Commissioner *for* Environmental Sustainability Victoria

State of the Marine and Coastal Environment 2021 Report – findings at a glance

December 2021

Image: Phillip Island's little penguins (*Eudyptula minor*)
Credit: Phillip Island Nature Parks

The State of the Marine and Coastal Environment 2021 Report:

- Includes 215 assessments across 82 indicators, covering five regions and identifies five priorities for future focus.
- Builds on the findings of other statutory reports for Victoria including the: State of the Bays 2016 and Victorian State of the Environment 2018 reports* and the Victorian Environment and Assessment Council's Assessment of the Values of Victoria's Marine Environment, 2019**.
- Is the first report delivered according to the approach outlined in the Commissioner's "Science for Sustainable Development", Framework for the Victorian State of the Environment 2023 Report*.
- Improves the scientific baseline & understanding of Victoria's marine and coastal environments ahead of the complete, state-wide State of the Marine and Coastal Environment 2024 Report and identifies opportunities for the use of spatial information and technologies to fill knowledge gaps.

Available online * www.ces.vic.gov.au **www.veac.vic.gov.au

3 BIOUNITS

- Port Phillip Bay
- Port Phillip Heads
- Western Port

State of the Bays 2016 Report

6 BIOUNITS

- Port Phillip Bay
- Port Phillip Heads
- Western Port
- Gippsland Lakes
- Corner Inlet
- Nooramunga

State of the Marine and Coastal Environment 2021 Report

In addition, all marine protected areas (marine national parks and marine sanctuaries). Geographic extent includes 5 km inland of the high-water mark from the sea (as per the Marine and Coastal Act 2018).

ALL 26 BIOUNITS

State of the Marine and Coastal Environment 2024 Report

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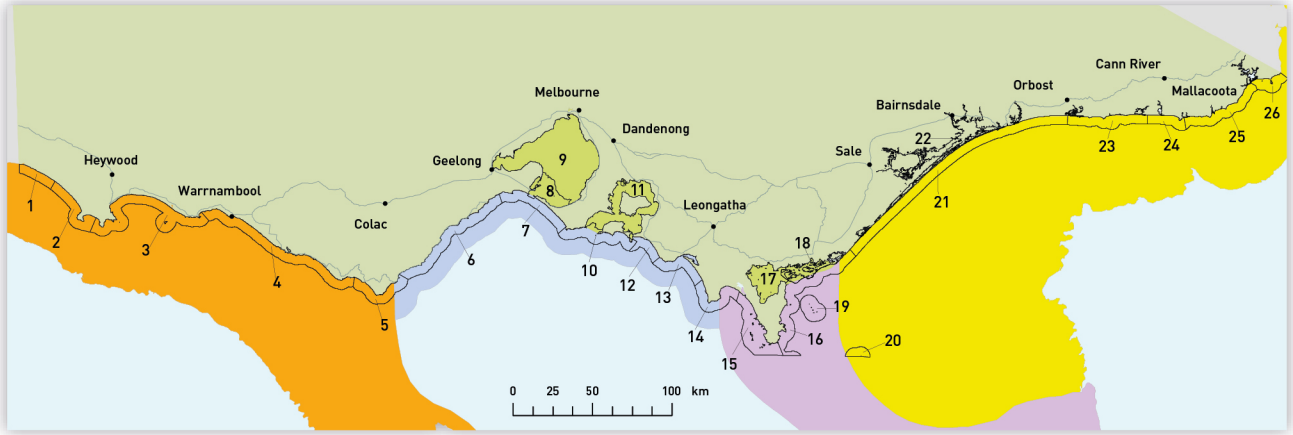

Marine Bioregions

- Central Victoria
- Flinders
- Otway
- Twofold Shelf
- Victorian Embayments

Marine Biounits

1. Glenelg
2. Discovery Bay
3. Cape Nelson
4. Shipwreck Coast
5. Cape Otway
6. Surf Coast
7. Bellarine-Mornington
8. Port Phillip Heads
9. Port Phillip Bay
10. Schank-Woolamai
11. Western Port
12. Wonthaggi
13. Bunurong
14. Cape Liptrap
15. Wilsons Prom West
16. Wilsons Prom East
17. Corner Inlet
18. Nooramunga
19. Cliffy Group
20. Hogan Group North
21. Ninety Mile Beach
22. Gippsland Lakes
23. Cape Conran
24. Point Hicks
25. Croajingolong
26. Gabo-Howe

