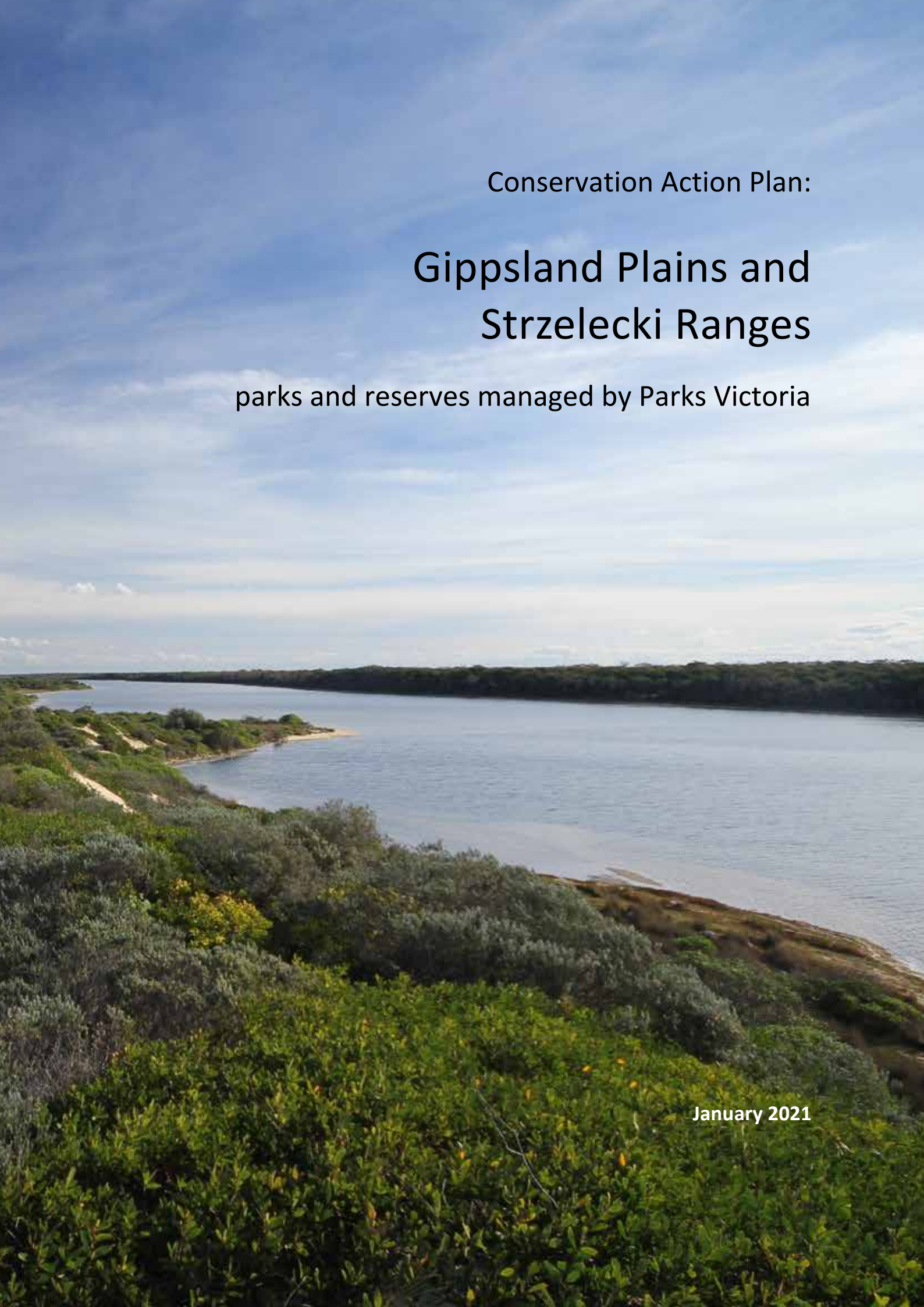

Conservation Action Plan:

Gippsland Plains and Strzelecki Ranges

parks and reserves managed by Parks Victoria

January 2021

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Disclaimer

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.

Every effort has been made to ensure that the information in this plan is accurate. Parks Victoria does not guarantee that the publication is without flaw of any kind and therefore disclaims all liability for any error, loss or other consequence that may arise from you relying on any information in the publication.

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Cover: Bunga Arm, Gippsland Lakes Coastal Park (Sean Phillipson)

Foreword

Parks Victoria recognises the diversity of cultures, deep connections and the rights and responsibilities that Traditional Owners have over the lands and waters covered by this 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 and sea use and the impacts that introduced threats and intensive resource management have had on this unique cultural landscape. The plan presented here is offered as 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.

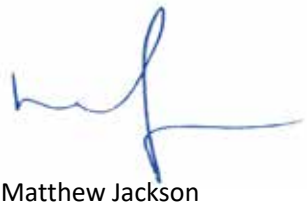
The Gippsland Plains and Strzelecki Ranges Conservation Action Plan focuses primarily on the first of Parks Victoria's three strategic themes:

- 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.

The plan 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 Gippsland Plains and Strzelecki Ranges Parks Landscape.



Matthew Jackson
Chief Executive Officer
Parks Victoria

Managing Country together

Cultural significance

Traditional Owners are the custodians of a living cultural heritage. The forests, rivers, coastal areas, plants and animals are all part of Country and the cultural identity of Traditional Owners. Protecting, managing and enjoying the land are important parts of this connection and Traditional Owner knowledge and perspectives are critical in best practice land and natural resource management to bring benefits to both the parks and the whole community.

The Gippsland Plains and Strzelecki Ranges Parks Landscape is within the Traditional lands of the Gunaikurnai and Bunurong peoples, with legislated authority for the protection and management of their cultural heritage. As Traditional owners, the Gunaikurnai and Bunurong have been part of this landscape for tens of thousands of years. Some of their traditional areas are now parks and reserves, each of which is extremely important in maintaining their respective cultural connections.

The Gippsland Plains and Strzelecki Ranges Parks Landscape remains rich in Aboriginal cultural heritage, both tangible sites and intangible heritage, closely linked to traditional stories and embedded in customary access to, and use of, Country. 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. Supporting the inclusion of traditional ecological knowledge in land management practices can assist in healing Country and achieving conservation outcomes, including through better understanding of environmental drivers such as cultural water flows and rekindling cultural burning practices. Where possible, traditional ecological knowledge has been taken into account in the plan, and opportunities to investigate and apply traditional ecological knowledge will be developed further in future iterations of the plan.

Joint management agreements

The Gunaikurnai and Victorian Government Joint Management Plan (GKTOLMB 2018) highlights the importance of strengthening respectful partnerships to manage and care for country together, particularly as management of public land evolves into joint management arrangements. The Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC) represents Traditional Owners from the Brataualung, Brayakaulung, Brabralung, Krauatungalung and Tatungalung family clans, who were recognised in the Native Title Consent Determination, made under the Victorian *Traditional Owner Settlement Act 2010*.

Nine parks and reserves are currently jointly managed by Parks Victoria and Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC): Buchan Caves Reserve, Corringle Foreshore Reserve, Gippsland Lakes Coastal Park, Gippsland Lakes Reserve at Raymond Island, Lake Tyers State Park, Mitchell River National Park, New Guinea Cave within the Snowy River National Park, Tarra–Bulga National Park, and The Lakes National Park. A tenth reserve, The Knob Reserve, is jointly managed by GLaWAC, the Victorian Department of Environment, Land, Water and Planning (DELWP) and the Gunaikurnai Traditional Owner Land Management Board (GKTOLMB). Four of these parks and reserves (Gippsland Lakes Coastal Park, Gippsland Lakes Reserve at Raymond Island, Tarra Bulga National Park and The Lakes National Park) form part of the Gippsland Plains and Strzelecki Ranges Parks Landscape.

The Joint Management Plan 2018 highlights traditional connections to country and outlines Traditional Owner priorities for the coming years. In July 2017 Bunurong Land Council Aboriginal Corporation (BLCAC) was approved as a Registered Aboriginal Party for land including the far western part of the landsscape, and Parks Victoria is in discussions with BLCAC about their future land management plans.

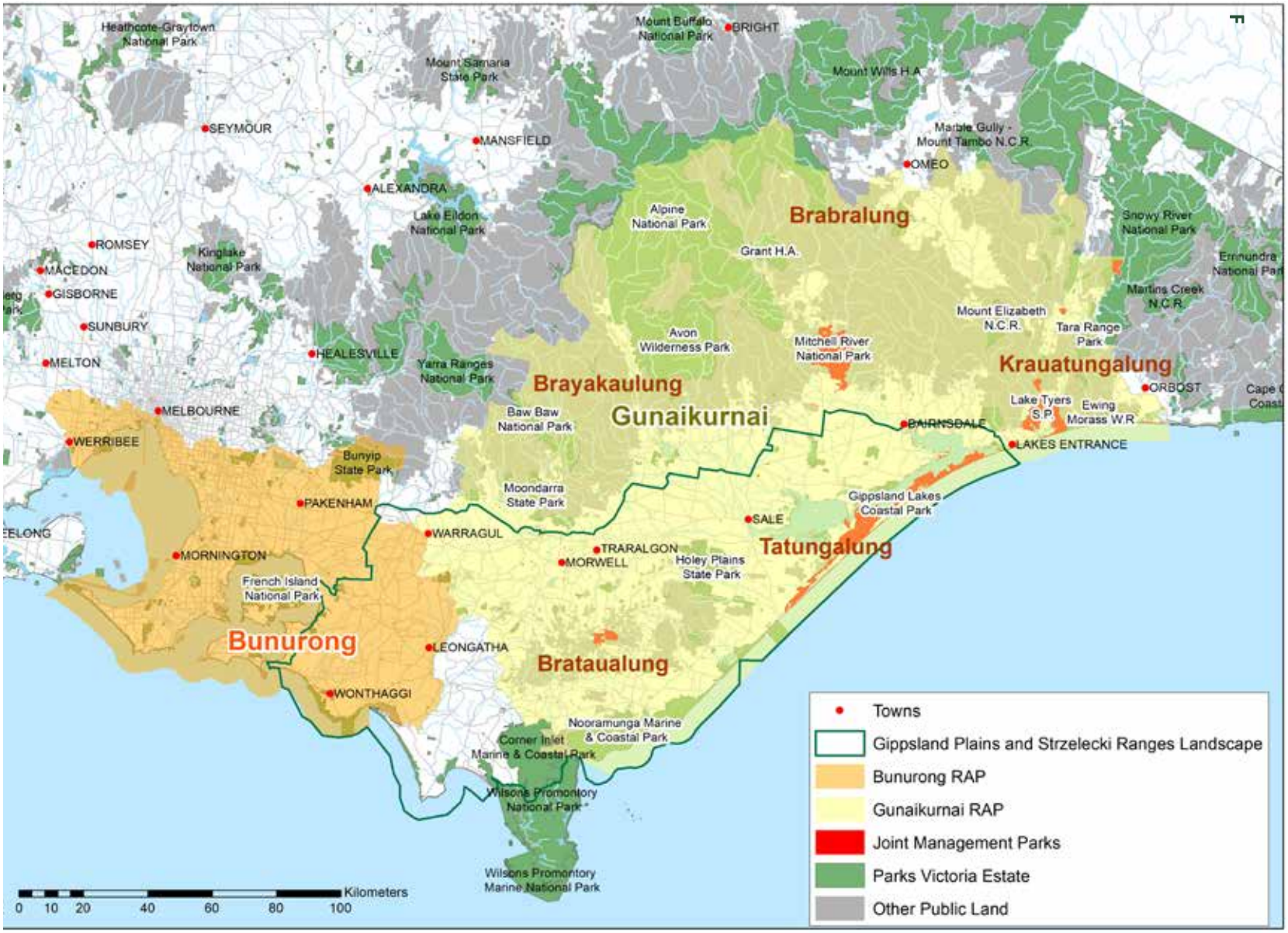


Figure 0.1 Intersection of the Gippsland Plains and Strzelecki Ranges Parks Landscape with Gunaikurnai and Bunurong Registered Aboriginal Party boundaries.

Cool Temperate Rainforest,
Tarra–Bulga National Park

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Summary

The Gippsland Plains and Strzelecki Ranges Parks Landscape is a region of great biodiversity and cultural heritage. It encompasses old growth forests, internationally recognised wetlands, and sandy beaches backed by coastal dunes and heathlands. It has significant marine values, including extensive seagrass beds that support both fisheries and migratory birds, and extensive rocky reefs. It is home to many threatened species, including the Southern Brown Bandicoot, Spotted Quoll, Orange-bellied Parrot, Regent Honeyeater, Dwarf Kerrawang and Metallic Sun-orchid. The area covered by this plan is part of an Indigenous cultural landscape containing Aboriginal values and places of significance to the Gunaikurnai and Bunurong peoples.

This Conservation Action Plan defines the priority conservation strategies for the Gippsland Plains and Strzelecki Ranges Parks Landscape to 2026, and broadly describes the expected outcomes of those strategies. The plan outlines the actions that can be realistically implemented to tackle the threats that pose the greatest risk to conservation assets. The Conservation Action Plan will direct the achievement of the conservation vision:

The resilience of natural assets in the Gippsland Plains and Strzelecki Ranges 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 landscapes, 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. The Gunaikurnai and Bunurong peoples, who are traditionally and culturally associated with the area, are represented by the Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC), which has a joint management agreement with the State of Victoria covering several parks and reserves in this landscape, and the Bunurong Land Council Aboriginal Corporation. 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 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 Parks Landscape includes The Lakes National Park, Tarra–Bulga National Park, Gippsland Lakes Coastal Park, Cape Liptrap Coastal Park, Holey Plains State Park, Mount Worth State Park, Bunurong Marine National Park, Ninety Mile Beach Marine National Park, Shallow Inlet Marine and Coastal Park, Corner Inlet Marine and Coastal Park and Marine National Park, Nooramunga Marine and Coastal Park, and the newly established Yallock–Bulluk Marine and Coastal Park. The landscape covers more than 145 000 hectares, including more than 200 other parks and reserves, and is home to many endangered plant and animal species, nationally significant wetlands, and thousands of significant cultural heritage places.

The development, implementation and review of this 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.

Five terrestrial and five marine conservation assets have been identified in the Gippsland Plains and Strzelecki Ranges Parks Landscape. Within each of these assets a range of nested assets, such as threatened species and important ecological assemblages, have 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, or poor) and the trend in condition (improving, stable, or 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.

Terrestrial conservation assets

- **Wet Forest and Rainforest** conservation asset is in good condition.
- **Dry Forest and Woodland**, **Heathland**, **Wetland**, and **Coastal** conservation assets are in fair condition.

Marine conservation assets

- **Water Column (pelagic)** conservation asset is in very good condition.
- **Soft Sediment**, **Seagrass**, and **Subtidal and Intertidal Reefs** conservation assets are in good condition.
- **Saltmarsh and Mangrove** conservation asset is in fair condition.

For conservation assets that are already categorised as good or very good, the desired future trends of asset condition health are mostly stable. For conservation assets categorised as fair, the desired future trend is to improve. These trends depend on the implementation of all the listed strategies.

Fifteen threatening processes are identified in the plan. Eight threatening processes or threat agents are considered to pose an extreme or high risk, and are therefore the priority threats considered in this plan. They are:

- Terrestrial weeds, diseases and pathogens
- Marine invasive or overabundant species
- Introduced predators
- Recreation/natural resource extraction
- Inappropriate fire regimes
- Introduced herbivores
- Extreme weather events and climate change
- Altered hydrology/reduced water quality.

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 will therefore be better able to withstand the impacts of climate change. Conservation strategies have been developed to mitigate threats, including the compounding effect of climate change, to improve the assets' capacity to adapt. Most assets are vulnerable to the impacts of climate change, and specific adaptation strategies have been designed to, where feasible, maintain ecosystem function, facilitate the movement of communities and species, and maximising species persistence through managing *in situ* refugia.

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 outcomes.

- Fire management for ecological health — Using fire as a tool to maintain fire dependent habitat or species, exclude planned fire from fire sensitive habitats, and apply planned fire in appropriate areas of the landscape to help protect priority species and habitats from high-severity bushfire.
- Weed control using a biosecurity approach — Managing weeds to reduce their spread, establishment and impact, focusing on species that have, or are likely to have, significant impacts on the health of conservation assets.
- Ongoing control of introduced predators to support native fauna populations — Supporting vulnerable native animal species to persist and recolonise suitable habitat.
- Herbivore management – Increasing the health of habitats for native flora and fauna, and the health of waterways, by managing exotic grazing and browsing species, and overgrazing by native herbivores.
- Water management for conservation outcomes — Supporting partnerships to improve water-dependent conservation assets by maintaining and improving the hydrological regimes that support them in the Parks Landscape.

- Reducing the impacts of recreation, illegal activities and natural resource extraction on natural values — Encouraging the public to enjoy nature-based tourism activities, while reducing the impacts of illegal activities.
- Managing marine pests for healthy marine protected areas — Containing existing marine pest populations and preventing new invasions.
- Establishing collaborative partnerships and addressing key knowledge gaps — Promoting effective collaboration and partnership between Parks Victoria, Traditional Owners, land management partners, researchers and community groups to support improved management across the fragmented Parks Landscape.

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

Parks Victoria's Conservation Action Plans generally define and prioritise conservation strategies for five-year periods. However, Conservation Action Plans are also designed to evolve and adapt according to changes in circumstance and evidence. This first version of the Gippsland Plains and Strzelecki Ranges Parks Landscape Conservation Action Plan may be revised before its scheduled review period in 2026 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. This Conservation Action Plan has been informed by the Joint Management Plan prepared by the Gunaikurnai Land and Waters Aboriginal Corporation.

Commonly used terms and abbreviations

CMA	Catchment Management Authority.
DELWP	Victorian Department of Environment, Land, Water and Planning.
EPBC	The *Environment Protection and Biodiversity Conservation Act 1999*, under which threatened species, communities and locations can be listed for protection. Administered by the Federal Department of the Environment and Energy.
EVC	Ecological Vegetation Class, a vegetation classification system based on floristic species composition, structural features, and ecological traits of the community.
EVD	Ecological Vegetation Division, a grouping of Ecological Vegetation Classes based on broad similarities.
FFG	The Victorian *Flora and Fauna Guarantee Act 1988*, under which threatened species and communities can be listed for protection against potentially threatening processes.
Functional group	A group of species which share similar characteristics (e.g. colonial nesting birds, riverine / wetland specialist fish).
IUCN	International Union for the Conservation of Nature.

Neptune’s Necklace

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 Park landscapes

Park landscapes are classified according to a combination of ecological attributes, landforms and administrative boundaries. There are 18 park 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 park 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.

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 that manage conservation lands in Victoria.

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 possible conservation outcomes, 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.

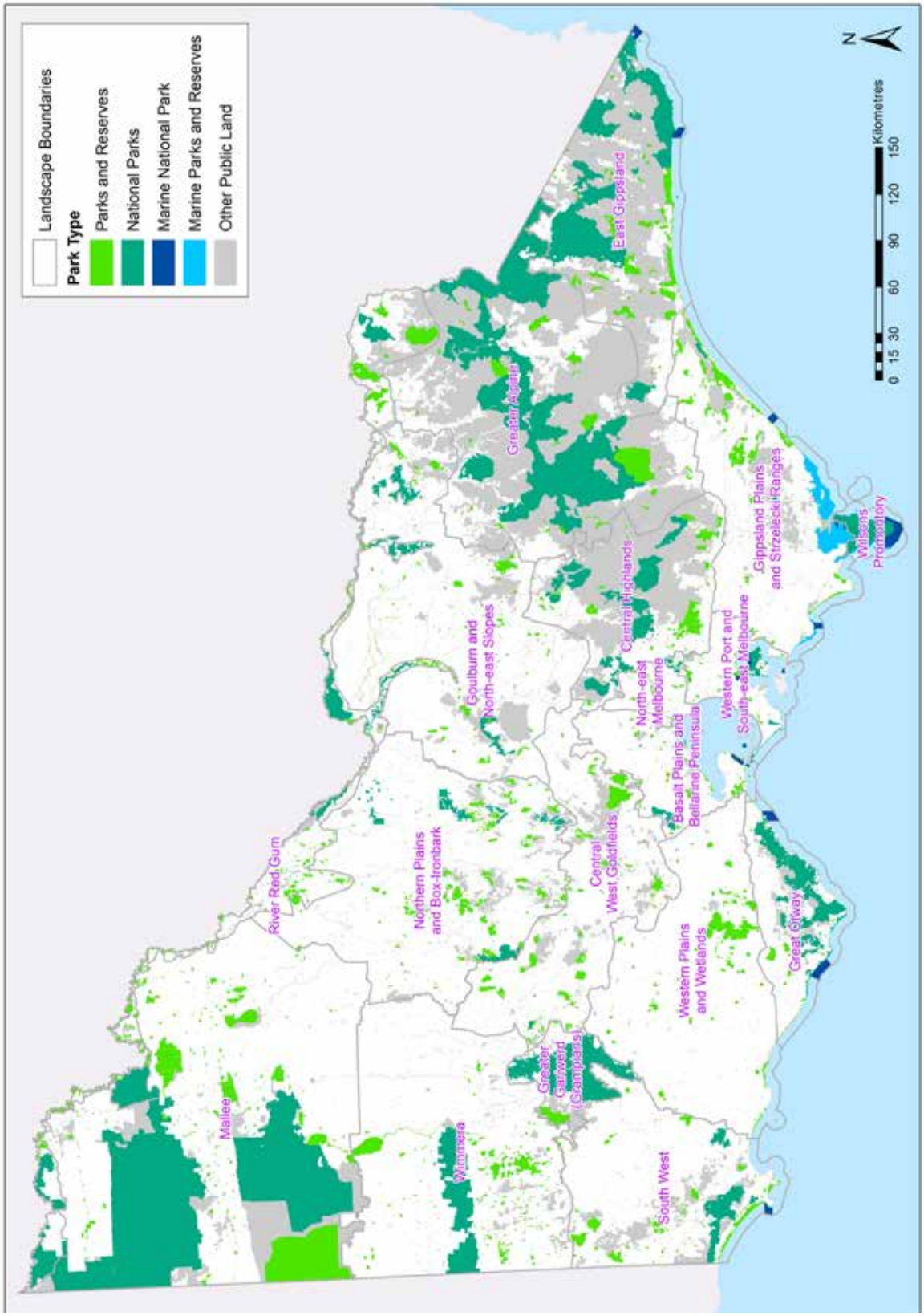


Figure 1.1 Parks Victoria's Park landscapes.

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

1 Scope planning, people and resources.
2 Identify conservation assets.
3 Assess the viability of conservation assets and set conservation outcomes.
4 Identify and assess threats to conservation outcomes.
5 Develop action options from situational analysis.
6 Prioritise conservation strategies.
7 Set performance measures
8 Plan work.
9 Implement operational plans.
10 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.

Silver Banksia,
Walkerville

2 Scope

2.1 Geographic scope

This Conservation Action Plan covers parks and reserves managed by Parks Victoria that protect more than 145 000 hectares in the Gippsland Plains and Strzelecki Ranges Parks Landscape (see Figure 2.1). The Gippsland Plains and Strzelecki Ranges Parks Landscape is home to many endangered plant and animal species and nationally significant wetlands, and protects thousands of significant cultural heritage places. The planning area covers six terrestrial parks managed under the Victorian *National Parks Act*, totalling over 39 000 hectares, and more than 200 other parks and reserves managed under various other legislation totalling almost 37 000 hectares (see Appendix A for a full list of parks and reserves). The Parks Landscape includes a significant portion of Victoria's marine protected areas and includes seven marine protected areas managed under the National Parks Act, totalling almost 70 000 hectares. The new Yallock–Bulluk Marine and Coastal Park is of significant cultural and ecological value. The Gippsland Plains and Strzelecki Ranges Parks Landscape includes a number of parks and reserves that are also important recreational and tourism destinations for Victorians and visitors.

The many parks and reserves that make up this Parks Landscape each have their own particular history of land management and reservation. Much of this Parks Landscape consists of small isolated blocks of protected areas, surrounded by agricultural land.

Table 2.1 Major terrestrial and marine parks and reserves in the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Park/reserve name	Area (hectares)	Level of Protection	IUCN Protected Areas Category
Cape Liptrap Coastal Park	4320	A2	2 – National Park
Nooramunga Marine and Coastal Park	30091	A2	6 – Protected area with sustainable use of natural resources
Corner Inlet Marine and Coastal Park	28559	A2	6 – Protected area with sustainable use of natural resources
Providence Ponds Flora and Fauna Reserve	2534	B	1a – Strict Nature Reserve
Moormurng Flora and Fauna Reserve	966	B	1a – Strict Nature Reserve
Holey Plains State Park	10747	B	2 – National Park
The Lakes National Park	2405	B	2 – National Park
Tarra–Bulga National Park	2018	B	2 – National Park
Morwell National Park	565	B	3 – Natural Monument or Feature
Mirboo North Regional Park	1255	B	Not an IUCN protected area
Gippsland Lakes Coastal Park	17787	B	6 – Protected area with sustainable use of natural resources
Shallow Inlet Marine and Coastal Park	1966	B	6 – Protected area with sustainable use of natural resources
Nyerimilang Park Gippsland Lakes Reserve	182	B	6 – Protected area with sustainable use of natural resources
Rigby Island Gippsland Lakes Reserve	132	B	6 – Protected area with sustainable use of natural resources

Park/reserve name	Area (hectares)	Level of Protection	IUCN Protected Areas Category
Raymond Island Gippsland Lakes Reserve	219	C	6 – Protected area with sustainable use of natural resources
Ninety Mile Beach Marine National Park	2653	Marine A	2 – National Park
Bunurong Marine National Park	2049	Marine A	2 – National Park
Corner Inlet Marine National Park	1407	Marine A	2 – National Park
Yallock–Bulluk Marine and Coastal Park	3205	A2	—

* As this is a new park the IUCN status has not yet been assigned.

2.2 Significant natural values

Natural values of significance in this Parks Landscape include:

- two wetlands of international significance listed under the Ramsar Convention (Corner Inlet and Gippsland Lakes)
- 12 Nationally important wetlands (Appendix E)
- diverse vegetation communities, including five nationally threatened ecological vegetation types
- current occurrence of 5 nationally critically endangered flora and fauna species, 46 nationally endangered or vulnerable fauna and flora species. Eighty-two flora and fauna species are currently listed under the Flora and Fauna Guarantee Act
- totemic species of significance to the Gunaikurnai, including Borun (pelican), Tuk (Musk Duck), Southern Emu-Wren and Superb Fairy-wren.

The Victorian Biodiversity Atlas includes records of more than 2470 native species from the Gippsland Plains and Strzelecki Ranges Parks Landscape, including:

- 1629 plants and algae
- 82 mammals
- 345 birds
- 140 fish
- 43 reptiles
- 27 amphibians
- 205 recorded invertebrates.

Ramsar wetlands in the Gippsland Plains and Strzelecki Ranges Parks Landscape

The wetlands of Corner Inlet and the Gippsland Lakes have been recognised as internationally important habitat for migratory shorebirds and are listed under the Ramsar Convention (see section 2.4). The Corner Inlet site (over 65 000 hectares) covers all of Corner Inlet and Nooramunga Marine and Coastal Parks, protecting large tracts of unvegetated soft sediments and the only beds of Broad-leaf Seagrass in Victoria. The Gippsland Lakes site (over 60 000 hectares) has been recognised for shorebird habitat provided by marine subtidal aquatic beds, coastal brackish or saline lagoons and fringing wetlands (East Gippsland CMA 2015). The site incorporates The Lakes National Park and most of the parks and reserves fringing the lakes, as well as the water bodies that make up the lake system.

2.3 Joint management agreements

Nine parks and reserves are currently jointly managed by Parks Victoria and Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC): Buchan Caves Reserve, Corringle Foreshore Reserve, Gippsland Lakes Coastal Park, Gippsland Lakes Reserve at Raymond Island, Lake Tyers State Park, Mitchell River National Park, New Guinea Cave within the Snowy River National Park, Tarra-Bulga National Park and The Lakes National Park. A tenth reserve, The Knob Reserve, is jointly managed by GLaWAC, DELWP and GKTOLMB.

Four of these parks and reserves form part of the Gippsland Plains and Strzelecki Ranges Parks Landscape: Tarra-Bulga National Park, The Lakes National Park, Gippsland Lakes Coastal Park, and Gippsland Lakes Reserve at Raymond Island.

Some priority areas and actions relating to joint management in the Gippsland Plains and Strzelecki Ranges Parks Landscape include:

- undertaking cultural mapping for various parks and reserves
- enacting strategies to limit the drying and warming impacts of climate change
- substantially renovating the Balook visitor centre and developing an improved operations base for joint management rangers and volunteers working in the Tarra–Bulga National Park
- designating areas for Gunaikurnai community gatherings and camping
- continuing to develop Point Wilson as a major hub for cultural interpretation
- improving walking tracks and signage around Ocean Grange and other residential areas adjacent to Gippsland Lakes Coastal Park to clarify the public-private boundary for visitors
- in park operations in The Lakes National Park and Gippsland Lakes Coastal Park, giving greater and earlier priority to protection of cultural sites that are vulnerable to disturbance from storm and wind erosion, as well as development and recreational activity
- improving the capabilities of the joint management ranger team to undertake on-water operations
- preparing a conservation and recreation zoning scheme for Raymond Island Gippsland Lakes Reserve, including the ‘Koala Walk’ area and the Gravelly Point visitor site
- managing Koala numbers and health in Raymond Island Gippsland Lakes Reserve to ensure that the population is at sustainable levels
- continuing and expanding programs to control invasive plants
- collaborating with local residents and community groups in conserving the parks and reserves and providing visitor experiences.

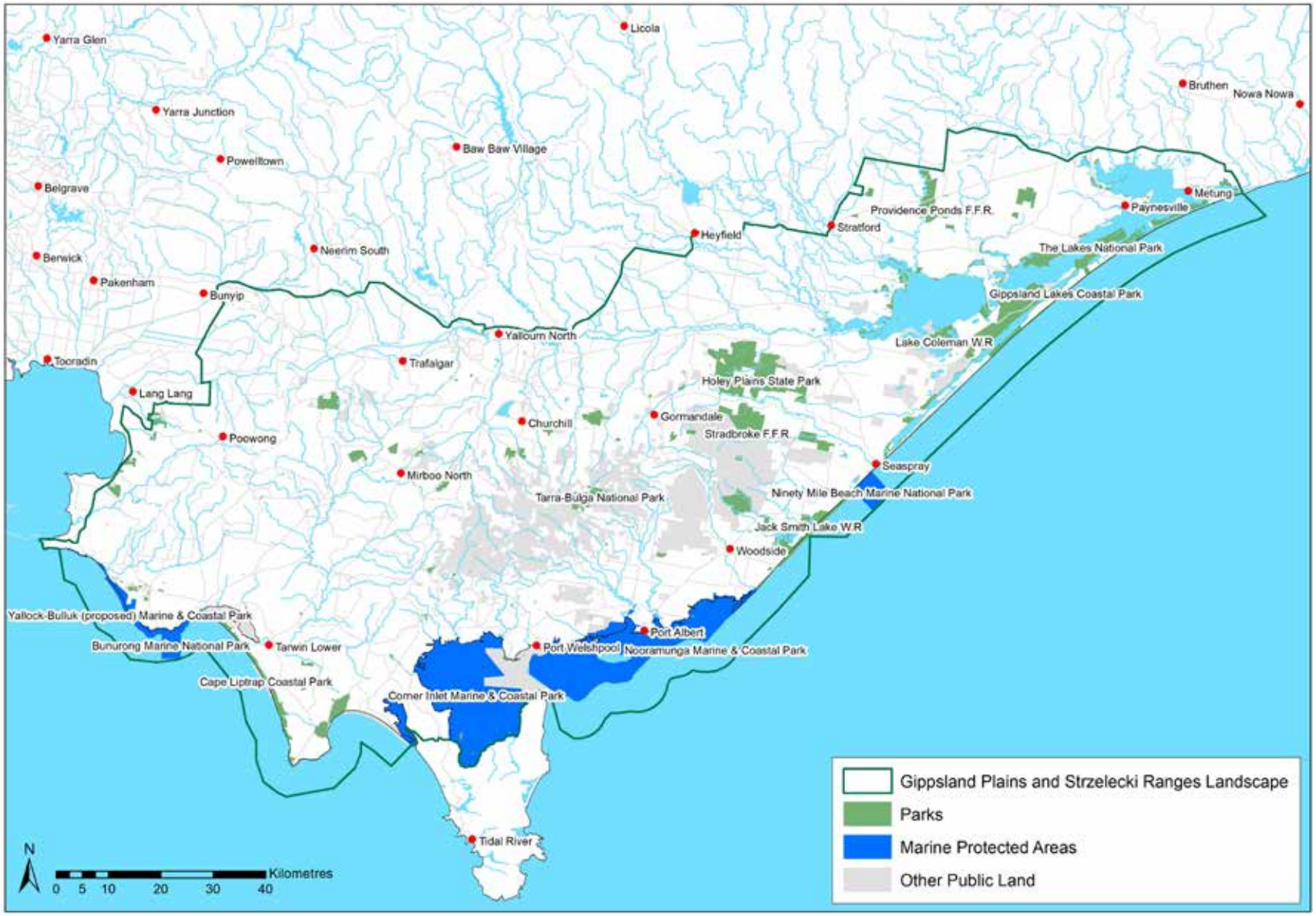


Figure 2.1 Geographic scope of conservation planning for the Gippsland Plains and Strzelecki Ranges Parks Landscape.

2.4 Legislative and planning context

The management of land and water resources, cultural heritage, flora and fauna in the Gippsland Plains and Strzelecki Ranges Parks Landscape is guided by many pieces of Commonwealth and Victorian legislation, as well as Victorian Government policies and priorities. This domestic legislation also implements a number of Australia's international treaty obligations.

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 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.[1] 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 in the Gippsland Plains and Strzelecki Parks Landscape, and will contribute to the delivery of Victoria's biodiversity strategy *Protecting Victoria's Environment – Biodiversity 2037,* which established a 20-year framework for the protection of biodiversity in Victoria.

The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Victoria has 12 Ramsar-listed wetlands, two of which occur in the Gippsland Plains and Strzelecki Ranges Parks Landscape. 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:

(a) to describe and maintain the ecological character of the wetland; and
(b) to formulate and implement planning that promotes:
    (i) conservation of the wetland; and
    (ii) 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.

The planning context for conservation action plans include the statutory basis for reservation of the parks and reserves, as follows:

- A large proportion of the Gippsland Plains and Strzelecki Ranges Parks Landscape is reserved and managed under the provisions of the National Parks Act (108 977 hectares), including 69 931 hectares of marine protected areas.
- More than 83 237 hectares of parks and reserves in the Parks Landscape are listed under the Ramsar Convention, which declares areas as internationally important wetlands. The Mitchell River has been proclaimed a Victorian Heritage River under the Victorian *Heritage Rivers Act 1992* due to its significant environmental and social values.
- Nature Conservation Reserves make up 13 083 hectares. Other areas include 23 735 hectares of other parks and reserves under various legislation, such as Regional Parks and Natural Features Reserves.
- Reference Areas have been established (under the Victorian *Reference Areas Act 1978*) in Mullungdung Flora and Fauna Reserve and Tarra–Bulga National Park, covering a total of 339 hectares.

The protected area management categories of the International Union for Conservation of Nature and Natural Resources (IUCN) classify protected areas according to their management purpose. Parks Victoria uses a tool (Levels of Protection) to aid planning and resource allocation at a state-wide scale by classifying

[1] *Parks Victoria Act 2018 (Vic)* Part 2, S7 (a) and (f)

parks according to composition and representation of biodiversity attributes. Both of these classifications are provided in the table of parks and reserves (Appendix A).

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

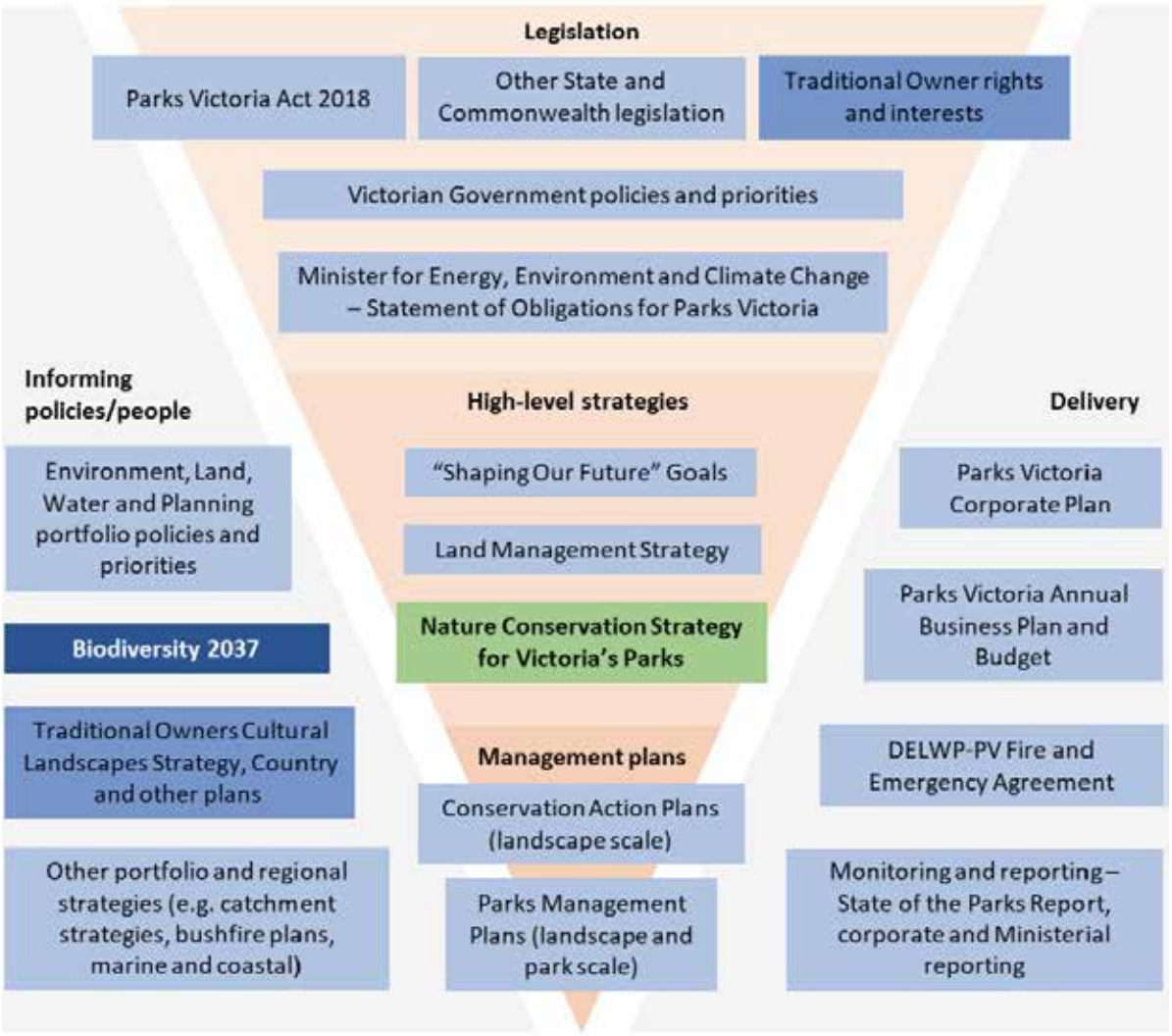


Figure 2.2 Parks Victoria's planning and management context.

