

# Catchment Condition

## Context

This report provides a snapshot of some aspects of the environmental condition of the Port Phillip and Western Port region – the state of its biodiversity, waterways, land, coast, bays and community stewardship. It fulfills the Port Phillip & Westernport CMA's responsibility under the *Catchment and Land Protection Act 1994* to submit a report on the condition and management of land and water resources in its region.

## Regional overview

**Significant natural features:** Port Phillip Bay, Western Port, Phillip Island, Dandenong Ranges National Park, Yarra Ranges National Park, Brisbane Ranges National Park

**Major waterways:** Yarra River, Maribyrnong River, Werribee River, Edithvale-Seaford Wetlands (Ramsar-listed), Port Phillip Bay Western Shoreline and Bellarine Peninsula (Ramsar-listed), Dandenong Creek, Western Port (Ramsar-listed), Bunyip River, Lang Lang River, Bass River

**Traditional owner groups:** Wurundjeri Tribe Land Compensation and Cultural Heritage Council, Wathaurong Aboriginal Cooperative, Boon Wurrung Foundation, Bunurong Land Council Aboriginal Corporation

Area  
**1.3m**  
hectares

Population  
**4.5m**

Waterways  
**800km**

Agriculture  
**23%**  
of the region

Coastline  
**600km**

Parks  
**73,500**  
hectares



## Summary of the PPWCMA's view of trends

Biodiversity	Highly concerned ↓
Waterways	Neutral —
Land	Concerned ↓
Coasts	Concerned ↓
Port Phillip Bay and Western Port	Positive ↑
Community engagement and stewardship	Positive ↑

## The condition of biodiversity in this region

The extent and quality of native vegetation and habitat is a critical foundation for biodiversity. Past data from the Department of Environment, Land, Water and Planning indicated that approximately 500,000 hectares of native vegetation remains in this region, covering around 40 per cent of the land area. Around two-fifths of it is classified as 'endangered', 'vulnerable', 'depleted' or 'rare'.

One third of the native vegetation occurs in parks and conservation reserves while two-thirds is on other public and private land. Protection and maintenance of the vegetation on public land is important as it often provides large areas and long-term security for biodiversity. However, most of the region's native vegetation is on private land so there is a critical need for a system in which private landholders are able, willing and encouraged to protect native vegetation.

More information on native vegetation is available in the Regional Catchment Strategy at [ppwrcs.vic.gov.au](http://ppwrcs.vic.gov.au). The following table summarises the extent and quality of native vegetation in areas of the region.


Area	Extent	Quality
	(Area of native vegetation as a proportion of total area)	(% of native vegetation with quality score greater than 0.5, in a scale of 0-1)
Mornington Peninsula	28%	45%
Moorabool, Melton, Wyndham and Greater Geelong	39%	62%
Urban Melbourne	11%	24%
Macedon Ranges, Hume and Whittlesea	30%	46%
Yarra Ranges and Nillumbik	74%	85%
Casey, Cardinia and Baw Baw	33%	67%
Bass Coast, South Gippsland and Islands	31%	67%

In regard to native animals, the following table summarises an analysis of the likely persistence of native animal species using sighting records for amphibian, reptile, bird, mammal and fish species. The analysis is not about the health or extent of animal populations but rather the likelihood that a species observed in the past still occurs in an area.

The analysis was commissioned by the PPWCMA and undertaken by the Australian Research Centre for Urban Ecology in 2008. It accessed a large data set including some monitoring that has been continuous from the late 19th century. There are acknowledged limitations to the data and its analysis and the initial analysis is now nearing a decade old. More explanation and information is available in the Regional Catchment Strategy at [ppwrcs.vic.gov.au](http://ppwrcs.vic.gov.au).