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Summary of science

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Summary of science

Status Assessments

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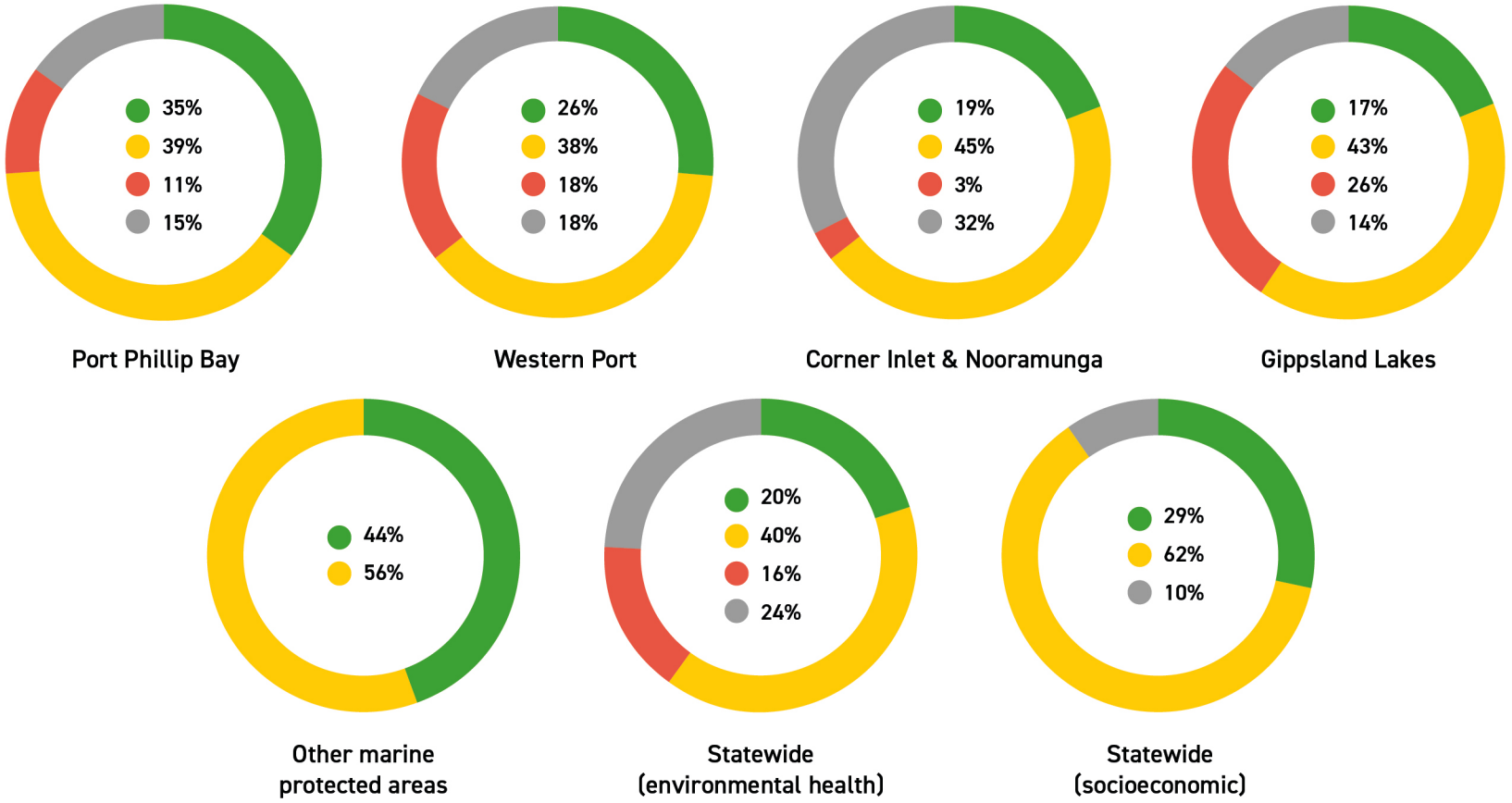