2.5 Alignment with other strategies and plans

Regional Catchment Strategies

This Conservation Action Plan addresses objectives and actions in the West Gippsland and East Gippsland Regional Catchment Strategies (EGCMA 2008, WGCMA 2012) in relation to:

- rivers and streams
- wetlands and peatlands
- coastal and marine systems
- soil
- native vegetation
- threatened species and communities.

This plan will support the objectives of those strategies by:

- maintaining or improving the extent and quality of riparian and wetland ecosystems
- promoting water quality improvement objectives and the restoration of natural hydrological regimes

- protecting and sustaining wetland ecosystems with recognised conservation significance
- improving the management of existing native vegetation
- demonstrating actions leading to improving the status of listed species
- integrating fire management actions.

The Corner Inlet Connections project, initiated by the West Gippsland CMA, aims to maintain the ecological character of the Corner Inlet Ramsar Site and address threats to critical components of the Ramsar site such as seagrass beds, waterbirds, and saltmarsh and mangrove communities. As a part of this project, the CMA recently undertook an Investment Framework for Environmental Resources (INFFER) analysis. INFFER is a framework (based on benefit:cost analysis principles) for developing and prioritising projects to address environmental issues such as reduced water quality, biodiversity, environmental pests and land degradation (Dickson and Park 2020). Parks Victoria will work with the West Gippsland CMA and other partners and land managers to achieve environmental outcomes derived from this analysis.

Other information sources

Parks Victoria reports and management plans and other documents that directly assisted and informed the preparation of this plan can be found in the reference section at the end of this document.

Traditional ecological knowledge from the Gunaikurnai Joint Management Plan has been incorporated into the planning process, and future opportunities to investigate and apply traditional ecological knowledge will be developed further in subsequent iterations of the plan.

Parks Victoria will work with stakeholders to utilise other relevant plans and information to assist in implementing this and future plans, including a recently completed assessment of Victoria's Coastal Reserves (VEAC 2020).

2.6 Participation

A series of conservation action planning workshops were held during 2017 and 2018 to support the planning process for this Conservation Action Plan.

The success of the workshops drew from the great depth of knowledge and experience of participants, including staff from Parks Victoria, the Department of Environment, Land, Water and Planning, the East Gippsland Catchment Management Authority, the West Gippsland Catchment Management Authority, Trust for Nature and community stakeholders.

Further engagement has occurred with Traditional Owners, specifically the two Registered Aboriginal Parties (Gunaikurnai Land and Waters Aboriginal Corporation and Bunurong Land Council Aboriginal Corporation) whose Country includes the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Additional meetings and mini-workshops have also been held with local and specialist staff to enhance the information in the plan.

Green and Golden Bell Frog, Gippsland Lakes

3 Conservation assets

3.1 Methodology for 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 management drivers. The classification of terrestrial assets is based on the eight natural ecosystem groups described in Victoria's previous biodiversity strategy (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 efforts 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 co-occur 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 are also 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 the 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 Conservation assets

The Gippsland Plains and Strzelecki Ranges Parks Landscape consists of approximately 145 000 hectares of Parks Victoria-managed parks and reserves, including approximately 69 900 hectares of marine parks and reserves. The Parks Landscape is divided into ten conservation assets (see Figure 3.1), each of which contain multiple nested assets. The component EVCs and EVDs associated with each conservation asset are listed in Appendix B.

Table 3.1 Areas of conservation assets in the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Conservation asset	Area (hectares)
Wet Forest and Rainforest	5106
Dry Forest and Woodland	22107
Heathland	21104
Wetland	24982
Coastal	7512
Saltmarsh and Mangrove	6844
Soft Sediment	41533
Seagrass	14634
Subtidal and Intertidal Reefs	2378
Water Column (pelagic)†	—

† The Water Column overlaps all other marine assets, so a total area figure is not provided.

In the Gippsland Plains and Strzelecki Ranges Parks Landscape, riparian EVCs tend to be either linear and embedded within other conservation assets (e.g. small strips of Riparian Forest within broader areas of Wet Forest), or part of a complex of wetland ecosystems (e.g. Swamp Scrub within broader Wetland). These riparian areas are generally managed as a component of the broader ecosystems. Therefore, riparian EVCs are not treated as a separate conservation asset in this landscape, but are included with the surrounding ecosystems in the relevant conservation asset (Appendix B).

3.4 Gippsland Plains and Strzelecki Ranges 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 Gippsland Plains and Strzelecki Ranges Parks Landscape:

The resilience of natural assets in the Gippsland Plains and Strzelecki Ranges Parks Landscape is increased and ecosystem services are maintained in the face of climate change and other stressors.

In partnership with Traditional Owners and stakeholders, Parks Victoria will work to improve the health of Country, by actively managing the water, fire, wildlife and biodiversity, in a culturally appropriate way.

The Gippsland Plains and Strzelecki Ranges Parks Landscape features wet forest and rainforest, dry forest, woodland, and heathland through to coastal, saltmarsh and mangrove, seagrass, subtidal and intertidal reefs, with rivers and wetlands connecting the landscape with marine influenced areas.

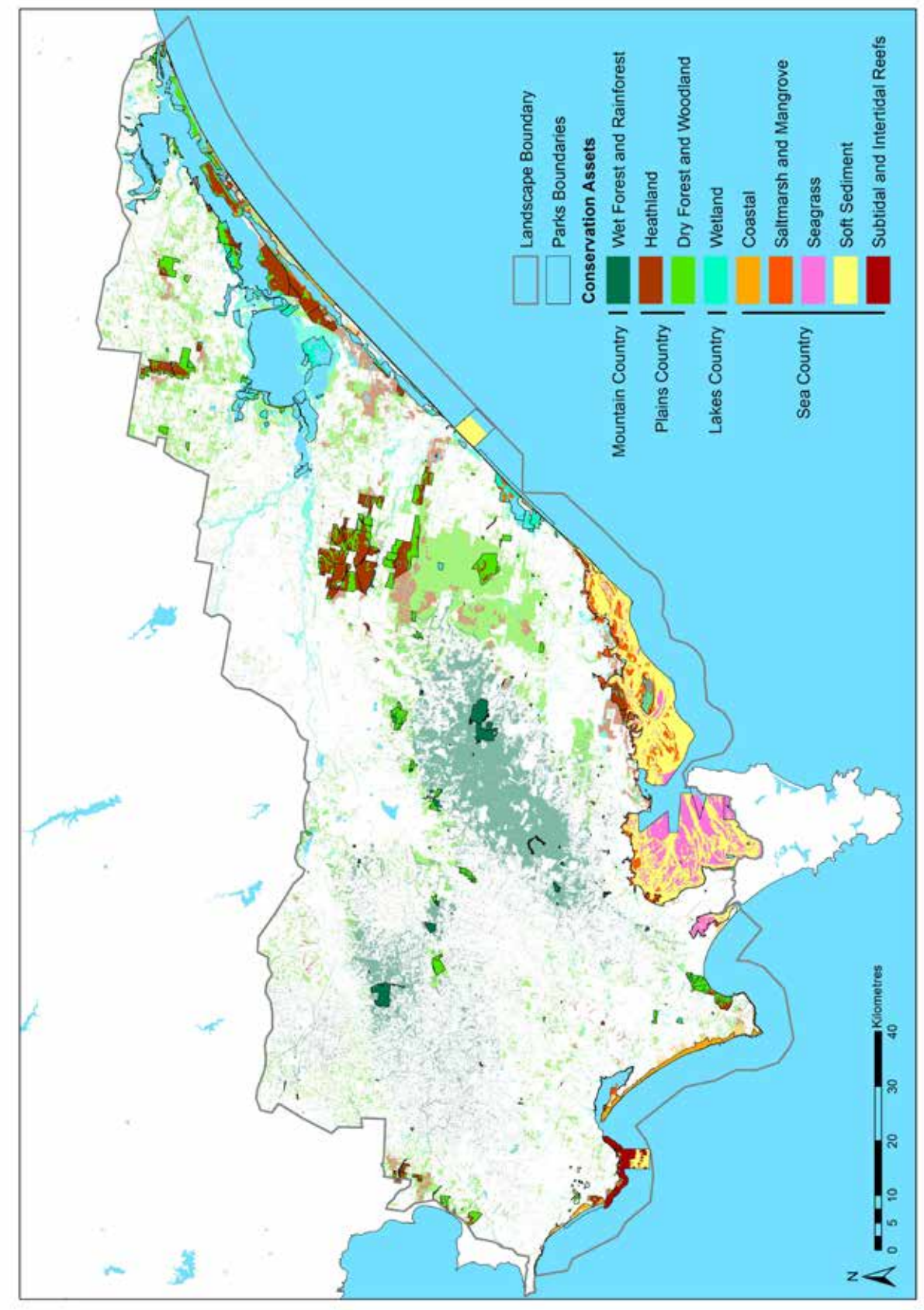


Figure 3.1 Conservation assets in the Gippsland Plains and Strzelecki Ranges Parks Landscape. Similar ecosystems not managed by Parks Victoria are shown in lighter shading.

The Parks landscape includes old-growth forests, internationally recognised wetlands, sandy beaches backed by coastal dunes and heathlands, extensive seagrass meadows and rocky reefs, and supports many threatened species.

The fragmented nature of the Gippsland Plains and Strzelecki Ranges Parks Landscape necessitates a collaborative approach with neighbours and other land managers to provide connectivity between reserves and manage threats across boundaries. The current condition of the conservation assets ranges from fair to very good. The implementation of this plan will improve the quality of habitat and its capacity to support flora and fauna populations.

Coastal areas of Gippsland Plains and Strzelecki Ranges Parks Landscape are at risk from climate change impacts such as sea level rise, increased storm surges and changes to sand movement, and increasing pressure from visitation, and are currently rated as being in fair condition. Stabilising and improving the structure and composition of dune scrub and banksia woodland communities will ensure the persistence of shorebirds and small mammals in these areas.

Marine areas are also being influenced by increased climate-related stressors such as warming waters, increased storm surge and wave activity, changes in the flow of water from catchments due to altered rainfall patterns, and increases in sea level.

Heathland and Dry Forest and Woodland in this Landscape have a very high plant diversity, including such significant species as Metallic Sun-orchid, Wellington Mint-bush, Tassel Rope-rush and Eastern Spider-orchid, and also provides critical habitat for the endangered Southern Brown Bandicoot. These conservation assets are currently in fair condition, and fire is the primary driver of their condition, with appropriate timing, intensity, frequency and extent of fire events essential in the maintenance of healthy and resilient ecological communities. Weeds are also a significant driver of condition in these conservation assets.

Much of the Wet Forest and Rainforest in the Parks Landscape is mature, and is at risk of disturbance by fire, flooding and extreme weather. The exclusion of these drivers of condition will enable the forests to continue to provide habitat for species dependent on mature tall forest, such as the Greater Glider.

The broader Gippsland Plains and Strzelecki Ranges landscape is highly modified. It is a patchwork of public land for conservation and forestry, and agricultural land. In relation to the native forest and Mountain Ash (*Eucalyptus regnans*) plantations, HVP Plantations has proposed the return of 8000 hectares of plantations and revegetated forest to public ownership via the 'Cores and Links' agreement with the Victorian Government, to create the Brataualung Forest Park. The project would link large areas of protected habitat (cores) and corridors of connectivity between them (links), and permanently protect an additional 15 000 hectares of native forest in the Strzelecki Ranges. The proposed area ranges from Tarra-Bulga National Park in the east to Gunyah Rainforest Scenic Reserve to the west.

In addition to habitat connectivity projects between parks to reduce fragmentation, the management of other threats such as grazing pressure and weeds will assist these systems to adapt to a changing climate. The management of ecological processes and threats, particularly fire regimes and the incursion of introduced predators, will ensure the continuing health of these systems and support the persistence of local native flora and fauna.

" Our work, our country that Bunjil (our creator sprit) told us to look after the land and help the country thrive is now starting to happen again, after 200 years of not practicing our duty and culture we are now here, starting again and our country will begin to share her wonderful beauty with us again."

Senior Bunurong Elder, 2020

Eastern Fiddler Ray

4 Conservation asset descriptions

Conservation asset description format

The following pages provide a description of the conservation assets within the Parks 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 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. An example is shown below.

Riparian	Current condition	Desired trend	Desired condition
By 2036, 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

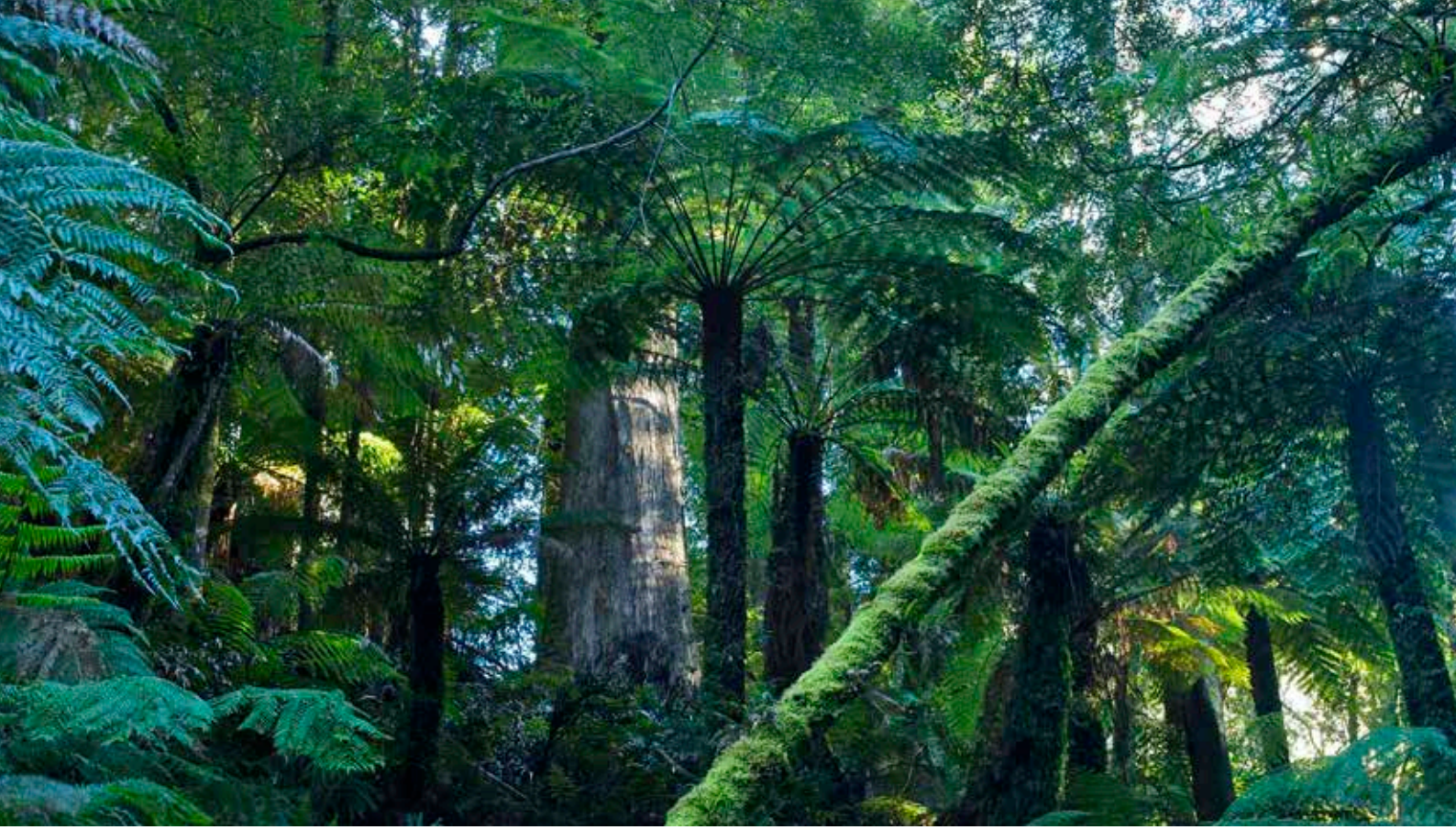
The assessment of current condition and desired future status is represented by the following categories. Measures to assess this classification are documented in the Monitoring, Evaluation and Reporting Plan.

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
Function and connectivity	The components needed to support ecosystem processes (e.g. flow regime, water quality).
Abundance	The number of individuals present of a particular species or functional group.
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).
Extent	Area of cover of a particular species or functional group, attribute or area subjected to particular conditions (e.g. flooding, salinity).
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.
Site occupancy	The presence of a particular species or functional group within a suitable habitat. 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.
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.
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.

Indicator	Description
Spatial distribution	Identifies presence and cover of species or functional groups across the landscape. Can be used to detect change in distribution of species across 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 richness	Identifies how many different species are present at a particular location or across a landscape area



Wet Forest and Rainforest

Covering a little over 5000 hectares in the Gippsland Plains and Strzelecki Ranges Parks Landscape, Wet Forest and Rainforest is among the Landscape's smallest conservation assets. It is primarily represented in two discrete patches along the north-western (Mount Worth State Park) and eastern (Tarra–Bulga National Park) areas of the Strzelecki Ranges. Tarra–Bulga National Park contains the largest representative undisturbed sample of tall open forest and riparian vegetation in the Strzelecki Ranges, including Mountain Ash and fern gully / rainforest communities (DNRE 1996a). Wet Forest and Rainforest is also a significant element of other parks and reserves, including Mirboo North Regional Park, Morwell National Park and Gunyah Rainforest Scenic Reserve. As a refugial habitat, this conservation asset is home to a large number of threatened species and abundant non-vascular flora.

Within the Gippsland Plains and Strzelecki Ranges Parks Landscape, the Wet Forest and Rainforest asset is characterised by Wet Forest (3207 hectares) and Damp Forest (1521 hectares) EVCs, with smaller areas of Cool Temperate Rainforest, Warm Temperate Rainforest and Dry Rainforest EVCs. The southernmost occurrence of the critically endangered Littoral Rainforests and Coastal Vine Thickets of Eastern Australia ecological community is present in this asset. Cool Temperate Rainforest is a closed non-eucalypt forest to 25 m tall, dominated by Myrtle Beech which co-occurs with Blackwood and Southern Sassafras over a fern understory. Warm Temperate Rainforest is similarly a closed canopy forest dominated by non-eucalypts. Where it occurs within the Gippsland Plains bioregion it is dominated by Lilly Pilly and Blackwood, which tend to occur at lower elevations close to lakes and estuaries. Warm Temperate Rainforest of the Strzelecki Ranges bioregion is dominated by a mixture of Austral Mulberry, Blackwood, Hazel Pomaderris and Muttonwood. Sweet Pittosporum is also a dominant species in Morwell National Park, although it is not considered to be native to the Strzelecki Ranges.

Damp forest is dominated by a tall eucalypt canopy to 90 m tall over a medium to tall dense shrub layer of broad-leaved species mixed with elements from dry forest types. The ground layer includes herbs and grasses as well as a variety of moisture-dependent ferns. Wet Forest is restricted to south-facing, steep narrow gullies. These gullies are sometimes spring fed and supplemented by relatively high annual rainfall. Wet Forest is characterised by a tall Mountain Ash overstorey to 90 m tall with scattered understorey trees and shrubs over a moist, shaded, fern-rich ground layer dominated by tree-ferns.

This conservation asset provides important habitat for a range of fauna species. Tall Mist Forest (Wet Forest EVC) is important habitat for the Smoky Mouse, large forest owls and assemblages of invertebrates. Threatened species such as the Greater Glider, Powerful Owl and four species of burrowing crayfish are present in the landscape. The nationally endangered Giant Gippsland Earthworm has been recorded in Mount Worth State Park (DNRE 1996b).

This conservation asset is rich in non-vascular flora such as bryophytes (mosses, liverworts and hornworts), fungi, lichens, algae and slime moulds. In particular, Tarra–Bulga National Park is highly significant for these groups (DNRE 1996a).

Much of the Wet Forest and Rainforest in the Parks Landscape is mature, and is at risk of disturbance by fire, flooding and extreme weather. The exclusion of fire will support the forests to continue to provide habitat for species that depend on mature tall forest. The condition of this asset may be threatened by Myrtle Wilt disease, which kills Myrtle Beech. The composition of floristic communities is also degraded by introduced deer, and ground-dwelling species including small mammals and frogs are impacted by exotic predators.

Nested assets

Seven nested assets have been identified for this asset, with all components dependent on the range of key ecological attributes detailed in the tables below.

Nested asset	Examples of components
Vegetation	Cool Temperate Rainforest, Littoral Rainforest
Invertebrates	Giant Gippsland Earthworm, burrowing crayfish
Flora	Tree-ferns, Fairy Lanterns, Mountain Ash, Shining Gum, Myrtle Beech, ferns, orchids, bryophytes, lichens, fungi
Mammals	Greater Glider, Grey-headed Flying-Fox
Large forest owls	Powerful Owl, Barking Owl
Other birds	Superb Lyrebird
Fish	Galaxiids, Australian Grayling

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Growth stage	Growth stage distribution	Good	→	80% of Wet Forest and Rainforest remains within intermediate to mature growth stages over the next 15 years.	Fire
Structure and composition	EVC benchmark	Good	→	80% of extant stands of Wet Forest and Rainforest are within benchmark for relevant EVCs over the next 15 years.	Weeds Herbivores Recreation
Recruitment	Seedling success	Good	→	By 2036, multiple age classes are present in over 80% of Wet Forest and Rainforest stands with sufficient numbers of seedlings present to maintain each structural component.	Fire Weeds Herbivores
Arboreal mammals	Greater Glider occupancy	Very Good	→	All suitable habitat remains occupied by 2036.	Predation
Freshwater invertebrate abundance and diversity	Macro-invertebrate richness and abundance*	Unknown	Unknown	Condition goal yet to be identified.*	Condition**

* Key knowledge gaps are to be addressed through collaborative partnerships.
** These KEA goals are indicators of general condition, rather than an outcome representative of a specific strategy

Conservation outcome

Wet Forest and Rainforest	Current condition	Desired trend	Desired condition
Maintain the extent of canopy species' older growth stages and other structural components of Wet Forest and Rainforest, and maintain diversity of dependent vertebrate and invertebrate fauna	Good		Good

Dry Forest and Woodland

The Dry Forest and Woodland conservation asset in the Gippsland Plains and Strzelecki Ranges Parks Landscape covers approximately 22 000 hectares, which is approximately 27% of the native vegetation in the Parks Landscape. Holey Plains State Park, Nooramunga Marine and Coastal Park, and Gippsland Lakes and Cape Liptrap coastal parks all contain areas of Dry Forest and Woodland. Although widely distributed, this asset is more common in the eastern and coastal areas of the Landscape, with a large contiguous area of Dry Forest and Woodland occurring to the north of Yarram, where Mullungdung and Stradbroke flora and fauna reserves occur. It is also the dominant conservation asset in several conservation reserves, including Grantville Nature Conservation Reserve, The Gurdies Nature Conservation Reserve, Moormurng Flora and Fauna Reserve and Traralgon South Flora and Fauna Reserve, as well as a number of smaller reserves across the Landscape.

This conservation asset is characterised by a shrubby to grassy ground layer with an open woodland to forest canopy. Dominated by Damp Sands Herb-rich Woodland (6333 hectares) and Lowland Forest (6390 hectares), as well as vegetation mosaics containing these EVCs, it also contains a number of endangered EVCs, including Creekline Herb-rich Woodland, Grassy Plain Woodland, Plains Grassland and Sandy Flood Scrub. Eucalypts and non-eucalypts may be prominent, including Messmate Stringybark, Gippsland Peppermint, Yertchuk, Rough-barked Manna Gum, Black Wattle, Silver Banksia and Prickly Tea-tree. The various understorey components are determined largely by aspect, geology, soils and management history. This asset is also home to three critically endangered ecological communities: Gippsland Red Gum Grassy Woodland and Associated Native Grassland, Natural Damp Grassland of the Victorian Coastal Plains, and White Box Yellow Box Blakely's Red Gum Grassy Woodland and Associated Native Grassland.

Dry Forest and Woodland provides important habitat for a range of well-known fauna, including the Long-nosed Bandicoot, Koala and Lace Monitor. The dense cover of low-growing vegetation often found in Dry Forest and Woodland also provides critical habitat for the endangered Southern Brown Bandicoot.

The timing, intensity, frequency and extent of fire are important drivers of condition within this system. For instance, frequent low-intensity fires are known to improve overall habitat conditions through the promotion of higher diversity in grasses and herbaceous flora, while large, fast burning, high-intensity bushfires can have a detrimental impact. The spatial and temporal distribution of vegetation growth stages

in Dry Forest and Woodland is important across the Landscape, and also within smaller discrete geographical areas made up of groups of functionally connected parks and reserves. These areas include Holey Plains / Mullungdung / Stradbroke, Providence Ponds / Moormurng, Cape Liptrap, Nooramunga, Grantville / The Gurdies, and Traralgon South / Morwell.

In early 2019 a bushfire burnt through much of the Dry Forest and Woodland in Grantville Nature Conservation Reserve. This has resulted in a large area of single (juvenile) growth stage, and may open up the area to invasion by weeds and predators.

Other relevant drivers include the impact of exotic predators on the abundance of ground-dwelling reptiles and mammals, and grazing pressure of exotic herbivores on native plant species such as orchids.

The Koala populations on Raymond and Snake islands are descended from translocations from Phillip and French islands and have a very low genetic diversity. They are now subject to population control programs using fertility control, to limit defoliation of food trees and the risk of population starvation. A population of Koalas in the Strzelecki Ranges is genetically distinct from the Snake Island and Raymond island populations, and is linked to populations in Mullungdung and Won Wron State Forests. There is also an isolated population at Holey Plains, which was impacted by the 2019 fire. These Koala populations in South Gippsland are the only known remnant of the original Victorian Koala population, and have largely persisted in the landscape without the management interventions seen elsewhere. These Koalas are much more genetically diverse and as a result are more resistant to environmental pressures, and less vulnerable to a population collapse than other Victorian populations, so it is important that the Strzelecki Koalas are managed to maintain their genetic differences.

Nested assets

Four nested assets were identified in the Dry Forest and Woodland conservation asset, with their components dependent on the range of key ecological attributes described in the following tables.

Nested asset	Examples of components
Vegetation	Red Gum plains, EPBC-listed Gippsland Red Gum Grassy Woodlands, Robust Spider Orchid
Birds	Woodland birds
Reptiles and amphibians	Lace Monitor
Mammals	Long-nosed Bandicoot, Southern Brown Bandicoot, Koala

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Vegetation growth stage	Growth stage distribution	Fair	→	All growth stages are represented within Dry Forest and Woodland by 2036.	Fire
Orchid abundance	Presence and abundance	Fair	↘	There will be no reduction in known populations over the period to 2036.	Fire Weeds Herbivores
Woodland bird extent, abundance and diversity	Site occupancy and richness	Fair	↘	Bird numbers and diversity remain stable at 2020 levels to 2036.	Fire Predation

Small and critical weight range mammal extent and abundance	Site occupancy	Unknown*	Unknown*	By 2036 in suitable habitat, predicted species will be regularly detected at selected sites.	Fire Predation
Koala habitat structure at Raymond and Snake Islands	Foliar cover	Fair		By 2036 foliar cover of Koala food tree species is restored to good condition	Herbivores

* Key knowledge gaps are to be addressed through collaborative partnerships.

Conservation outcome

Dry Forest and Woodland	Current condition	Desired trend	Desired Condition
By 2036 maintain or improve the heterogeneity of vegetation structure and growth stage distribution to support occupancy and richness of woodland birds and mammals.	Fair		Good

Heathland

Heathland comprises over 21 000 hectares of the Gippsland Plains and Strzelecki Ranges Parks Landscape and is one of the two dominant assets within the internationally recognised Gippsland Lakes Ramsar site. Much of this asset is grouped into two distinct clusters in the east of the Landscape; an inland area represented in the Holey Plains State Park and Stradbroke Flora and Fauna Reserve, and a coastal area that incorporates the Gippsland Lakes Coastal Park and The Lakes National Park. Other significant areas include Nooramunga Marine and Coastal Park, Cape Liptrap Coastal Park, Providence Ponds Flora and Fauna Reserve, Wonthaggi Heathlands and Adams Creek Nature Conservation Reserves.

Heathy Woodland EVC is prevalent in inland areas, while a combination of Heathy Woodland and Sand Heathland EVC is dominant in the coastal areas. Heathy Woodland (13 467 hectares) supports eucalypt and Saw Banksia woodlands that lack a secondary tree layer. Shrubs are dominant below the canopy, except where frequent fire has reduced this to a dense cover of bracken. The largely treeless Sand Heathland EVC (6305 hectares) is characterised by a low, dense shrub and sedge layer with an infrequent or absent ground layer. Clay Heathland EVC (particularly in Mullungdung and Stradbroke Flora and Fauna Reserves) and Wet Heathland EVC (particularly in Cape Liptrap Coastal Park and Nooramunga Marine and Coastal Park) are also present in this asset, with neither exceeding 1000 hectares.

Heathland in this Landscape has a very high plant diversity, including such significant species as Metallic Sun-orchid, Wellington Mint-bush, Tassel Rope-rush and Eastern Spider-orchid. This plant diversity in turn supports rich bird assemblages and several significant mammal species, such as the culturally significant Southern Emu-Wren and Superb Fairy-wren, as well as Ground Parrot, Eastern Pygmy Possum and White-footed Dunnart.

Heathland in this landscape is an important habitat for Ground Parrot, including areas in Gippsland Lakes, Nooramunga Marine and Coastal Park, and Cape Liptrap Coastal Park. With the widespread 2019-20 bushfires in similar habitat in East Gippsland, Heathland in the Gippsland Plains and Strzelecki Ranges Landscape have become even more important for the conservation of this species. Heathland in the west of the landscape (e.g. Wonthaggi Heathlands and Adams Creek Nature Conservation Reserves) is important habitat for the conservation of the Southern Brown Bandicoot.

Fire is the primary driver of condition in this conservation asset. The appropriate timing, intensity, frequency and extent of fire events is essential for maintaining healthy and resilient Heathland. For instance, altered fire regimes have been linked with the invasion of Coastal Tea-tree scrub into Sand Heathland EVC in The Lakes National Park, and into Sand Heathland / Wet Heathland Mosaic EVC in Wonthaggi Heathlands and a subsequent decline in native orchids. Heathland fauna populations are dependent on the structure, composition and health of vegetation, which is driven by the appropriate application of ecological fire and the absence of large-scale bushfires. The spatial and temporal distribution of vegetation growth stages in heathland and heathy woodland is important across the Landscape and also within smaller discrete geographical areas consisting of groups of functionally connected parks and reserves. These areas include the Gippsland Lakes area, Holey Plains / Stradbroke, Providence Ponds, Cape Liptrap, Wonthaggi Heathlands, Nooramunga, and Adams Creek.

In early 2019 a large-scale, high-intensity bushfire burnt through much of the heathland and heathy woodland in Holey Plains State Park. This has resulted in a large area with a single (juvenile) growth stage, and may open up the area to invasion by weeds and predators.

Pest plants and animals are recognised as drivers of condition in Heathland. In Holey Plains State Park, phytophthora root rot has been linked with banksia and grass-tree dieback, while foxes and cats are known to prey on the ecologically important Long-nosed Bandicoot and Southern Emu-wren.

Nested assets

Six nested assets have been identified for this asset, with all components dependent on the range of key ecological attributes detailed in the tables below.

Nested asset	Examples of components
Flora	Metallic Sun-orchid, Wellington Mint-bush, Tassel Rope-rush, Eastern Spider-orchid
Birds	Heathland birds, Southern Emu-wren, Ground Parrot
Mammals	Eastern Pygmy Possum, Southern Brown Bandicoot, Long-nosed Bandicoot, White-footed Dunnart, ground dwelling mammals
Reptiles	Common Scaly-foot
Cultural	Southern Emu-wren, Superb Fairy-wren, Indigenous food / utility resources
Habitat features	Coarse woody debris, mosaic age structure

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Growth stage	Growth stage distribution	Fair	→	Establish and maintain a diversity of growth stage distribution by 2036.	Fire
Structure and composition	EVC benchmark	Fair	→	By 2036, over 80% of sampled sites have structural element and successional stages at benchmark condition.	Fire Weeds Herbivores Recreation
Heathland bird diversity	Occupancy and species richness	Fair	↘	Occupancy of suitable habitat by heathland birds increased by 20% by 2036.	Fire Predation
Heathland ground dwelling mammal diversity	Occupancy and species richness	Fair	↘	Occupancy of suitable habitat by heathland ground dwelling mammals maintained by 2036.	Fire Predation
Heathland bird abundance	Ground Parrot abundance	Fair	↘	Abundance of ground parrots increased by 20% by 2036.	Fire Predation
Orchid diversity	Recruitment	Fair	→	Orchid recruitment observed at over 80% of sampled sites by 2036.	Fire Weeds Herbivores

Conservation outcome

Heathland	Current condition	Desired trend	Desired Condition
By 2036 improve the distribution of growth stages to maintain floristic diversity, including orchids, and provide high quality habitat and conditions for ground dwelling mammals and heathland birds.	Fair	↗	Good

Wetland

The Gippsland Plains and Strzelecki Ranges Parks Landscape contains around 25 000 hectares of reserved Wetland, across both freshwater and saline ecosystems. Freshwater wetlands, such as Sale Common and Macleod Morass, are fed largely by a combination of freshwater streams, run-off and groundwater flows from higher in the Gippsland Lakes catchment. Saline wetlands are primarily distributed along the coast and are heavily influenced by marine inflows associated with storm surges and wind-driven wave effects from Bass Strait. The Gippsland Lakes Coastal Park (Lake Reeve, Lake King, Lake Victoria and Jones Bay), The Lakes National Park, Jack Smith Lake Wildlife Reserve, and Corner Inlet and Nooramunga Marine and Coastal Parks all contain examples of saline wetlands. Freshwater and estuarine wetlands occur in Yallock-Bulluk Marine and Coastal Park, particularly in the Powlett River estuary.

The Gippsland Lakes and Corner Inlet systems are listed under the Ramsar Convention as areas of international significance for migratory waders and shorebirds. The Ramsar sites support over 20 bird species that are listed under international migratory bird agreements with China, Japan and South Korea (EGCMA 2015). Important habitats include intertidal mudflats and saltmarsh, where migratory waders feed, and high-tide roosting sites (EGCMA 2015).

Freshwater wetlands are characterised by low-lying areas of ephemeral, seasonal or permanent inundation in depressions on silty, peaty or heavy clay soils, which are typically fertile and high in organic matter. The unvegetated Water Body – Fresh EVC, covering over 11 000 hectares, comprises one third of this asset, primarily as catchment run-off into the Gippsland Lakes. Swamp Scrub and Deep Freshwater Marsh EVCs are restricted largely to wetlands in and around Lake Wellington, where sedges and aquatic herbs fringe a closed scrub of tea-trees and paperbark shrubs. A critically endangered ecological community, Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowlands, is also present in this asset. Sedge Wetland EVC is present in Kangaroo Swamp Nature Conservation Reserve and Stradbroke Flora and Fauna Reserve, and is threatened by the drying effects of groundwater extraction and climate change.

Estuarine Wetland (2987 hectares) is the dominant EVC in wetlands of higher salinity. Coastal Saltmarsh communities occur on and above tidal flats in bands of succulent herbs, low succulent shrubs, rushes and sedges. Similarly, Estuarine Wetland communities are found along the edges of estuarine waterbodies and

are dominated by graminoids and halophytic herbs, which may be replaced by a tall scrub layer of Swamp Paperbark away from the waterline.

This asset is an important breeding ground for culturally significant species, including the Australian Pelican and Musk Duck.

Estuarine, marsh and freshwater habitats in this asset support important feeding grounds for shorebirds and migratory birds, including the Australasian Bittern, Painted Snipe and Freckled Duck. They also provide nurseries for many fish species and are home to a number of threatened amphibians, namely the Green and Golden Bell-frog and the Growling Grass-frog. A diversity of riparian vegetation types provide drought refugia for a range of species, which are dependent on the health of aquatic and semi-aquatic systems.

The primary driver of condition in this asset is the water regime, with timing, duration, frequency of inundation, all important factors. It is thought that increasing salinity is altering the ecological composition wetlands, such as the increased distribution of swamp scrub in the Gippsland Lakes.

The quality of water entering wetlands is also a driver of condition with significant efforts underway at present, particularly in the Gippsland Lakes and Corner Inlet catchments, to improve riparian and waterway condition, and reduce the flow of both sediments and nutrients into wetland systems.

The landscape also encompasses 12 wetlands of national importance (Appendix E). Nationally important wetlands must meet a number of listing criteria which include species habitat, ecosystem function and cultural significance.

Nested assets

Six nested assets have been identified for this asset, with all components dependent on the range of key ecological attributes detailed in the tables below.

Nested asset	Examples of components
Threatened waterbirds	Australasian Bittern, Fairy Tern, Curlew Sandpiper, Eastern Curlew, Hooded Plover
Threatened amphibians	Green and Golden Bell-frog, Growling Grass-frog, Martin's Toadlet
Threatened flora	Swamp Everlasting, Dwarf Kerrawang
Drought refugia	Sale Common and Macleod Morass
Vegetation	Reed-beds, seasonal herbaceous wetlands
Cultural	Pelican, Musk Duck, basket grasses and reeds

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Wetland type extent	Area of freshwater/ brackish/ saline lagoons or marshes	Fair	↘	No change in wetland typology from 1980 classification.	Condition*
Colonial waterbird recruitment	Nest sites	Fair	→	All colonial bird breeding sites are available and used.	Water
Freshwater wetland functioning and connectivity	Salinity Freshwater inflow quantity and quality	Fair	↘	Freshwater refuge available for freshwater-dependent species in all seasons across the landscape.	Herbivores Water
Frog diversity	Species richness (presence, diversity)	Fair	→	Maintain frog diversity including no loss of threatened species from known sites.	Predation Water
Shorebird and waterbird diversity and abundance	Species richness and abundance	Good	→	No absence of key species in five successive years, median abundance remains greater than 20th percentile of baseline.	Predation Recreation
Threatened flora presence	Dwarf Kerrawang presence	Fair	→	Maintain presence of Dwarf Kerrawang at known sites.	Weeds Herbivores
Threatened flora presence	Swamp Everlasting presence	Fair	↘	Maintain presence of Swamp Everlasting at known sites, and re-establish further populations at suitable locations.	Weeds Herbivores

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

Conservation outcome

Wetland	Current condition	Desired trend	Desired Condition
By 2036 maintain and improve the character of freshwater and brackish wetland and associated vegetation communities, and the diversity and abundance of dependent waterbirds and amphibians	Fair	↗	Good

Coastal

The Coastal conservation asset encompasses approximately 7500 hectares of sandy beaches, unvegetated coastal dunes, coastal dune grasslands and scrub, and shrubland and grasslands on exposed coastal cliffs and headlands in the Gippsland Plains and Strzelecki Ranges Parks Landscape. It is primarily distributed along the coastline of the Cape Liptrap Coastal Park and scattered along the southern and eastern edges of the Parks Landscape, including Yallock-Bulluk Marine and Coastal Park, Gippsland Lakes Coastal Park, and Nooramunga Marine and Coastal Park, where it adjoins the extensive Unvegetated Soft Sediment conservation asset.