Area	Known no. of species	Species likely to be persisting	
		No.	%
Mornington Peninsula	321	212	66%
Moorabool, Melton, Wyndham and Greater Geelong	400	290	73%
Urban Melbourne	447	327	73%
Macedon Ranges, Hume and Whittlesea	338	231	68%
Yarra Ranges and Nillumbik	346	259	75%
Casey, Cardinia and Baw Baw	340	231	68%
Bass Coast, South Gippsland and Islands	293	87	30%

Taking a broad perspective, the PPWCMA is highly concerned that the overall extent and condition of native vegetation in the region is reducing and that the diversity of native animal species is declining. Further, the PPWCMA is highly concerned that there is not an adequate system in place to accurately measure and monitor the situation.

PPWCMA view of trend in biodiversity condition	Highly concerned 
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Matters that contribute to loss and degradation of native vegetation in the region include:

- Incremental loss of vegetation through small-scale clearing at property level;
- Clearing of vegetation that is permitted for various reasons including for major urban and infrastructure development but for which there is a lag in the establishment of 'offsets' plus dubious certainty that the offsets are ever commensurate with the losses;
- Impacts of weeds, pest animals, recreation, overuse and other factors affecting the quality of native vegetation; and
- Illegal clearing.

There is a lack of monitoring for many of these factors so there is no accurate 'balance sheet' for the losses and gains in native vegetation. Adding to this, there is a lack of ground-truthed data on vegetation extent and quality across the region. The PPWCMA is concerned at a reliance on modelling of vegetation extent and quality, and that the gap between modelled data and the on-ground reality is wide and widening.

The lack of specific, ground-truthed data is also an important issue regarding the diversity and health of native animal species. A follow-up assessment of native animal diversity in this region is a priority as it would enable a comparison with the first assessment undertaken in 2008.

On the positive side, there has been an advance in the planning for biodiversity health with the release of *Victoria's Environment – Biodiversity 2037*. This strategy sets a direction for biodiversity improvement across Victoria and should generate improved funding and increased work in biodiversity protection, connecting community to nature, monitoring and reporting.

In this region, there are also many projects and activities undertaken each year by councils, government agencies, non-government organisations, Landcare groups and networks, community groups, individual property managers and others that protect and improve biodiversity. In 2016-17, projects that contributed to the protection and enhancement of native vegetation and native animals included:

- Parks Victoria's ongoing management of large areas of native vegetation in the many parks in this region.
- Ongoing work by the Trust for Nature establishing and maintaining covenants on private land to permanently protect high quality remnant vegetation. There are around 240 covenants established in the region protecting around 3,800 hectares of native vegetation.
- Major landscape revegetation programs including the Greening the West, Grow West and Greening the Maribyrnong programs that are progressively restoring degraded land to the west of Melbourne with extensive plantings of new native vegetation. These programs often have funding support from the Victorian and Australian Governments and are planned and implemented collaboratively by Councils, Government agencies, water authorities, community groups, volunteer groups and individual landowners.
- Environmental enhancement schemes in the Victorian Volcanic Plains in the west of the region involving the Hume, Melton and Wyndham Councils contributing to the protection and enhancement of grasslands and endangered species such as Spiny Rice Flower, Striped Legless Lizard and Golden Sun Moth.

- Projects led by the Department of Environment, Land, Water & Planning, Zoos Victoria and others to help threatened species by implementing actions at high priority locations to reduce the possibility of extinction in the wild and increase the likelihood of threatened species becoming self-sustaining in the long-term.
- Innovative initiatives by many Councils in urban areas including the City of Knox's 'Gardens for Wildlife' scheme and the City of Melbourne's urban forest initiative.
- Ongoing efforts by thousands of volunteers involved in Landcare, 'Friends' and other community groups to maintain and improve the biodiversity values of local parks, reserves and areas of private land.

### The condition of waterways in this region

There are many agencies, organisations, groups and community sectors that have a role in the protection and management of this region's waterways. The Department of Environment, Land, Water and Planning has led the development of Water for Victoria and the Victorian Waterway Management Strategy which establish the state-wide policy framework for water and waterway management. In the Port Phillip and Western Port region, Melbourne Water is the designated waterway management authority and 'caretaker of river health'. Melbourne Water has led development and implementation of the Healthy Waterways Strategy for this region which contributes to meeting the state-wide aims. The Environment Protection Authority, Councils, Parks Victoria, community groups and individual landowners also make very important contributions.


