerging weeds before they can become established. Any new weed species identified within the Parks Landscape should be eradicated as a management priority and the area of infestation monitored for re-emergence. Once a species has become established, its potential for eradication becomes less feasible and more resource intensive.

DELWP have designed a decision-making framework to managing Weeds of Early Stages of Invasion (WESI). This framework will guide and support the management of new and emerging weeds. The WESI principles are based on a landscape approach to identifying new and emerging species. The process to address new and emerging weed threats should follow the six-step approach outlined in the Weeds of Early Stages of Invasion framework. Eradication is the objective for new and emerging weeds where feasible.

Containment

Containment is an ongoing maintenance approach to managing the spread of established weeds. Management tracks, ridgelines and other landscape features are useful in defining containment boundaries. Containment is used when a species is not considered feasibly eradicable in the short-medium term, however a strategy establishing containment lines and constricting the containment area over time may have a long-term eradication goal.

It is important to inspect a buffer around an established containment area to ensure efforts are effective and new populations are not establishing beyond containment boundaries. Where there are pathways of spread through a containment area (e.g. vehicles, walkers, river corridors) a concerted effort should be made to undertake control works along tracks and waterways to decrease the likelihood of spread. Containment includes the eradication of satellite or local populations of weeds outside the containment area.

Asset Protection

A range of weeds are well established and widespread within the Parks Landscape. If a weed species presents a specific threat to a specific value, an asset protection approach to weed management may be undertaken. Examples of assets include riparian corridors, threatened species, cultural heritage sites, visitor sites and infrastructure. Asset protection will generally involve specifying a buffer around the asset and treating weeds within its perimeter. Biological controls can assist with containment for established weeds but are limited to species with an available control agent.

Appendix E — Parks and reserves in the Western Port and South-east Melbourne Parks Landscape

Park name	Reserve type	Area (ha)
Arthurs Seat SP (Parkdale Estate)	Other	4.3
Arthurs Seat State Park	State Park - Schedule 2B, National Parks Act	527
Bald Hill N.C.R.	Nature Conservation Reserve	22
Bald Hills B.R.	Natural Features Reserve - Bushland Reserve	2.5
Balnarring G95 B.R.	Natural Features Reserve - Bushland Reserve	3.9
Baluk Willam N.C.R.	Nature Conservation Reserve	67
Belgrave South B.R.	Natural Features Reserve - Bushland Reserve	2
Braeside Park	Metropolitan Park	130
Buckley N.C.R.	Nature Conservation Reserve	32
Cape Schanck Lighthouse Reserve	Lighthouse Reserve	6.8
Cardinia Creek Parklands	Metropolitan Park	61
Cardinia Creek Parklands (addition)	Proposed National Parks Act park or park addition	1.6
Cardinia Reservoir Parks	Reservoir Park	186
Churchill Island Marine National Park	Marine National Park - Schedule 7, National Parks Act	24
Churchill National Park	National Park - Schedule 2, National Parks Act	265
Collins Settlement Site H.A	Historic Reserve	0.2
Coolart H.A	Historic Reserve	48
Corinella Cemetery B.R.	Natural Features Reserve - Bushland Reserve	2.5
Corinella Pier	Port & Coastal Facility	0.1
Cranbourne Wetlands N.C.R.	Nature Conservation Reserve	11
Crib Point G229 B.R.	Natural Features Reserve - Bushland Reserve	0.5
Dandenong Police Paddocks Reserve	Metropolitan Park	291
Devilbend N.F.R.	Natural Features Reserve	592
Fingal B.R	Natural Features Reserve - Bushland Reserve	1.9
Flinders G234 B.R.	Natural Features Reserve - Bushland Reserve	0.8
Flinders N.F.R.	Natural Features Reserve	4
Frankston N.C.R.	Nature Conservation Reserve	82
French Island Barge Landing (Saltmine Point)	Other	0.1
French Island G230 B.R	Natural Features Reserve - Bushland Reserve	1.3
French Island Marine National Park	Marine National Park - Schedule 7, National Parks Act	167
French Island National Park	National Park - Schedule 2, National Parks Act	10 084
Hastings Pier	Port & Coastal Facility	0.7

Park name	Reserve type	Area (ha)
Kangerong N.C.R	Nature Conservation Reserve	21
Karkarook Park	Metropolitan Park	2.1
Koo-Wee-Rup East B.R	Natural Features Reserve - Bushland Reserve	0.8
Lang Lang B.R	Natural Features Reserve - Bushland Reserve	9.3
Lang Lang Jetty	Port & Coastal Facility	0.2
Langwarrin B.R.	Natural Features Reserve - Bushland Reserve	1.7
Langwarrin Flora & Fauna Reserve	Other Park - Schedule 3, National Parks Act	214
Lysterfield Park	Other Park - Schedule 3, National Parks Act	1359
Main Ridge N.C.R.	Nature Conservation Reserve	63
Mornington Peninsula National Park	National Park - Schedule 2, National Parks Act	2291
Mushroom Reef Marine Sanctuary	Marine Sanctuary - Schedule 8, National Parks Act	2.5
National Water Sports Centre	Metropolitan Park	1.8
North Western Port N.C.R.	Nature Conservation Reserve	1902
Patterson River Rock Walls	Port & Coastal Facility	0.3
Point Nepean National Park	National Park - Schedule 2, National Parks Act	494
Red Hill South B.R.	Natural Features Reserve - Bushland Reserve	1.3
Reef Island and Bass River Mouth N.C.R	Nature Conservation Reserve	162
San Remo Jetty	Port & Coastal Facility	1.2
Selby G190 B.R.	Natural Features Reserve - Bushland Reserve	21
Selby G193 B.R.	Natural Features Reserve - Bushland Reserve	2.7
Selby G196 B.R.	Natural Features Reserve - Bushland Reserve	0.6
Somers Foreshore Reserve	Coastal Reserve	12
The Pines F.F.R.	Other Park - Schedule 3, National Parks Act	168
Tooradin Jetty	Port & Coastal Facility	0
Tubbarubba Creek B.R.	Natural Features Reserve - Bushland Reserve	0.6
Tyabb B.R.	Natural Features Reserve - Bushland Reserve	9.6
Upper Beaconsfield N.C.R.	Nature Conservation Reserve	34
Warneet N.F.R.	Natural Features Reserve	3.7
Warneet North Jetty	Port & Coastal Facility	0
Western Port Intertidal Coastal Reserve	Coastal Reserve	264
Yannathan 197 B.R.	Natural Features Reserve - Bushland Reserve	10
Yaringa Marine National Park	Marine National Park - Schedule 7, National Parks Act	459