Within the Gippsland Plains and Strzelecki Ranges Parks Landscape, the Coastal conservation asset is dominated by the Coast Dune Scrub / Coast Dune Grassland Mosaic EVC (5000 hectares). This mosaic is characterised by an inland transition from grasses and succulent colonisers that inhabit sandy foredunes to a closed shrub layer of Coast Wattle, Seaberry Saltbush, Coast Beard-heath and Coast Tea-tree on secondary dunes. In some areas this transition continues farther inland, with over 500 hectares of Coast Banksia Woodland / Coast Dune Scrub Mosaic transitioning into Coast Banksia Woodland EVC (315 hectares). Elsewhere within the asset, the Coastal Tussock Grassland EVC (880 hectares) is common along exposed coastal cliffs and bluffs, particularly in Cape Liptrap Coastal Park and the proposed Yallock-Bulluk Marine and Coastal Park.

A wide diversity of birdlife utilises the Coastal conservation asset for nesting, roosting, and foraging. This includes migratory waders and shorebirds, including beach-nesting species including the FFG-listed Hooded Plover. Culturally significant species include the Southern Emu-Wren and Superb Fairy-wren. The Coastal asset also provides habitat for the New Holland Mouse, which is nationally vulnerable.

The main drivers of condition in this asset are the relative isolation of coastal habitats and the extent of disturbance, including the level of weed invasion and trampling. This asset is also particularly exposed to sea-level rise, increased storm surge activity, and a warming and drying environment associated with predicted climate change.

Nested assets

Six nested assets have been identified for this asset, with all components dependent on the range of key ecological attributes detailed in the tables below.

Nested asset	Examples of components
Vegetation	Banksia woodland, dune vegetation
Birds	Hooded Plover and other beach-nesting birds, shorebirds, terns
Critical weight range mammals	Southern Brown Bandicoot, New Holland Mouse
Reptiles	Metallic Skink, Swamp Skink, Glossy Grass Skink, Eastern Three-lined Skink, Southern Grass Skink, Blue-tongued Lizard
Fossils	Dinosaur fossils
Cultural	Southern Emu-wren, Superb Fairy-wren, food plants

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Banksia Woodland growth stage	Growth stage distribution	Fair	↘	Establish and maintain a temporal diversity of growth stages by 2036	Recreation
Coastal vegetation structure and composition	EVC benchmark	Fair	↘	By 2036, over 80% of sample sites have structural element and successional stages at benchmark condition	Herbivores Recreation Weeds
Beach-nesting birds	Breeding success and abundance of specific beach-nesting species (incl. Little Tern, Hooded Plover, Pied Oystercatcher and Red-capped Plover)	Fair	↘	By 2036, improve fledging success at key breeding sites	Predation Recreation
Migratory waders	Site occupancy Species richness	Fair	↘	Occupancy of migratory waders maintained by 2036	Predation Recreation
Critical weight range mammals	Site occupancy Species richness	Poor	→	Occupancy of critical weight range mammals increased by 2036	Predation

Conservation outcome

Coastal	Current condition	Desired trend	Desired condition
By 2036 stabilise and then improve the structure and composition of dune scrub and banksia woodland communities and ensure persistence of shorebirds and small mammals.	Fair	↗	Good

Saltmarsh and Mangrove

Restricted to less than 7000 hectares in the Gippsland Plains and Strzelecki Ranges Parks Landscape, the Saltmarsh and Mangrove asset is closely associated with marine and estuarine tidal flats. The largest areas are in Corner Inlet and Nooramunga Marine and Coastal Parks and the Gippsland Lakes parks and reserves. Smaller areas are in Anderson Inlet, Shallow Inlet Marine and Coastal Park and the Powlett River estuary in Yallock-Bulluk Marine and Coastal Park.

This conservation asset formed on accumulated fine sediments in coastal areas sheltered from strong wave action and currents, and was once more widely distributed. Saltmarsh and Mangrove act as buffers against erosional processes such as storm surges, and the widespread post-settlement removal of this vegetation has resulted in severe coastal erosion in some areas.

Saltmarsh and Mangrove within the Gippsland Plains and Strzelecki Ranges Parks Landscape consist of two EVCs — Coastal Saltmarsh (4599 hectares) and Mangrove Shrubland (2235 hectares). These EVCs often adjoin one another, and Coastal Saltmarsh replaces Mangrove Shrubland above the tidal zone where this occurs. The Mangrove Shrubland EVC is typified by plants under two metres tall, primarily White Mangrove (Victoria's only mangrove species) and Dwarf Grass-wrack, which are regularly inundated by tidal flows. It provides habitat for numerous marine and terrestrial invertebrates, fish species, migratory waders and shorebirds. The Coastal Saltmarsh EVC is inundated less often and is floristically diverse, supporting succulent herbs, low shrubs, rushes and sedges. It also supports a high diversity of terrestrial fauna and invertebrates, and provides an important feeding ground for birds, including the critically endangered Orange-bellied Parrot, which has been recorded at both Corner Inlet and Andersons Inlet.

Multiple drivers of condition are recognised in the Saltmarsh and Mangrove asset, including water quality and depth, weed invasion (particularly Spartina), sediment transport and salinity. Climate change will be a prevalent driver in this asset, with the potential to impact many of its biotic features. Sea level rise has also been linked to instances of Mangrove Shrublands expanding landwards and replacing Coastal Saltmarsh as the dominant ecosystem.

It is worth noting that the extent of this asset across most of the broader landscape is a small fraction of what was present prior to settlement (Boon *et al* 2011). Alterations of landforms including drainage for

agriculture and construction for protection from tidal inundation and storm surge through creation of levees have isolated many saltmarsh communities in this landscape from the sea.

Nested assets

Three nested assets have been identified for this asset, with all components dependent on the range of key ecological attributes detailed in the tables below.

Nested asset	Examples of components
Birds	Resident shorebirds, migratory waders, Orange-bellied Parrot
Flora	Saltmarsh species including rare and threatened species, Metallic Sun-orchid, Mangrove
Ecosystem services	Coastal protection, carbon storage, fish nurseries

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Structure and composition	Mangrove canopy cover	Good	→	Canopy cover is maintained at benchmark levels for all existing stands of mangrove shrublands (relative to climate change modelling*)	Weeds Water
Intactness of saltmarsh	EVC benchmark	Fair	→	Over 80% of extant stands of saltmarsh (relative to climate change modelling*) meet EVC benchmark condition by 2036	Water Recreation
Mix of mangrove and saltmarsh	Ratio of mangrove to saltmarsh	Good	↘	Maintain ratio of mangrove to saltmarsh	Water
Extent	Saltmarsh and mangrove extent	Good	→	Increase the extent of saltmarsh and mangrove communities from 2020 levels	Water
Recruitment	Rate of mangrove seedling establishment	Fair	→	Evidence of on-site recruitment of mangroves within a majority of stands maintained or improved by 2036	Weeds Water

* Key knowledge gaps are to be addressed through collaborative partnerships.

Conservation outcome

Saltmarsh and Mangrove	Current condition	Desired trend	Desired condition
By 2036 improve the combined extent of Saltmarsh and Mangrove, current structure, composition, condition and distribution of at current levels, and maximise the potential for the landward expansion of saltmarsh and mangrove communities resulting from sea level rise.	Fair	↗	Good

Soft Sediment

This conservation asset comprises intertidal or subtidal benthic areas of mud, silt, shell grit or sand that is not contained in the Seagrass or Saltmarsh and Mangrove conservation assets. Its fauna is dominated by a diverse range of invertebrates.

There are more than 40 000 hectares of unvegetated Soft Sediment in the Gippsland Plains and Strzelecki Ranges Parks Landscape: in Nooramunga Marine and Coastal Park, Corner Inlet Marine and Coastal Park, Corner Inlet Marine National Park, Bunurong Marine National Park, Ninety Mile Beach Marine National Park, Shallow Inlet Marine and Coastal Park, Yallock-Bulluk Marine and Coastal Park, and Anderson Inlet.

The marine protected areas of the Parks Landscape protect internationally significant sandy environments, recognised for their exceptionally high diversity of marine invertebrates (Parks Victoria 2006a). Soft Sediment communities in the Ninety Mile Beach Marine National Park contain some of the highest levels of biodiversity in marine waters anywhere in the world, and are recognised as being an important nursery habitat for the endangered Great White Shark.

The invertebrate assemblages provide food for fish, including a range of ray and shark species, migratory waders and other shorebirds. Beach components of Soft Sediment are breeding grounds for resident shorebirds such as the Hooded Plover, Red-capped Plover, Pied Oystercatcher, Crested Tern and Caspian Tern.

As is the case with other marine assets, climate is a primary driver of condition. For example, increased water temperatures can affect species assemblages, while higher storm activity may increase erosion and sediment transport, rapidly altering Soft Sediment habitats. Secondary drivers such as water quality and history of use, including shellfish collection, can also adversely affect the condition of this asset. Coastal erosion, seasonal sand movement, water quality and pollution events are also potential drivers of condition.

Nested assets

Three nested assets have been identified for this asset, with all components dependent on the range of key ecological attributes detailed in the tables below.

Nested asset	Examples of components
Characteristic invertebrate communities	Infauna*
Characteristic demersal fish communities	Sharks, including Gummy Shark, School Shark, Elephant Shark, and Great White Shark
Shorebirds	Intertidal soft sediment foraging shorebirds, e.g. Hooded Plover, Pied Oystercatcher and migratory waders

* Animals living in the sediments.

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Characteristic invertebrate communities (f† and infauna)	Diversity of invertebrate communities	Good	➡	Maintain diversity across range of unvegetated soft sediment types	Recreation Marine
Resident and migratory shorebirds (intertidal)	Species richness and abundance	Good		Species richness and abundance of resident and migratory shorebirds increases	Predation Water
Resident and migratory shorebirds (intertidal)	Abundance of key migratory bird species	Fair	➡	Abundance of key migratory wader species as a % of flyway population increases	Predation Water
Shorebird habitat	Extent of intertidal sediment as foraging habitat	Good	➡	Extent of intertidal sediment available as shorebird habitat maintained in good condition	Condition*

† Animals living on the surface of the sediments.

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

Conservation outcome

Soft Sediment	Current condition	Desired trend	Desired condition
Maintain the extent and condition of Soft Sediment to ensure suitable conditions for invertebrates, fish, shorebirds and other dependent species.	Good	➡	Good

Seagrass

Approximately 15 000 hectares of Seagrass meadows are distributed across this Landscape's coastal estuaries, bays and inlets, although most are in Nooramunga Marine and Coastal Park, Corner Inlet Marine and Coastal Park and Corner Inlet Marine National Park. Seagrass also occurs in Shallow Inlet Marine and Coastal Park, Anderson Inlet, and parts of the Gippsland Lakes. Smaller patches of the seagrasses Sea Nymph and Tasman Grass-wrack are found in sheltered coves on sand substrates within the Bunurong Marine National Park and Yallock-Bulluk Marine and Coastal Park.

Corner Inlet and Nooramunga supports the only Broad-leaf Seagrass meadows in Victoria.

Seagrass meadows arise through the gradual accumulation of a nutrient-rich organic substrate in warm, shallow, protected waters that provide favourable conditions for both the intertidal and subtidal seagrass species that typify this asset.

Seagrass meadows typically support a high faunal diversity and play a crucial role in the early stages of the lifecycle of many fish species, including King George Whiting, Rock Flathead, and Southern Calamari Squid. Seagrass meadows support over 400 species of marine invertebrates, and provide an important post-breeding habitat for birds such as the Black Swan, Grey Teal and Chestnut Teal (Parks Victoria 2005).

Seagrass beds are sensitive to catchment activities and their associated environmental disturbances, including increased sediment deposition, increased turbidity, high ambient nutrient loads, pollution (e.g. oil and chemical spills), and anchoring. These are significant challenges across this highly modified Landscape, particularly for seagrass in Corner Inlet and the Gippsland Lakes. Loss of seagrass habitat associated with a boom in native sea urchin populations has been a significant recent problem in Nooramunga Marine and Coastal Park.

Climate is also considered a driver of Seagrass condition; associated changes in water temperature, water quality and depth are all factors that may affect its health. Most fauna associated with seagrass beds are heavily reliant on the extent and abundance of the predominant seagrass species.

Nested assets

Four nested assets have been identified for this asset, with all components dependent on the range of key ecological attributes detailed in the tables below.

Nested asset	Examples of components
Fish species	King George Whiting, Rock Flathead, Southern Calamari Squid
Seagrass species	Seagrass species
Invertebrates	Molluscs, echinoderms, polychaetes, ascidians, cnidarians, sponges
Water birds	Black Swans, Grey Teal, and Chestnut Teal

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Subtidal seagrass beds	Extent (area), Connectivity	Good	→	Maintain 2020 extent (total area) and connectivity, or improve the average extent and connectivity of seagrass beds over the next 15 years, within the context of natural long-term variability in distribution	Recreation Marine
	% Cover	Good	→	Maintain current pattern of annual of seagrass % cover over the next 15 years	Recreation
Intertidal seagrass beds	Extent (area), Connectivity	Good	Unknown*	Maintain 2020 extent (total area) and connectivity, or improve the average extent and connectivity of seagrass beds over the next 15 years, within the context of natural long-term variability in distribution	Recreation Marine
	% Cover	Good	Unknown*	Maintain current pattern of annual of seagrass % cover over the next 15 years	Recreation

* Key knowledge gaps are to be addressed through collaborative partnerships.

Conservation outcome

Seagrass	Current condition	Desired trend	Desired condition
By 2036 maintain and improve the extent and condition of seagrass communities.	Good	→	Good

Subtidal and Intertidal Reefs

The Subtidal and Intertidal Reefs conservation asset is restricted to less than 2500 hectares in the west of the Gippsland Plains and Strzelecki Ranges Parks Landscape. It comprises reefs in the Bunurong Marine National Park and adjoining Yallock-Bulluk Marine and Coastal Park, and low-profile reefs in Ninety Mile Beach Marine National Park. The Landscape contains some of Victoria's most extensive intertidal and subtidal reefs (Parks Victoria 2006b).

This asset consists of two components: intertidal reefs along the coast, and offshore subtidal reefs. Intertidal reefs, which include boulder fields and rock platforms, are located between the high and low water marks and are regularly exposed to both marine and terrestrial conditions. Conversely, subtidal reefs are below the low water mark and include shallow reefs, deep reefs and some deep canyons.

Intertidal and subtidal reefs support many highly diverse habitats, including communities dominated by brown algae, macroinvertebrate communities on intertidal and shallow subtidal reefs, and sessile invertebrate communities on deeper subtidal reefs. Subtidal reefs can also support diverse fish assemblages, including sharks and rays. Shorebirds use intertidal reefs for both feeding and roosting.

The condition of subtidal and intertidal reefs within this Landscape are largely driven by water quality and history of past use including fishing. Many components of this asset depend on the health and abundance of macroalgae in areas with adequate light, or in structures created by sessile invertebrates such as sponges and ascidians in deeper water. Key threatening processes for subtidal reefs include the removal of biota for bait and food, marine pests, and pollution. Predicted stressors related to climate change, such as changes in water temperature, decreases in pH, and altered ocean currents, are likely to significantly impact this asset.

Nested assets

Six nested assets have been identified for this asset, with all components dependent on the range of key ecological attributes detailed in the tables below.

Nested asset	Examples of components
Birds	Waders, resident shorebirds, migratory shorebirds
Invertebrates	Small species of crustaceans and molluscs
Macroalgae	Habitat-forming brown algae such as Crayweed, Common Kelp, and intertidal Neptune's Necklace
Fish	Common Seadragon, Blue-throated Wrasse
Macroinvertebrates	Crustaceans (including Rock Lobster), octopuses, abalone and other gastropods, FFG-listed Sea Cucumber
Substrate	Diversity of microhabitats

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Structure and composition	Cover of macroalgae and sessile invertebrates	Good	→	Mosaic of all habitat types present at all surveys	Recreation Marine
Habitat type and diversity	Number of different species	Good	→	Mosaic of all desired habitat types present at all surveys	Condition*
Subtidal algae extent and structure	Cover and extent Connectivity and diversity	Good	→	Maintain the cover extent and diversity of algae species to 2036	Marine
Intertidal algae extent and structure	Cover and extent Connectivity and diversity	Good	→	Maintain the cover extent and diversity of algae species to 2036	Marine
Marine invertebrate abundance and recruitment	Rock Lobster and abalone count and size frequency	Good	→	All identified focal species are present at each survey	Recreation
Marine fish abundance and recruitment	Count and size frequency	Good	→	All identified focal species are present at each survey	Recreation

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

Conservation outcome

Subtidal and Intertidal Reefs	Current condition	Desired trend	Desired condition
Maintain the algal, invertebrate and fish assemblages that inhabit Subtidal and Intertidal Reefs.	Good	→	Good

Water Column (pelagic)

The Water Column (pelagic) conservation asset comprises all the water lying above reefs and vegetated or unvegetated soft sediments, including seagrass meadows. Depths range from very shallow intertidal and subtidal waters to very deep offshore waters.

The water column supports a range of free-floating planktonic species, comprising permanently planktonic organisms (ranging in size from microscopic bacteria and fungi to small invertebrate animals) and many larval stages of invertebrates and fish that disperse through the water column. Plankton is also a major food source for larger marine organisms, ranging in size from small filter-feeding invertebrates such as sponges to giant baleen whales.

Within this Landscape, the water column provide foraging areas for marine mammals and larger pelagic fish species that feed upon fish and plankton, including Bottlenose, Burrunan and Common Dolphins, Southern Right Whales, Australian Fur Seals, and seabirds such as Australasian Gannets and albatrosses. The endangered Burrunan Dolphin is endemic to south-eastern Australia, with a number of small, isolated and genetically distinct populations in Victoria, Tasmania and South Australia. The Gippsland Lakes is home to one of only two known resident populations in Victoria.

Climate change is predicted to be an important driver of condition in the Water Column (pelagic) conservation asset, specifically via changes to water temperature, ocean acidity, ocean currents, and surface wind conditions. As with Soft Sediment, water quality, light penetration and adjacent land use can also shape the condition of this asset. Some intertidal and subtidal organisms spend the early stage of their life in the pelagic environment and rely on currents to distribute recruits back to the intertidal and subtidal habitats and are therefore vulnerable to impacts on water quality.

Nested assets

Two nested assets have been identified for this asset, with all components dependent on the range of key ecological attributes detailed in the tables below.

Nested asset	Examples of components
Mammals	Dolphins, seals, whales
Invertebrates	Plankton

Condition

Key ecological attributes	Indicator	Current condition	Current trend	KEA goal	Strategy abbrev.
Shark populations	Great White Shark numbers	Very Good		Population sizes are maintained	Condition**
Shark populations	Gummy Shark numbers	Unknown*	Unknown*	Condition goal yet to be identified*	Condition**
Embayment water quality	Nutrient levels (total N, total P, nitrates)	Good		Water quality, particularly at sites such as Corner Inlet, is improved	Water
Embayment and lake water quality	Turbidity	Good		Water quality, particularly at sites such as Corner Inlet and the Gippsland Lakes, is improved	Water Recreation

* Key knowledge gaps are to be addressed through collaborative partnerships.

** These KEA goals are indicators of general condition, not an outcome representative of a specific strategy

Conservation outcome

Water Column (pelagic)	Current condition	Desired trend	Desired condition
Maintain water quality in order to provide suitable habitat for pelagic communities.	Very Good		Very Good

Mountain Ash canopy,
Tarra–Bulga National Park

5 Threats

Identifying priority threats to conservation outcomes

A broad range of key threats to the conservation assets of the Gippsland Plains and Strzelecki Ranges 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's method for assessing threats broadly follows the process outlined in the current standard for risk management (AS/NZS ISO 31000: 2009). 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). 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

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 for 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 as 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 wetland ecosystems, climate change will have a profound impact on the functioning of these ecosystems to the extent that they may transition into different ecosystem types.

The threat table (Table 5.1) identifies threatening processes and agents and their relative risk. 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; 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

Priority threatening processes include:

- Terrestrial weeds, diseases and pathogens
- Marine invasive or overabundant species
- Introduced predators
- Recreation/natural resource extraction
- Inappropriate fire regimes
- Introduced herbivores
- Extreme weather events and climate change
- Altered hydrology / reduced water quality.

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.

Threatening process	Threat agents and impact	Wet Forest and Rainforest	Dry Forest and Woodland	Heathland	Wetland	Coastal	Saltmarsh and Mangrove	Soft Sediment	Seagrass	Intertidal and Subtidal reefs	Water Column (pelagic)
Habitat fragmentation	Internal infrastructure and development, such as construction of roads, fuel breaks, and other structures, can reduce connectivity between habitat and populations across the local landscape.		High		Low	High	Mod		Low		
	External impacts from adjoining land use, such as development and agriculture, can reduce quality of habitat near edges and reduce available suitable habitat for some species outside of protected areas.	High	Mod		Low	Mod	Low	Low	High	Mod	Mod
Habitat degradation	Visitor impacts (e.g. mountain biking, camping, motorbiking, four-wheel driving, off-track walking, littering, hunting, boating, fossicking) can disturb habitat, cause erosion and facilitate the movement of weeds and pathogens.		Mod	High	High	Mod	Mod	Mod	High	High	Mod
	Aquatic system modifications such as channel modification, dredging, levees, dam-building, etc., disturb microhabitat for aquatic organisms, potentially affecting occupancy and breeding success.				High	High	High	High	Mod		Low
	Drought, wind damage, flooding, and other extreme weather events can destroy or greatly disturb habitat (e.g. recession of dunes near Gippsland Lakes from increased storm surges), affect survivability of native species and increase susceptibility of invasive species establishment.		Low		High	High	Low	Low	Mod	Mod	Low
Natural resource extraction	Legal and illegal natural resource extraction can destroy habitat (e.g. grazing, timber harvesting, track creation) or directly affect species populations (e.g. hunting, fishing).		Very High	Mod	High	High	Mod	Mod	High	High	Mod
Pollution	Pollution from both internal sources (e.g. littering) and external sources (e.g. chemical spills, stormwater runoff, sewage, nutrients and sediments) can impact ecosystems in protected areas.				Mod	Low	Mod	Low	Very High	Mod	Low

Table 5.1 Key threats to the conservation assets of the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Threatening process	Threat agents and impact	Wet Forest and Rainforest	Dry Forest and Woodland	Heathland	Wetland	Coastal	Saltmarsh and Mangrove	Soft Sediment	Seagrass	Intertidal and Subtidal reefs	Water Column (pelagic)
Alterations to marine habitat	Coastal erosion may be increased by more frequent extreme weather events. Storm surges and flooding have the capacity to greatly increase erosion in areas adjacent to the coast.				High	High	Mod	Low	High	Mod	Low
	Pollutants from private land can enter estuaries via waterways and drains, which can affect marine water quality. Many drains are untreated and unmonitored.						Mod	Mod	High	Low	Low
Fire regimes and management	Fire regimes which are too frequent, infrequent, wrong season/severity/scale, can cause the degradation of habitat, landscape functioning and connectivity. Cal also result in a reduced capacity for the landscape to support biodiversity.	High	Mod	High		Very High	Mod				
	Fire management actions such as construction of fuel breaks, off-track driving, fire ignition and use of chemicals can cause damage to habitat and areas of Aboriginal and European cultural heritage.		Mod	Mod			Low				
Sedimentation	Human induced activities (e.g. soil disturbance, land clearing, recreational activities) can contribute to sedimentation. Excess sediment deposition can smother bottom-dwelling organisms and change features of the aquatic habitat.		Low		High	Mod	Mod	High	Very High	High	High
Alteration to natural hydrology	Harvesting or diversion of ground and surface water can impact hydrological processes and the species dependent upon them.				Very High						
	Barriers to water movement, like levy banks, dams, hinder aquatic species movement.				High		Very High				
	Extreme weather events, such as floods and storm surges, can increase water turbidity or push saline water deeper inland.	Mod	Low		Very High		Mod	Low	Mod	Low	Mod
Diseases	Plant pathogens such as Phytophthora and Myrtle Wilt can cause mass dieback of affected species. Animal pathogens such as chytrid fungus and abalone herpes can severely	Very High	Mod	High	High	Mod				Mod	

Threatening process	Threat agents and impact	Wet Forest and Rainforest	Dry Forest and Woodland	Heathland	Wetland	Coastal	Saltmarsh and Mangrove	Soft Sediment	Seagrass	Intertidal and Subtidal reefs	Water Column (pelagic)
Weed invasion (terrestrial or aquatic)	Weeds displace native species, alter vegetation structure and impact fire regimes. Over abundant native species displace existing flora and congest streams.	High	High	Mod	Very High	High	Very High	Very High	Very High		
Predation	Declines in populations and abundance of native species due to fox and cat predation. Introduced predators can act as disease and weed vectors.	High	Very High	High	High	Very High	High	Mod			
Overgrazing and overbrowsing (terrestrial)	Introduced herbivores (e.g. deer, pigs, rabbits, goats) impact the regeneration and recruitment of native species by overgrazing.	High	Low		High	Mod	Mod				
	Overgrazing by native herbivores (e.g. macropods, Koalas) impact regeneration and recruitment, resulting in simplification of vegetation structure and reduced floral diversity.		Low		Low	Low					
Trampling and wallowing	Deer, pigs and goats disturb the ground by trampling, and wallowing in shallow water can reduce water quality by stirring up sediment.	High	Low		Very High		Mod				
Competitive interactions	Native fauna (e.g. cockatoos, corellas, galahs) and introduced fauna (e.g. bees, trout) can compete with indigenous species, resulting in lower breeding success and occupancy.		High		High						
Marine pests	Marine pests including both overabundant native species such as Purple Urchins and introduced marine pests (e.g. Northern Pacific Sea Star, Japanese Kelp, sea urchins) can greatly change the marine environment and affect threatened communities. Modification of reefs and seagrass meadows, and displacement of native species, can severely change marine ecosystem dynamics.				Mod		High	Mod	Very High	High	

5.1 Inappropriate fire regimes

Threat description

Bushfires, prescribed burning and fire management activities are a moderate to extreme threat to terrestrial assets in the Parks Landscape. The role of fire varies in the conservation assets; in some conservation assets there is not enough fire to maintain ecosystem health, in others fire is too frequent and reduces habitat quality. In particular, repeat fires below the minimum tolerable fire interval for an ecosystem are likely to result in decreased ecosystem health and habitat quality, and in some cases may result in significant ecosystem change and the loss of ecosystems. Large-scale, high-severity bushfires such as those in Holey Plains State Park and Grantville Nature Conservation Reserve in 2019 can have a negative impact on conservation assets (even fire-dependent assets) and flora and fauna, especially due to the fragmented nature of this Landscape, which may limit post-fire recruitment back into the area.

In Wet Forest and Rainforest, the primary threat is too-frequent fire; the vegetation is not fire-adapted and recovers slowly. As far as possible, fire should be excluded from rainforest entirely. Areas of Wet Forest and Rainforest in the Parks Landscape were burnt in the 2009 fires, including Traralgon South Flora and Fauna Reserve. In these areas, fire reduces the extent of old growth vegetation and the habitat available for the fauna it supports (such as the hollow-dwelling Greater Glider and Powerful Owl). In some parks (such as Tarra–Bulga National Park) areas of Wet Forest and Rainforest have historically been reduced in extent after successive fires.

Heathland, Dry Forest and Woodland and some coastal vegetation types require fire to maintain habitat structure and floristic diversity. An appropriate spatial and temporal distribution of vegetation growth stages in these conservation assets is required to maintain ecosystem health. A mix of vegetation growth stages is crucial for the persistence of species such as the Ground Parrot and small mammals such as the Southern Brown Bandicoot and New Holland Mouse. Fire may directly kill animals in the path of fire and also reduce the habitat and food availability for surviving animals, which can have catastrophic consequences for rare and threatened species populations. Furthermore, there is less shelter available to native animals in vegetation that has been recently burnt, leaving them more exposed to predators.

Hot and windy conditions are required to successfully burn coastal vegetation, presenting operational challenges as these conditions are considered too risky for prescribed burning. Consequently, much of the coastal vegetation in the landscape has not been burnt with sufficient frequency. The coastal islands of Nooramunga Marine and Coastal Park also lack frequent fire. This has resulted in an overrepresentation of older vegetation in coastal parks and islands, and a lack younger vegetation.

Disturbance of native vegetation by bushfire or planned burning may provide opportunities for weeds to invade or become established.

Fire management activities, such as creating track and control lines for planned burning and bushfire suppression and use of fire retardants, can damage habitat and sites of indigenous and European cultural heritage. Management vehicles can also introduce and spread pathogens such as Phytophthora and Myrtle Rust, as well as weeds. Where possible, existing roads and tracks should be used to limit the physical impacts of fire management, as well as the spread of pathogens and weeds.

Threat objective

By 2026, exclude bushfire and prescribed burning from Wet Forest and Rainforest. Apply appropriate ecological fire regimes to fire-dependent ecosystems. Reduce the negative impacts of other threats (e.g. weeds, pathogens, herbivores and predators) during and following fire.

This threat is addressed through the Conservation Strategy ‘Fire management for ecological health’.

5.2 Altered hydrology/reduced water quality

Threat description

Altered hydrology — The health of riparian, wetland and estuarine systems depends on suitable hydrological regimes. These regimes include the rates with which water moves through watercourses, the timing, duration and frequency of floods, and the behaviour of coastal tides. Since European settlement, significant modifications to the watercourses, coast and lake systems of the Gippsland Plains and Strzelecki Ranges Parks Landscape have changed the natural hydrology of freshwater and marine habitats. Hydrological regimes are the primary driver of the composition and characteristics of the habitats they support. Over time there have been extensive losses of saltmarsh in Andersons Inlet, Shallow Inlet, and Corner Inlet and Nooramunga Marine and Coastal Parks due to land use changes, including drainage for agriculture and construction of levees.

Reduced water quality — Pollutants such as biocides, fertilisers, oils, chemicals, sediments, and nutrients can enter estuaries, the Gippsland Lakes and Corner Inlet, Shallow Inlet, and Andersons Inlet via waterways and drains upstream. This reduced water quality directly affects parks and reserves in the Parks Landscape, but originates mainly from catchment sources including agricultural land, eroding creeks and waters, and stormwater from urban areas. Several active ports in South Gippsland (e.g. Port Welshpool, Port Albert, Barry Beach / Port Anthony), have the potential to adversely impact water quality, especially through oil and chemical spills. Storm surges can introduce sediment and chemicals into marine and lake systems (see the 'Extreme weather events and climate change' threat).

Threat objective

By 2026, mitigate the impacts of altered hydrology and extreme events (flood, drought), and optimise freshwater or saltwater inputs to wetlands, improve water quality and restore natural hydrology and connectivity to freshwater, estuarine and marine habitats.

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

5.3 Terrestrial weeds, diseases and pathogens

Threat description

Weeds and pathogens are a high to extreme threat to the conservation assets throughout the Gippsland Plains and Strzelecki Ranges Parks Landscape. Invasive plants compete with native plant species for resources and alter the structure and function of habitat. They can also degrade sites of cultural significance.

Fires (both bushfires and planned burning) and floods can cause soil disturbance and spread weed propagules, creating conditions for weeds to rapidly establish and expand their populations. Mechanical works, such as fire prevention and fire management activities, also create opportunities for weed invasion and the spread of pathogens through soil disturbance and the spread of propagules on equipment. Animals also spread weeds and pathogens through the landscape, particularly feral predators and herbivores that travel long distances.

Weeds and pathogens on private land can be a significant source of weed infestation and reinfestation to public parks and reserves, requiring a collaborative approach to management across land tenures to be effective in increasing the health of vegetation assets. On coastal islands, weeds are a significant threat to plant communities and to the conservation of mammal and bird populations.

Significant weeds

In Wet Forest and Rainforest, significant weed species include Tutsan, Sycamore Maple, Himalayan Honeysuckle, Ivy, Holly, Blue Periwinkle, Sweet Pittosporum, Blackberry, Radiata Pine and willows. These weeds degrade parks in the Strzelecki Ranges such as Tarra–Bulga National Park, Mt Worth State Park and Mirboo Regional Park. A different suite of weeds threatens the drier conservation assets such as Heathland and Dry Forest and Woodland. Boneseed, Burgan, Bridal Creeper are significant weeds in these ecosystems. In the heathy vegetation of Holey Plains State Park, Radiata Pine is also a threatening weed.

Weeds of the coastal areas are hardy, able to withstand wind and salt. Sea Spurge, Boneseed, Sweet Pittosporum, African Boxthorn, Coastal Tea-tree and Bridal Creeper compete aggressively with native coastal plants for resources. Blue Periwinkle, Bridal Creeper, African Boxthorn, Sea Spurge, Dolichos Pea,

Agapanthus and Wheel Cactus have been identified as priority weeds for control in the Gippsland Lakes reserves (GKTOLMB 2018).

Cord-grasses are major environmental weeds of coastal inlets and are declared noxious aquatic species under the Victorian *Fisheries Act 1995*. They have invaded saltmarsh, mangrove and soft sediment within Nooramunga Marine and Coastal Park, Corner Inlet Marine National Park, Shallow Inlet Marine and Coastal Park and the coastal parks around Anderson Inlet. Control programs have reduced the infestation, but ongoing control is crucial.

Many of the weeds in this Landscape are of such significance in Australia that they are classified as 'Weeds of National Significance', including African Boxthorn, Asparagus Fern, Blackberry, Boneseed, Bridal Creeper, English Broom, Flax-leafed Broom, Gorse, Montpellier Broom, Salvinia, Wheel Cactus, and Willow spp.

Pathogens

Phytophthora (also called Cinnamon Fungus) is a pathogen that affects the root systems of susceptible plant species, causing dieback and death. The fungus is spread on the shoes of hikers, on management and recreational vehicles and bicycles, and by animals moving through the landscape. For these reasons the effects of the fungus are often most obvious along tracks and roads. Heathy ecosystems are particularly affected, so the fungus is established in many coastal reserves, as well as reserves such as Holey Plains State Park, Mullungdung Flora and Fauna Reserve and Adams Creek Nature Conservation Reserve.

Myrtle Rust, caused by the native fungus *Chalara australis*, affects Myrtle Beech trees. The fungus invades via wounds on the outer bark or by root contact with infected plants, and may be exacerbated by damage caused during management activities (e.g. road and track construction and maintenance). Myrtle Wilt occurs in elevated parks in the Parks Landscape, notably Tarra–Bulga National Park and Gunyah Rainforest Scenic Reserve.

Pathogens such as Chytrid Fungus are known to significantly impact amphibian populations in this Landscape. However, management of this threat is challenging because of the highly modified and fragmented nature of the Landscape.

Threat objective

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

This threat is addressed through the Conservation Strategy 'Weed and pathogen control using a biosecurity approach'.

5.4 Introduced herbivores

Threat description

Introduced herbivores that graze and browse native vegetation are a moderate to extreme threat across the Gippsland Plains and Strzelecki Ranges Parks Landscape. Overgrazing and overbrowsing degrade vegetation by lowering plant diversity, altering the structure of vegetation and reducing habitat resilience to disturbance such as fire or prolonged drought. Grazing can cause severe damage to populations of rare and threatened plants, notably orchids. Large introduced herbivores can also cause erosion damage to cultural heritage sites and waterways through trampling with their hard hooves. Rabbits cause the most grazing damage to the Parks Landscape because of their numbers, but hares, deer, pigs and goats can also cause significant damage when they disperse across the landscape and their populations increase.

Sandy soils in coastal areas are favoured habitat for rabbits, which are also present in the Dry Forest and Woodland and Wetland assets. Without active management, seedlings and saplings can be severely damaged or killed by selective grazing by rabbits. Understory species also suffer from grazing and browsing pressure, compounded by competition with weedy plant species.

Sambar deer are widespread in the landscape, inhabiting most available and suitable habitats including inland Wet Forest and Rainforest and Dry Forest and Woodland. They are also present in inland Heathland such as Holey Plains State Park and Providence Ponds Flora and Fauna Reserve. Deer numbers are high in coastal areas of South Gippsland, with significant populations in Corner Inlet and Nooramunga Marine and Coastal Parks and at Jack Smith Lake State Game Reserve, which are having a significant impact on condition of coastal vegetation communities including structure and species diversity. The control of Hog Deer, a highly prized game species, is limited at this stage to removal via the recreational harvest, although Hog deer are culled by contractors on Wilsons Promontory to reduce grazing pressure. Red Deer and Fallow Deer are less widespread and are a lower threat. As well as grazing and browsing, deer degrade the water quality of wetlands and waterways by excreting and wallowing in shallow water, and opening wallows in wet areas such as drainage lines and peatlands.

The distribution of feral pigs is restricted in the Parks Landscape, but they have been recorded in The Gurdies Nature Conservation Reserve and the coastal area adjacent to the Gippsland Lakes. As well as

grazing on native flora, the hard hooves of pigs pug soft or damp soils. Like rabbits and hares, feral goats compromise herb and shrub regrowth, but they can also affect canopy regeneration. Feral goats have recently been eradicated in Gippsland Lakes Coastal Park and the Blond Bay area, but continuing surveillance is needed to ensure that the populations are not re-established from outside the parks and reserves.

Illegal cattle grazing, although not currently a major concern, does occur intermittently in some parks and reserves in this Landscape. For example, grazing of saltmarsh in Shallow Inlet adversely impacts water quality.

Managing introduced herbivores to reduce their grazing and browsing impacts is necessary to promote the successful regeneration of canopy species, increase the diversity of plants and animals, and improve overall vegetation cover and complexity. Because rabbits are an abundant prey species, predator control needs to be undertaken alongside rabbit control to avoid prey switching, whereby native animals become more heavily preyed upon by foxes and cats.

Threat objective

By 2026, reduce grazing, browsing and trampling of native vegetation by rabbits, hares, deer, pigs and goats, impacts at priority sites across the landscape and review native herbivore population management at priority locations.

This threat is addressed through the Conservation Strategy ‘Herbivore management’.

5.5 Introduced predators

Threat description

Cats and foxes are widespread throughout the Gippsland Plains and Strzelecki Ranges Parks Landscape, and predation threatens a range of ground-dwelling animals, including woodland birds, small mammals and reptiles. Predation by cats and foxes is ranked as a high to extreme threat across all terrestrial conservation assets in the Parks Landscape and has contributed to declines in sensitive fauna populations. Feral pigs, although not as widespread, prey on earthworms, amphibians, fish, insects, reptiles, ground-nesting birds and small mammals.

Reduced numbers of native fauna also affect the health of the ecosystems they inhabit, especially species that support ecological processes, such as soil engineers (small burrowing or digging animals) and pollinators. Changes in the composition of native fauna populations can disrupt the function of food chains, and introduced predators can spread unwanted weeds and diseases.