Melbourne Water's Yarra and Bay 2015-16 Report Card (available at [yarraandbay.vic.gov.au](http://yarraandbay.vic.gov.au)) provides the following overview of water quality for various areas in the region.

Area	Very good (high quality waterways) or Good (meets Victorian water quality standards)	Fair (some evidence of stress)	Poor (under considerable stress) or Very poor (under severe stress)	Overall rating	Trend over the past 15 years
Dandenong Catchment	2%	0%	98%	Very poor	Stable
Mornington Catchment	0%	0%	100%	Very poor	Stable
Yarra Catchment	33%	19%	47%	Poor (bordering on Fair)	Improving
Maribyrnong Catchment	0%	86%	14%	Fair	Improving
Werribee Catchment	0%	46%	54%	Poor (bordering on Fair)	Improving
Western Port Catchment	21.3%	34.9%	56.2%	Poor	Stable

The assessments reflect the profound impacts that the extensive urbanisation and intense rural land use that exist in this region can have on water quality. A pattern across the region is that sites in forested parks in upper catchment areas are protected from development and achieve 'Very Good' and 'Good' scores. Water quality declines as waters flow from the rural middle catchment and pass through more developed or urbanised areas in the lower catchment. Rural sites in the middle of catchments where nutrients and sediments enter waterways through runoff from farmland and when stock damage creeks and river banks are typically 'Fair'. In urban areas 'Poor' and 'Very Poor' water quality scores result from inputs of nutrients and pollutants in runoff from residential, commercial and industrial areas, roads and other hard surfaces, particularly in small tributaries.

It is recognised that water quality is only one of the factors to assess the health of streams in the region. The Healthy Waterways Strategy therefore also aims to protect and enhance habitat, flows, connectivity and physical form to support a range of waterway-dependant values including birds, frogs, fish, platypus, macroinvertebrates, vegetation and amenity. Actions to achieve this include revegetation projects, stormwater harvesting, mitigation and treatment projects, community capacity building and grants programs.

Melbourne Water's development of a new Healthy Waterway Strategy, combined with a stable funding process, provides a sound platform for potential improvement in the future, though there are significant challenges associated with continued urbanisation and population growth.

PPWCMA view of trend in waterways	Neutral 
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Projects and activities undertaken by Melbourne Water, retail water authorities, councils, government agencies, non-government organisations, Landcare groups and networks, community groups, individual property managers and others that helped to protect and improve waterways, wetlands and water quality in 2016-17 included:

- Extensive works by Melbourne Water including establishment of vegetation along 225 kilometres of waterways, vegetation management along 1852 kilometres of waterways, 95 hectares of aquatic habitat improvement, 73 kilometres of stock exclusion fencing along waterways and removal of three fish barriers;
- Grants to local government to support sustainable stormwater management with activities such as design and construction of stormwater treatment systems and harvesting schemes, planning, stormwater investigations, monitoring and the preparation of communication material and education programs;
- Grants through Melbourne Water's River Health Incentives Program to farmers, community groups and land management agencies to protect and improve waterways and water quality.
- Coordination of Waterwatch, a citizen science program that encourages communities to help with monitoring, protecting and enhancing the health of our local rivers and creeks, in which nearly 9,000 people participated in 2016-17 including the Frog Census, Platypus Census, Waterbug Census and stream water quality testing; and
- Management by Melbourne Water, on behalf of the Victorian Environmental Water Holder, of the environmental water reserve for the river systems of Port Phillip and Western Port catchments, primarily the Yarra, Werribee and Tarago which included delivery of over 51.2 megalitres of environmental flows.

## The condition of land in this region

Land value in the Port Phillip and Western Port region is estimated to total over \$870 billion which is 83 per cent of Victoria's total rateable land value (ABS, 2012). Only around 24 per cent of the land is residential but it has a total value of around \$770 billion (ABS, 2012).