Good Fair Poor Unknown

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Summary of science

Trend Assessments

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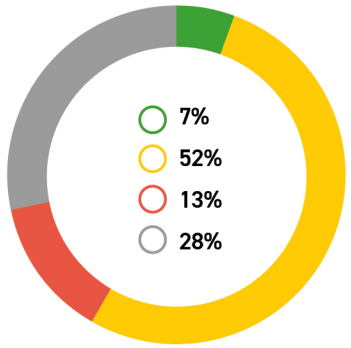
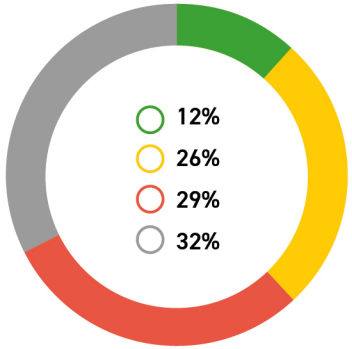
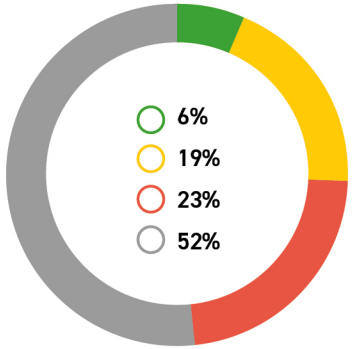


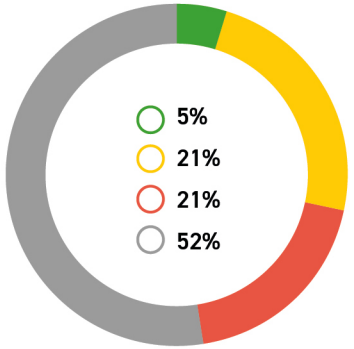
Port Phillip Bay



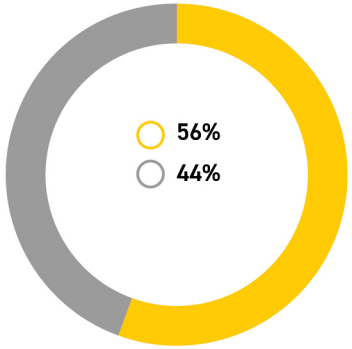
Western Port



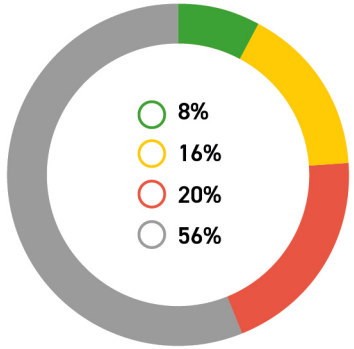
Corner Inlet & Nooramunga



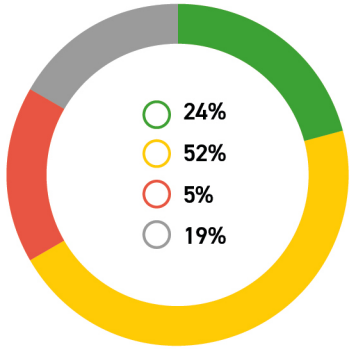
Gippsland Lakes



Other marine protected areas



Statewide (environmental health)



Statewide (socioeconomic)