During times of increased pressure, such as during or following drought, planned burning and bushfire, native animal populations can be very vulnerable to predation. Bushfires and planned burning may decrease refuges for native fauna and increase access for predators. Post-fire prey switching may occur, resulting in an increased threat to native fauna. Interactions between fire and predation may be particularly acute where large fires burn much or all of a park or reserve, especially for threatened native fauna. For example, most of Holey Plains State Park and Grantville Nature Conservation Reserve were burnt by high-severity bushfires in 2019, leaving few unburnt refuges. The impact of predation can be increased in a fragmented landscape, leading to an increased risk of localised extinctions of native fauna.

In coastal areas, wading birds and beach-nesting birds such as the Hooded Plover are particularly vulnerable. Predation is the primary threat to the survival of heathland-dwelling small mammals such as New Holland Mouse and Southern Brown Bandicoot. In forest habitats, predators take animals including gliding possums, Spencer's Skink, Long-nosed Bandicoots and Superb Lyrebirds.

Many of the parks in this landscape are isolated from one another, surrounded by private land. To effectively improve the health of native animal populations, integrated predator management is needed

beyond park boundaries. Because there are so many neighbours bordering the parks and reserves in the Gippsland Plains and Strzelecki Ranges Parks Landscape, engaging with them all is a significant challenge for cross-tenure, landscape-scale introduced predator control. The current policy and legislation regulating Feral Cat control also impedes the effective management of predators in the landscape as the scope to control feral cats on private land is extremely limited.

The roles of native predators such as the Lace Monitor and birds of prey, as well as predators no longer present or in low numbers such as quolls, are poorly understood. Introduced predators are likely to modify the food chain and disrupt the behaviour of native predators. Building knowledge on both the role of native predators and the interactions between native and introduced predators will support the ongoing effective management of predation pressure, and may aid the recovery of native predator species.

Threat objective

By 2026, reduce predation by foxes, feral cats and pigs at key locations to levels low enough to support increasing populations of priority native animal species.

This threat is addressed through the Conservation Strategy ‘Ongoing control of introduced predators to support resilient native fauna populations’.

5.6 Marine pests

Threat description

Marine pests pose a high to extreme risk to the marine assets of the Gippsland Plains and Strzelecki Ranges Parks Landscape. Marine pest species rapidly colonise new areas by natural dispersal (currents and storms) and via artificial vectors such as the hulls of boats and bilge and ballast water from larger vessels. Once established, introduced marine pests are almost impossible to eradicate.

Marine pest species can impede the regeneration of seaweed canopy species, prey on native marine species, and outcompete native species for habitat and resources. The effective management of this threat involves preventing the spread via artificial vectors and, where they occur, by containment.

Northern Pacific Seastars modify reefs, seagrass beds and unvegetated soft sediment by feeding on native marine species, including shellfish, crustaceans, sessile invertebrates and fish eggs. Well established in Port Phillip Bay to the west, this species has been reported from Anderson Inlet, Waratah Bay and Tidal River. The New Zealand Screw Shell occupies similar habitat and forms dense shell beds that compete with native scallop colonies.

Japanese Kelp or Wakame Seaweed, which displaces native kelp species, is considered one of the top 100 most invasive species in the world (ISSG 2020). It has become naturalised in Port Phillip Bay, and the nearby Bunurong Marine National Park is at risk of infestation. In August 2018 it was detected in Port Welshpool harbour, close to Nooramunga Marine and Coastal Park.

Overabundant native marine species also behave like marine pests and impact marine habitats. Although sea urchins are native to many marine systems, the native Purple Sea Urchin has become overabundant in Nooramunga Marine and Coastal Park. High numbers of urchins cause ‘barrens’ — areas that have been stripped of seagrass, which the urchin feed on. These denuded areas can be suitable habitat for other invasive marine species, including Japanese Kelp. Managing the grazing pressure of overabundant urchins to support the health and regeneration of seagrass systems is currently the focus of an adaptive management program.

Other notable invasive species in the Landscape include the Pacific Oyster and European Green Shore Crab. The introduced marine alga Dead Man's Fingers, native to the eastern Asia, is a significant marine pest in Corner Inlet and Nooramunga Marine and Coastal. It can become a dominant species in the subtidal zone, attaching to almost any hard surface. It may attach to shellfish and then float away, carrying the shellfish with it.

Threat objective

By 2026, eradicate new and emerging marine pests, ensure that the density of sea urchins is reduced and the spread of targeted marine invasive species is limited, to maintain the health of key ecological attributes of these systems.

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

5.7 Recreation / natural resource extraction

Threat description

The parks in the Gippsland Plains and Strzelecki Ranges Parks Landscape provide excellent opportunities for nature-based recreation. Camping, fishing, hunting and driving are popular activities. Enjoyment of the parks must be balanced with conservation of the plants, animals and ecosystems they support, as both legal and illegal recreation can degrade natural and cultural assets.

Recreation

Dirt-biking and four-wheel driving is a widespread activity which is legal in designated areas. Riding and driving where it is prohibited (particularly in the heathlands / dry forests east of Westernport, inland forest parks and Holey Plains) damages vegetation, soil crusts and sites of cultural significance, and disturbs wildlife. Mountain biking also causes damage in some areas.

Camping is popular along the Gippsland Plains coast and in the Gippsland Lakes precinct. The western section of the Gippsland Lakes Coastal Park, along the Ninety Mile Beach, is subject to heavy visitor use in peak holiday periods, leading to impacts on vegetation and cultural sites in the narrow dune strip around campgrounds. Threats associated with camping include rubbish dumping, firewood collection and bushfires caused by campfires.

Another threat in coastal areas is off-leash dog walking on beaches. Unrestrained dogs disturb beach-nesting and wading birds, notably the nationally vulnerable Hooded Plover. Recreational watercraft can effect marine and coastal ecosystems by leaking fuel and oil, interrupting the feeding, roosting and breeding activity of waterbirds and shorebirds, striking pelagic animals, and damaging substrates when launching, retrieving, anchoring, and operating in shallow water (especially personal watercraft).

Hunting, fishing and shellfish collection

Fishing and shellfish collection are not permitted in marine national parks or marine sanctuaries, including Corner Inlet Marine National Park, Bunurong Marine National Park, and Ninety Mile Beach Marine National Park. Fishing is permitted in the Gippsland Lakes, and in Corner Inlet, Nooramunga, Shallow Inlet, and

Yallock-Bulluk Marine and Coastal Parks, but it is challenging to enforce penalties for overfishing and overcollecting.

Firewood collection

Illegal firewood collection can negatively impact conservation values through the destruction of habitat trees, removal of coarse woody debris, and damage to understorey vegetation. It can occur throughout the landscape but has been particularly noticeable at Grantville, The Gurdies Nature Conservation Reserve, and Mirboo North Regional Park (primarily in the Halston block).

Threat objective

By 2026, effectively control visitor impacts on the health of priority conservation and cultural assets across the Parks Landscape.

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

5.8 Extreme weather events and climate change

(Drought, extreme temperatures, storm surges, sea temperature rise)

Threat description

Storms, floods, heatwaves and erosion have long been a part of the Gippsland Plains and Strzelecki Ranges Parks Landscape. However, the consequences of these extreme weather events are increasing because of reduced habitat remaining due to clearing, the isolation of parks from one another, an increased severity of weather events and increased temperature due to climate change (CES 2018).

Flood and storm damage

Floods have many ecological benefits, including flushing wetlands, distributing plant propagules and animals across the landscape, refreshing drought refuges and bringing nutrients that increase productivity. However, they can degrade habitat in vulnerable areas such as Corner Inlet and the Gippsland Lakes, causing water turbidity in these systems. Turbidity reduces light availability and increases siltation and deposition, potentially affecting hydrodynamic processes and marine flora and fauna. Floods and storm surges can also inundate land with seawater, causing an increase in soil salinity which may decrease the health of vegetation. Raw sewage may also be discharged into Corner Inlet from nearby septic systems during these events.

Historic clearing of coastal and wetland vegetation has rendered shorelines and lakes less resilient to wind and storm damage in coastal areas and lakes. Erosion has been active in in the Gippsland Lakes system since an artificial opening was constructed in the late 1800s. Infrastructure was installed to reduce flooding and permanently open the Gippsland Lakes, significantly altering flood patterns and the way local creeks flow (Parks Victoria 1998). Storm damage also affects tall, wet forests, which are susceptible to wind damage and damage from heavy rainfall events.

Coastal storm surges are predicted to increase as climate change progresses. Surges are a threat to exposed coastal areas, causing dune recession along the coastline adjacent to the Gippsland Lakes and in other areas. Extensive coastal erosion is threatening coastal infrastructure at Inverloch (including Surf Life Saving

Club buildings and Bunurong Coastal Drive) and at Kilcunda, where beach staircases have been lost and the rail trail has been closed because of the extent of the erosion.

Sea level and sea temperature rise

Under climate change, high tides are predicted to extend considerably farther inland in areas such as Anderson Inlet, Shallow Inlet, Corner Inlet, the islands and coastline of Nooramunga Marine and Coastal Park, and the Gippsland Lakes. The extension of tides inland will push coastal vegetation inland, beyond the narrow coastal park boundaries in some areas.

Sea level rise and coastal storm surges are likely to change the profile of beaches and diminish natural seasonal renourishment, resulting in a loss of habitat for beach-nesting shorebirds.

Suitable land for vegetation such as mangrove and the nationally vulnerable Subtropical and Temperate Coastal Saltmarsh community to colonise may need to be secured beyond the current parks and reserves if these important elements are to persist in the Parks Landscape. Future sea level rise combined with reduced freshwater flows is likely to increase the salinity of some freshwater or brackish lakes in the Gippsland Lakes, with potential saline flows into high-diversity freshwater wetlands.

Another consequence of climate change will be sea temperature rise, which is predicted to increase the temperature of the water above Seagrass and Subtidal and Intertidal Reefs conservation assets. This may result in a contraction or loss of these assets. Sea temperature rise could also affect the range or migration of various marine species (e.g. the migration of some warmer water species down the east coast and into Victorian waters).

Threat objective

By 2026, increase knowledge and improve our ability to adapt to extreme weather events and climate change in vulnerable areas.

This threat is addressed primarily through the Conservation Strategy ‘Supporting partnerships to address threats to water-dependent assets’.

Dusky Coral Pea
Gippsland Lakes Coastal Park

White-faced Heron,
Bunurong Marine National Park

6 Conservation strategies

Prioritising 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 strategies identified by regional staff and conservation partners. These strategies have been designed to achieve the desired conservation outcomes identified in this plan. The Strategic Management Prospects tool (DELWP 2018) will be used to help determine the priority areas for implementing these strategies along with other assessments of impact, feasibility and cost. Each strategy may be suitable for further refinement or development with conservation partners and stakeholders who wish to further support conservation outcomes in the Gippsland Plains and Strzelecki Ranges Parks Landscape. Where appropriate, adaptations to climate change have been considered in developing these strategies.

These strategies will support the persistence of conservation assets in this Parks Landscape by mitigating priority threats, thereby strengthening the capacity of ecosystems to absorb impacts of long-term climatic change. In some assets, such as coastal and wetlands, where climate change will have a profound impact on the function and composition of these ecosystems, proposed adaptation measures have the aim of maintaining ecosystem function with altered composition, facilitating movement of communities or species, or maximising species persistence through managing *in situ* or *ex situ* refugia.

Strategies developed for this Parks Landscape have considered a range of recognised climate adaptation actions, such as:

- Ensuring connectivity — ensuring connectivity of coastal vegetation by supporting the landward retreat of coastal saltmarsh.
- Protecting key ecosystem features — such as mangroves and seagrass beds which provide important fish nurseries and spawning areas.
- 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 Parks Landscape.

Strategies prioritised and developed through this process are:

- Managing fire for ecological health.
- Controlling weeds using a biosecurity approach.
- Controlling introduced predators to support native fauna populations.
- Managing grazing and browsing pressure.
- Supporting partnerships to address threats to water-dependent assets.
- Reducing the impacts of recreation, illegal activities and natural resource extraction on natural values.
- Managing marine pests for healthy marine protected areas.
- Establishing collaborative partnerships and address key knowledge gaps.

Strategy description format

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

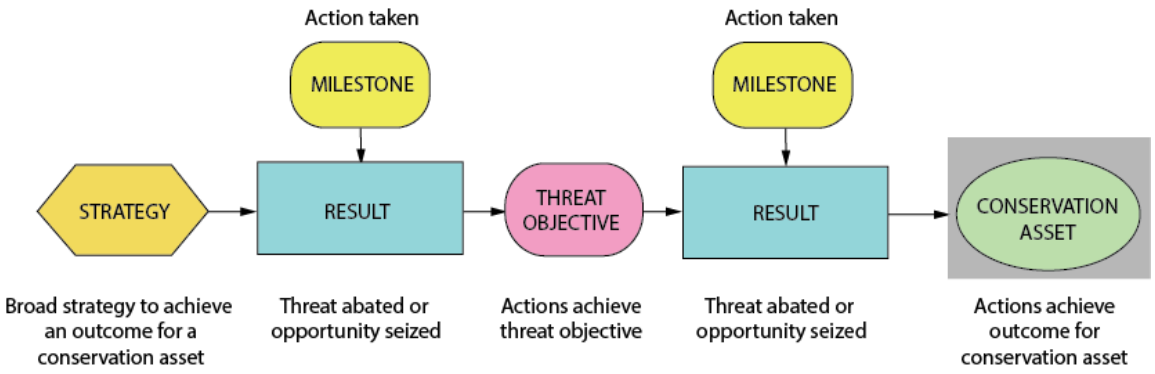
Conservation strategy

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	• Milestone from results chain, with locational and other detail •
	•
Threat objective	•

6.1 Fire management for ecological health

Conservation outcomes

Burning vegetation within an appropriate fire regime will aim to improve habitat condition and increase the extent of old and mid-growth stages of forest habitats and the structural and ecological diversity of fire-adapted habitats. Post-fire monitoring and rehabilitation activities will reduce the threats of pest plant and animal invasion.

Strategy

This strategy guides aims to improve the ecological and cultural health of the Gippsland Plains and Strzelecki Ranges Parks Landscape through managing bushfire and planned burning. Fire planning and management will be carried out with DELWP, in consultation with the CFA, neighbours and the community. Cross-tenure management is key to protecting long unburnt vegetation and preventing landscape-scale bushfires.

Parks Victoria will work with Traditional Owners to help implement cultural fire practices, where practical. Parks Victoria will also work with DELWP and Traditional Owners to determine areas of high ecological and cultural value, and assess potential fire damage to ecological and cultural values.

In fragmented landscapes, such as the Gippsland Plains and Strzelecki Ranges, appropriate fire management on adjoining private land is also important in achieving ecological outcomes.

Fire management

Beyond asset protection zones, fire management programs will focus on maintaining vegetation within the appropriate fire regimes. As part of implementing an appropriate fire regime, Tolerable Fire Intervals (TFI) will be used to measure fire frequency (return time) and Vegetative Growth stage analysis will measure spatial and temporal heterogeneity. Other measures of ecosystem resilience, including geometric mean abundance, may be useful. However, their applicability in such a fragmented landscape is uncertain.

For fire-dependent ecosystems, such as Heathland and Dry Forest and Woodland, ecological fire strategies will be developed to guide the implementation of appropriate ecological fire regimes. Planned burning will

be carried out, based on ecological fire strategies, and taking in to consideration total fire in the landscape (both planned burning and bushfire), to maintain and improve spatial and temporal heterogeneity, composition and structural diversity, and to improve habitat health.

Coastal vegetation presents a risk management challenge because it often exists adjacent to populated coastal areas, but due to its fuel structure may require burning under windy conditions outside of usual planned burning prescriptions. Part of this strategy is to investigate alternative techniques to safely burn coastal vegetation, or to provide alternative fuel modification and disturbance (for example, slashing or mulching) to stimulate habitat regeneration and create habitat structure required for coastal plants and animals.

In areas such as Rainforest and Wet Forest, action will be taken to reduce the threat of bushfire and to avoid planned burns where possible. The retention of old growth vegetation in forest and woodland will be promoted by protecting existing old-growth areas from fire and setting aside areas of mid growth stage to mature in the future.

To achieve these objectives, the following principles will be built into fire management planning and planned burns outside of asset protection zones:

- Develop ecological fire strategies for priority areas with fire-dependent assets (Heathland and Dry Forest and Woodland).
- Plan and implement appropriate fire regimes in fire-dependent ecosystems (to the extent possible within smaller fragmented areas).
- Exclude fire from the Wet Forest and Rainforest conservation asset.
- Identify, map and avoid burning remaining areas of long unburnt vegetation in Dry Forest and Woodland and Wet Forest areas.
- Increase the extent of long unburnt vegetation.
- Protect priority species and ecological communities from impacts of planned burns and large-scale bushfires, including the potential use of planned burning for ‘asset protection’ for these nested assets.
- Monitor the effects of fire (both planned burning and bushfire) and subsequent post-fire recovery of flora and fauna, including interactions with and effects of other drivers and threats.
- Minimise fire management activities in reference areas and other areas of high conservation significance.
- Adhere to good hygiene protocols when undertaking fire management activities.
- Minimise fire suppression interventions for naturally occurring fires on islands.

Fire recovery

Recovery activities after bushfire will be well-timed to support the rehabilitation of conservation assets and cultural sites. Monitoring and targeted research into fire effects and recovery will be an important component of fire recovery. As fires can trigger increases in weeds and pest animals, fire management will be carried out in conjunction with the strategies that address these threats.

Both Holey Plains State Park and Grantville Nature Conservation Reserve were impacted by high-severity bushfires in early 2019, which burnt much of both the park and reserve. These areas should be a priority for fire recovery planning and activities. It will be important to monitor the effects of these large, high intensity fires and subsequent post-fire recovery of flora and fauna, including interactions with and effects of other drivers and threats.

Strategy summary

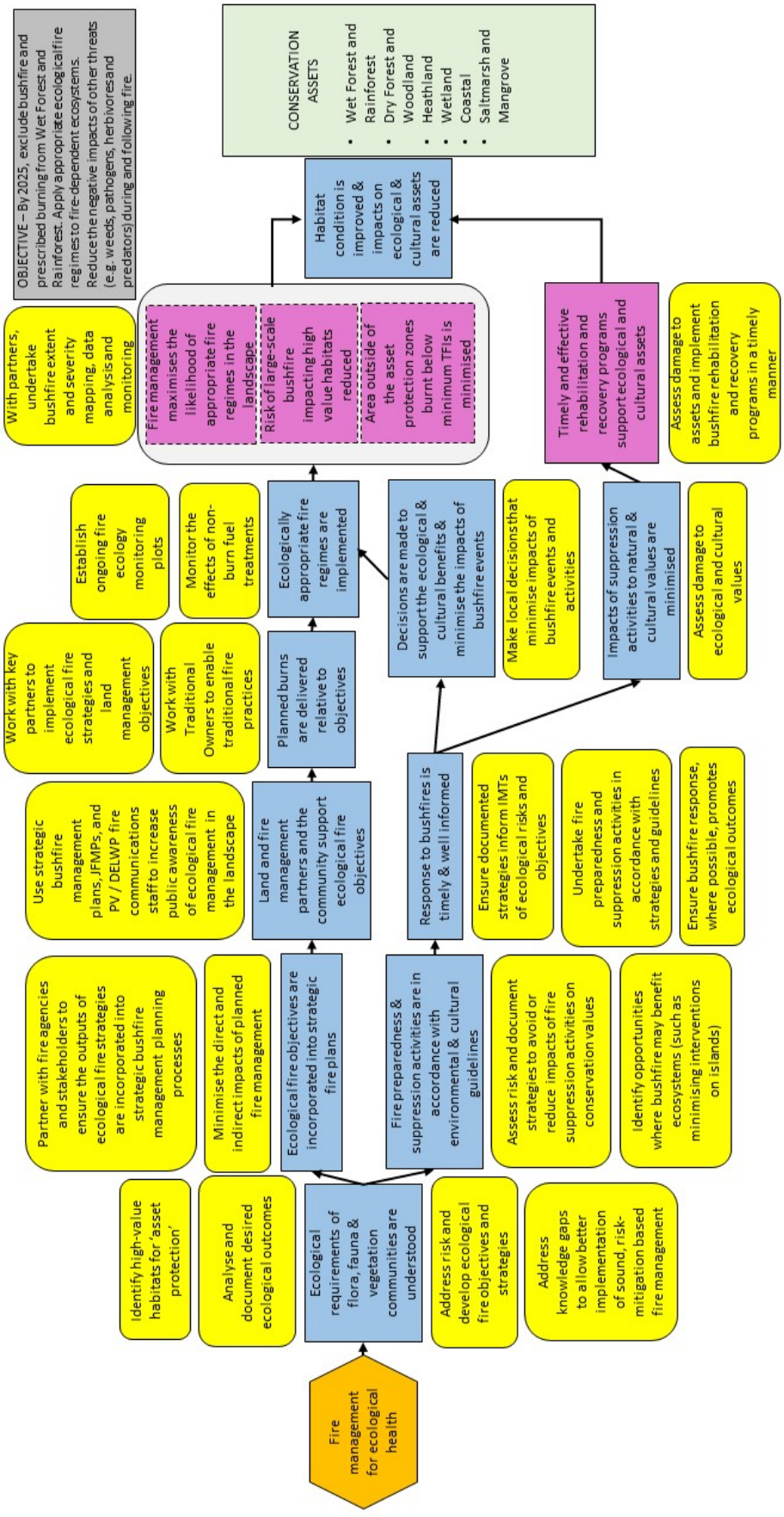
Fire management for ecological health – Using fire as a tool to maintain fire dependent habitat or species, exclude planned fire from fire sensitive habitats and apply fire peripheral to priority species and habitats to provide protection.

Table 6.1 Priority areas for ecological fire strategies.

Priority areas	Major conservation assets*
Strzelecki Ranges (including Tarra-Bulga / Mount Worth)	Wet Forest and Rainforest
Holey Plains / Stradbroke / Mullungdung / Giffard	Heathland, Dry Forest and Woodland
Gippsland Lakes area	Heathland, Dry Forest and Woodland
Providence Ponds / Moormurng	Heathland, Dry Forest and Woodland
Cape Liptrap	Heathland, Dry Forest and Woodland
Grantville / The Gurdies / Adams Creek	Heathland, Dry Forest and Woodland
Nooramunga	Heathland, Dry Forest and Woodland
Wonthaggi Heathlands	Heathland

*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.	• Identify high-value habitats for ecological asset protection, including fire sensitive vegetation, critical habitat and wildlife refugia in priority areas.
	• Analyse and document desired ecological outcomes, informed by:
	  • bushfire risk analysis of impacts of future fire in sensitive vegetation, critical habitat and wildlife refugia.
	  • ecological growth stage structure (spatial and temporal) for habitat in fire dependent vegetation.
	  • tolerable fire intervals, for floristic diversity.
	  • future fire scenarios under climate change predictions.
	  • understanding links between desired ecological outcomes and Traditional Owner cultural landscape management.
	• Assess risk and develop ecological fire objectives and strategies for priority areas to:
	  • exclude fire from fire sensitive conservation assets, including rainforest and wet forest, or important older habitat. Mitigations may include reducing the potential severity of future fires by burning in nearby fire dependent / fire tolerant vegetation.
	  • use planned burning (ecological burning) in heathlands and other fire dependent vegetation to maintain floristic diversity, provide a range of habitat growth stages and protect important wildlife refugia.
	  • maintain or improve ecosystem health, and avoid or reduce impacts on ecological assets, including the interactions between fire and invasive species.
	  • reduce impacts on ecological assets from problem native species, such as coast tea tree and sallow wattle.
	• Address knowledge gaps to allow better implementation of sound, risk-mitigation based fire management, including:
	  • ecosystem, habitat and species responses to fire.
	  • interactions between fire and invasive species.
	  • interactions between fire and problem native species.
	  • investigate techniques and procedures to address risks to achieving ecological objectives in coastal habitats.

Ecological fire objectives and strategies are incorporated into strategic fire plans.	Partner with fire agencies and stakeholders to ensure the outputs of ecological fire strategies are incorporated into strategic bushfire management planning processes, including setting land management objectives for ecological burning that may include:
	• reducing bushfire risk.
	  ▪ reduce impacts of future fires on fire sensitive vegetation.
	  ▪ reduce impacts on high-value habitat.
	  ▪ reduce likelihood of large severe landscape scale bushfires.
	• contributing to healthy ecosystems.
	  ▪ floristic diversity.

Result	Action
	▪ growth stage diversity of fire dependent vegetation (e.g. heathlands). ▪ fauna habitat requirements. • Minimise the direct and indirect impacts of planned fire management, including: • planning to manage pre- and post-treatment invasive species issues. • minimise the area of planned fuel breaks in conservation assets, where possible, by working with partners across land tenures. • with agency partners, continually review fire management zoning.
Fire preparedness and suppression activities are planned in accordance with environmental and cultural guidelines.	• Assess risk and document strategies to avoid or reduce impacts of fire suppression activities on conservation values. • high value fire sensitive conservation assets that are likely to be significantly impacted by bushfire are spatially identified for potential suppression activity. • important conservation assets are spatially identified and mitigations to reduce impacts from machinery and other tactical activities during bushfire suppression are documented. • map key values (both natural and cultural) and threatening processes (including weeds, pests and pathogens) that fire suppression will impact. • support DELWP to apply preferred suppression tactics in environmentally and culturally sensitive areas. • Identify opportunities where bushfire may benefit ecosystems (such as minimising interventions on islands).
Land and fire management partners and the community support ecological fire objectives.	• Use strategic bushfire management plans, Joint Fuel Management Programs (JFMPs), and Parks Victoria / DELWP fire communications staff to increase public awareness of ecological fire management in the landscape, including ecological burning, planned burn exclusion, and the use of non-burn fuel treatments. • partner with DELWP, CFA and Traditional Owners, and use the strategic bushfire management plan to engage with the community, including how this supports ecological fire management, and the Joint Fuel Management Program to inform regular conversations with communities and stakeholders on implementing the strategy, including consideration of conservation outcomes. • in partnership with DELWP, CFA and Traditional Owners engage with the community about why we are doing ecological burns, what we are learning when we do them, how they might help reduce the negative impacts of bushfires, and what the results are telling us.

Result	Action
Response to bushfires is timely and well informed.	• Ensure documented strategies inform Incident Management Teams (IMTs) of ecological risks and objectives, and enable them to make dynamic decisions. • Undertake fire preparedness and suppression activities in accordance with strategies and guidelines. • Ensuring that the bushfire response promotes ecological outcomes (which may include actively limiting or halting suppression activities).

Planned burns are delivered relative to objectives (e.g. for health of species, vegetation communities and cultural assets).	• Work with key partners to implement ecological fire strategies and land management objectives, through JFMPs.
	  • land and fire managers refer to ecological fire strategies to inform JFMP development and support decisions on where and when and how to burn.
	  • ecological burns are scheduled, prioritised, resourced and implemented.
	  • cool, patchy mosaic burning may be used where appropriate (monitor the effectiveness of this for floristic diversity and habitat values). This may be in a layered approach to implement strategies over multiple years within ecological / burn units.
	  • consider and plan for potential post-fire impacts (such as invasive species) during JFMP development and implementation.
	• Work with Traditional Owners to enable traditional fire practices.

Ecologically appropriate fire regimes are implemented.	• Establish ongoing fire ecology monitoring plots in selected areas to measure ecosystem health and to assess and refine ecological fire regimes. • Monitor the effects of non-burn fuel treatments.
Decisions are made to support the ecological and cultural benefits and minimise the impacts of bushfire events.	• Make local decisions that minimise impacts, such as placing mechanical breaks and fire retardants away from priority areas, and where appropriate allowing bushfires to burn naturally to promote ecological outcomes.
Impacts of suppression activities to natural and cultural values are minimised.	• Assess damage to ecological and cultural values.

Fire management maximises the likelihood of appropriate fire regimes in the landscape.
Risk of large-scale bushfire impacting high-value habitats reduced.
The area outside of the asset protection zones that is burnt below minimum TFIs is minimised.
	• With partners, undertake bushfire extent and severity mapping, data analysis and monitoring.
	  • Use monitoring data to adapt management, informing the most appropriate spatial and temporal growth stage distributions and ensure a continuous long-term supply of appropriately aged vegetation to support habitats, including sufficient high- value areas of mid and older growth stages.
	  • When competing objectives must be managed ensure that monitoring data supports the decision-making, e.g. some high-value areas for threatened species may require active fire exclusion, contrary to risk-minimisation needs.

Result	Action

Timely and effective rehabilitation and recovery programs support ecological and cultural assets.	• Assess damage to assets and implement rehabilitation and recovery programs in a timely manner.
	  • ensure risks to impacted threatened species populations can be managed effectively, with assistance from partners.
	  • minimise post-fire establishment of invasive species and impacts of erosion and sedimentation.

Habitat condition is improved and impacts on ecological and cultural assets are reduced.	

6.2 Supporting partnerships to address threats to water-dependent assets

Conservation outcomes

Improved condition of freshwater and marine wetland values. Increased area of mangroves and saltmarsh. The impact of changing hydrology from sea level rise and storm surge on wetland and estuarine ecosystems is minimised.

Strategy

Water-dependent assets are marine and terrestrial systems that require permanent or periodic inundation to persist in the landscape. The aim of this strategy is to increase the health of water-dependent assets, with a particular focus on the Corner Inlet and Gippsland Lakes Ramsar sites. This will be achieved by working with partners to reduce the threats of altered hydrology and reduction in water quality caused by water diversion, erosion, sedimentation and nutrient inputs, and to increase the resilience of water-dependent assets to climate change and extreme weather events.

Water quality

Much of the catchment for the waters of the Gippsland Plains and Strzelecki Ranges Parks Landscape is on private land and land owned by other public organisations. This strategy will primarily involve working with other agencies to increase the health and resilience of water-dependent assets, especially in the Corner Inlet Ramsar site, the Gippsland Lakes Ramsar site, Shallow Inlet and Nooramunga.

Parks Victoria will work with West Gippsland and East Gippsland CMAs to determine the water requirements for water-dependent assets in the Parks Landscape and develop strategic plans to increase water quality and environmental flows. Much of this work will involve engaging the community to understand the impact of nutrient inputs, erosion and sedimentation on water-dependent assets and to encourage private land management that reduces these threats. Best-practice management of drains and waterways, including fencing to exclude stock, revegetation of drain sides and ongoing maintenance rather than periodic excavation, would contribute to minimising the amount of nutrients and pollutants entering

freshwater and marine environments (WGCMA 2014). Opportunities exist to establish Waterwatch monitoring sites along waterways that flow into significant areas.

Parks Victoria will also work to improve water quality through works on reserved land including revegetation, weed control and herbivore management. Parks Victoria will also work to improve marine water quality through collaborations with local ports.

Sea level rise / storm surge

Reserves and habitats most vulnerable to sea level rise and storm surge will be identified using predictive modelling. Vulnerable areas are likely to include freshwater systems at risk of saltwater inundation and coastal assets such as mangroves and saltmarsh that will need to retreat inland. Previous land protection works, such as levees that prevent saltwater from entering farm land, are currently blocking landward retreat of these ecosystems. Restoring the natural hydrology of aquatic systems, where possible, would allow for migration of species uphill as sea levels rise. Opportunities to address these threats will be investigated as a priority. Areas in and around Andersons Inlet, Shallow Inlet, Corner Inlet, Nooramunga, and around many of the Gippsland Lakes may provide opportunities for restoring and expanding saltmarsh. Current projects, including Biodiversity Response Planning 'Blue Carbon' trials, are providing methodology and investment for this.

The current silt jetties protection program may also be important in providing shelter from wave activity for Jones Bay.

Threatened species

Parks Victoria will work with stakeholders to explore the feasibility of creating satellite wetlands that are open, sunny and warm, primarily as refugia for frog species, which may provide protection from the Chytrid Fungus.

Parks Victoria, in conjunction with stakeholders, will aim to find suitable locations to re-establish populations of threatened Swamp Everlasting, using collected viable seed.

Strategy summary

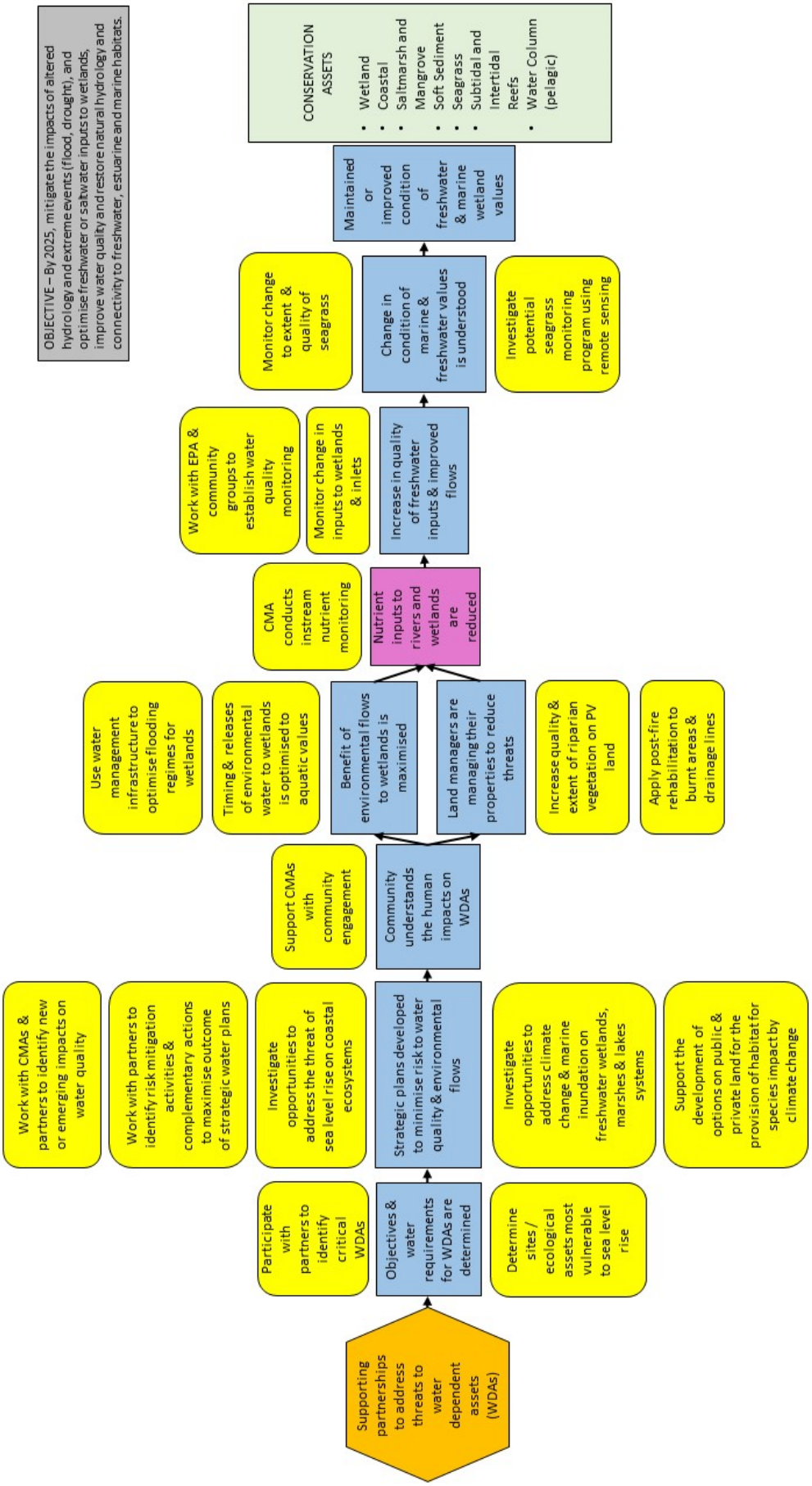
Water Management for Conservation Outcomes – Supporting partnerships to improve water dependent conservation assets by maintaining and improving the hydrological regimes that support them in the Landscape.

Table 6.2 Priority water management areas in the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Priority areas	Major conservation assets*
Corner Inlet Ramsar site (including Corner Inlet Marine National Park, Corner Inlet Marine & Coastal Park, Nooramunga Marine & Coastal Park)	Wetland, Coastal, Saltmarsh and Mangrove, Soft Sediment, Seagrass
Gippsland Lakes Ramsar site (including The Lakes National Park, Gippsland Lakes Coastal Park, Gippsland Lakes Reserves)	Wetland, Coastal, Saltmarsh and Mangrove, Soft Sediment
Shallow Inlet Marine & Coastal Park	Wetland, Coastal, Saltmarsh and Mangrove, Soft Sediment, Seagrass
Andersons Inlet	Wetland, Coastal, Saltmarsh and Mangrove, Soft Sediment

*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
Objectives and water requirements for water-dependent assets (water-dependent assets) are determined.	• Participate with other partners to identify critical Water dependent assets including drought refugia. • Determine sites and ecological assets most vulnerable to sea level rise.
Strategic plans developed to minimise risk to water quality and environmental flows.	• Work with West Gippsland Catchment Management Authority (WGCMA) 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 on coastal ecosystems (e.g. saltmarsh, mangrove, dunes). • Investigate opportunities to address climate change and marine inundation on freshwater wetlands, marshes and lakes systems. • Support the development of options on public and private land for the provision of habitat for species impact by climate change.
Community understands the human impacts on Water dependent assets (nutrients, flows, sedimentation and climate change).	• Support CMAs to engage the community through the delivery of key messages about the value of Water dependent assets.
Land managers are managing their properties to reduce threats (nutrients, erosion and sedimentation).	• Increase quality and extent of riparian vegetation on Parks Victoria land through revegetation, weed and herbivore management programs. • Apply post-fire rehabilitation to burnt areas and drainage lines.
Benefit of environmental flows to wetlands is maximised.	• Use water management infrastructure to optimise flooding regimes for wetlands. • Timing and releases of environmental water to wetlands optimised to aquatic values.
Nutrient inputs to rivers are reduced.	• Catchment Management Authorities (CMAs) carries out instream nutrient monitoring.
Increase in quality of freshwater inputs and improved flows to Corner and Shallow Inlets, Nooramunga and the Gippsland Lakes.	• Work with EPA and community groups to establish water quality monitoring in Corner Inlet and Gippsland Lakes. • Monitor change in inputs to wetlands and inlets.
Change in condition of marine and freshwater values is understood.	• Investigate potential seagrass monitoring program using remote sensing. • Monitor change to extent and quality of seagrass via sea search program.
Maintained or improved condition of freshwater and marine wetland values.	

6.3 Weed and pathogen control using a biosecurity approach

Conservation outcomes

In partnership with neighbours and other agencies, priority areas are managed for high threat weeds, supporting healthy ecosystems and species. Conservation assets are protected from new and emerging weeds.

Strategy

This strategy provides a strategic framework for analysing and prioritising weed management at a Parks 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 Gippsland Plains and Strzelecki Ranges Parks Landscape.

The strategy is guided by the overarching framework, the *Invasive Plants and Animals Policy Framework* (DPI 2010), 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 the management of the highest risk species in the highest value parks and the level of establishment of the species in the landscape. Management priority is eradicating occurrences of new and emerging species which are eradicable and not yet well established.