The value of this region's primary production is estimated at \$17 billion (ABS, 2012). This is the highest of the ten catchment management regions in Victoria despite it having the second smallest area of land use for agriculture. This reflects the intensive, high value farming that occurs in and around Melbourne in a variety of agricultural industries.

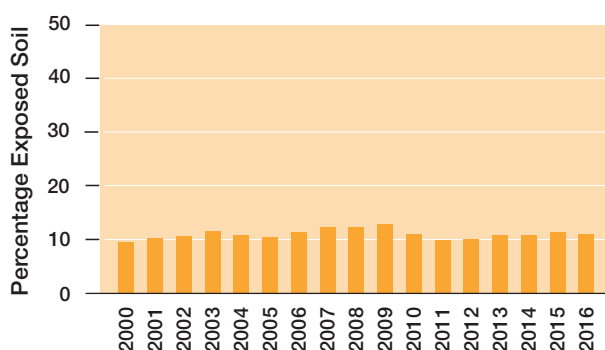
Land and soil across the region is considered to be in fair condition overall. Relatively high average rainfall for the region enables much of the region's soil to retain vegetation cover, as seen in the graph below. This means there is relatively low risk of widespread soil erosion. The higher rainfall and irrigation areas support high-yield agriculture where soil maintenance is a priority for most landowners. Lower rainfall areas, generally in the west of this region, can be more susceptible to soil erosion, soil quality decline and pest infestations.

However, there are a number of significant factors that impact the condition of land and landscapes in this region including:

- Continued expansion of the urban area, with new housing and associated infrastructure reducing the area of productive agricultural land, decreasing biodiversity and green space, and introducing a range of new impacts to adjoining rural properties;
- High farming intensity on some areas of land;
- The introduction and spread of weeds and pest animals decreasing soil health, productivity, profitability and land resilience;
- Removal and fragmentation of native vegetation and habitat across the region;
- Climate variations, including drought, impacting on soil and native vegetation resilience and health; and
- Some land management practices leading to increased risk of soil erosion, reduced primary production outputs and a decrease in soil carbon sequestration.

From a broad perspective, the PPWCMA is concerned that the health and resilience of the land and landscapes in the region is declining. The PPWCMA is particularly concerned regarding the ongoing conversion of productive agricultural land to urban use.

**The percentage of exposed soil in the Port Phillip and Western Port region between 2000 and 2016 (Australia's Environment Explorer 2016)**





On the positive side, there are many projects and activities undertaken across this region by councils, government agencies, non-government organisations, Landcare groups and networks, community groups, individual property managers and others that seek to protect and improve land health. In 2016-17, this work included:

- Various projects with agricultural industry groups and farmers to improve sustainable land management practices including trials in the use of compost under grapevines and cultivation practices in the vegetable industry;

- A project led by the Western Port Catchment Landcare Network using on-farm demonstrations and trials to support hundreds of farmers to increase their knowledge and adoption of innovative farming practices that could improve productivity and natural resource condition; and
- Land management grants and rate rebate schemes by Councils such as the Hume City Council's 'Conserving our Rural Environment' grants and 'Agricultural Land


Use Rebate'. In 2015-16, the Council awarded grants totalling around \$310,000 to landholders to conserve and improve rural land and the natural environmental assets on private property. The council also approve a rate rebate for 296 landowners, equating to over \$670,000, addressing land management issues including noxious weed control and pest animal control on their agricultural properties.

### The condition of coastal areas in this region

The 600 kilometres of coastline in this region has diverse habitats and values and is heavily visited and used. Much of the coast has been impacted by urban development, coastal settlement, high levels of recreational use and invasive species. The amount and quality of native vegetation, as indicators of the environmental value of the coastal zone, is summarised in the Regional Catchment Strategy (available at [ppwrccs.vic.gov.au](http://ppwrccs.vic.gov.au)) and shown in the table below.