↗ Improving → Stable ↙ Deteriorating ? Unclear

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Summary of science

Data Confidence

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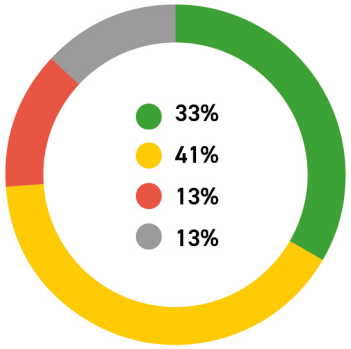
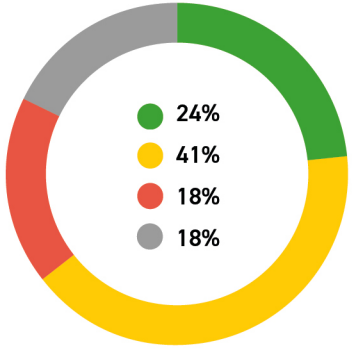
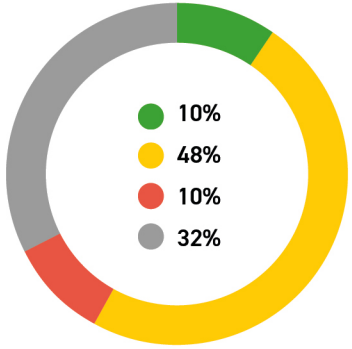


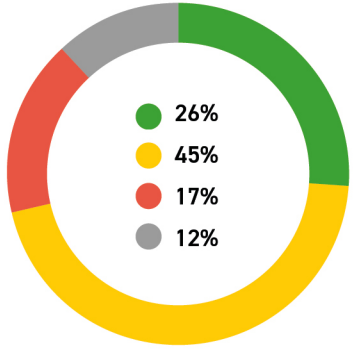
Port Phillip Bay



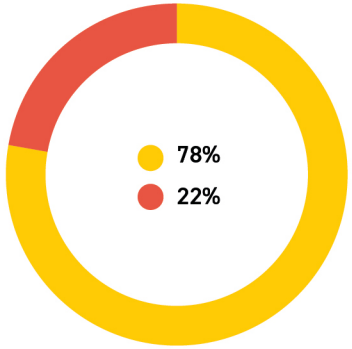
Western Port



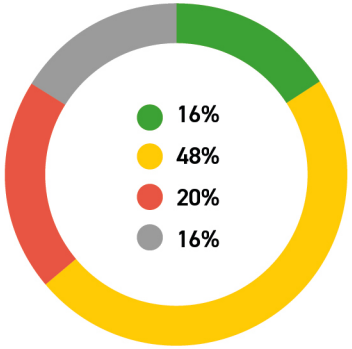
Corner Inlet & Nooramunga



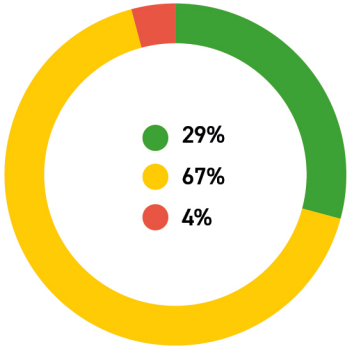
Gippsland Lakes



Other marine protected areas



Statewide (environmental health)



Statewide (socioeconomic)

High

Moderate

Low

Insufficient evidence to assess

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Key findings by theme

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Key findings by theme

Water Quality and Catchment Inputs

- Water quality is monitored regularly in Port Phillip Bay, Western Port and the Gippsland Lakes.
    - Port Phillip Bay has been rated as good or very good each year since monitoring and reporting began in 2002.
    - Western Port has been good every year since monitoring and reporting began in 2000 except in 2017 (fair).
    - Eastern Gippsland Lakes (Lake King and Lake Victoria) has been good in six of the past seven years, while in Lake Wellington it has been poor for the past three years, and poor or very poor in seven of the past 10 years.
- However, seagrass extent in Western Port is impacted by turbidity caused by sediment loads and variation in water depth. Five of the nine estuaries flowing into Western Port and assessed for water quality in the 2021 Index of Estuary Condition received a rating of very poor.
- Effects of stormwater vary across Port Phillip Bay's catchments. In the Dandenong catchment stream health is poor.
- Water quality in Corner Inlet and Nooramunga is not routinely measured.

Key findings by theme

Litter Pollution

- The number of litter items and microplastics flowing into Port Phillip Bay from the Yarra and Maribyrnong Rivers each year is estimated at more than 2.5 billion. About 85% are microplastics. Industrial precincts were responsible for a large majority of microplastics.
- No specific analyses of litter and plastics have occurred in Western Port, Corner Inlet and Nooramunga, or the Gippsland Lakes.
- The coastal air quality indicator in this report is believed to be the first instance of focused coastal air quality reporting in Australia.
    - Port Phillip Bay air quality is generally good. However, focused research on air quality near shipping terminals using lower-quality air monitoring sensors provides evidence of poor air quality, due to high concentrations of fine particle pollution near Station Pier.
    - Regionally, bushfire smoke has been measured at levels significantly higher than health-based standards. Air quality at Gippsland Lakes was closely monitored during the 2019–20 bushfire season during which time the daily air quality standard PM2.5 was frequently breached.