Level of infestation using the biosecurity approach

A biosecurity approach to pest plant management is a Victorian Government standard for identifying the threat of an invasive species and undertaking an assessment of its relative risk 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 their current extent and the level of risk they present to conservation values in the Gippsland Plains and Strzelecki Ranges 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 high-risk weeds in adjoining land and other 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 education and cooperation with neighbours to eradicate or control high-risk weeds, and 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 before planned disturbance events such as planned burning and environmental watering.

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 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 species such as Bridal Creeper and Bluebell Creeper in coastal areas and Blue Periwinkle in Wet Forest and Rainforest conservation asset. Effective eradication is the objective for this group of weeds.

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. 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 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 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 cord-grasses in coastal inlets, African Boxthorn and Sweet Pittosporum in coastal vegetation and Blackberry in Wet Forest and Rainforest. Native species that are colonising new areas are also included in this approach, such as Coast Tea-tree colonising heathlands.

Because widespread control is not feasible, the objective for these species is to reduce their abundance and to prevent invasion into priority areas.

Knowledge gaps

Given 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 where the current weed threat is unknown include Lake Kakydra GLR, Lake Coleman Wildlife Reserve, Salt Lake-Backwater Morass GLR, Turtons Creek Scenic Reserve, Gunyah Rainforest Scenic Reserve, Hoddle Range Flora Reserve, Kings Flat Flora Reserve, Mirboo North Regional Park (Hallston Block), Mirboo North Regional Park (Boolarra South Block). Point Fullerton GLR has many weed species adjacent to the reserve, in an old dumping ground. Understanding the level of threat to the reserve, and appropriate management actions, is important.

Weed Species by Management Priority

Table 5.2 classifies parks and weeds into priority groupings (numbered 1 to 9). All the parks and weeds in each priority grouping have the same priority status in considering the allocation of resources. A general management response (prevention, eradication, containment or asset protection) is applied to sub-groupings. Species classified as **Weeds of National Significance** are indicated by an asterisk (*).

Whilst most parks and reserves have been assessed individually, the many parks and reserves in the Gippsland Lakes area have been grouped into geographic areas (see Appendix C). Mostly, the weeds associated with these groups effect all of the parks and reserves in the grouping. In some cases, however, a weed may only effect one reserve in the group. Here an abbreviation of the reserve name is given after the weed name, e.g. Flax-leaf Broom* (SL) currently only effects Slaughterhouse Creek GLR (SL), not the other reserves in that group.

Details of the weed management priority assessment process can be found in Appendix C.

Strategy summary

Weed control using a biosecurity approach – Managing weeds to reduce their spread, establishment and impact, with focus on species that have, or are likely to have, significant impacts on the health of conservation assets.

Table 6.3 Priority weed management in the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Priority	Action	Park/Reserve	Common name	Botanical name
1	Prevention	**Cape Liptrap Coastal Park**	Montpellier Broom*	*Genista monspessulana*
			Spanish Heath	*Erica lusitanica*
		Gippsland Lakes Coastal Park	Spanish Heath	*Erica lusitanica*
		Gippsland Lakes parks and reserves CENTRAL – LOP B The Lakes National Park	Boneseed*	*Chrysanthemoides monilifera* subsp. *monilifera*
			Common Thorn Apple	*Datura stramonium*
			Mirror Bush	*Coprosma repens*
		Gippsland Lakes parks and reserves EAST – LOP D Eagle Point GLR, Flannagan Island GLR, Point Fullarton GLR, Slaughterhouse Creek GLR (SL), Jones Bay WR	Flax-leaf Broom * (SL)	*Genista linifolia*
		Gippsland Lakes parks and reserves LOP B Nyerimilang and Rigby Is. GLRs	Boneseed*	*Chrysanthemoides monilifera* subsp. *monilifera*
		Gippsland Lakes parks and reserves Lower Latrobe Wetlands LOP C/D Sale Common NCR, Heart Morass WR, Dowd Morass WR	Paterson's Curse	*Echium plantagineum*
			Salvinia*	*Salvinia molesta*
		Holey Plains State Park	Pampas Grass	*Cortaderia selloana* or *jubata*
		Morwell National Park	Banana Passionfruit	*Passiflora tarminiana*
			Bridal Creeper*	*Asparagus asparagoides*
		Providence Ponds FFR	Radiata Pine	*Pinus radiata*
			Sweet Pittosporum	*Pittosporum undulatum*
			Bluebell Creeper	*Billardiera heterophylla*
		Tarra Bulga National Park	Banana Passionfruit	*Passiflora tarminiana*
			Elegant Poison-berry (Red Cestrum)	*Cestrum elegans*
			Montbretia	*Crocosmia* × *crocosmiiflora*
			Peruvian Lily (Lily of the Inca or Parrot Lily)	*Alstroemeria aurea*
2	Prevention	**Mount Worth State Park**	English Broom*	*Cytisus scoparius*
	Eradication	**Yallock-Bulluk Marine and Coastal Park (proposed)**	Bluebell Creeper	*Billardiera heterophylla*
		Cape Liptrap Coastal Park	Blue Butterfly Bush	*Psoralea pinnata*
			Cotoneaster	*Cotoneaster* spp.
			Gorse*	*Ulex europaeus*
			Montbretia	*C.* × *crocosmiiflora*
		Mirboo North Regional Park (Dickies Hill Block)	Balm of Gilead	*Cedronella canariensis*
		Gippsland Lakes Coastal Park	Agapanthus	*Agapanthus praecox* subsp. *orientalis*
			Boneseed*	*Chrysanthemoides monilifera* subsp. *monilifera*
			Wood Forget-me-not	*Myosotis sylvatica*
			Hawthorn	*Crataegus monogyna*

Priority	Action	Park/Reserve	Common name	Botanical name
2	**Eradication**		Mirror Bush	*Coprosma repens*
			Pampas Grass	*Cortaderia selloana*
			Prickly Pear	*Opuntia* sp.
			Radiata Pine	*Pinus radiata*
			Blue Periwinkle	*Vinca major*
			Mother of Millions	*Bryophyllum delagoense*
			Sea Spurge	*Euphorbia paralias*
		Gippsland Lakes parks and reserves CENTRAL – LOP B The Lakes National Park	African Box-thorn*	*Lycium ferocissimum*
		Gippsland Lakes parks and reserves CENTRAL – LOP C Blond Bay WR, Morley Swamp GLR	African Love-grass	*Eragrostis curvula*
		Gippsland Lakes parks and reserves EAST – LOP C Jones Bay GLR, Macleods Morass WR, Raymond Island GLR	Desert Ash	*Fraxinus angustifolia* subsp. *angustifolia*
			Mirror Bush	*Coprosma repens*
			Willow*	*Salix* sp.
		Gippsland Lakes parks and reserves LOP B Nyerimilang and Rigby Is. GLRs	Sea Spurge	*Euphorbia paralias*
		Gippsland Lakes parks and reserves Lower Latrobe Wetlands LOP C/D Sale Common NCR (SC), Heart Morass WR, Dowd Morass WR (DM)	Crack Willow* (Brittle Willow) (SC, DM)	*Salix fragilis* var. *fragilis*
			Grey Sallow Willow*	*Salix cinerea*
			Montpellier Broom* (SC)	*Genista monspessulana*
			Prickly Pear (SC)	*Opuntia* sp.
			Sweet Pittosporum (SC)	*Pittosporum undulatum*
		Holey Plains State Park	Cotoneaster	*Cotoneaster* spp.
			Radiata Pine	*Pinus radiata*
			Red-ink Weed	*Phytolacca octandra*
		Mirboo North Regional Park (Dickies Hill Block)	Agapanthus	*Agapanthus praecox* subsp. *orientalis*
			English Ivy	*Hedera helix*
			White Arum-lily	*Zantedeschia aethiopica*
		Morwell National Park	Angled Onion (Three-Cornered Garlic)	*Allium triquetrum*
			English Ivy	*Hedera helix*
		Mullungdung FFR	Radiata Pine	*Pinus radiata*
		Stradbroke FFR	Radiata Pine	*Pinus radiata*
		Tarra Bulga National Park	English Holly	*Ilex aquifolium*
			Fuchsia	*Fuchsia magellanica*
			Ivy / Cape Ivy	*Hedera helix* / *Delairea odorata*
			Red-ink Weed	*Phytolacca octandra*
			Sycamore Maple	*Acer pseudoplatanus*
			Wandering Trad	*Tradescantia fluminensis*

Priority	Action	Park/Reserve	Common name	Botanical name
3	Eradication	**Bald Hills Creek WR**	Bridal Creeper*	*Asparagus asparagoides*
		Gippsland Lakes Coastal Park	Spiny Rush	*Juncus acutus* subsp. *acutus*
		Gippsland Lakes parks and reserves CENTRAL – LOP B The Lakes National Park	Aloe	*Aloe* spp.
		Gippsland Lakes parks and reserves CENTRAL – LOP C Blond Bay WR, Morley Swamp GLR	Ragwort	*Senecio jacobaea*
		Gippsland Lakes parks and reserves EAST – LOP D Eagle Point GLR, Flannagan Island GLR, Point Fullarton GLR, Slaughterhouse Creek GLR, Jones Bay WR	Sea Spurge	*Euphorbia paralias*
		Gippsland Lakes parks and reserves Lower Latrobe Wetlands LOP C/D Sale Common NCR (SC), Heart Morass WR, Dowd Morass WR (DM)	African Box-thorn* (DM) (SC)	*Lycium ferocissimum*
			Boneseed*	*Chrysanthemoides monilifera* subsp. *monilifera*
			Cherry-plum	*Prunus cerasifera*
			Purpletop Verbena	*Verbena bonariensis* var. *bonariensis*
			Red-ink weed	*Phytolacca octandra*
			Trailing African Daisy	*Dimorphotheca fruticosa*
3	Eradication	**Gippsland Lakes parks and reserves WEST – LOP D** Clydebank Morass WR (CM), Avon-Perry Delta GLR (AP), Lake Kakydra GLR, The Dardenelles GLR, Tucker Swamp GLR	Boneseed* (AP & CM)	*Chrysanthemoides monilifera* subsp. *monilifera*
			Cherry-plum (CM)	*Prunus cerasifera*
			Pepper Tree	*Schinus molle*
		Mount Worth State Park	Angled Onion (Three-Cornered Garlic)	*Allium triquetrum*
			Banana Passionfruit	*Passiflora tarminiana*
			Cherry Laurel	*Prunus laurocerasus*
			English Ivy	*Hedera helix*
			Grey Sallow Willow*	*Salix cinerea*
			Himalayan Honeysuckle	*Leycesteria formosa*
			Sycamore Maple	*Acer pseudoplatanus*
			White Arum-lily	*Zantedeschia aethiopica*
		Mullungdung FFR	Gorse*	*Ulex europaeus*
			Ragwort	*Senecio jacobaea*
		State Coal Mine HA	Bridal Creeper*	*Asparagus asparagoides*
		Tarra Bulga National Park	Blue-spur Flower	*Plectranthus ecklonii*
		The Gurdies NCR	Bulbil Watsonia	*Watsonia meriana* var. *bulbillifera*
3	Containment	**Cape Liptrap Coastal Park**	Blackberry*	*Rubus fruticosus* spp. agg.
			Bluebell Creeper	*Billardiera heterophylla*
			Cape Ivy (Ivy Groundsel)	*Delairea odorata*
			Dolichos Pea	*Dipogon lignosus*
			English Ivy	*Hedera helix*
			Sweet Pittosporum	*Pittosporum undulatum*

Priority	Action	Park/Reserve	Common name	Botanical name
4	Eradication	**Gippsland Lakes parks and reserves Lower Latrobe Wetlands LOP C/D** Sale Common NCR, Heart Morass WR, Dowd Morass WR	Apple	*Malus pumila*
			Bathurst Burr	*Xanthium spinosum*
			Variegated Thistle	*Silybum marianum*
		Mount Worth State Park	Fishbone Cotoneaster (Rock Cotoneaster)	*Cotoneaster horizontalis*
		The Gurdies NCR	Ragwort	*Senecio jacobaea*
	Containment	**Bald Hills Creek WR**	Blackberry*	*Rubus fruticosus* spp. agg.
		Yallock-Bulluk Marine and Coastal Park (proposed)	African Box-thorn*	*Lycium ferocissimum*
			African Love-grass	*Eragrostis curvula*
			Agapanthus	*Agapanthus praecox* subsp. *orientalis*
			Annual Veldt-grass	*Ehrharta longiflora*
			Blue Periwinkle	*Vinca major*
			Boneseed*	*Chrysanthemoides monilifera* subsp. *monilifera*
			Bridal Creeper*	*Asparagus asparagoides*
			Cape Wattle	*Paraserianthes lophantha*
			Fennel	*Foeniculum vulgare*
			Montpellier Broom*	*Genista monpessulana*
			Pampas Grass	*Cortaderia selloana*
			Rat-tail Grass	*Sporobolus africanus*
			Sweet Hakea	*Hakea drupacea*
			Trailing African Daisy	*Dimorphotheca fruticosa*
			White Arum-lily	*Zantedeschia aethiopica*
			Wood Forget-me-not	*Myosotis sylvatica*
			Yorkshire Fog	*Holcus lanatus*
4		**Cape Liptrap Coastal Park**	African Box-thorn*	*Lycium ferocissimum*
		Gippsland Lakes Coastal Park	African Box-thorn*	*Lycium ferocissimum*
			Agapanthus	*Agapanthus praecox* subsp. *Orientalis*
			Bridal Creeper*	*Asparagus asparagoides*
			Cape Ivy (Ivy Groundsel)	*Delairea odorata*
			Common Dipogon	*Dipogon lignosus*
			Dolichos Pea	*Dipogon lignosus*
			Gazania	*Gazania linearis, G. rigens*
			Lion's Ear	*Leonotis leonurus*
			Myrtle-leaf Milkwort	*Polygala myrtifolia*
			Sweet Pittosporum	*Pittosporum undulatum*
			Wheel Cactus*	*Opuntia robusta*
		Gippsland Lakes parks and reserves CENTRAL – LOP B The Lakes National Park	Radiata Pine	*Pinus radiata*
		Gippsland Lakes parks and reserves EAST – LOP C Jones Bay GLR, Macleods Morass WR, Raymond Island GLR	African Love-grass	*Eragrostis curvula*
			Agapanthus	*Agapanthus praecox* subsp. *orientalis*
			Blackberry*	*Rubus fruticosus* spp. agg.
			Bluebell Creeper	*Billardiera heterophylla*
			Dolichos Pea	*Dipogon lignosus*

Priority	Action	Park/Reserve	Common name	Botanical name
4	Containment		English Ivy	*Hedera helix*
			Myrtle-Leaf Milkwort	*Polygala myrtifolia*
			Kangaroo Paw	*Anigozanthos* spp.
			Wandering Trad	*Tradescantia fluminensis*
		Gippsland Lakes parks and reserves LOP B Nyerimilang and Rigby Island GLRs	African Box-thorn*	*Lycium ferocissimum*
			Agapanthus	*Agapanthus praecox* subsp. *orientalis*
			Blue Periwinkle	*Vinca major*
			Cape Ivy (Ivy Groundsel)	*Delairea odorata*
		Gippsland Lakes parks and reserves Lower Latrobe Wetlands LOP C/D Sale Common NCR (SC), Heart Morass WR, Dowd Morass WR	Blackberry*	*Rubus fruticosus* spp. agg.
			English Ivy (SC)	*Hedera helix*
			Parrot's Feather (SC)	*Myriophyllum aquaticum*
			Reed Canary Grass	*Phalaris arundinacea* var. *arundinacea*
		Grantville NCR	Bubil Watsonia	*Watsonia meriana* var. *bulbillifera*
			Dolichos Pea	*Dipogon lignosus*
		Holey Plains State Park	Blackberry*	*Rubus fruticosus* spp. agg.
		Mirboo North Regional Park (Barktown Block)	Radiata Pine	*Pinus radiata*
		Mirboo North Regional Park (Dickies Hill Block)	Pennyroyal	*Mentha pulegium*
			Pine	*Pinus radiata*
			Red-ink Weed	*Phytolacca octandra*
			Tutsan	*Hypericum androsaemum*
		Mirboo North Regional Park (Lyrebird Forest Block)	Blackberry*	*Rubus fruticosus* spp. agg.
			Montbretia	*C.* × *crocosmiiflora*
			Willows*	Species required
		Moormung FFR	Bridal Creeper*	*Asparagus asparagoides*
		Morwell National Park	Blackberry*	*Rubus fruticosus* spp. agg.
			Tutsan	*Hypericum androsaemum*
		Providence Ponds FFR	Blackberry*	*Rubus fruticosus* spp. agg.
			Sweet Briar	*Rosa rubiginosa*
		Shallow Inlet Marine and Coastal Park	African Box-thorn*	*Lycium ferocissimum*
			Blackberry*	*Rubus fruticosus* spp. agg.
			Bridal Creeper*	*Asparagus asparagoides*
			Sweet Pittosporum	*Pittosporum undulatum*
			Townsend's Cord-grass, Common Cord-grass	*Spartina* × *townsendii*, *Spartina anglica*
		Tarra Bulga National Park	Blue Periwinkle	*Vinca major*
			Himalayan Honeysuckle	*Leycesteria formosa*
			Ox-eye Daisy	*Leucanthemum vulgare*
			Tutsan	*Hypericum androsaemum*
		Wonthaggi Heathlands NCR	Blackberry*	*Rubus fruticosus* spp. agg.
			Cape Ivy (Ivy Groundsel)	*Delairea odorata*
			Cluster Pine	*Pinus pinaster*
			Coast Tea-tree	Leptospermum laevigatum
			Mirror Bush	*Coprosma repens*
			South African Orchid	*Disa bracteata*
			Sweet Pittosporum	*Pittosporum undulatum*

Priority	Action	Park/Reserve	Common name	Botanical name
5	Containment	**Anderson Inlet CR**	African Box-thorn*	*Lycium ferocissimum*
			Blackberry*	*Rubus fruticosus* spp. agg.
			Bridal Creeper*	*Asparagus asparagoides*
			Pampas Grass	*Cortaderia selloana* or *Cortaderia jubata*
			Sweet Pittosporum	*Pittosporum undulatum*
			Townsend's Cord-grass, Common Cord-grass	*Spartina × townsendii*, *Spartina anglica*
		Bald Hills Creek WR	Ragwort	*Senecio jacobaea*
		Cape Liptrap Coastal Park	Drain Flat-sedge (Umbrella Sedge)	*Cyperus eragrostis*
		Giffard (Rifle Range) FR	Gorse*	*Ulex europaeus*
			Horehound	*Marrubium vulgare*
			Paterson's Curse	*Echium plantagineum*
		Gippsland Lakes Coastal Park	Aloe	*Aloe* spp.
			Ragwort	*Senecio jacobaea*
			Spear Thistle	*Cirsium vulgare*
		Gippsland Lakes parks and reserves CENTRAL – LOP B The Lakes National Park	Belladonna Lily	*Amaryllis belladonna*
		Gippsland Lakes parks and reserves EAST – LOP C Jones Bay GLR, Macleods Morass WR, Raymond Island GLR	African Box-thorn*	*Lycium ferocissimum*
			Aloe	*Aloe* spp.
			Bridal Creeper*	*Asparagus asparagoides*
		Gippsland Lakes parks and reserves Lower Latrobe Wetlands LOP C/D Sale Common NCR, Heart Morass WR, Dowd Morass WR (DM)	Blue Periwinkle (DM)	*Vinca major*
		Gippsland Lakes parks and reserves WEST – LOP D Clydebank Morass WR (CM), Avon-Perry Delta GLR, Lake Kakydra GLR, The Dardenelles GLR, Tucker Swamp GLR	African Box-thorn*	*Lycium ferocissimum*
			Blackberry*	*Rubus fruticosus* spp. agg.
			Sweet Briar (CM)	*Rosa rubiginosa*
		Grantville NCR	Ragwort	*Senecio jacobaea*
		Holey Plains State Park	Ragwort	*Senecio jacobaea*
		Jack Smith Lake WR	Horehound	*Marrubium vulgare*
			Paterson's Curse	*Echium plantagineum*
			Sweet Briar	*Rosa rubiginosa*
		McLoughlin's Beach – Seaspray CR (also known at Ninety Mile Beach CR)	African Box-thorn*	*Lycium ferocissimum*
			Boneseed*	*Chrysanthemoides monilifera* subsp. *monilifera*
			Horehound	*Marrubium vulgare*
			Paterson's Curse	*Echium plantagineum*
			Sea Spurge	*Euphorbia paralias*
			Sweet Briar	*Rosa rubiginosa*
5	Containment	**Mirboo North Regional Park (Dickies Hill Block)**	Hemlock	*Conium maculatum*
			Perennial Thistle	*Cirsium arvense*
			Slender Thistle	*Carduus pycnocephalus*
			Spear Thistle	*Cirsium vulgare*
			Twiggy Mullein	*Verbascum virgatum*

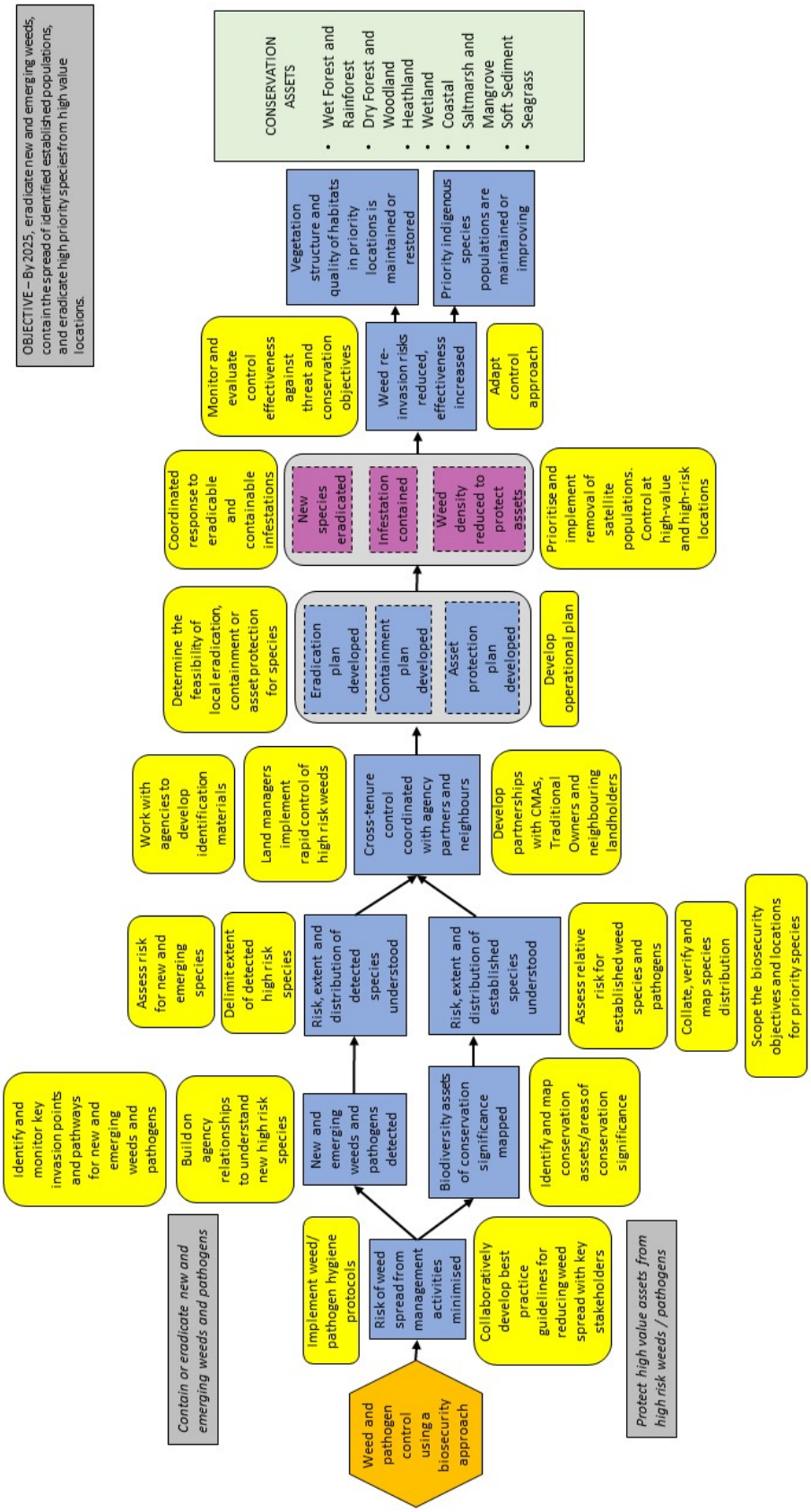
Priority	Action	Park/Reserve	Common name	Botanical name
		Morwell National Park	Black Nightshade	*Solanum nigrum*
			Ragwort	*Senecio jacobaea*
		Mount Worth State Park	Blackberry*	*Rubus fruticosus* spp. agg.
			Blue Periwinkle	*Vinca major*
			English Holly	*Ilex aquifolium*
			Radiata Pine	*Pinus radiata*
			Wandering Trad	*Tradescantia fluminensis*
		Port Franklin-Port Welshpool CR	Bridal Creeper*	*Asparagus asparagoides*
		Providence Ponds FFR	Ragwort	*Senecio jacobaea*
		State Coal Mine HA	Blackberry*	*Rubus fruticosus* spp. agg.
			Blue Periwinkle	*Vinca major*
			Cotoneaster	*Cotoneaster* spp.
			Fennel	*Foeniculum vulgare*
			Montpellier Broom*	*Genista monspessulana*
			Radiata Pine	*Pinus radiata*
			Sweet Pittosporum	*Pittosporum undulatum*
		Tarra Bulga National Park	Fox Glove	*Digitalis purpurea*
			Ragwort	*Senecio jacobaea*
			Slender Thistle	*Carduus pycnocephalus*
			Sow Thistle	*Sonchus oleraceus*
			Spear Thistle	*Cirsium vulgare*
		The Gurdies NCR	Agapanthus	*Agapanthus praecox* subsp. *orientalis*
			Sweet Pittosporum	*Pittosporum undulatum*
		Wonthaggi Heathlands NCR	Angled Onion (Three-Cornered Garlic)	*Allium triquetrum*
		Cape Liptrap Coastal Park	Agapanthus	*Agapanthus praecox* subsp. *orientalis*
			Asparagus Fern*	*Asparagus scandens*
			Mirror Bush	*Coprosma repens*
			White Arum-lily	*Zantedeschia aethiopica*
		Corner Inlet Marine and Coastal Park	Blackberry*	*Rubus fruticosus* spp. agg.
			Bulbil Watsonia	*Watsonia meriana* spp.
			Common Dipogon	*Dipogon lignosus*
5	**Asset Protection**		Townsend's Cord-grass, Common Cord-grass	*Spartina × townsendii*, *Spartina anglica*
			Mirror Bush	*Coprosma repens*
		Nooramunga Marine and Coastal Park	Blackberry*	*Rubus fruticosus* spp. agg.
			Bluebell Creeper	*Billardiera heterophylla*
			Cape Ivy (Ivy Groundsel)	*Delairea odorata*
			Common Dipogon	*Dipogon lignosus*
			Townsend's Cord-grass, Common Cord-grass	*Spartina × townsendii*, *Spartina anglica*
			Mirror Bush	*Coprosma repens*
6	**Containment**	**Adams Creek NCR**	Ragwort	*Senecio jacobaea*
		Gippsland Lakes parks and reserves EAST – LOP D Eagle Point GLR, Flannagan Island GLR, Point Fullarton GLR,	Spiny Rush (SL)	*Juncus acutus* subsp. *acutus*

Priority	Action	Park/Reserve	Common name	Botanical name
		Slaughterhouse Creek GLR (SL), Jones Bay WR		
		Gippsland Lakes parks and reserves WEST – LOP D Clydebank Morass WR, Avon-Perry Delta GLR (AP), Lake Kakydra GLR, The Dardenelles GLR, Tucker Swamp GLR	Common Soap Aloe (AP)	*Aloe saponaria*
		Mount Worth State Park	Ragwort	*Senecio jacobaea*
		State Coal Mine HA	Spear Thistle	*Cirsium vulgare*
			Variegated Thistle	*Silybum marianum*
		Wonthaggi Heathlands NCR	Cape Weed	*Arctotheca calendula*
		Yallock-Bulluk Marine and Coastal Park (proposed)	Angled Onion (Three-Cornered Garlic)	*Allium triquetrum*
			Blackberry*	*Rubus fruticosus* spp. agg.
			Cape Ivy (Ivy Groundsel)	*Delairea odorata*
			Cleavers	*Galium aparine*
			Cocksfoot	*Dactylis glomerata*
			Dolichos Pea	*Dipogon lignosus*
			English Ivy	*Hedera helix*
			Mirror Bush	*Coprosma repens*
			Montbretia	*Crocosmia × crocosmiiflora*
			Ox-tongue	*Helminthotheca echioides*
			Panic Veldt-grass	*Erharta erecta* var. *erecta*
			Pennyroyal	*Mentha pulegium*
			Sea Spurge	*Euphorbia paralias*
			Soursob	*Oxalis pes-caprae*
			Sweet Pittosporum	*Pittosporum undulatum*
			Sweet Vernal-grass	*Anthoxanthum odoratum*
6	**Asset Protection**	**Cape Liptrap Coastal Park**	Angled Onion (Three-Cornered Garlic)	*Allium triquetrum*
			Ragwort	*Senecio jacobaea*
			Sea Spurge	*Euphorbia paralias*
			Slender Thistle	*Carduus pycnocephalus*
			Spear Thistle	*Cirsium vulgare*
		Corner Inlet Marine and Coastal Park	African Box-thorn*	*Lycium ferocissimum*
			Ragwort	*Senecio jacobaea*
			Sea Spurge	*Euphorbia paralias*
			Slender Thistle	*Carduus pycnocephalus*
			Townsend's Cord-grass, Common Cord-grass	*Spartina × townsendii*, *Spartina anglica*
		Gippsland Lakes Coastal Park	Sea Spurge	*Euphorbia paralias*
		Gippsland Lakes parks and reserves CENTRAL – LOP B The Lakes National Park	Bridal Creeper*	*Asparagus asparagoides*
			Buffalo Grass	*Stenotaphrum secundatum*
			Common Dipogon	*Dipogon lignosus*
			Horehound	*Marrubium vulgare*
		Grantville NCR	Blackberry*	*Rubus fruticosus* spp. agg.
			Sweet Pittosporum	*Pittosporum undulatum*
		Holey Plains State Park	Ox-eye Daisy	*Leucanthemum vulgare*

Priority	Action	Park/Reserve	Common name	Botanical name
		Mirboo North Regional Park (Dickies Hill Block)	Blackberry*	*Rubus fruticosus* spp. agg.
			Sweet Pittosporum	*Pittosporum undulatum*
		Morwell National Park	Purpletop Verbena	*Verbena bonariensis* var. *bonariensis*
		Nooramunga Marine and Coastal Park	African Box-thorn*	*Lycium ferocissimum*
			Gorse*	*Ulex europaeus*
			Ragwort	*Senecio jacobaea*
			Sea Spurge	*Euphorbia paralias*
			Townsend's Cord-grass, Common Cord-grass	*Spartina × townsendii*, *Spartina anglica*
		Providence Ponds FFR	African Love-grass	*Eragrostis curvula*
			Bridal Creeper*	*Asparagus asparagoides*
		Tarra Bulga National Park	Blackberry*	*Rubus fruticosus* spp. agg.
7	**Asset Protection**	**Adams Creek NCR**	Blackberry*	*Rubus fruticosus* spp. agg.
			Sweet Pittosporum	*Pittosporum undulatum*
		Anderson Inlet CR	Sweet Violet	*Viola odorata*
		Yallock-Bulluk Marine and Coastal Park (proposed)	Belladonna Lily	*Amaryllis belladonna*
			Blackberry Nightshade	*Solanum nigrum*
			Broadleaf Dock	*Rumex obtusifolius*
			Couch Grass	*Cynodon dactylon*
			Marram Grass	*Ammophila arenaria*
			Nodding Thistle (Musk Thistle)	*Carduus nutans*
			Perennial Thistle	*Cirsium arvense*
			Ragwort	*Senecio jacobaea*
			Silver Wormwood	*Artemisia arborescens*
			Spear Thistle	*Cirsium vulgare*
			Stinkwort	*Dittrichia graveolens*
			Variegated Thistle	*Silybum marianum*
			Winged Slender-thistle	*Carduus tenuiflorus*
		Gippsland Lakes parks and reserves CENTRAL – LOP B The Lakes National Park	Ragwort	*Senecio jacobaea*
			Spear Thistle	*Cirsium vulgare*
		Gippsland Lakes parks and reserves Lower Latrobe Wetlands LOP C/D Sale Common NCR, Heart Morass WR, Dowd Morass WR (DM)	Saffron Thistle (DM)	*Carthamus lanatus*
			Spear Thistle (DM)	*Cirsium vulgare*
			Tall Fleabane (DM)	*Erigeron sumatrensis*
		Jack Smith Lake WR	African Box-thorn*	*Lycium ferocissimum*
			Sea Spurge	*Euphorbia paralias*
		Mirboo North Regional Park (Dickies Hill Block)	Ragwort	*Senecio jacobaea*
		Morwell National Park	Perennial Thistle	*Cirsium arvense*
			Spear Thistle	*Cirsium vulgare*
		Mount Worth State Park	Hawthorn	*Crataegus monogyna*
		Providence Ponds FFR	Spear Thistle	*Cirsium vulgare*
		The Gurdies NCR	Red-ink weed	*Phytolacca octandra*

Priority	Action	Park/Reserve	Common name	Botanical name
8	Asset Protection	**Anderson Inlet CR**	Blackberry Nightshade	*Solanum nigrum*
		Anderson Inlet CR	Ragwort	*Senecio jacobaea*
		Gippsland Lakes parks and reserves Lower Latrobe Wetlands LOP C/D Sale Common NCR (SC), Heart Morass WR, Dowd Morass WR	Water Buttons (SC)	*Cotula coronopifolia*
		Gippsland Lakes parks and reserves WEST – LOP D Clydebank Morass WR, Avon-Perry Delta GLR, Lake Kakydra GLR, The Dardenelles GLR, Tucker Swamp GLR	Spear Thistle	*Cirsium vulgare*
		Gippsland Lakes parks and reserves reserves Lower Latrobe Wetlands LOP C/D Sale Common NCR (SC), Clydebank Morass WR, Heart Morass WR	Thistles (SC)	
		The Gurdies NCR	Thistles	
9	Containment	**Gippsland Lakes parks and reserves CENTRAL – LOP C** Blond Bay WR, Morley Swamp GLR	Scotch Thistle (Heraldic Thistle)	*Onopordum acanthium*
9	Asset protection	**Gippsland Lakes parks and reserves CENTRAL – LOP C** Blond Bay WR, Morley Swamp GLR	Burgan*	*Kunzea ericoides*
		Gippsland Lakes parks and reserves Lower Latrobe Wetlands LOP C/D Sale Common NCR , Heart Morass WR, Dowd Morass WR (DM)	Scotch Thistle (Heraldic Thistle) (DM)	*Onopordum acanthium*
		Holey Plains State Park	Burgan*	*Kunzea ericoides*
		Morwell National Park	Wild Teasel	*Dipsacus fullonum*

Results chain



Implementation milestones

Result	Action
Contain or eradicate new and emerging weeds and pathogens	
The risk of weed spread from management activities is minimised.	• Develop and implement weed/pathogen hygiene protocols. • Develop best-practice guidelines for reducing weed spread, in collaboration with key stakeholders (DJPR and DELWP).
New and emerging weeds/pathogens are detected.	• Identify and monitor key invasion points and pathways for new and emerging weeds and pathogens. • Survey parks and reserves where the threat of pest plants is unknown. • Collaborate with land management and biosecurity partners to understand current and emerging risks.
The risk, extent and distribution of detected species is understood.	• Utilise weed management priority matrix (Appendix C) to assess risk and determine management priority ranking. • Delimit extent of detected high risk species.
Cross-tenure control is coordinated with partner agencies and/or park neighbours.	• Work with partner agencies to develop and distribute weed identification materials. • Neighbouring land managers implement rapid control of high risk weeds.
Eradication plan developed.	• Determine the feasibility of local eradication, containment or asset protection for species. • Develop operational plan.
New species eradicated.	• Coordinated response to eradicable and containable infestations.
Weed re-invasion risks are reduced, effectiveness increased.	• Monitor and evaluate control effectiveness against threat and conservation objectives. • Adapt control approach if required.
Vegetation structure and quality of habitats in priority locations is maintained or restored.	
Priority indigenous species populations are maintained or improving.	
Protect high-value areas from high-risk weeds and pathogens	
The risk of weeds spreading from management activities is minimised.	• Collaboratively develop best practice guidelines for reducing weed spread with key stakeholders. • Implement weed/pathogen hygiene protocols.
Biodiversity assets of conservation significance are mapped.	• Identify and map conservation assets and areas of conservation significance.
The risk, extent and distribution of detected species are understood.	• Assess the relative risks for established weed species and pathogens. • Collate, verify and map weed species distribution in relation to the assets. • Utilise weed management priority matrix (Appendix C) to determine management priority ranking.
Cross-tenure control is coordinated with agency or neighbour partners.	• Develop partnerships with CMAs, Traditional Owners, Landcare groups and neighbouring landholders.
Containment plan is developed. Asset protection plan is developed.	• Work with park neighbours to develop operational containment plans.

Result	Action
	• Develop asset protection plans for priority environmental assets • Determine the feasibility of local eradication, containment or asset protection for pest plant species.
Infestations are contained. Weed density is reduced to protect assets.	• Prioritise and implement the removal of satellite weed populations. • Control weeds at high-value and high-risk locations.
Weed re-invasion risks are reduced, effectiveness increased.	• Monitor and evaluate control effectiveness against threat and conservation objectives. • Adapt control approach if required.
Vegetation structure and quality of habitat in priority locations is maintained or restored.	
Priority indigenous species populations are maintained or improving.	

6.4 Herbivore management

Conservation outcomes

Increase in the health of ground layer vegetation and improvement in the structure of woodlands.

Strategy

The aim of herbivore management is to increase the health of habitats for native flora and fauna and the health of waterways in the Parks Landscape. A number of exotic grazing and browsing species will be managed concurrently to reduce competition with native animals and degradation to conservation and cultural assets.

Grazing and browsing management

Because of the size of the Gippsland Plains and Strzelecki Ranges Parks Landscape, it is not feasible to control introduced grazing and browsing animals across the entire scope. Significant areas of habitat that are being degraded by grazing, or associated impacts such as trampling and wallowing will be identified and prioritised for herbivore control works. Priority areas may include woodlands with heavily grazed shrub layers and sites with significant orchid populations. Habitat where new populations of introduced herbivores are establishing will also be targeted for control.

Initially, data will be collected about herbivore habitat use, movement patterns and the pathways used to enter parks. This information will be used to increase the effectiveness of herbivore control in significant areas and identify neighbours that Parks Victoria will partner with.