Coastal zone	Approx. length (km)	Average width (m)	Approx. area (Ha)	Area of native vegetation (Ha)	Proportion of zone with native vegetation (%)
Phillip Island ocean	42.3	258	1,091	922	85
Phillip Island bay	36.9	120	443	52	12
French Island south	23.6	342	807	693	86
French Island north	40.4	349	1,411	1,293	92
Western Port east	55.3	141	778	556	71
Western Port north	40.4	451	1,821	1,338	73
Hastings	22.9	460	1,053	662	63
Sandy Pt to Flinders	33.1	435	1,440	1,121	78
Flinders to Pt Nepean	45.5	451	2,050	1,782	87
Port Phillip Bay eastern beaches	115.5	83	959	440	46
Port Phillip Bay north western shoreline	60.1	446	2,681	1,505	56
Geelong	22.6	54	121	33	27
Corio Bay south	35.1	100	351	210	60
Swan Bay	36.2	931	3,369	725	22
Queenscliffe	7.1	106	75	52	69
<b>Total</b>	<b>617</b>	<b>299</b>	<b>18,454</b>	<b>11,384</b>	<b>62</b>

From a broad perspective, the PPWCMA is concerned that the overall environmental condition of coasts in the region is reducing. Further, the PPWCMA is concerned that there isn't a consistent approach to measuring coastal condition and there isn't a monitoring program in place to assess change over time. This situation may be improved through the development of a new Marine and Coastal Act in the near future.

PPWCMA view of trend in coastal condition	Concerned 
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However, there are many organisations that undertook work in 2016-17 that contributed to the health of the coasts including:

- Protection and renourishment of some threatened beaches and foreshores by the Department of Environment, Land, Water and Planning and some councils, including at Middle Park beach, Brighton beach, Rye beach and Rosebud beach;
- Ongoing implementation of a 'Ramsar Protection Program' directing funds from the Australian and Victorian governments to priority works by Parks Victoria, Councils, Phillip Island Nature Parks, community groups and others to control pests, protect native vegetation and raise community awareness of the values of Ramsar wetlands;
- Management of coastal areas by various community-based foreshore committees of management including weed management, fencing, erosion management and revegetation with native species; and
- The Coastal Assets Protection Program by the Department of Environment, Land, Water and Planning to identify built assets at risk from climate change impacts.

## The condition of Port Phillip Bay and Western Port

Port Phillip Bay and Western Port are significant environmental, social and economic assets in this region.

The bays are both generally healthy systems. However, risks to their condition include climate change, increased recreational use, litter, nutrients, sediment and pollutant loads and extreme weather events such as storms and peak rainfall events which transport nutrients and pollutants from rivers and drains into the bays over short periods of time.

The State of the Bays 2016 report by the Victorian Commissioner for Environmental Sustainability (available at [ces.vic.gov.au](http://ces.vic.gov.au)) reported on the condition of water quality, intertidal vegetation, water and shore birds and carbon sequestration for the bays and includes the information summarised below.

	Port Phillip Bay	Western Port
Coastline	333 km	295 km
Total area	1,930 km <sup>2</sup>	680 km <sup>2</sup>
Average depth	13 m	3 m
Greatest depth	24 m	6 m
Catchment area	9,790 km <sup>2</sup>	3,721 km <sup>2</sup>
Catchment population	4.5 million people	45,000 people

Water quality monitoring in the bays is one of the most complete environmental monitoring programs in this region. For a number of years, the Environment Protection Authority, in partnership with Melbourne Water, has undertaken water quality monitoring at fixed sites in Port Phillip Bay and Western Port. During the summer season, the Environment Protection Authority also issues beach advisory alerts to inform public recreational users across Port Phillip Bay. Of the 36 beaches monitored between 2013 and 2016, 94-97 per cent met the State Environment Protection Policy (Waters of Victoria) objectives for swimming. Water quality is assessed by monitoring a range of indicators including: nutrient levels, water clarity, dissolved oxygen, salinity, algae, metals, water temperature and faecal contamination. The table below summarises water quality condition for Port Phillip Bay and Western Port.