Parks Victoria will continue to carry out rabbit control, using contractors and shooting organisations. New sites suitable for biological control release will also be investigated. Because population numbers can increase quickly when 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 volunteer hunters, using specialist contractors and targeting

control efforts to high conservation value areas. Hog Deer control programs are currently underway in Wilsons Promontory and other programs may be developed for this landscape where required. Herbivore management is particularly important for critical island habitats (e.g. Hog Deer on Snake Island).

Parks Victoria will continue surveillance to ensure that goats do not become re-established in parks and reserves where they have been recently eradicated (e.g. Blond Bay WR). Parks Victoria will also continue to monitor for and enforce the removal of cattle being illegally grazed in parks and reserves.

Koala management

In the mid twentieth century, Koalas were introduced to Snake Island in Nooramunga Marine and Coastal Park and Raymond Island Gippsland Lakes Reserve and have since established large populations. Consequently, over-browsing has caused serious degradation to Manna Gum woodlands and an increase to the mortality rate of koalas due to starvation. On Snake Island, Koalas will continue to be managed through fertility control in accordance with the Snake Island Koala Impact Management Plan (Parks Victoria, 2018). The program to manage koala numbers and health on Raymond Island will continue with the aim of reducing the population size to a sustainable level through fertility control and translocation. On both islands, Koala population control will be carried out in conjunction with other herbivore management on the islands in order to maximise the recovery of the Manna Gum woodlands.

Communications

Public cooperation is essential for successful herbivore management. Deer populations are valued by hunters as game species, and are considered an unwanted pest by many landowners so particular care must be taken when communicating 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 rational 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.

Strategy summary

Herbivore management – Increasing the health of habitats for native flora and fauna, and the health of waterways, with management of exotic grazing and browsing species.

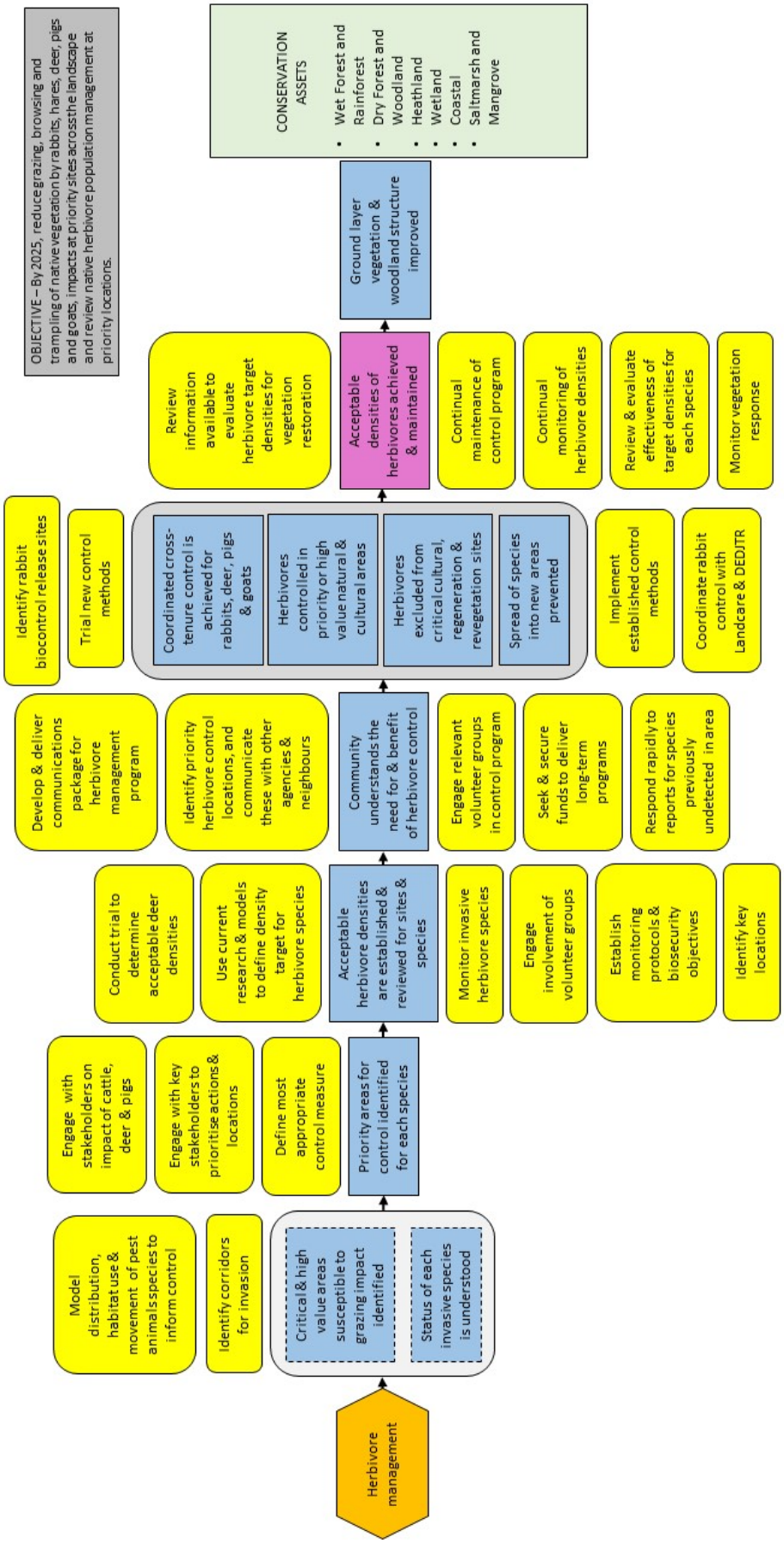
Table 6.4 Priority herbivore management in the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Target species	Conservation assets to benefit*	Priority locations
Goats	Heathland, Dry Forest and Woodland, Wetland	Gippsland Lakes Coastal Park, Gippsland Lakes Reserves
Domestic Cattle	Wetland, Coastal	Gippsland Lakes Reserves, Snake Island
Pigs	Heathland, Dry Forest and Woodland, Wetland	Gippsland Lakes Coastal Park, Gippsland Lakes Reserves, Providence Ponds FFR, The Gurdies NCR, Grantville NCR
Rabbits	Dry Forest and Woodland, Wetland	Jack Smith Lake WR, Nyerimilang Park
Hog Deer	Coastal, Dry Forest and Woodland, Wetland	Nooramunga Marine & Coastal Park

Target species	Conservation assets to benefit*	Priority locations
Sambar Deer	Wet Forest and Rainforest	Tarra Bulga National Park
	Dry Forest and Woodland, Wetland	The Lakes National Park, Gippsland Lakes Coastal Park , Gippsland Lakes Reserves, Providence Ponds FFR
Koalas	Dry Forest and Woodland	Raymond Island GLR, Snake 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
Critical and high value areas susceptible to grazing impact identified. Status of each invasive species is understood.	• Model distribution, habitat use and movement of pest animal species to inform control. • Identify corridors for invasion.
Priority areas for control identified for each invasive species.	• Engage with stakeholders on impact of cattle, deer and pigs. Engage with key stakeholders to prioritise actions and locations (e.g. land owners, traditional owners). • Define most appropriate control measure (e.g. fencing, culling. ripping, poisoning).
Acceptable herbivore densities are established and reviewed for sites and species.	• Conduct trial to determine acceptable deer and pig densities, relative to impact. • Use current research and models to define density target for herbivore species. • Monitor invasive herbivore species. • Engage involvement of volunteer groups such as the Sporting Shooters Association. • Establish monitoring protocols and biosecurity objectives. • Identify key locations for monitoring.
Community understands the need for and benefit of herbivore control and restoration.	• Develop and deliver communications package for herbivore management program. • Identify priority herbivore control locations. • 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.
Coordinated cross-tenure control is achieved for rabbits, deer, pigs and goats. Herbivores controlled in priority or high value natural and cultural areas. Herbivores excluded from critical cultural, regeneration and revegetation sites. Spread into new areas is prevented.	• Identify rabbit biocontrol release sites. • Trial new control methods as they become available. • Implement established control methods. • Coordinate rabbit control with Landcare and DJPR.
Acceptable densities of herbivores achieved and maintained.	• Monitor vegetation response. • Review information available to evaluate herbivore target densities for vegetation restoration. • Continual maintenance of control program. • Continual monitoring of herbivore densities. • Review and evaluate effectiveness of target densities for each species.
Ground layer vegetation and woodland structure improved.	

6.5 Ongoing control of introduced predators to support resilient native fauna populations

Conservation outcomes

Populations of native prey species persist in the Parks Landscape at viable levels. The distribution of prey species does not decrease, and populations may colonise new areas.

Strategy

The ongoing control of introduced predators will support vulnerable native animal species to persist, increase in numbers and recolonise suitable habitat in the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Predator control

In order to best inform predator control and monitoring efforts, species records and habitat suitability models will be used to inform the location and prioritisation of predator control and the monitoring of vulnerable prey species such as New Holland Mouse, Southern Brown Bandicoot, beach-nesting shorebirds (e.g. Hooded Plover, Crested Tern and Caspian Tern) and other migratory species. Predator control will then target areas with vulnerable populations of native prey species, including the Corner Inlet and Gippsland Lakes Ramsar sites, and critical island habitats (e.g. barrier islands in Nooramunga Marine and Coastal Park). Control will also prioritise areas which are identified as suitable habitat for native prey species but are unoccupied because of high predation pressure. To achieve an effective reduction in feral predators, control programs will be carried out with joint management partners and other agencies, and with neighbouring landowners beyond park and reserve boundaries.

Techniques currently available for fox control (baiting, soft jaw trapping, shooting and den fumigation) enable landscape-scale population control. Feral cats have recently been declared an established pest on public land under the Victorian *Catchment and Land Protection Act 1994*. Parks Victoria will seek the support of key agencies to develop alternative approaches to feral cat control, which may include a trial

program of targeted cat baiting. Targeted control of feral cats may be achieved through trapping, using cages or soft jaw traps.

A combination of integrated control methods will be used to control feral pigs, including building community awareness of impacts, engaging volunteer hunters, using specialist contractors and focusing control efforts on areas of high conservation value.

In some cases, control programs aimed at reducing numbers of one predator species have corresponded with increasing numbers of another predator. Therefore, integrated control of key predator species will be carried out to 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 also need to be considered together.

Although a significant threat, predators are not the only cause of declines in prey species. The strategy will be implemented in close conjunction with other strategies that aim to improve the quality and extent of available habitat for fauna (fire management, and managing grazing and browsing animals). Predator control needs to be integrated with planned burning and bushfire recovery, as reduced availability of refuges for native fauna, increased access for predators, and post-fire prey switching may occur.

Monitoring and research

The ecological roles of wild Dogs, Dingoes and other native predators such as quolls are poorly understood. To better understand the ecological role of native predators, Parks Victoria will seek to support research investigating the roles native predators play in the healthy functioning of the Gippsland Plains and Strzelecki Ranges Parks Landscape.

To evaluate the success of predator control, a number of native prey species will be selected and monitored as indicators of predation pressure. The presence and population sizes of introduced predators will also be monitored and control programs adapted accordingly.

Strategy summary

Ongoing control of introduced predators to support native fauna populations – to support vulnerable native animal species to persist and recolonise suitable habitat.

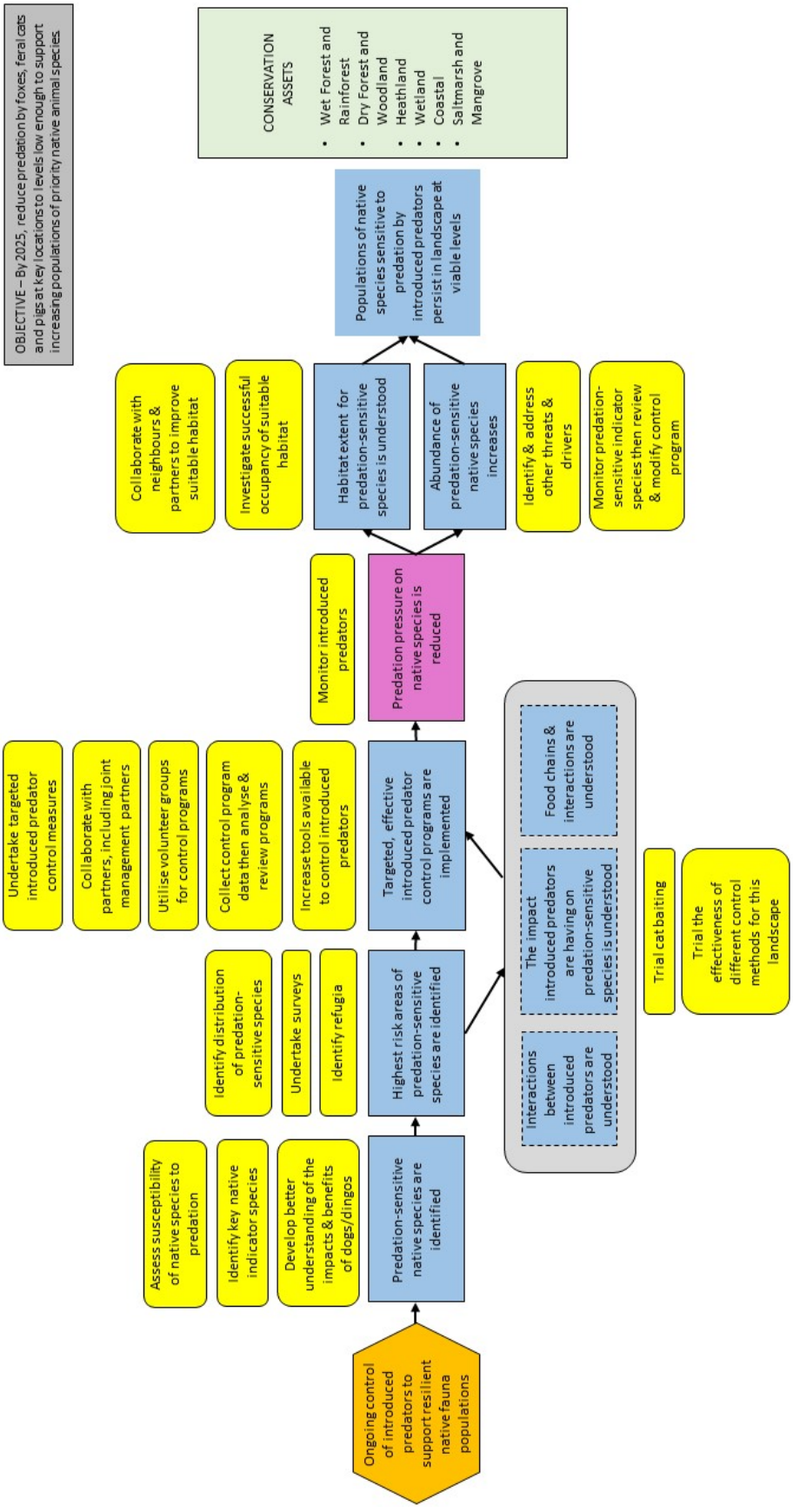
Table 6.5 Priority introduced predator (Fox/Cat) management in the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Nested assets	Conservation assets to benefit*	Priority locations
Bandicoot spp	Heathland, Dry Forest and Woodland, Coastal	Adams Creek/The Gurdies NCR/Grantville NCRs, Yallock-Bulluk Marine & Coastal Park, Cape Liptrap Coastal Park, Gippsland Lakes Coastal Park, Holey Plains State Park
Hooded Plover	Coastal	Cape Liptrap Coastal Park, Gippsland Lakes Coastal Park, Corner Inlet Marine & Coastal Park, Nooramunga Marine & Coastal Park

Nested assets	Conservation assets to benefit*	Priority locations
Waders	Coastal, Soft Sediment	Corner Inlet Marine & Coastal Park, Nooramunga Marine & Coastal Park, Shallow Inlet Marine & Coastal Park
Shorebird and waterbird species	Coastal, Wetland	Corner Inlet and Gippsland Lakes Ramsar sites, Gippsland Lakes Coastal Park
New Holland Mouse	Heathland	Gippsland Lakes Coastal Park, Providence Ponds FFR
Green and Golden Bell Frog	Wetland	Gippsland Lakes Reserves (esp. Macleod Morass & Clydebank Morass)
Lace Monitor	Dry Forest and Woodland	Holey Plains State Park, Providence Ponds FFR, Moormurng FFR
Gliders	Wet Forest and Rainforest	Tarra Bulga National Park
Lyrebird	Wet Forest and Rainforest	Tarra Bulga National Park
Spencer Skink	Wet Forest and Rainforest	Tarra Bulga National Park

*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
Predation-sensitive native species are identified.	• Identify key native indicator species. • Assess susceptibility of native species to predation.
Highest risk areas of predation-sensitive species are identified.	• Identify distribution of predation-sensitive species. • Undertake surveys of predation-sensitive species. • Identify refugia for predation-sensitive species.
Interactions between introduced predators are understood. The impact introduced predators are having on predation-sensitive species is understood. Food chains and interactions (such as prey switching) are understood.	• Trial cat baiting. • Trial the effectiveness of different control methods for this landscape. • Develop better understanding of the impacts and benefits of wild Dogs/Dingoes.
Targeted, effective introduced predator control programs are implemented.	• Undertake targeted introduced predator control measures based on predation-sensitive species, locations and timing. • Collaborate with partners, including joint management partners • Utilise volunteer groups for control programs where suitable/feasible. • Collect control program data then analyse and review programs • Increase tools available to control introduced predators effectively, efficiently and humanely.
Predation pressure on native species is reduced.	• Monitor introduced predators.
Habitat extent for predation-sensitive species is understood.	• Collaborate with neighbours and partners across the landscape to improve habitat for predation-sensitive species (e.g. habitat corridors, habitat improvement). • Investigate successful occupancy of suitable habitat.
Abundance of predation-sensitive native species increases.	• Ensure other threat and drivers are addressed for predation sensitive species. • Monitor predation-sensitive indicator species and review and modify control program.
Populations of native species sensitive to predation by introduced predators persist in landscape at viable levels.	

6.6 Managing marine pests for healthy marine protected areas

Conservation outcomes

New infestations of marine pests are reduced and marine pests have a minimal impact on marine ecosystems in marine protected areas. Existing incursions of marine pests are managed, where feasible, to minimise impacts so that native marine species recolonise and marine diversity is maximised.

Strategy

Preventing and managing new infestations

Because marine invasive species can arrive in new areas on the hulls of boats and fishing equipment, and in the bilge and ballast water of larger vessels, increasing public awareness of marine pests and good boat and equipment hygiene practices is essential, including in the numerous ports along the Gippsland coast. Parks Victoria will work with partner agencies to support the promotion of boat hygiene regulations, and will assist in the development or review of regulations to prevent the spread of pests. Continuing to work with partners to ensure that ballast water is not discharged in priority areas will also result in a decrease in the likelihood of the establishment of new marine pest populations.

Continual monitoring of the marine environment is required to identify and respond to new outbreaks of marine pests before they become established. Parks Victoria will work with partners to carry out surveillance for marine pests. Sufficient sites will be identified in order to establish a strong monitoring program that is likely to detect new infestations. Together with a rapid control response, the program will reduce the likelihood of new pest populations establishing.

Managing existing infestations

Once established, populations of marine pests are very difficult to reduce or eliminate. The priority for managing marine pests is to contain existing populations, and preventing new invasions, or manage their impacts on assets. Understanding the current distribution of pest marine species is essential for detecting new incursions.

In areas where overabundant marine species act like marine pests, such as overabundant Sea Urchins in Nooramunga Marine and Coastal Park, adaptive management programs will be undertaken with the aim of developing long term strategies to protect habitats.

Targeted marine pest monitoring program will assess impacts of existing pest populations, and management will be carried out where feasible. The existing Marine Pest Monitoring Plan for South Gippsland MPA's will be used as part of this process.

Strategy summary

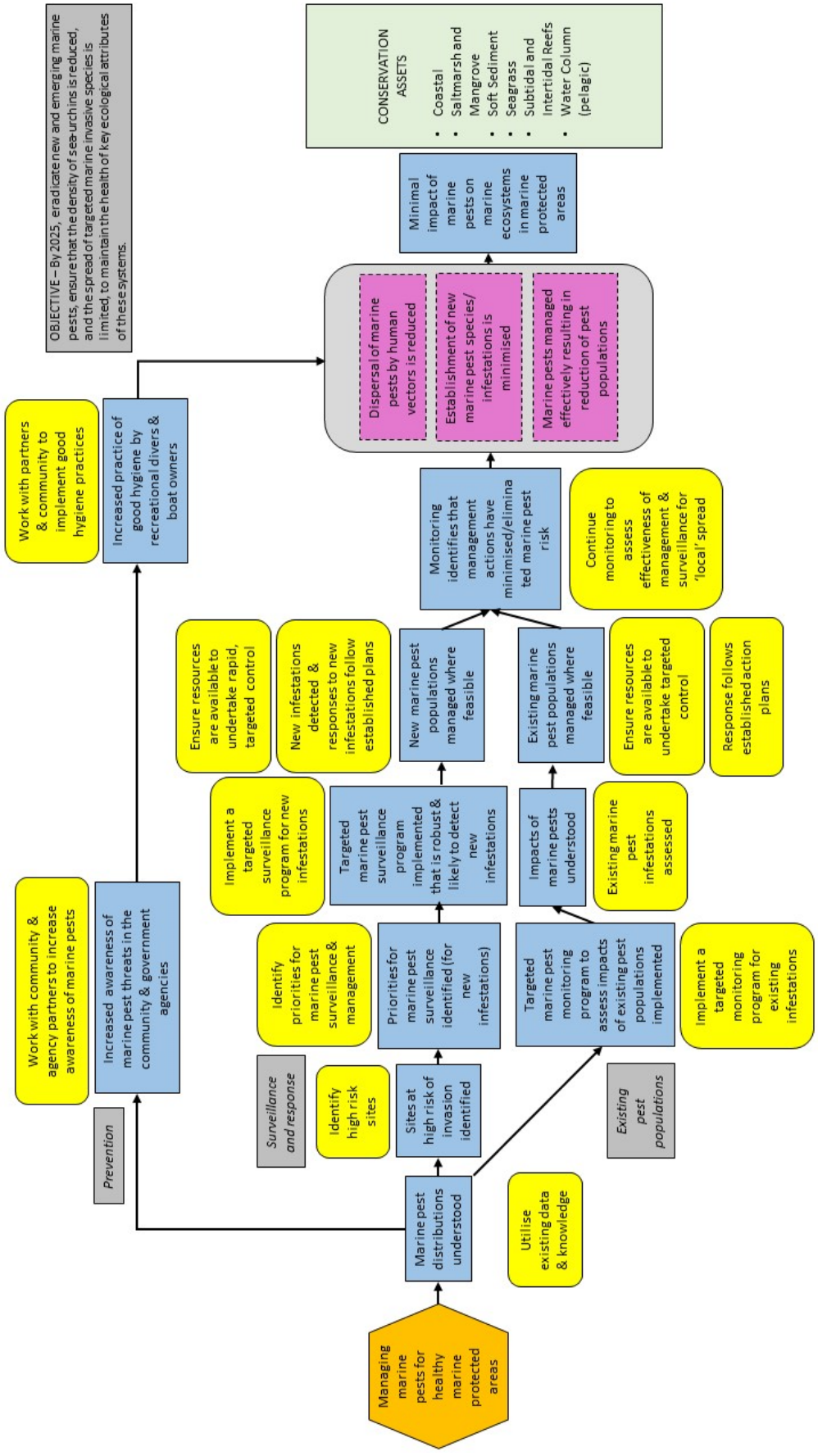
Managing marine pests for healthy marine protected areas – Containing existing marine pest populations and preventing new invasions.

Table 6.6 Priority marine pest management in the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Target species	Conservation assets to benefit*	Priority locations
Urchin	Seagrass	Nooramunga Marine & Coastal Park (present), Bunurong Marine National Park (potential)
Northern Pacific Seastar	Soft Sediment	Corner Inlet and Nooramunga marine & coastal parks (present), Gippsland Lakes Coastal Park (present), Andersons Inlet (potential), Shallow Inlet Marine & Coastal Park (potential)
Pacific Oyster	Soft Sediment	Gippsland Lakes Coastal Park (present)
New Zealand Screw Shell	Soft Sediment	Corner Inlet Marine National Park (present), Gippsland Lakes Coastal Park (present), Andersons Inlet, Shallow Inlet, Corner Inlet and Nooramunga marine & coastal parks (potential)
European Shore Crab	Soft Sediment, Saltmarsh and Mangrove	Corner Inlet Marine & Coastal Park (present), Gippsland Lakes Coastal Park (present)
Undaria	Subtidal and Intertidal Reefs	Bunurong Marine National Park (potential)
European Fan Worm	Soft Sediment	Gippsland Lakes Coastal Park (present)

*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.	• Utilise existing data and knowledge.
Prevention	
Increased awareness of marine pest threats in the community and government agencies.	• Work with partners to increase awareness of marine pests in the community and government agencies.
Increased practice of good hygiene by recreational divers and boat owners.	• Work with partners and community to implement good hygiene practices.
Dispersal of marine pests by human vectors is reduced.	
Surveillance and response	
Sites at high risk of invasion identified.	• Develop and run a risk assessment and modelling process to identify high risk sites, taking invasion pathways into account.
Priorities for marine pest surveillance identified (for new infestations).	• Identify priorities for marine pest surveillance and management using optimal resource allocation process.
Targeted marine pest surveillance program implemented that is robust and likely to detect new infestations.	• Implement a targeted surveillance program for new infestations.
New marine pest populations managed where feasible.	• Ensure resources are available to undertake rapid, targeted control. • Ensure new marine pest infestations are detected, and responses to new infestations or species follow established action plans.
Establishment of new marine pest species/ infestations is minimised	
Existing pest populations	
Targeted marine pest monitoring program to assess impacts of existing pest populations implemented.	• Implement a targeted monitoring program for existing infestations.
Impacts of marine pests understood	• Existing marine pest infestations assessed.
Existing marine pest populations managed where feasible.	• Ensure resources are available to undertake targeted control • Response follows established action plans.
Monitoring identifies that management actions have minimised / eliminated marine pest risk.	• Continue monitoring to assess effectiveness of management and surveillance for 'local' spread.
Targeted pest populations are reduced.	
Minimal impact of marine pests on marine ecosystems in marine protected areas.	

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

Conservation outcomes

The impacts of illegal activities on priority marine and terrestrial areas and species are minimised, pathways of invasion for pests are reduced and natural resource extraction is sustainable.

Strategy

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 illegal activities. These threats include firewood collection, illegal campfires causing bushfires, illegal access and rubbish dumping facilitating weed invasion and vegetation trampling, damage to cultural assets, illegal fishing and shellfish poaching and unregulated hunting.

Communication

In order to efficiently direct communication and compliance work, Parks Victoria will first identify areas of high impact illegal activity and the groups that use them. The channels and methods of communication will be tailored accordingly.

Public awareness of harvest and collection restrictions and the penalties that apply for infringements will be increased by working with user groups and partner agencies (such as the Sporting Shooters Association, Field & Game Australia, Victorian Game Management Authority) in the Parks Landscape. 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.

The western section of the Gippsland Lakes Coastal Park, along the Ninety Mile Beach, is subject to heavy visitor use in peak periods leading to impacts on vegetation and cultural sites in the narrow dune strip around campgrounds. Areas between the Honeysuckles and Paradise Beach would be improved by better

definition of campsites and vehicle access tracks. Toilets and other campground facilities will be progressively improved, initially at Golden Beach and Delray Beach.

Compliance

Parks Victoria will work closely with DELWP, Game Management Authority and Victorian Fisheries Authority to enforce park rules and regulations around collecting, harvesting, and hunting natural resources. Compliance activities will be 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. Compliance activities will be aligned with the priority activities and focus areas from the Eastern Region Compliance Plan, including fishing regulations, off road driving, and firewood collection. In particular, Corner Inlet and Gippsland Lakes Ramsar sites will be targeted for compliance.

Strategy summary

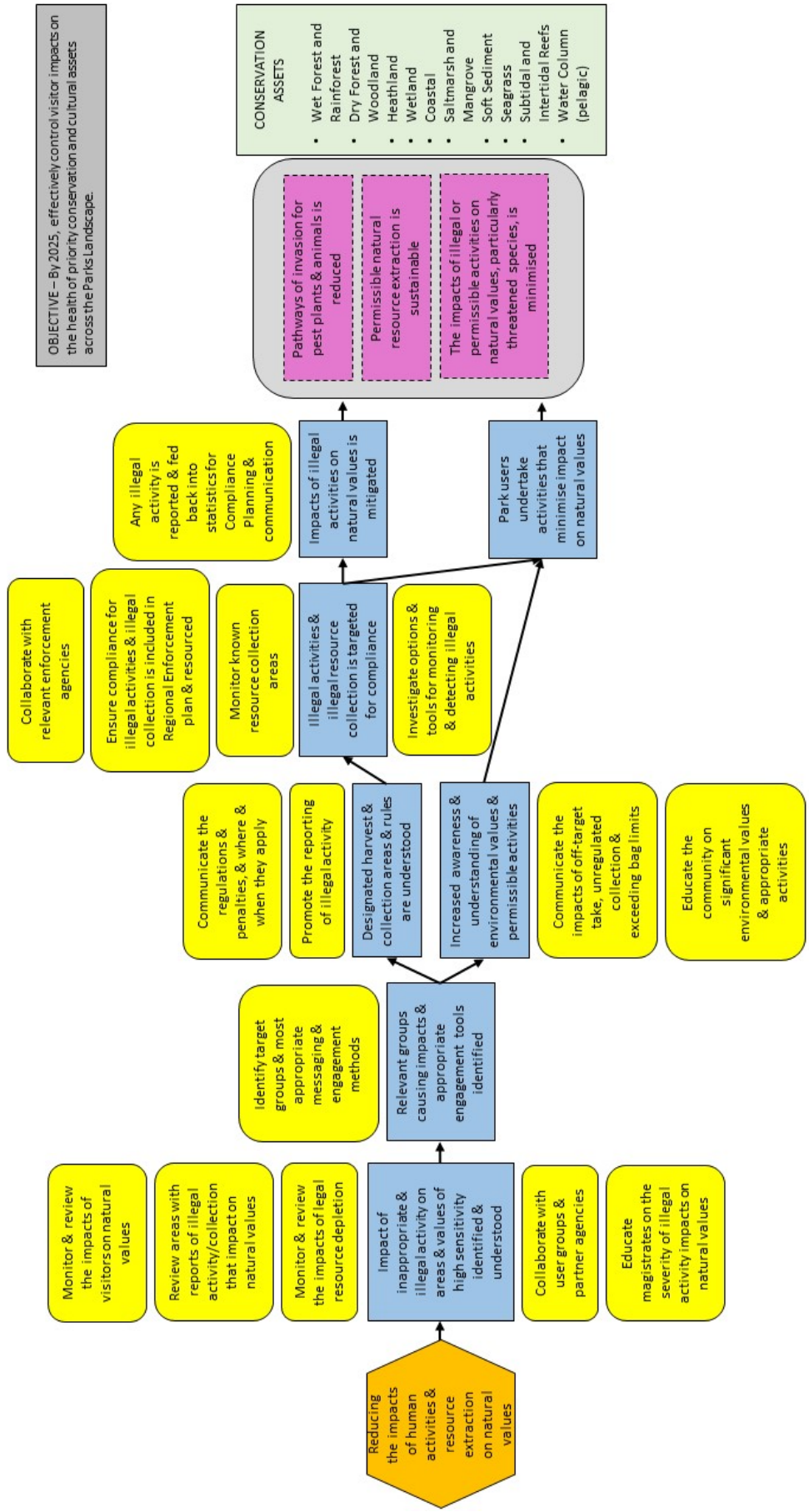
Reducing the impacts of recreation, illegal activities and natural resource extraction on natural values – Encouraging the public to enjoy nature-based tourism activities, while reducing the impacts of illegal activities.

Table 6.7 Priority human impacts management in the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Impact managed	Conservation assets to benefit*	Priority locations
Firewood collection	Heathland, Dry Forest and Woodland	The Gurdies NCR, Grantville NCR, Mirboo North Regional Park, Holey Plains State Park, Stradbrooke FFR, Providence Ponds FFR, Moormurng FFR, Gippsland Lakes Reserves
Shellfish harvesting	Coastal, Soft Sediment, Subtidal and Intertidal Reefs	Bunurong Marine National Park, Cape Liptrap Coastal Park, Nooramunga Marine & Coastal Park
Duck hunting	Wetland	Gippsland Lakes Reserves, Jack Smith Lake WR
Domestic Dogs	Coastal	Cape Liptrap Coastal Park, Yallock-Bulluk Marine & Coastal Park, Shallow Inlet Marine & Coastal Park
Trailbike riding	Dry Forest and Woodland, Heathland, Coastal, Wet Forest and Rainforest	Adams Creek/The Gurdies /Grantville NCRs, Mirboo North Regional Park, Holey Plains State Park, Providence Ponds FFR, Gippsland Lakes Coastal Park, Mullungdung FFR, Nooramunga Marine & Coastal Park, Mount Worth State Park
Boating	Coastal, Wetland, Saltmarsh and Mangrove, Soft Sediment, Seagrass, Water Column	Corner Inlet Marine National Park, Andersons Inlet, Shallow Inlet, Corner Inlet and Nooramunga marine & coastal parks, Gippsland Lakes Coastal Park, Gippsland Lakes Reserves, Jack Smith Lake WR
Illegal access	Coastal	Cape Liptrap Coastal Park, Gippsland Lakes Coastal Park, Jack Smith Lake WR
Camping	Coastal, Dry Forest and Woodland, Heathland	Gippsland Lakes Coastal Park
Fishing	Seagrass, Water Column	Nooramunga Marine & Coastal Park

*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
Impact of inappropriate and illegal activity on areas and values of high sensitivity identified and understood.	• Monitor and review the impacts of visitors on natural values. • Review areas with reports of illegal activity/collection that impact on natural values. • Monitor and review the impacts of legal resource depletion. • Collaborate with user groups and partner agencies. • Educate magistrates on the severity of illegal activity impacts on natural values.
Relevant groups causing impacts and appropriate engagement tools identified.	• Identify target groups and most appropriate messaging and engagement methods.
Designated harvest and collection areas and rules are understood.	• Communicate the regulations and penalties, and where and when they apply. • Promote the reporting of illegal activity. • Communicate the impacts of off-target take, unregulated collection and exceeding bag limits. • Educate the community on significant environmental values and appropriate activities.
Increased awareness and understanding of environmental values and permissible activities.	• Communicate the impacts of off-target take, unregulated collection and exceeding bag limits. • Educate the community on significant environmental values and appropriate activities.
Illegal activities and illegal resource collection is targeted for compliance.	• Seek funding opportunities to increase the capacity to undertake compliance. • Collaborate with relevant enforcement agencies (e.g. Department of Environment, Land, Water and Planning, Environment Protection Authority, Victorian Fisheries Authority, Victoria Police, Game Management Authority, Australian Maritime Safety Authority). • Ensure compliance for illegal activities and illegal collection is included in Regional Enforcement plan and resourced for implementation. • Monitor known resource collection areas. • Investigate options and tools for monitoring and detecting illegal activities.
Impacts of illegal activities on natural values is mitigated.	• Any illegal activity is reported and fed back into statistics for Compliance Planning and communication.
Park users undertake activities that minimise impact on natural values, within permitted areas and abide by regulations.	
Pathways of invasion for pest plants and animals is reduced. Permissible natural resource extraction is sustainable. The impacts of illegal or permissible activities on natural values, particularly threatened species, is minimised.	

6.8 Establishing collaborative partnerships and addressing key knowledge gaps

Conservation outcomes

Improved efficacy of park management, closer partnerships with Traditional Owners and other groups and increased preparedness to respond to climate change.

Strategy

Partnerships

Many of the actions in this plan will require close collaboration and involvement from our partners, stakeholders and community. The aim of this strategy is to promote effective collaboration and partnerships between Parks Victoria and land management partners to support connected management across the fragmented Parks Landscape. A key focus over the next five years will be to strengthen our relationships through agreements with partners that define future roles and actions.

The current joint management of four parks and reserves in this landscape, in a partnership between the Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC) and Parks Victoria, represents an exciting new way to manage *wurruk* (country) and acknowledge important past, present and future cultural and natural values. It aims to bring together the combined skills, expertise and cultural knowledge of the Gunaikurnai people and park staff, to manage the parks and reserves in a way that respects and values the culture and traditions. It is made up of two parts; the first being a joint management strategic plan describing shared joint management aspirations and the long-term strategy to achieve them, the second being a series of individual management plans for each park or reserve. It is expected to lead to Gunaikurnai people having a real influence on how the land is managed, employment creation, education and training opportunities, and park users and visitors continuing to be able to enjoy both traditional and new activities that connect them with nature and Gunaikurnai culture (GKTOLMB 2018).

Parks Victoria will continue to partner with the Gunaikurnai people across their traditional lands, and will support them in implementing the Gunaikurnai – Victorian Government Joint Management Plan. Public awareness of this partnership will be promoted, including through improved interpretive signage at Tarra–Bulga National Park and reserves around the Gippsland Lakes.

The Bunurong people have a deep connection to country, and caring for country plays a vital role in Bunurong culture. Parks Victoria will work collaboratively with the Bunurong Land Council Aboriginal Corporation across their traditional lands in the west of the Gippsland Plains and Strzelecki Ranges Parks Landscape (see Figure 0.1, page v).

A number of other groups are working to improve the health of the Parks Landscape, including DELWP, the West Gippsland and East Gippsland CMAs, Gippsland Plains Conservation Management Network, South Gippsland Conservation Society and Trust for Nature. Working with partners, including Greening Australia and Landcare networks, on cross-tenure projects is particularly important in such a fragmented landscape. Parks Victoria already has strong working arrangements with many of these groups and will take an active role in building and maintaining the partnerships to increase the effectiveness of strategic and operational planning, on-ground management, knowledge sharing, and providing cross-tenure support for projects and partners.

Partnerships are crucial to protect and improve the condition of assets that occur in small or narrow reserves. For example, rainforest in reserves such as Gunyah Rainforest Scenic Reserve can be surrounded by Wet Forest, plantations in State Forest, or private land. In order to protect the rainforest remnants, Parks Victoria must work in partnership with neighbours to manage the Wet Forest that buffers it. Parks Victoria will continue to work with HVP Plantations to connect and buffer Rainforest and Wet Forest reserves through the Cores and Links project.

Similarly, Parks Victoria will seek to work with landowners to increase available habitat for the Saltmarsh and Mangrove conservation asset as it retreats inland in the face of expected sea level rises, including utilising the Corner Inlet Connections partnership through the West Gippsland CMA.

Knowledge gaps

Parks Victoria seeks to increase collaboration with researchers and land and fire managers to address knowledge gaps, especially through adaptive management and formal research. This will include supporting cultural mapping of the landscape by joint management partners, as identified in the Gunaikurnai – Victorian Government Joint Management Plan. Cultural mapping will seek to determine the extent of occupation and traditional use of park areas by the Gunaikurnai.

Parks Victoria, in partnership with DELWP and the CFA undertake fire and biodiversity research across Victoria, through a number of programs, including the 'Bushfire Monitoring, Evaluation and Reporting (MER) Framework' and 'Safer Together'. However, many knowledge gaps remain in this complex field, particularly in fragmented landscapes such as the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Other key knowledge gaps to be investigated include:

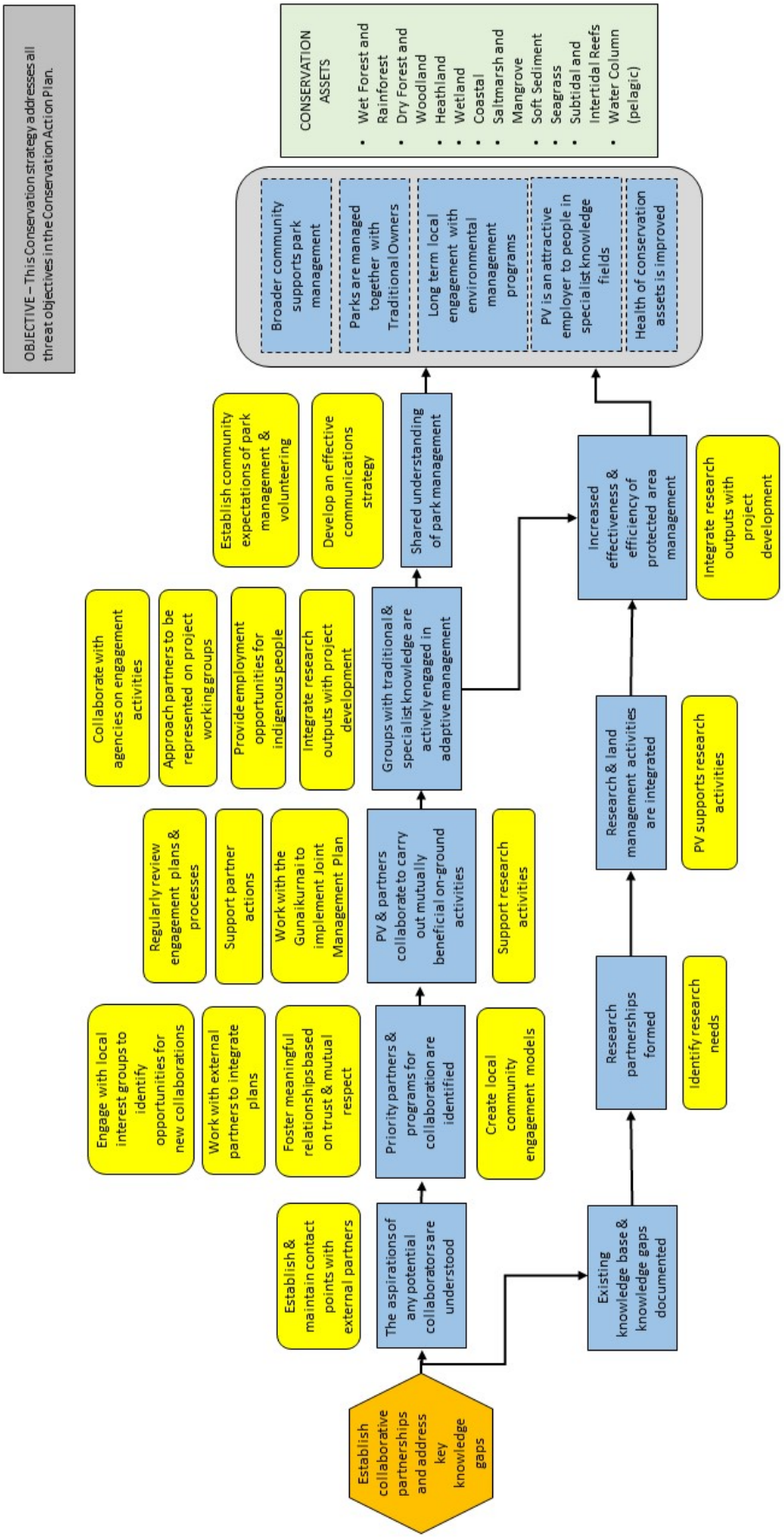
- the role of native predators such as the Lace Monitor, birds of prey and quolls in the health of the Parks Landscape
- effective, landscape-scale pest animal control, which may include trials of
  - cat baiting
  - alternative pig traps
  - physical barriers to reduce the movement of deer, pigs and goats
  - balloted Hog Deer hunting
- techniques to safely burn or provide alternative disturbance to coastal vegetation near populated areas
- modelling of the impact of climate change on the Saltmarsh and Mangrove conservation asset

- freshwater invertebrate abundance and diversity in Wet Forest and Rainforest
- the extent and abundance of mammals in the small to critical weight range
- native flora and weed surveys
- shark population trends.

Strategy summary

Establish collaborative partnerships and address key knowledge gaps – Promoting effective collaboration and partnership between Parks Victoria, Traditional Owners, land management partners, researchers and community groups to support improved management across the fragmented Parks Landscape.

Results chain



Implementation milestones

Result	Action
The aspirations of any potential collaborators are understood.	• Establish and maintain contact points with external partners.
Existing knowledge base and knowledge gaps documented	
Research partnerships formed.	• Identify research needs.
Research and land management activities are integrated.	• PV supports research activities.
Priority partners and programs for collaboration are identified.	• Engage with local interest groups to identify opportunities for new collaborations. • Work with external partners to integrate other formal plans with PV plans • Foster meaningful relationships based on trust and mutual respect. • Create local community engagement models.
PV and partners collaborate to carry out mutually beneficial on-ground activities.	• Regularly review engagement plans and processes. • Support partner actions. • Work with Gunaikurnai to implement Joint Management Plan. • Support research activities.
Groups with traditional and specialist knowledge are actively engaged in adaptive management.	• Collaborate with agencies on engagement activities to ensure most efficient use of everyone's time. • Approach partners to be represented on project working groups • Provide employment opportunities for indigenous people. • Integrate research outputs with project development.
Shared understanding of park management.	• Develop an effective communications strategy to disseminate research, conservation outcomes and important project milestones. • Establish community expectations of park management and volunteering.
Increased effectiveness and efficiency of protected area management.	• Integrate research outputs with project development.
Broader community supports park management. Parks are managed together with Traditional Owners. Long term local engagement with environmental management programs. PV is an attractive employer to people in specialist knowledge fields. Health of conservation assets is improved.	

Woodland, Moormurng Flora and Fauna Reserve

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 Gippsland Plains and Strzelecki Ranges 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 Gippsland Plains and Strzelecki Ranges Parks Landscape.

Activity measures	Threat measures	Outcome measures
STRATEGY: FIRE — FIRE MANAGEMENT FOR ECOLOGICAL HEALTH THREAT ADDRESSED: INAPPROPRIATE FIRE REGIMES		
• Frequency of engagement with bushfire management agencies and the community • Priority areas with current ecological fire strategies • Number and area of planned burns undertaken with ecological / cultural objectives • Timeliness of bushfire recovery and rehabilitation programs	• Incidence of bushfire in Wet Forest and Rainforest • Incidence of planned burning in Wet Forest and Rainforest • Spatial and temporal distribution of vegetation growth stages of fire-dependent ecosystems in the Parks Landscape • Area of EVCs and EVDs in parks and reserves, and across the Parks Landscape, within tolerable fire intervals	• Area of Wet Forest and Rainforest remaining in intermediate to mature growth stages • Area of old-growth forest • Occupancy of Wet Forest and Rainforest by characteristic arboreal mammal species • Spatial and temporal distribution of vegetation growth stages of fire-dependent ecosystems in the Parks Landscape • Occupancy of Heathland and Dry Forest and Woodland by characteristic small mammal species • Occupancy of Heathland and Dry Forest and Woodland by characteristic bird species • Orchid diversity in Heathland and Dry Forest and Woodland assets
STRATEGY: WATER — SUPPORTING PARTNERSHIPS TO ADDRESS THREATS TO WATER-DEPENDENT ASSETS THREAT ADDRESSED: EXTREME WEATHER EVENTS AND CLIMATE CHANGE, ALTERED HYDROLOGY / REDUCED WATER QUALITY		
• Engagement effort with partners • Timing and release of environmental water to wetlands • Water quality monitoring undertaken/supported	• Reduced nutrient input to rivers	• Maintained condition of freshwater and marine wetland • Waterbird diversity and abundance in the Corner Inlet Ramsar site is improved • Increase in resilience to climate change of freshwater and marine wetlands and fauna
STRATEGY: WEEDS — WEED AND PATHOGEN CONTROL USING A BIOSECURITY APPROACH THREAT ADDRESSED: TERRESTRIAL WEEDS, DISEASES AND PATHOGENS		
• Surveys to fill knowledge gaps (area surveyed, person-days) • Suiveillance effort for new and emerging weeds (area surveyed, person-days) • Treatment effort for new and emerging weeds (species, area treated, person-days) • Area of weeds treated (species, area treated, person-days) • Area of widespread weeds treated (species, area treated, person-days) • Area of priority established weeds for asset protection treated (species, area treated, person-days) • Area of good neighbour weed projects • Plans developed for high-priority species	• Number of populations of new and emerging weeds • Spread of identified populations • Abundance of high priority weed species in high value locations	• Maintained or improving complexity of vegetation structure • Maintained or improved populations of priority indigenous species
STRATEGY: HERBIVORES — HERBIVORE MANAGEMENT THREAT ADDRESSED: INTRODUCED HERBIVORES		
• Efficacy of communication to the public about control activities • Extent and frequency of herbivore control in high-value natural and cultural areas • Extent and frequency of cross-tenure rabbit, pig, deer and goat control • Extent and frequency of koala management	• Herbivore densities in high-value natural and cultural areas • Cross-tenure densities of rabbit, pig, deer and goats	• Multiple age classes present in Wet Forest and Rainforest stands with sufficient numbers of seedlings present to maintain each structural component • All growth stages are represented within Dry Forest and Woodland • Sampled Heathland sites have structural elements and successional stages at benchmark condition
STRATEGY: PREDATION — ONGOING CONTROL OF PREDATORS TO SUPPORT RESILIENT NATIVE FAUNA POPULATIONS		

Activity measures	Threat measures	Outcome measures
THREAT ADDRESSED: INTRODUCED PREDATORS		
• Extent and frequency of fox control in identified high risk areas • Extent and frequency of cat control in identified high risk areas • Number of neighbouring land managers engaged in cross-tenure pest animal management • Area treated for predator control • Person-days of predator control undertaken • Number of baits taken	• Cat activity in identified high risk areas • Fox activity in identified high risk areas	• Small and critical weight range native mammals will be regularly detected at selected sites with suitable habitat
STRATEGY: MARINE — MANAGING MARINE PESTS FOR HEALTHY MARINE PROTECTED AREAS THREAT ADDRESSED: MARINE PESTS		
• Proportion of existing infestations monitored • Number of person-days of surveillance for pests and opverabundant species • Number of partners engaged in marine hygiene practices • Proportion of marine pest populations being actively managed	• Reduced dispersal of marine pests by human vectors • Reduction of pest populations • Number of new pest species / infestations established	• Identified focal species are present at each survey • Presence of key bird species is maintained
STRATEGY: RECREATION — REDUCING THE IMPACTS OF RECREATION, ILLEGAL ACTIVITIES AND NATURAL RESOURCE EXTRACTION ON NATURAL VALUES THREAT ADDRESSED: RECREATION / NATURAL RESOURCE EXTRACTION		
• Number of collaborations with user groups and partner agencies • Amount of new communications around illegal activities and natural values • Number of compliance patrols	• Reduced disturbance to natural values • Reduced pathways of invasion for pest plants and animals • Sustainable legal natural resource extraction • Reduction in illegal activities affecting natural values, particularly threatened species • Reduced effect of permissible visitor activities on natural values, particularly threatened species	• Improve fledging success at key Hooded Plover breeding sites • Diversity and abundance of key marine invertebrate species is maintained
STRATEGY: COLLABORATIONS — ESTABLISH COLLABORATIVE PARTNERSHIPS AND ADDRESS KEY KNOWLEDGE GAPS THREAT ADDRESSED: ALL THREATS		
• Number of partner groups contacted • Number of on-ground activities carried out with partner groups • Number of research projects supported / carried out • Number of volunteer days engaged in park management	• Total effort to manage each threat • Total cost to manage a unit of threat	• Improved efficacy of park management • Strength of partnerships with Traditional Owners and other groups • Increase in preparedness to respond to climate change • Cost / benefits of management

Crested Terns and Pacific Gull,
Ninety Mile Beach Marine National Park

Great Egret,
Gippsland Lakes Coastal Park

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* (Cwlth), *Traditional Owner Settlement Act 2010* (Vic.) and/or *Aboriginal Heritage Act 2006* (Vic.).

PV 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 PV 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 can be identified and appropriately incorporated into project budgets.

The Bunurong community have expressed a desire to help other people understand that its 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, storage and collation 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 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 Gippsland Plains and Strzelecki Ranges 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, 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 logistical issues including access, cultural heritage and areas of high visitation. Engaging with Traditional owners and opportunities for collaboration will be investigated 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 Districts 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 reiterated in response to the outcomes of the Monitoring, Evaluation and Reporting Plan and in response to emerging issues. Reiteration 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 reiteration 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.

Nudibranch, Corner Inlet Marine National Park

References

BMT WBM (2011). *Ecological Character Description of the Corner Inlet Ramsar Site – Final Report.* Prepared for the Australian Department of Sustainability, Environment, Water, Population and Communities, Canberra.

BMT WBM (2011). *Ecological Character Description of the Gippsland Lakes Ramsar Site – Final Report.* Prepared for the Australian Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Boon, P., Allen, T., Brook, J., Carr, G., Frood, D., Hoye, J., Harty, C., McMahon, A., Mathews, S., Rosengren, N., Sinclair, S., White, M. and Yugovic, J. (2011) *Mangroves and Coastal Saltmarsh of Victoria: Distribution, Condition, Threats and Management.* Technical Report. Victoria University, Melbourne.

Carey, J.M., Burgman, M.A., Boxshall, A., Beilin, R., Flander, L., Pegler, P., and White, A.K., (2007). *Identification of Threats to Natural Values in Victoria's Marine National Parks and Marine Sanctuaries.* Parks Victoria Technical Series No. 33. Parks Victoria, Melbourne.

CES (2018) *State of the Environment Report 2018.* Victorian Commissioner for Environmental Sustainability, Melbourne.

Cheal, D. (2010) *Growth Stages and Tolerable Fire Intervals for Victoria's Native Vegetation Data Sets*. Fire and Adaptive Management Report No. 84. Victorian Department of Sustainability and Environment, East Melbourne, Victoria, Australia.

DELWP (2017). *Protecting Victoria's Environment Biodiversity 2037*. Victorian Department of Environment, Land, Water and Planning, East Melbourne.

DELWP (2018). *Weed Risk Ratings* website [https://www.environment.vic.gov.au/invasive-plants-and-animals/weed-risk-ratings], accessed March 2019.

DNRE (1996a). *Tarra–Bulga National Park Management Plan.* Victorian Department of Natural Resources and Environment, East Melbourne, Victoria.

DNRE (1996b). *Mount Worth State Park Management Plan.* Victorian Department of Natural Resources and Environment, East Melbourne, Victoria.

DNRE (1997). *Victoria's Biodiversity: Our Living Wealth.* Victorian Department of Natural Resources and Environment, East Melbourne, Victoria.

DPI (2010). *Invasive plants and animals: policy framework.* State of Victoria Victorian Department of Primary Industries, Melbourne.

Dickson, M. and Park, G. (2020) *Corner Inlet Connections Project Implementation Plan 2018-2023*. Unpublished report for the West Gippsland CMA, Traralgon.

EGCMA (2008) *Regional Catchment Strategy Improving Natural Resource Outcomes in East Gippsland.* East Gippsland Catchment Management Authority, Bairnsdale.

EGCMA (2015) *Gippsland Lakes Ramsar Site Management Plan.* East Gippsland Catchment Management Authority, Bairnsdale.

ISSG (2020) Global Invasive Species Database [http://issg.org/database/welcome/aboutGISD.asp], accessed 24 September 2020.

Gunaikurnai Traditional Owner Land Management Board (2018) *Gunaikurnai and Victorian Government Joint Management Plan.* Gunaikurnai Traditional Owner Land Management Board, Bairnsdale.

Low G. (2003). *Landscape-scale Conservation: A Practitioners Guide*, 4th edition. The Nature Conservancy: Arlington, USA.

Parks Victoria (1998) *The Lakes National Park Management Plan.* Parks Victoria, Melbourne.

Parks Victoria (2005) *Corner Inlet Marine National Park Management Plan.* Parks Victoria, Melbourne.

Parks Victoria (2006a) *Ninety Mile Beach Marine National Park Management Plan*. Parks Victoria, Melbourne.

Parks Victoria (2006b) *Bunurong Marine National Park, Bunurong Marine Park, Bunurong Coastal Reserve and Kilcunda-Harmers Haven Coastal Reserve Management Plan*. Parks Victoria, Melbourne.

Pocklington, J.B., Carey, J.M., Murshed, M.D.T. and Howe, S.A.J. (2012) *Conceptual Models for Victorian Ecosystems: Marine and Estuarine Ecosystems.* Parks Victoria Technical Series No. 66. Parks Victoria, Melbourne.

VEAC (2020) *Assessment of Victoria's Coastal Reserves — Final Report*. Victorian Environmental Assessment Council, Melbourne.

WGCMA (2012) *West Gippsland Regional Catchment Strategy.* West Gippsland Catchment Management Authority, Traralgon.

WGCMA (2014) *West Gippsland Waterway Strategy 2014–2022.* West Gippsland Catchment Management Authority, Traralgon.

White, A.K. (2012). *Ecosystem Conceptual Models for Victorian Ecosystems.* Parks Victoria Technical Series No. 65. Parks Victoria, Melbourne.

White, M., Cheal, D., Carr, G. W., Adair, R., Blood, K. and Meagher, D. (2018). *Advisory List of Environmental Weeds in Victoria*. Arthur Rylah Institute for Environmental Research Technical Report Series No. 287. Department of Environment, Land, Water and Planning, Heidelberg, Victoria.

Zimmer, H., Cheal, D., and Cross, E. (2012). *Post-fire Weeds Triage Manual: Black Saturday Victoria 2009 – Natural Values Fire Recovery Program.* Department of Sustainability and Environment, Heidelberg, Victoria.

Appendices

Appendix A — Parks and reserves in the Gippsland Plains and Strzelecki Ranges Parks Landscape and their protection status

Levels of Protection (LoP) for natural values management

Levels of Protection is a tool to aid planning and resource allocation by placing individual parks in a statewide context. Parks have been classified (or grouped) according to composition and representation of attributes classified at the EVC and species scale (Table A.1). A key principle of the framework is that protected area planning is conducted in a bioregional context. The bioregional value, and hence management priority, of biodiversity attributes in parks and reserves has been assessed on the basis of:

- conserving the range of ecosystems and existing biotic diversity
- the occurrence of attributes that depend on a particular park for their security.

The IUCN 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: http://www.iucn.org/theme/protected-areas/about/categories

Category Ia Strict Nature Reserve — strictly protected area set aside to protect biodiversity and also 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.

Table A.1 Park groups and their attributes.

Park group	General description of park group attributes
A1	All parks represent at least 2 bioregions.
	Parks generally greater than 10000 hectares (up to 660 000 hectares), all scheduled under the *National Parks Act*.
	Most parks very large or have contiguity with state forest areas (or both), and have very high area to boundary ratios.
	All have very high diversity in terms of both vegetation communities and species, and represent a high proportion of the bioregions species diversity (about 40–60%).
	Very large number of threatened species present and important for protecting a relatively high proportion of those species.
	Internal fragmentation is highly variable across the scale of these parks as is areas of highly disturbing previous land use.
A2	With Park Group A1, captures representation of all bioregions.
	Park size generally greater than 1000 hectares (up to 21 600 hectares), mostly parks scheduled under the *National Parks Act* but also includes high value nature conservation reserves.
	All have relatively high diversity in terms of both vegetation communities and species, and represent a high proportion of the bioregions species diversity (about 40–60%).
	Large number of threatened species present and important for protecting a relatively high proportion of those species.
	A greater degree of exposure to threatening processes at their edge (than A1), as well as from previous disturbing land uses.
A – Marine	Marine National Parks scheduled under the *National Parks Act*.
B	Represents full range of bioregions, except for 3 bioregions completely conserved within parks in A1 and A2.
	Park size ranges from 50 hectares to 40 000 hectares, majority of nature conservation reserves.
	Parks are protecting vegetation communities largely of moderate significance and well represented in the parks system.
	Parks have relatively lower species diversity, representing a moderate proportion of the bioregions species diversity (about 20–40%).
	Moderate number of threatened species present and important for protecting a small number of those species.
B – Marine	Marine Sanctuaries scheduled under the *National Parks Act*
C	Park size ranges from 1 hectare to 142 300 hectares, predominantly nature conservation reserves, with a small number of parks scheduled under the *National Parks Act* that have relatively low or common biodiversity values.
	Parks are protecting vegetation communities largely of low to moderate significance and that are well represented in the parks system. Generally have moderate to high levels of internal fragmentation and adjacency to non-native vegetation.
	Parks have relatively lower species diversity, representing a moderate proportion of the bioregions species diversity (about 10–30%).
	Moderate but variable number of threatened species present and important for protecting a small number of those species.
D	Park sizes range from 10 hectares to 15 000 hectares, and are conservation reserves.
	Parks have relatively lower species diversity, representing a moderate proportion of the bioregions species diversity (about 2–15%).
	Relatively small number of threatened species present.
E	Generally have very low or nil recorded values of low biodiversity conservation significance.

Table A.2 List of parks and reserves in the Gippsland Plains and Strzelecki Ranges Parks Landscape.

PV area codes used: SGB = South Gippsland and Bass, VPC = Valley Plains and Coasts, LEA = Lakes and Eastern Alps, FSA = Foothills and Southern Alps, WP = Wilsons Promontory, EPP = East Port Phillip and Western Port

Park/reserve name	Reserve type	IUCN categ.	Area (hectares)	Level of Protection	PV Area
Adams Creek N.C.R.	Nature Conservation Reserve	Ia	418.1	D	SGB
Agnes Falls S.R.	Natural Features Reserve – Scenic Reserve	III	10.1	E1	SGB
Allambee East G91 B.R.	Natural Features Reserve – Bushland Reserve	IV	21.1	E1	VPC
Allambee East H12 B.R	Natural Features Reserve – Bushland Reserve	IV	0.4	E1	SGB
Anderson Inlet Coastal Reserve	Coastal Reserve	Not a Protected Area	152.3	No Group	SGB
Andrew Bay – Grebe Bay G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	171.6	E1	VPC
Avon River SS.R.	Natural Features Reserve – Streamside Reserve	III	2.1	E1	VPC
Avon-Perry River Delta G.L.R	Natural Features Reserve – Gippsland Lakes Reserve	VI	169.2	D	VPC
Backwater Morass G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	551.6	D	LEA
Bairnsdale F.R.	Nature Conservation Reserve – Flora Reserve	Ia	2.0	E2	LEA
Bald Hills Creek W.R	Nature Conservation Reserve – Wildlife Reserve (no hunting)	Ia	136.3	C	SGB
Bancroft Bay – Kalimna G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	65.5	No Group	LEA
Baxter Island G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	4.1	E1	LEA
Bengworden N.C.R.	Nature Conservation Reserve	Ia	106.9	No Group	LEA
Bennison F.F.R.	Nature Conservation Reserve – Flora and Fauna Reserve	Ia	2.3	E1	SGB
Binginwarri H15 B.R	Natural Features Reserve – Bushland Reserve	IV	2.8	E1	VPC
Binginwarri H18 B.R	Natural Features Reserve – Bushland Reserve	IV	11.4	E1	VPC
Binginwarri H19 B.R	Natural Features Reserve – Bushland Reserve	IV	4.1	E1	VPC
Binginwarri H43 B.R	Natural Features Reserve – Bushland Reserve	IV	0.9	E1	VPC
Blond Bay G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	184.7	D	LEA
Blond Bay W.R.	Natural Features Reserve – Wildlife Reserve (hunting)	VI	1922.2	C	LEA
Bonnie Brae SS.R.	Natural Features Reserve – Streamside Reserve	III	2.4	E1	SGB

Park/reserve name	Reserve type	IUCN categ.	Area (hectares)	Level of Protection	PV Area
Boolarra N.C.R.	Nature Conservation Reserve	Ia	13.1	E1	VPC
Bruthen Creek SS.R.	Natural Features Reserve – Streamside Reserve	III	3.5	E1	VPC
Bruthen F.R	Nature Conservation Reserve – Flora Reserve	Ia	9.0	E1	VPC
Budgeree B.R.	Natural Features Reserve – Bushland Reserve	IV	3.6	E1	VPC
Bunurong Marine National Park	Marine National Park – Schedule 7, National Parks Act	II	2049.1	Marine A	SGB
Callignee B.R	Natural Features Reserve – Bushland Reserve	IV	2.0	E1	VPC
Callignee W.R	Nature Conservation Reserve – Wildlife Reserve (no hunting)	Ia	44.9	E1	VPC
Cape Liptrap Coastal Park	Other Park – Schedule 3, National Parks Act	II	4320.6	A2	SGB
Cape Liptrap Lighthouse Reserve	Lighthouse Reserve	Not a Protected Area	0.0	E1	SGB
Cape Patterson N.C.R	Nature Conservation Reserve	Ia	2.4	E1	SGB
Carrajung H23 B.R	Natural Features Reserve – Bushland Reserve	IV	1.5	E1	VPC
Carrajung H34 B.R	Natural Features Reserve – Bushland Reserve	IV	2.4	E1	VPC
Clydebank Frontage G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	76.2	No Group	VPC
Clydebank Morass W.R.	Natural Features Reserve – Wildlife Reserve (hunting)	VI	1449.8	D	VPC
Coal Creek SS.R.	Natural Features Reserve – Streamside Reserve	III	18.0	E1	SGB
Coalville G218 B.R	Natural Features Reserve – Bushland Reserve	IV	2.7	E1	VPC
Coalville G219 B.R	Natural Features Reserve – Bushland Reserve	IV	22.8	E1	VPC
Colbert Ck B.R	Natural Features Reserve – Bushland Reserve	IV	2.2	E1	SGB
Cooks Gully F.R	Nature Conservation Reserve – Flora Reserve	Ia	7.3	D	VPC
Corinella B.R.	Natural Features Reserve – Bushland Reserve	IV	4.0	E1	SGB
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve (Marine and Wildlife Reserve)	VI	28559.2	A2	SGB
Corner Inlet Marine National Park	Marine National Park – Schedule 7, National Parks Act	II	1407.2	Marine A	SGB
Darriman H29 B.R	Natural Features Reserve – Bushland Reserve	IV	20.0	E1	VPC
Darriman H33 B.R	Natural Features Reserve – Bushland Reserve	IV	18.1	E1	VPC
Devon B.R.	Natural Features Reserve – Bushland Reserve	IV	18.5	E1	VPC

Park/reserve name	Reserve type	IUCN categ.	Area (hectares)	Level of Protection	PV Area
Dowd Morass W.R.	Natural Features Reserve – Wildlife Reserve (hunting)	VI	1504.1	C	VPC
Drouin G215 B.R	Natural Features Reserve – Bushland Reserve	IV	1.8	E2	VPC
Drouin West G82 B.R	Natural Features Reserve – Bushland Reserve	IV	12.0	E1	VPC
Drouin West G83 B.R.	Natural Features Reserve – Bushland Reserve	IV	10.0	E1	VPC
Drouin West G84 B.R.	Natural Features Reserve – Bushland Reserve	IV	1.6	E1	VPC
Drumdlemara H1 B.R	Natural Features Reserve – Bushland Reserve	IV	3.2	E1	SGB
Drumdlemara H2 B.R	Natural Features Reserve – Bushland Reserve	IV	3.0	E1	SGB
Drumdlemara H4 B.R	Natural Features Reserve – Bushland Reserve	IV	0.6	E1	SGB
Drumdlemara H8 B.R	Natural Features Reserve – Bushland Reserve	IV	31.7	E1	SGB
Eagle Point G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	54.5	D	LEA
Flannagan Island G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	43.2	D	LEA
Franklin River SS.R.	Natural Features Reserve – Streamside Reserve	III	28.5	E1	SGB
Fraser Island G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	3.9	E1	LEA
Fresh-water Swamp, Woodside Beach W.R	Natural Features Reserve – Wildlife Reserve (hunting)	VI	36.2	E1	VPC
Giffard (Rifle Range) F.R.	Nature Conservation Reserve – Flora Reserve	Ia	1092.1	D	VPC
Giffard H30 B.R	Natural Features Reserve – Bushland Reserve	IV	4.4	E1	VPC
Giffard H31 B.R	Natural Features Reserve – Bushland Reserve	IV	17.8	E1	VPC
Gippsland lakes (addition)	Proposed National Parks Act park or park addition	#N/A	3.2		VPC
Gippsland Lakes Coastal Park	Other Park – Schedule 3, National Parks Act	VI	14790.1	B	VPC
Gippsland Lakes Coastal Park	Other Park – Schedule 3, National Parks Act	VI	2997.4	B	LEA
Gormandale F.R	Nature Conservation Reserve – Flora Reserve	Ia	34.4	E1	VPC
Grantville B.R	Natural Features Reserve – Bushland Reserve	IV	29.6	E1	SGB
Grantville N.C.R	Nature Conservation Reserve	Ia	384.1	C	SGB
Greig Creek SS.R.	Natural Features Reserve – Streamside Reserve	III	6.1	E2	VPC
Gunyah Rainforest S.R.	Natural Features Reserve – Scenic Reserve	III	150.4	D	SGB
Heart Morass W.R	Natural Features Reserve – Wildlife Reserve (hunting)	VI	375.0	D	VPC
Hoddle Range F.R.	Nature Conservation Reserve – Flora Reserve	Ia	46.0	D	SGB

Park/reserve name	Reserve type	IUCN categ.	Area (hectares)	Level of Protection	PV Area
Holey Plains State Park	State Park – Schedule 2B, National Parks Act	II	10747.2	B	VPC
Hurdy Gurdy Creek N.C.R	Nature Conservation Reserve	Ia	37.3	E1	SGB
Jack River SS.R.	Natural Features Reserve – Streamside Reserve	III	4.3	E1	VPC
Jack Smith Lake W.R	Natural Features Reserve – Wildlife Reserve (hunting)	VI	2782.4	C	VPC
Jeeralang North E.A.	Education Area	Not a Protected Area	146.0	No Group	VPC
Jones Bay G.L.R	Natural Features Reserve – Gippsland Lakes Reserve	VI	1869.5	C	LEA
Jones Bay W.R	Natural Features Reserve – Wildlife Reserve (hunting)	VI	120.2	D	LEA
Kangaroo Swamp N.C.R.	Nature Conservation Reserve	Ia	104.9	No Group	VPC
Kilcunda N.C.R.	Nature Conservation Reserve	Ia	4.3	No Group	SGB
Kings Flat F.R	Nature Conservation Reserve – Flora Reserve	Ia	80.6	D	SGB
Koonwarra F.R.	Nature Conservation Reserve – Flora Reserve	Ia	13.4	E1	SGB
Lake Coleman W.R	Natural Features Reserve – Wildlife Reserve (hunting)	VI	2095.7	C	VPC
Lake Coleman West W.R	Natural Features Reserve – Wildlife Reserve (hunting)	VI	53.2	E1	VPC
Lake Denison W.R	Natural Features Reserve – Wildlife Reserve (hunting)	VI	117.6	E1	VPC
Lake Kakydra G.L.R	Natural Features Reserve – Gippsland Lakes Reserve	VI	175.5	D	VPC
Lake Melanydra G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	60.2	E1	VPC
Lang Lang E.A.	Education Area	Not a Protected Area	130.2	No Group	SGB
Lang Lang River, Topiram SS.R.	Natural Features Reserve – Streamside Reserve	III	5.7	C	SGB
LaTrobe River, Tyers SS.R.	Natural Features Reserve – Streamside Reserve	III	2.8	E2	VPC
Little Franklin River S.R.	Natural Features Reserve – Scenic Reserve	III	38.4	E1	SGB
Longford N.F.R	Natural Features Reserve	IV	2.9	E2	VPC
Macleod Morass W.R.	Natural Features Reserve – Wildlife Reserve (hunting)	VI	540.3	C	LEA
McLoughlins Beach – Seaspray Coastal Reserve	Coastal Reserve	Not a Protected Area	1735.2	D	VPC
Meerlieu I15 B.R.	Natural Features Reserve – Bushland Reserve	IV	129.0	D	VPC
Meerlieu I16 B.R	Natural Features Reserve – Bushland Reserve	IV	4.2	E1	VPC

Park/reserve name	Reserve type	IUCN categ.	Area (hectares)	Level of Protection	PV Area
Merrimans Creek F.R.	Nature Conservation Reserve – Flora Reserve	Ia	66.8	E1	VPC
Metung B.R.	Natural Features Reserve – Bushland Reserve	IV	4.0	E1	LEA
Mirboo North H13 B.R	Natural Features Reserve – Bushland Reserve	IV	5.8	E1	SGB
Mirboo North R.P	Regional Park – not scheduled under National Parks Act	Not a Protected Area	1255.8	B	SGB
Mirboo South H39 B.R	Natural Features Reserve – Bushland Reserve	IV	6.6	E1	SGB
Mitchell River Silt Jetties G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	275.7	E1	LEA
Mitchell River water reserve G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	15.3	E1	LEA
Moormurng F.F.R.	Nature Conservation Reserve – Flora and Fauna Reserve	Ia	966.3	B	LEA
Morley Swamp G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	230.3	C	VPC
Morwell National Park	National Park – Schedule 2, National Parks Act	III	565.5	B	VPC
Mount Fatigue S.R.	Natural Features Reserve – Scenic Reserve	III	8.9	E1	SGB
Mount Worth State Park	State Park – Schedule 2B, National Parks Act	III	1032.1	D	VPC
Mullungdung F.F.R	Nature Conservation Reserve – Flora and Fauna Reserve	Ia	1656.3	C	VPC
Narracan Falls SS.R.	Natural Features Reserve – Streamside Reserve	III	0.3	E2	VPC
New Zealand Hill F.R.	Nature Conservation Reserve – Flora Reserve	Ia	42.9	E1	SGB
Nicholson Floodplain G.L.R	Natural Features Reserve – Gippsland Lakes Reserve	VI	51.4	No Group	LEA
Ninety Mile Beach Marine National Park	Marine National Park – Schedule 7, National Parks Act	II	2653.1	Marine A	VPC
Nooramunga Marine and Coastal Park	National Parks Act Schedule 4 park or reserve (Marine and Wildlife Reserve)	VI	30091.5	A2	SGB
Nungurner B.R.	Natural Features Reserve – Bushland Reserve	IV	3.8	E1	LEA
Nyerimilang Park G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	182.1	B	LEA
Nyora N.C.R.	Nature Conservation Reserve	Ia	22.2	E1	SGB
Outtrim B.R.	Natural Features Reserve – Bushland Reserve	IV	15.1	E1	SGB
Outtrim Cemetery N.C.R	Nature Conservation Reserve	Ia	5.1	E1	SGB
Poddy Bay G.L.R	Natural Features Reserve – Gippsland Lakes Reserve	VI	215.6	E1	VPC
Point Fullarton G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	54.8	D	LEA

Park/reserve name	Reserve type	IUCN categ.	Area (hectares)	Level of Protection	PV Area
Port Franklin – Port Welshpool Coastal Reserve	Coastal Reserve	Not a Protected Area	245.1	D	SGB
Providence Ponds F.F.R.	Nature Conservation Reserve – Flora and Fauna Reserve	Ia	2534.2	B	LEA
Raymond Island G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	219.0	C	LEA
Red Morass G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	294.6	E1	VPC
Redbank SS.R.	Natural Features Reserve – Streamside Reserve	III	1.7	E2	VPC
Rigby Island G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	132.6	B	LEA
Robin Hood SS.R.	Natural Features Reserve – Streamside Reserve	III	0.7	E1	VPC
Rosedale B.R.	Natural Features Reserve – Bushland Reserve	IV	17.4	E1	VPC
Roseneath Peninsula (1) G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	7.7	E1	VPC
Roseneath Peninsula (2) G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	17.4	E1	VPC
Sale Camping Reserve G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	36.1	E1	VPC
Sale Common N.C.R.	Nature Conservation Reserve – Wildlife Reserve (no hunting)	Ia	325.1	D	VPC
Salt Lake – Backwater Morass G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	302.0	C	VPC
Saplings Morass F.F.R.	Nature Conservation Reserve – Flora and Fauna Reserve	Ia	9.6	E1	LEA
Sayers Trig B.R.	Natural Features Reserve – Bushland Reserve	IV	20.4	E1	VPC
Shallow Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve (Marine and Wildlife Reserve)	VI	1966.1	B	SGB
Slaughterhouse Creek G.L.R	Natural Features Reserve – Gippsland Lakes Reserve	VI	129.9	D	LEA
State Coal Mine H.A.	Historic Reserve	Not a Protected Area	258.5	D	SGB
Steel Bay – Newland Backwater G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	230.6	E1	LEA
Stradbroke F.F.R.	Nature Conservation Reserve – Flora and Fauna Reserve	Ia	3452.1	C	VPC
Stratford H.P.	Natural Features Reserve – Highway Park	Not a Protected Area	71.3	D	VPC
Swallow Lagoon N.C.R.	Nature Conservation Reserve	Ia	192.7	E1	FSA
Swan Reach Bay G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	33.2	No Group	LEA
Swell Point – Roseneath Point G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	165.2	E1	VPC

Park/reserve name	Reserve type	IUCN categ.	Area (hectares)	Level of Protection	PV Area
Tambo Delta – Metung G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	31.2	E1	LEA
Tambo floodplain G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	16.8	E1	LEA
Tanjil East G86 B.R	Natural Features Reserve – Bushland Reserve	IV	0.3	E1	VPC
Tarra River SS.R.	Natural Features Reserve – Streamside Reserve	III	4.6	E2	VPC
Tarra Tarra B.R	Natural Features Reserve – Bushland Reserve	IV	4.1	E1	SGB
Tarra–Bulga National Park	National Park – Schedule 2, National Parks Act	II	2017.9	B	VPC
Tarwin H7 B.R	Natural Features Reserve – Bushland Reserve	IV	4.1	E1	SGB
Tarwin South B.R	Natural Features Reserve – Bushland Reserve	IV	2.9	E1	SGB
The Billabong F.F.R.	Nature Conservation Reserve – Flora and Fauna Reserve	Ia	20.5	D	LEA
The Dardenelles G.L.R	Natural Features Reserve – Gippsland Lakes Reserve	VI	302.7	D	VPC
The Gurdies N.C.R	Nature Conservation Reserve	Ia	256.9	D	SGB
The Lakes National Park	National Park – Schedule 2, National Parks Act	II	2405.3	B	VPC
The Waterhole G.L.R	Natural Features Reserve – Gippsland Lakes Reserve	VI	14.4	E1	VPC
Thomson River SS.R.	Natural Features Reserve – Streamside Reserve	III	2.6	E2	VPC
Toms Cap S.R.	Natural Features Reserve – Scenic Reserve	III	127.8	D	VPC
Toora H37 B.R	Natural Features Reserve – Bushland Reserve	IV	3.7	E1	SGB
Toora H41 B.R	Natural Features Reserve – Bushland Reserve	IV	19.1	C	SGB
Traralgon South F.F.R.	Nature Conservation Reserve – Flora and Fauna Reserve	Ia	848.5	E1	VPC
Traralgon South F.R	Nature Conservation Reserve – Flora Reserve	Ia	1.6	E1	VPC
Tucker Swamp G.L.R	Natural Features Reserve – Gippsland Lakes Reserve	VI	131.5	D	VPC
Turtons Creek S.R.	Natural Features Reserve – Scenic Reserve	III	125.2	C	SGB
Victoria Lagoon G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	452.2	D	VPC
Waratah B.R	Natural Features Reserve – Bushland Reserve	IV	9.4	E1	SGB
Warragul B.R.	Natural Features Reserve – Bushland Reserve	IV	6.4	E1	VPC
Warrigal Creek SS.R.	Natural Features Reserve – Streamside Reserve	III	35.9	E1	VPC
Wattle Point G.L.R.	Natural Features Reserve – Gippsland Lakes Reserve	VI	84.5	D	LEA
Welshpool H16 B.R	Natural Features Reserve – Bushland Reserve	IV	3.0	E1	SGB

Park/reserve name	Reserve type	IUCN categ.	Area (hectares)	Level of Protection	PV Area
Welshpool H17 B.R	Natural Features Reserve – Bushland Reserve	IV	9.4	E1	SGB
Westbury N.F.S.R.	Natural Features Reserve – Natural Features and Scenic Reserve	III	2.9	E1	VPC
Whipstick Gully N.F.R.	Natural Features Reserve	IV	25.6	E1	SGB
Whiskey Creek B.R.	Natural Features Reserve – Bushland Reserve	IV	2.7	E1	VPC
Willung B.R	Natural Features Reserve – Bushland Reserve	IV	2.2	E2	VPC
Willung South B.R.	Natural Features Reserve – Bushland Reserve	IV	145.1	E1	VPC
Wilsons Promontory National Park	National Park – Schedule 2, National Parks Act	II	166.8	A1	WP
Wilsons Promontory National Park	National Park – Schedule 2, National Parks Act	II	0.8	A1	SGB
Won Wron F.R	Nature Conservation Reserve – Flora Reserve	Ia	125.3	E1	VPC
Won Wron H21 B.R	Natural Features Reserve – Bushland Reserve	IV	15.5	E1	VPC
Won Wron H22 B.R	Natural Features Reserve – Bushland Reserve	IV	12.5	E1	VPC
Wonga Wonga South B.R	Natural Features Reserve – Bushland Reserve	IV	3.9	E1	SGB
Wonthaggi G237 B.R.	Natural Features Reserve – Bushland Reserve	IV	6.6	E1	SGB
Wonthaggi G238 B.R.	Natural Features Reserve – Bushland Reserve	IV	37.2	E1	SGB
Wonthaggi G239 B.R.	Natural Features Reserve – Bushland Reserve	IV	6.1	E1	SGB
Wonthaggi G240 B.R.	Natural Features Reserve – Bushland Reserve	IV	9.3	E1	SGB
Wonthaggi G241 B.R.	Natural Features Reserve – Bushland Reserve	IV	1.8	E1	SGB
Wonthaggi G242 B.R.	Natural Features Reserve – Bushland Reserve	IV	7.2	E1	SGB
Wonthaggi G243 B.R.	Natural Features Reserve – Bushland Reserve	IV	2.2	E1	SGB
Wonthaggi G244 B.R.	Natural Features Reserve – Bushland Reserve	IV	9.5	E1	SGB
Wonthaggi G245 B.R.	Natural Features Reserve – Bushland Reserve	IV	2.0	E1	SGB
Wonthaggi G246 B.R	Natural Features Reserve – Bushland Reserve	IV	3.7	E1	SGB
Woodside F.R	Nature Conservation Reserve – Flora Reserve	Ia	11.1	D	VPC
Woodside H25 B.R	Natural Features Reserve – Bushland Reserve	IV	2.1	E1	VPC
Woodside H26 B.R.	Natural Features Reserve – Bushland Reserve	IV	17.8	E1	VPC
Woodside H27 B.R	Natural Features Reserve – Bushland Reserve	IV	13.0	E1	VPC

Park/reserve name	Reserve type	IUCN categ.	Area (hectares)	Level of Protection	PV Area
Woodside H28 B.R	Natural Features Reserve – Bushland Reserve	IV	189.4	E1	VPC
Woorabinda E.A.	Education Area	Not a Protected Area	49.9	No Group	VPC
Woranga B.R	Natural Features Reserve – Bushland Reserve	IV	2.1	E2	VPC
Yallock-Bulluk Marine and Coastal Park	National Parks Act Schedule 4 park or reserve (Marine and Wildlife Reserve)	n/a	17.5		EPPWP
Yallock-Bulluk Marine and Coastal Park	National Parks Act Schedule 4 park or reserve (Marine and Wildlife Reserve)	n/a	3187.6		SGB
Yanakie F.R	Nature Conservation Reserve – Flora Reserve	Ia	6.5	E1	SGB
Yarragon B.R	Natural Features Reserve – Bushland Reserve	IV	0.4	E2	VPC
Yeerung B.R.	Natural Features Reserve – Bushland Reserve	IV	9.9	E1	VPC
Yinnar B.R	Natural Features Reserve – Bushland Reserve	IV	1.1	E1	VPC

Appendix B – Conservation assets

This appendix provides an overview of the area of ecosystems (aligned to EVDs and EVCs) within the Gippsland Plains and Strzelecki Ranges Parks Landscape.