Water Quality Indicator	Port Phillip Bay	Western Port
Water quality	Good	Poor
Phytoplankton levels	Good	Poor
Sediment contamination	Fair	Fair
Other indicators	Good	Good

Intertidal vegetation across the bays is predominantly comprised of mangroves, saltmarsh and seagrass. Since European settlement, Port Phillip Bay has retained 50 per cent of its saltmarsh area and Western Port has retained 90-95 per cent though sea level rise is causing fragmentation to saltmarsh communities. During the last major drought (1997-2009), Port Phillip Bay lost large areas of seagrass. Seagrass in Western Port declined between the mid-1970s to 1984 but then increased in the mid-1990s to 1999. The table below provides an overall assessment of these three intertidal habitats:


Habitat	Port Phillip Bay	Western Port
Saltmarsh	Fair	Fair
Mangrove	Good	Fair
Seagrass extent	Fair	Fair

Available bird data focuses on roosting shore birds for Port Phillip Bay and water birds for Western Port. Over the past 20 years, roosting shore birds have been declining globally and this pattern is seen in Port Phillip Bay. From 1981 to 2010, 16 migratory roosting shore bird species were monitored during the summer season along the western shoreline. Of these, 10 species have exhibited significant population decline. Similarly, several Western Port water bird species have experienced serious declines including terns, cormorants and the Australian pelican.

Bird	Port Phillip Bay	Western Port
Roosting shore birds	Fair	NA
Water birds	NA	Fair



The PPWCMA is of the view that the condition of Port Phillip Bay and Western Port is generally improving and that continued improvement is likely into the future.

PPWCMA view of trend in condition of bays	Positive 
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There are many agencies, organisations, groups and community sectors that have a role in the protection and management of water quality in Port Phillip Bay and Western Port. The Environment Protection Authority has led the development of State environment protection policies (SEPPs) for both bays which establish targets for various parameters of water quality and works in partnership with Melbourne Water to monitor water quality outputs into both bays. DELWP, Parks Victoria, Melbourne Water, councils and thousands of individual land managers also make very important contributions to the management and protection of the bays.

Many of these organisations undertook work in 2016-17 that contributed to understanding and improving the health of the bays including:

- Melbourne Water's Western Port environment scientific review to understand the health of Western Port and to inform future investment to protect and improve the bay's health;
- Management of the marine parks and sanctuaries in Port Phillip Bay and Western Port by Parks Victoria to maintain biodiversity values;
- The Department of Environment, Land, Water & Planning's Port Phillip Bay Fund assigning \$3.57 million to 36 new projects to be delivered by community groups and organisations to protect the health of Port Phillip Bay and the wider catchment area;
- Environment Protection Authority's ongoing work aimed at reducing the amount of pollutants entering waterways and bays from rural, urban and coastal areas; and
- The Nature Conservancy's work to restore Port Phillip Bay's shellfish reefs.

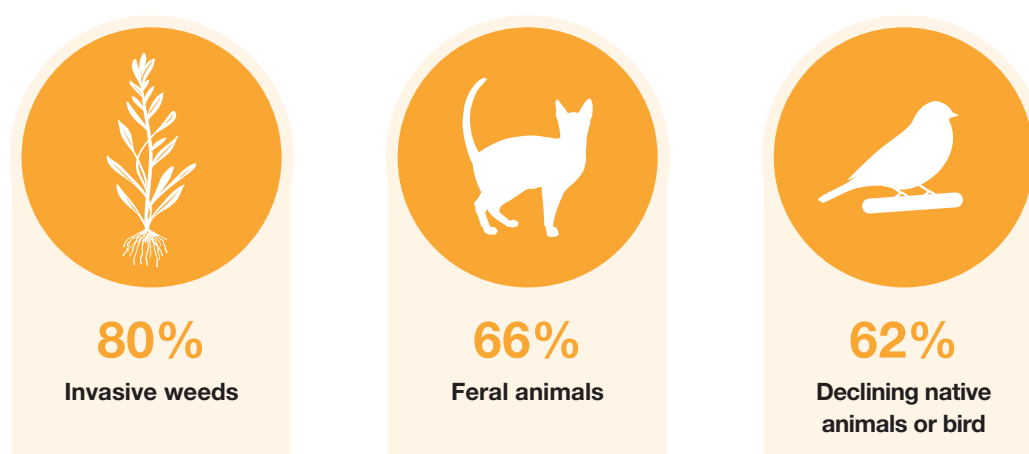
## Community engagement and stewardship

Continuing population growth generates challenges for natural resource management in this region. During 2015-16, Melbourne had the largest (107,800 people) and fastest growth rate (2.4 per cent) across all Australian capital cities. Five of Melbourne's outer suburbs ranked in Australia's top 10 largest growth suburbs - South Morang in the city's north, Cranbourne East in the south-east, Craigieburn-Mickleham in the north, Point Cook in the west and Epping.

With an increased population using and impacting on natural resources, a priority of the Victorian Government's new Biodiversity 2037 plan is to create opportunities for communities to better connect with their local natural areas and to identify understand the issues that must be addressed into the future.

The top three community concerns about environmental health relate to invasive weeds, feral animals and declining numbers of native animals (from Regional Wellbeing Survey 2015, available at [regionalwellbeing.org.au](http://regionalwellbeing.org.au)) though the survey results need to be interpreted with caution due to the small sample size in a region with a population of 4.5 million people.

## COMMUNITY CONCERNS Top three



Perceived environmental health measures in the Port Phillip & Western Port region 2015 (Source: Schirmer et al., 2016).

There are many agencies, organisations, groups and community sectors that engage with community sectors to improve the community's connection with nature and to build a strong stewardship ethos. Councils, the Department of Environment, Land, Water & Planning, Melbourne Water, Parks Victoria and others make very important contributions.

The Landcare movement in this region includes 85 Landcare groups and 13 networks that together cover 83 per cent of the region's rural

land area and directly involve around 3000 landowners managing 2000 properties. The 2015-16 Port Phillip & Western Port Landcare Report Card indicated that around 50,000 hours of volunteer time were provided for Landcare activities in that year. This work achieves significant benefit for natural resources every year and the Landcare movement also provides significant additional benefits by educating the broader community, fostering resilient communities and engaging the youth of today to be the environmental leaders of tomorrow.

The Landcare movement in rural areas is complemented by hundreds of similar volunteer groups operating in urban and peri-urban areas such as 'Friends of' groups and committees of management that work in coastal areas.

From a broad perspective, the PPWCMA is of the view that the participation and stewardship by the region's natural resource management community is generally strong and improving, and that continued improvement is likely into the future.

PPWCMA view of community participation and stewardship

Positive



## Summary of project outputs in 2016-17

The PPWCMA directed funds from the Victorian Government, Australian Government and other sources to numerous priority projects across the region in 2016-17. Outputs collectively achieved with these funds included:

- 11.5 kilometers of fencing;
- 794 hectares of new vegetation established;
- 3,622 hectares treated to manage weed infestations;
- 24,840 hectares treated to manage pest animals;
- 32 hectares with environmental fire regime;
- 13,661 hectares with changed agricultural practices;

- 182 management agreements in place;
- 10,462 participants at various community and stakeholder events;
- 203 partnerships;
- 10 plans produced; and
- 11 publications produced.

## Key challenges for management

A perennial challenge in this region is the large number of land managers and planning authorities which each have a stake in the management of natural resources. The large number of organisations and high population means there are significant resources dedicated to environmental management but coordination between the many players is difficult.

Other significant challenges in the management of land, water and coastal resources in this region have been:

- Continuing rapid population growth and associated large scale land use change on the metropolitan fringe which often requires trade-offs between social, economic and environmental values; and
- Climate change impacts which continue to present new threats and uncertainties for natural resource management and planning.

In response, the PPWCMA has focused on enhancing collaborative environmental planning, monitoring and reporting in this region. It has coordinated development of the Regional Catchment Strategy so it includes specific, measurable environmental targets and identifies organisations that have agreed to play leadership and collaborative roles in efforts to attain these targets.