Conservation asset	EVD	EVC	Biodiversity Conservation Status	Total (hectares)
Wet Forest and Rainforest	Tall Mist Forest	Wet Forest	Depleted	3207.5
	Moist Forest	Damp Forest	Endangered	1521.1
		Gully Woodland	Endangered	3.4
		Shrubby Damp Forest	Least Concern	2.0
	Closed Forest	Cool Temperate Rainforest	Endangered	243.6
		Warm Temperate Rainforest	Endangered	81.4
		Dry Rainforest	Endangered	9.9
	Riparian (higher rainfall)	Riparian Forest	Vulnerable	21.3
		Riparian Forest / Warm Temperate Rainforest Mosaic	Endangered	16.0
	Wet Forest and Rainforest			**5106.3**
Dry Forest and Woodland	Tall Mixed Forest (Eastern)	Lowland Forest	Vulnerable	6389.7
		Lowland Forest/Damp Sands Herb-rich Woodland Mosaic	Vulnerable	1528.6
		Limestone Box Forest	Vulnerable	75.0
		Lowland Forest/Heathy Woodland Mosaic	Vulnerable	46.3
	Forby Forest	Damp Sands Herb-rich Woodland	Vulnerable	6332.9
		Damp Sands Herb-rich Woodland/Swamp Scrub Complex	Vulnerable	317.0
		Herb-rich Foothill Forest	Endangered (STZ)	215.0
			Vulnerable (GIP)	97.2
		Creekline Herb-rich Woodland	Endangered	185.2
		Damp Sands Herb-rich Woodland/Swamp Scrub Mosaic	Endangered	125.3
		Grassy Woodland	Endangered	77.5
		Lowland Herb-rich Forest	Depleted	4.8
	Inland Plains Woodland	Plains Grassy Forest	Vulnerable (GIP)	1746.6
			Endangered (STZ)	1.6
		Plains Grassy Woodland	Endangered	1098.3
		Plains Grassy Woodland/Gilgai Wetland Mosaic	Endangered	7.9
	Damp Scrub	Riparian Scrub	Vulnerable	1729.1
	Grassy/Heathy Dry Forest	Damp Heathy Woodland/Lowland Forest Mosaic	Vulnerable	1054.7
		Damp Heathy Woodland	Vulnerable (GIP)	209.6
			Depleted (STZ)	3.5
		Dry Valley Forest/Swamp Scrub/Warm Temperate Rainforest Mosaic	Endangered	100.9
	Basalt Grassland	Plains Grassland	Endangered	344.4

Conservation asset	EVD	EVC	Biodiversity Conservation Status	Total (hectares)
	Riparian (higher rainfall)	Sandy Flood Scrub	Endangered	340.9
	Treed Swampy Wetland	Swampy Riparian Woodland	Endangered	23.0
		Swampy Riparian Complex	Endangered	14.1
		Swampy Riparian Woodland/Swamp Scrub Mosaic	Endangered	9.0
		Swampy Woodland	Endangered	8.5
		Seasonally Inundated Shrubby Woodland	Endangered	0.7
	Foothills Forest	Grassy Woodland/Swamp Scrub Mosaic	Endangered	7.1
		Shrubby Foothill Forest	Endangered	6.6
		Valley Grassy Forest	Vulnerable	3.0
		Valley Grassy Forest/Swamp Scrub Mosaic	Endangered	1.0
		Grassy Forest	Endangered	0.1
	Rocky Knoll	Limestone Pomaderris Shrubland	Endangered	2.8
	Dry Forest and Woodland			**22145.1**
Heathland	Heathland (sands)	Heathy Woodland	Least Concern (GIP)	13461.3
			Depleted (STZ)	5.4
		Sand Heathland	Rare	6304.7
		Wet Heathland	Depleted (GIP)	525.1
			Vulnerable (STZ)	110.6
		Clay Heathland	Depleted	320.7
		Sand Heathland/Wet Heathland Mosaic	Depleted (GIP)	225.3
			Least Concern (STZ)	78.9
		Wet Heathland/Damp Heathland Mosaic	Depleted	72.1
		Clay Heathland/Wet Heathland/Riparian Scrub Mosaic	Depleted	0.4
	Heathland			**21104.7**
Wetland	Freshwater Wetland (permanent)	Water Body – Fresh	n/a	11023.2
		Deep Freshwater Marsh	Vulnerable	2811.8
		Sedge Wetland	Vulnerable	452.5
		Wetland Formation	Endangered	370.4
		Aquatic Herbland/Plains Sedgy Wetland Mosaic	Vulnerable	190.8
		Floodplain Reedbed	Endangered	40.2
		Billabong Wetland Aggregate	Endangered	20.8
		Blocked Coastal Stream Swamp	Rare	<0.1
	Damp Scrub	Swamp Scrub	Endangered	6854.7
		Swamp Scrub/Wet Heathland Mosaic	Endangered	46.0
		Swamp Scrub/Plains Grassland Mosaic	Endangered	27.9

Conservation asset	EVD	EVC	Biodiversity Conservation Status	Total (hectares)
	Saline Wetland	Estuarine Wetland		2987.2
		Estuarine Wetland/Estuarine Swamp Scrub Mosaic	Depleted	32.0
	Riverine Woodland / Forest	Floodplain Riparian Woodland	Least Concern	123.8
	Wetland			**24982.0**
Coastal	Coastal	Coastal Dune Scrub/Coastal Dune Grassland Mosaic	Depleted	5008.7
		Coastal Tussock Grassland	Vulnerable (GIP)	874.6
			Depleted (STZ)	5.2
		Coast Banksia Woodland/Coastal Dune Scrub Mosaic	Vulnerable	544.0
		Coastal Headland Scrub	Depleted (GIP)	250.0
			Vulnerable (STZ)	122.9
		Coast Banksia Woodland	Vulnerable	315.0
		Sandy Beach	n/a	247.4
		Coastal Headland Scrub/Coastal Tussock Grassland Mosaic	Depleted	57.0
		Coastal Dune Grassland	Depleted	34.9
		Coastal Dune Scrub	Depleted	30.9
		Coast Banksia Woodland/Warm Temperate Rainforest Mosaic	Endangered	13.2
		Coastal Alkaline Scrub	Vulnerable	8.6
		Berm Grassy Shrubland	Endangered	0.2
	Coastal			**7512.5**
	Not a valid EVD			100.3
	Total			**80823.3**

Marine conservation asset	Habitat	Total (hectares)
Saltmarsh and Mangrove	Mangrove Shrubland	2902.9
	Coastal Saltmarsh	3530.4
	Saltmarsh and Mangrove	**6433.3**
Subtidal and Intertidal Reefs	Subtidal Reefs	2370.9
	Intertidal Reefs	7.4
	Subtidal and Intertidal Reefs	**2378.3**
Seagrass	**Seagrass**	**14634.0**
Soft Sediment	**Soft Sediment**	**41532.6**
	Total	**64978.2**

Appendix C – Weed management priority assessment

Factors when determining priorities

With over 200 parks and reserves covered under this CAP, there needs to be a way to maximise the protection of conservation values from the threat caused by the impacts of weeds, by prioritising investment in management actions that will have the greatest benefit to values and give the highest return on investment.

The key factors considered for determining priority are:

1. The **level of infestation** within the park (as defined from the biosecurity approach);
2. The **values** present in a park as based on the park or reserve's Level of Protection (LOP) rating; and
3. The **threat** that is in the park (i.e. weed species), and how much of a **risk** it is to values, e.g. a high risk weed like Bridal Creeper *Asparagus asparagoides* versus a more 'benign' weed such as Cape Weed *Arctotheca calendula*.

Figure C.1 illustrates that it is more cost effective to prevent a threat entering a park or reserve than it is to try and control a threat that has become widespread, and at the same time considering that it is better to invest in protecting parks with higher values (as defined by LOP) than it is for parks where values have already been compromised by threats.

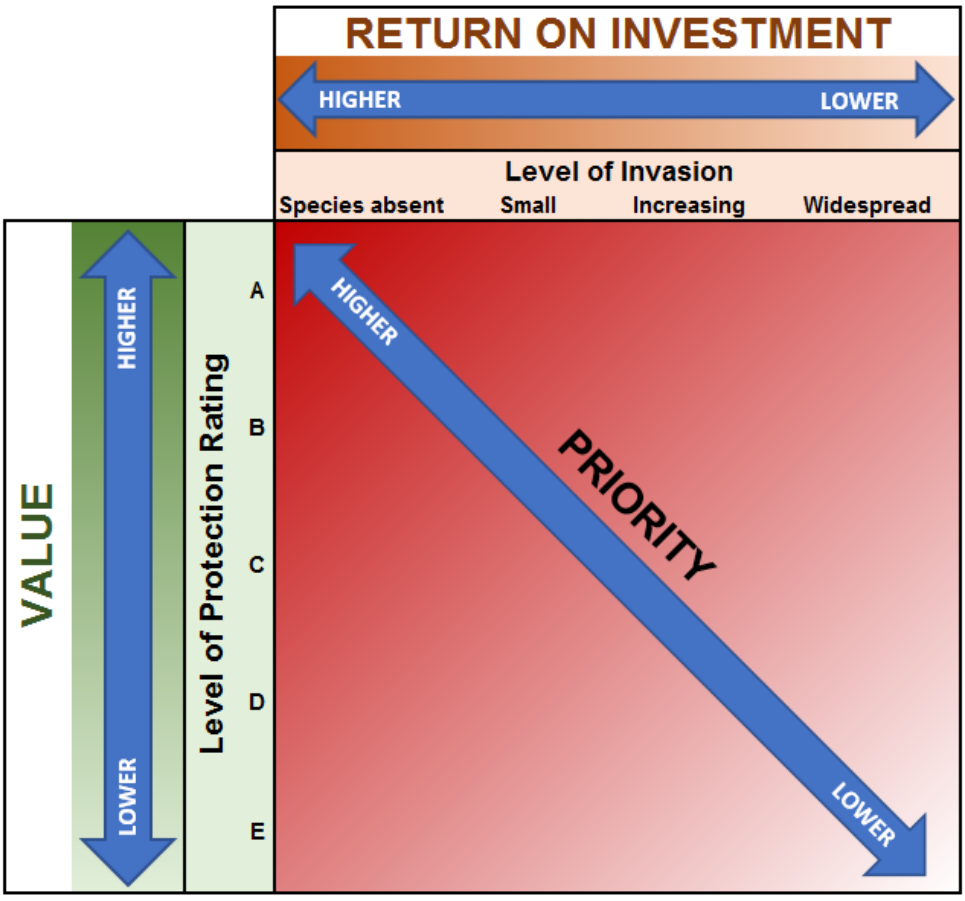


Figure C.1 Prioritisation concept.

Values

Parks Victoria uses a Levels of Protection (LOP) classification tool to aid planning and resource allocation by placing individual parks and reserves in a state-wide context.

The LOP framework groups parks according to biodiversity value criteria and allocates broad conservation objectives to each group. After assessing a wide range of biodiversity value considerations, parks are placed into a group, of which there are seven terrestrial (A1, A2, B, C, D, E1, E2) and three marine (A, B, C). This establishes a hierarchy of management response that is useful to park managers in determining management and resourcing priorities and effort and provides a sound basis for decision-making (Parks Victoria 2018). Each LOP group has broad conservation objectives that can be used to prioritise resource allocation, which is consistent with best practice management.

LOP sets out management responses in a hierarchy so management and resourcing priorities can be determined. It allows for protected area planning and management to be conducted in a bioregional context (Parks Victoria 2018). LOP uses common elements advocated in the state and national biodiversity strategies.

Threat

The level of risk posed by individual species of invasive plants present in the CAP area has been primarily assessed using the *Advisory list of environmental weeds in Victoria*. This updated advisory list assesses 1780 plants using an objective 'expert system' for ranking environmental weed species with respect to management urgency (DELWP 2018). This risk rating (threat) for weeds is determined by a number of factors:

- impact on natural systems
- area of potential distribution remaining
- potential for invasion
- rate of dispersal
- range of susceptible habitat types.

Parks and reserves included

Because of the large number of parks covered by this CAP, only higher value parks and reserves have been reviewed. This includes most parks and reserves with the LOP rating of D or higher. While around 50% of all parks and reserves in this Parks Landscape have an LOP rating of E1 or E2, they have not been considered because they generally are of small size, have low diversity of ecological vegetation classes, relatively low species diversity and moderate to high levels of internal fragmentation (Parks Victoria 2018). At a landscape scale, it is not feasible to have these parks included.

Most parks and reserves with a LOP of more than D have been assessed individually. The exception to this is the Gippsland Lakes area, where parks have been grouped into geographic areas (Figure C.2). The Lower Latrobe Wetlands (Sale Common NCR, Dowd Morass WR and Heart Morass WR) have been grouped together despite having two different LOP ratings. The rationale for this is that these three areas are recognised as the Lower Latrobe Wetland system. Although Sale Common and Heart Morass have the lower LOP rating of D, their proximity to the larger Dowd Morass (LOP rating C) means that threats present in them could adversely affect the values present in Dowd Morass, particularly Sale Common, which is upstream of Dowd Morass.

Gippsland Lakes Parks and Reserves					
LOP	Lower Latrobe Wetlands *	(Lake Wellington area)	(Lake Victoria area)	East (Lake King area)	Coast
B			The Lakes National Park	Nyerimilang Park G.L.R. Rigby Island G.L.R.	Gippsland Lakes Coastal Park
C	Dowd Morass W.R. (LOP C)	Lake Coleman W.R Salt Lake - Backwater Morass G.L.R.	Blond Bay W.R. Morley Swamp G.L.R.	Jones Bay G.L.R Raymond Island G.L.R. Macleod Morass W.R.	
D	Heart Morass W.R. (LOP D) Sale Common N.C.R. (LOP D)	Avon-Perry River Delta, Lake Kakydra, The Dardenelles, Tucker Swamp GLRs Clydebank Morass W.R.	Backwater Morass, Blond Bay, Victoria Lagoon, Wattle Point G.L.Rs	Eagle Point, Flannagan Island, Point Fullarton, Slaughterhouse Creek G.L.Rs. Jones Bay W.R.	

* Reserves in the Lower Latrobe Wetlands will be considered together despite having different LOP ratings

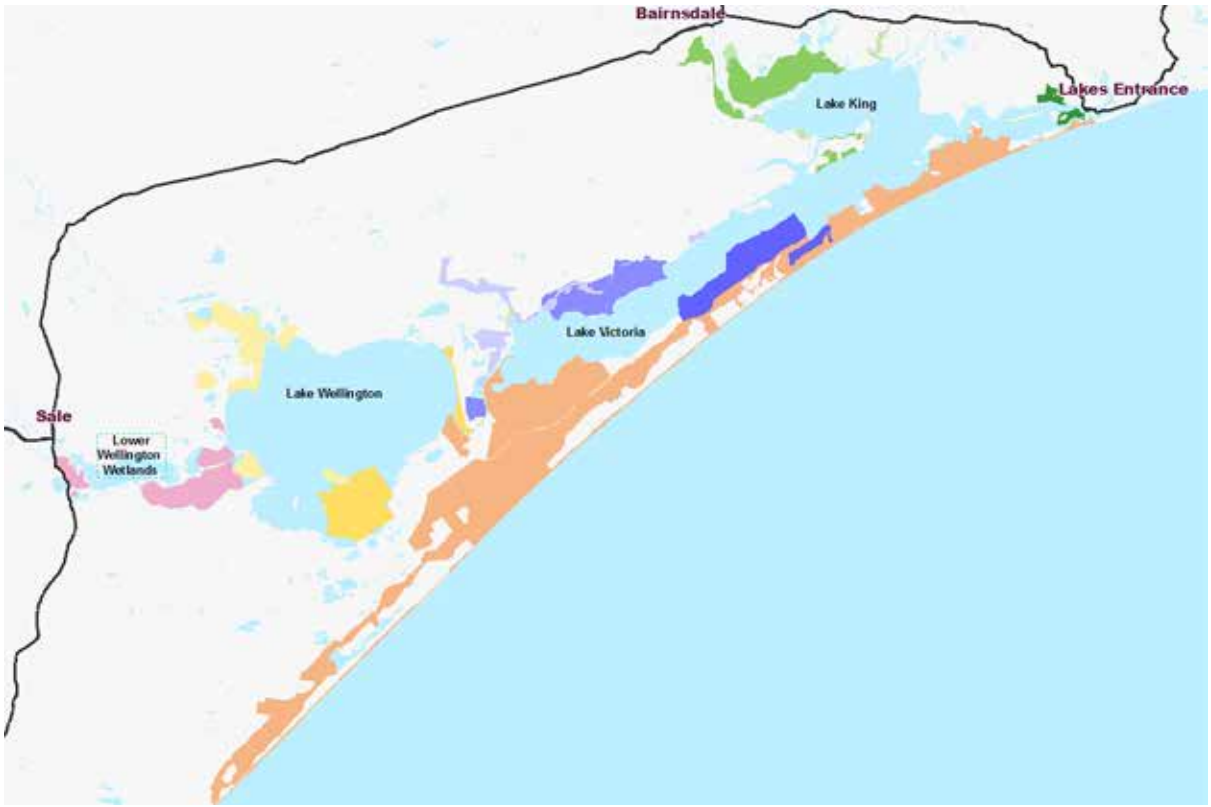


Figure C.2 Gippsland Lakes parks and reserves, grouped by location and levels of protection.

Ascertaining threat and levels of infestation information

Finding out which weed species occur in each park or reserve, and the level of infestation was obtained from a number of sources:

- workshops with park management staff
- information from State of the Parks 2017 reporting
- EIS weed control information
- internal and external weed survey reports.

Ascertaining overall priority in the Gippsland Plains and Strzelecki Ranges Parks Landscape

Each weed species in each park or reserve is assessed and given a score as per the matrix below using the three factors detailed above:

- infestation level
- risk rating of the weed (from *Advisory list of environmental weeds in Victoria*).
- value from LOP park rating.

The resulting score (1–9) represents the priority for weed management action.

		RISK																			
	Economic returns	1:100					1:25					1:5-10					1:1-5				
	Infestation detail	Species absent					New and emerging					Established and expanding					Widespread				
	Action	Surveillance, vehicle hygiene, liaise with external					Eradication					Containment					Specific asset / site/ value protection only				
	Biosecurity level	Prevention					Eradication					Containment					Asset Protection				
	Weed risk rating	Very High	High	Mod. High	Medium	Lower	Very High	High	Mod. High	Medium	Lower	Very High	High	Mod. High	Medium	Lower	Very High	High	Mod. High	Medium	Lower
VALUE	Terrestrial Parks LOP A2	1	1	1	1	9	2	2	2	3	9	3	4	4	5	9	5	6	6	7	9
	B	1	1	1	2	9	2	2	3	3	9	4	4	5	5	9	6	6	7	7	9
	C	1	1	2	2	9	2	3	3	4	9	4	5	5	6	9	6	7	7	8	9
	D	1	2	2	3	9	3	3	4	4	9	5	5	6	6	9	7	7	8	8	9
	E	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

Figure C.3 Weed management priority matrix.

Appendix D – Scientific names of species mentioned in the plan

Common name	Scientific name	Conservation status*		
		EPBC	FFG	VROTS
African Boxthorn	*Lycium ferocissimum*			
African Love-grass	*Eragrostis curvula*			
Agapanthus	*Agapanthus praecox*			
Angled Onion	*Allium triquetrum*			
Asparagus Fern	*Asparagus scandens*			
Australasian Bittern	*Botaurus poiciloptilus*	Endangered	Listed	Endangered
Australian Fur Seal	*Arctocephalus pusillus*			
Australian Ghost Shark	*Callorhynchus milii*			
Australian Grayling	*Prototroctes maraena*	Vulnerable	Listed	Vulnerable
Banana Passionfruit	*Passiflora tarminiana*			
Barking Owl	*Ninox connivens*		Listed	Endangered
Black Nightshade	*Solanum nigrum*			
Black Swan	*Cygnus atratus*			
Black Wattle	*Acacia mearnsii*			
Blackberry	*Rubus fruticosus*			
Blue Periwinkle	*Vinca major*			
Blue-spur Flower	*Plectranthus ecklonii*			
Blue-throated Wrasse	*Notolabrus tetricus*			
Blue-tongued Lizard	*Tiliqua scincoides scincoides*			
Bluebell Creeper	*Billardiera heterophylla*			
Boneseed	*Chrysanthemoides monilifera*			
Bottlenose Dolphin	*Tursiops truncatus*			
Bridal Creeper	*Asparagus asparagoides*			
Broad-leaf Seagrass	*Posidonia australis*			
Broad-Toothed Rat	*Mastacomys fuscus*	Vulnerable	Listed	Endangered
Brown macroalgae	*Heterokontophyta* spp.			
Buffalo Grass	*Stenotaphrum secundatum*			
Bulbil Watsonia	*Watsonia meriana* var. *bulbillifera*			
Burgan	*Kunzea ericoides*			
Burrunan Dolphin	*Tursiops australis*			
Burrowing Crayfish	*Engaeus rostrogaleatus*		Listed	Endangered
Butterfly Orchid	*Sarcochilus australis*			
Callistemon	*Callistemon* spp.			
Cape Ivy	*Delairea odorata*			
Cape Weed	*Arctotheca calendula*			
Cat	*Felis catus*			
Cattle	*Bos taurus*			
Chalara australis (no common name)	*Chalara australis*			
Cherry Laurel	*Charadrius ruficapillus*			
Chestnut Teal	*Prunus laurocerasus*			
Cluster Pine	*Pinus pinaster*			
Coast Beard-heath	*Leucopogon parviflorus*			

Common name	Scientific name	Conservation status*		
		EPBC	FFG	VROTS
Coast Tea-tree	*Leptospermum laevigatum*			
Coast Wattle	*Acacia longifolia* subsp. *sophorae*			
Common Dipogon	*Dipogon lignosus*			
Common Dolphin	*Delphinus delphis*			
Common Kelp	*Ecklonia radiata*			
Common Sawshark	*Pristiophorus cirratus*			
Common Seadragon	*Phyllopteryx taeniolatus*			
Common Scaly-foot	*Pygopus lepidopodus*			
Common Thorn-apple	*Datura stramonium*			
Cord-grasses	*Spartina* × *townsendii*, *S. anglica*			
Cotoneaster	*Cotoneaster glaucophyllus*			
Crack Willow	*Salix fragilis*			
Crayweed	*Phyllospora comosa*			
Curlew Sandpiper	*Calidris ferruginea*	Critically Endangered		Endangered
Dead Man's Fingers	*Codium fragile* subsp. *fragile*			
Dingo	*Canis lupus dingo*			Data deficient
Dolichos Pea	*Dipogon lignosus*			
Dusky Coral Pea	*Kennedia rubicunda*			
Dwarf Grass-wrack	*Zostera muelleri*			
Dwarf Kerrawang	*Commersonia prostrata*	Endangered	Listed	Endangered
Eastern curlew	*Numenius madagascariensis*	Critically Endangered		Vulnerable
Eastern Pygmy Possum	*Cecartetus nanus*			Near threatened
Eastern Spider-orchid	*Caladenia orientalis*	Endangered	Listed	Endangered
Eastern Three-lined Skink	*Bassiana duperreyi*			
Elephant Shark	*Callorhinchus milii*			
Emu	*Dromaius novaehollandiae*			Near threatened
English Broom	*Cytisus scoparius*			
English Ivy	*Hedera helix*			
European Green Shore Crab	*Carcinus maenas*			
Fairy Lanterns	*Thismia rodwayi*			
Fairy Tern	*Sternula nereis*	Vulnerable	Listed	Endangered
Fallow Deer	*Dama dama*			
Fennel	*Foeniculum vulgare*			
Fishbone Cotoneaster	*Cotoneaster horizontalis*			
Flax-leaved Broom	*Genista linifolia*			
Forked Comb-Fern	*Schizaea bifida*			
Fox (Red Fox)	*Vulpes vulpes*			
Freckled Duck	*Stictonetta naevosa*		Listed	Endangered

Common name	Scientific name	Conservation status*		
		EPBC	FFG	VROTS
Fuchsia	*Fuchsia* spp.			
Galaxids	*Galaxias* spp.			
Galeorhinus australis	*Galeorhinus galeus*			
Gazania	*Gazania linearis*			
Giant Gippsland Earthworm	*Megascolides australis*	Vulnerable	Listed	Endangered
Gippsland Peppermint	*Eucalyptus croajingolensis*			
Glossy Grass Skink	*Pseudemoia rawlinsoni*			Vulnerable
Goat	*Capra hircus*			
Gorse	*Ulex europaeus*			
Great White Shark	*Carcharodon carcharias*	Vulnerable	Listed	Vulnerable
Greater Glider	*Petauroides volans*	Vulnerable	Listed	Vulnerable
Green and Golden Bell-frog	*Litoria aurea*	Vulnerable		Vulnerable
Grey Sallow	*Salix cinerea*			
Grey Teal	*Anas gracilis*			
Grey-headed Flying Fox	*Pteropus poliocephalus*	Vulnerable	Listed	Vulnerable
Ground Parrot	*Pezoporus wallicus*		Listed	Endangered
Growling Grass-frog	*Litoria raniformis*	Vulnerable	Listed	Endangered
Gummy Shark	*Mustelus antarcticus*			
Hares	*Lepus europaeus*			
Himalayan Honeysuckle	*Leycesteria Formosa*			
Hog Deer	*Axis porcinus*			
Holly	*Ilex aquifolium*			
Hooded Plover	*Thinornis rubricollis*	Vulnerable	Listed	Vulnerable
Horehound	*Marrubium vulgare*			
Horse	*Equus caballus*			
Japanese Kelp or Wakame Seaweed	*Undaria pinnatifida*			
Kangaroo Island Eelgrass	*Zostera nigricaulis*			
Kangaroo Paw	*Anigozanthos spp.*			
King George Whiting	*Sillaginodes punctatus*			
Koala	*Phascolarctos cinereus*			
Lace Monitor	*Varanus varius*			Endangered
Leadbeaters Possum	*Gymnobelideus leadbeateri*	Endangered	Listed	Endangered
Leopard Seal	*Hydrurga leptonyx*			
Little Tern	*Sternula albifrons*			Vulnerable
Long-nosed Bandicoot	*Perameles nasuta*			
Martin's Toadlet	*Uperoleia martini*		Listed	Critically endangered
Messmate Stringybark	*Eucalyptus obliqua*			
Metallic Skink	*Niveoscincus metallicus*			
Metallic Sun-orchid	*Thelymitra epipactoides*	Endangered	Listed	Endangered
Mirror Bush	*Coprosma repens*			
Monterey Pine	*Monterey Pine*			
Montpellier Broom	*Genista monspessulana*			
Mountain Ash	*Eucalyptus regnans*			
Mullet	*Mugilidae spp.*			

Common name	Scientific name	Conservation status*		
		EPBC	FFG	VROTS
Myrtle Beech	*Nothofagus cunninghamii*			
Myrtle Rust	*Uredo rangelii*			
Myrtle Wilt	*Chalara australia*			
Neptune's Necklace	*Hormosira banksii*			
New Holland Mouse	*Pseudomys novaehollandiae*	Vulnerable	Listed	Vulnerable
Northern Pacific Seastar	*Asterias amurensis*			
Orange-bellied Parrot	*Neophema chrysogaster*	Critically Endangered	Listed	Critically endangered
Ox-eye Daisy	*Leucanthemum vulgare*			
Pacific Oyster	*Crassostrea gigas*			
Painted Snipe	*Rostratula australis*	Endangered	Listed	Critically endangered
Pampas Grass	*Cortaderia selloana*			
Panic Veldt-grass	*Ehrharta erecta*			
Parrot's Feather	*Myriophyllum aquaticum*			
Paterson's Curse	*Echium plantagineum*			
Perennial Thistle	*Cirsium arvense*			
Phytophthora	*Phytophthora cinnamomi*			
Pied Oystercatcher	*Haematopus longirostris*			
Pig	*Sus scrofa*			
Pot-bellied Seahorse	*Hippocampus abdominalis*			
Powerful Owl	*Ninox strenua*		Listed	Vulnerable
Prickly Pear	*Opuntia* spp.			
Prickly Tea-tree	*Leptospermum juniperinum*			
Purple Sea Urchin	*Heliocidaris erythrogramma*			
Quoll	*Dasyurus* spp.	Endangered	Listed	Endangered
Rabbit	*Oryctolagus cuniculus*			
Radiata Pine	*Pinus radiata*			
Ragwort	*Senecio jacobaea*			
Red Deer	*Cervus elaphus*			
Red-capped Plover	*Charadrius ruficapillus*			
Red-ink Weed	*Phytolacca octandra*			
Rock Flathead	*Platycephalus laevigatus*			
Rock Lobster	*Jasus verreauxi*			
Rough-barked Manna Gum	*Eucalyptus viminalis* subsp. *cygnetensis*			
Saffron Thistle	*Carthamus lanatus*			
Salvinia	*Salvinia molesta*			
Sambar	*Rusa unicolor*			
School Shark	*Galeorhinus galeus*			
Scotch Thistle	*Onopordum acanthium*			
Sea Cucumber	*Pentocnus bursatus*		Listed	Vulnerable
Sea Nymph	*Amphibolis antarctica*			
Sea Spurge	*Euphorbia paralias*			
Sea urchins	*Echinoidea* spp.			

Common name	Scientific name	Conservation status*		
		EPBC	FFG	VROTS
Seaberry Saltbush	*Chenopodium candolleanum*			
Shining Gum	*Eucalyptus nitens*			
Silver Banksia	*Banksia marginata*			
Slender Thistle	*Carduus tenuiflorus*			
Slender Tree fern	*Cyathea cunninghamii*			Vulnerable
South African Weed Orchid	*Disa bracteata*			
Southern Brown Bandicoot	*Isoodon obesulus*	Endangered	Listed	Near threatened
Southern Calamari Squid	*Sepioteuthis australis*			
Southern Emu-Wren	*Stipiturus malachurus*			
Southern Grass Skink	*Pseudemoia entrecasteauxii*			
Southern Right Whale	*Eubalaena australis*	Endangered	Listed	Critically endangered
Southern Saw Shark	*Pristiophorus cirratus*			
Spear Thistle	*Cirsium vulgare*			
Spencer's Skink	*Pseudemoia spenceri*			
Spot-tailed Quoll	*Dasyurus maculatus*	Endangered	Listed	Endangered
Superb Lyrebird	*Menura novaehollandiae*			
Swamp Everlasting	*Xerochrysum palustre*	Vulnerable	Listed	Vulnerable
Swamp Paperbark	*Melaleuca ericifolia*			
Swamp Skink	*Lissolepis coventryi*		Listed	Vulnerable
Sweet Briar	*Rosa rubiginosa*			
Sweet Pittosporum	*Pittosporum undulatum*			
Sycamore Maple	*Acer pseudoplatanus*			
Tailor	*Pomatomus saltatrix*			
Tall Fleabane	*Erigeron elatior*			
Tasman Grass-wrack	*Heterozostera tasmanica*			
Tassel Rope-rush	*Hypolaena fastigiata*			
Tutsan	*Hypericum androsaemum*			
Variegated Thistle	*Silybum marianum*			
Water Buttons	*Cotula spp.*			
Wellington Mint-bush	*Prostanthera galbraithiae*	Vulnerable	Listed	Vulnerable
Wheel Cactus	*Opuntia robusta*			
White Arum-lily	*Zantedeschia aethiopica*			
White Mangrove	*Avicennia marina* subsp. *australasica*			Rare
White-footed Dunnart	*Sminthopsis leucopus*			Near threatened
White-fronted Chat	*Epthianura albifrons*			
Wild Dog	*Canis lupus familiaris*			
Willow	*Salix* spp.			
Yertchuk	*Eucalyptus consideniana*			

* EPBC = National status under the Environment Protection and Biodiversity Conservation Act 1990
FFG = Victorian status under the Flora and Fauna Guarantee Act 1988
VROTS = Vulnerable Rare or Threatened Species listed in Victorian threatened species advisory lists

Appendix E — Nationally Important Wetlands

Wetland	Parks and reserves
Anderson Inlet	Anderson Inlet Coastal Reserve, Point Smythe Coastal Reserve, Cape Liptrap Coastal Park
Bald Hills State Wildlife Reserve	Bald Hills Creek Wildlife Reserve
Billabong Flora and Fauna Reserve	The Billabong Flora and Fauna Reserve
Bosses / Nebbor Swamp	Nicholson Floodplain Gippsland Lakes Reserve
Corner Inlet	Corner Inlet Marine and Coastal Park, Corner Inlet Marine National Park, Nooramunga Marine and Coastal Park
Jack Smith Lake State Game Reserve	Jack Smith Lake Wildlife Reserve
Lake King Wetlands	Mitchell River Silt Jetties GLR, Eagle Point GLR, Point Fullarton GLR, Raymond Island GLR, Swan Reach Bay GLR, Slaughterhouse Creek GLR, Tambo Delta- Metung GLR
Lake Victoria Wetlands	Lonsdale Lakes Wildlife Reserve
Lake Wellington Wetlands	Clydebank Morass Wildlife Reserve, Swell Point-Roseneath Point GLR, Andrew Bay – Grebe Bay GLR, The Dardanelles GLR, Paddy Bay GLR, Tucker Swamp GLR, Salt Lake-Blackwater Morass GLR, Avon-Perry River Delta GLR
Macleod Morass	Macleod Morass Wildlife Reserve
Powlett River Mouth	Yallock-Bulluk Marine and Coastal Park
Shallow Inlet Marine and Coastal Park	Shallow Inlet Marine and Coastal Park, Waratah Bay-Shallow Inlet Coastal Reserve

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