Key findings by theme

Biodiversity: fish and invertebrates

- The biodiversity theme includes indicator assessments on coastal vegetation, invertebrates on intertidal and subtidal reefs, fish, birds and marine mammals.
- A few important stories emerged on fish and invertebrates:
  - Black bream and dusky flathead have both been rated as having a poor status in the Gippsland Lakes.
  - Blacklip abalone has been assessed as poor, with a deteriorating trend.
  - Southern sand flathead has been assessed as poor in Port Phillip Bay, an unchanged status from State of the Bays 2016.
  - There is a declining trend in the recreational fishery for adult snapper in Western Port. However, strong recruitment of snapper in Port Phillip Bay is expected to lead to improved fishery performance in Western Port over the next 5 to 10 years.
  - King George whiting is expected to remain sustainable in Port Phillip Bay, Western Port and Corner Inlet.
  - Abundance and biomass of southern rock lobsters outside the Point Addis Marine National Park increased closer to the park, suggesting that the park may be increasing the supply of lobsters to surrounding waters.

Key findings by theme

Biodiversity: birds and mammals

- The main declines in the bird indicators were among trans-equatorial migratory shorebirds. These declines are most likely due to habitat loss on their migratory flyways in east Asia, particularly over the Yellow Sea.
- Little penguins continue to thrive on Phillip Island and around the St Kilda breakwater. Their numbers on Phillip Island are estimated at 32,000, and at St Kilda 1,400.
- There is a stable population of approximately 100 dolphins in Port Phillip Bay. Western Port has a small but stable resident population of 20 dolphins. There is also a population of between 60 and 100 dolphins living in the Gippsland Lakes, but there has been significant mortality recently, linked with severe bushfire effects.
- The health of Australian fur seals - numbers, pup production and disease (inc. toxicants) - can indicate trends in the general health of the marine environment. Colonies at Cape Bridgewater, Chinaman's Hat, Phillip Island and Wilsons Promontory have also become major tourist assets. There are 20,000 to 30,000 at the Seal Rocks colony (Western Port).

Key findings by theme

Seafloor Integrity and Health

- Seagrass meadows are critical habitat for marine species, protect shorelines and store significant amounts of carbon. Considerable seagrass loss has been observed in Port Phillip Bay (1997 -2009), in Western Port (mid '70s and early '80s) and in Corner Inlet (a slow decline from 1965 to 2013).

- The condition and extent of macroalgae on subtidal reefs in Port Phillip Bay has been assessed as poor for Point Cooke and Jawbone marine sanctuaries, fair for Ricketts Point Marine Sanctuary, and good for Port Phillip Heads Marine National Park. Macroalgae has been under threat in Cape Howe Marine National Park and Beware Reef Marine National Park), and there has been an increase in urchin barrens. Golden kelp (Point Addis Marine National Park) has declined since 2012.

- Shellfish reefs provide valuable ecosystem services including fish production, coastal protection, erosion mitigation and nutrient cycling. The extent of shellfish reefs in Port Phillip Bay, Western Port and Corner Inlet is now minimal, and the status of the shellfish reefs indicator has been rated as poor.

Key findings by theme

Pests and Invasive Species

- There are more than 160 invasive marine species in Port Phillip Bay. The impacts of these invasive species are significant, e.g. the northern Pacific seastar causes changes in fish populations. The population had reached 165 million just five years after the species was first detected. New invasive species continue to arrive, most recently the Asian shore crab in late 2020.
- Western Port has several known invasive marine species, although the size and number of infestations is significantly less than in Port Phillip Bay.
- Corner Inlet has remained relatively free of invasive marine species. Japanese kelp has been detected at Port Welshpool, and the northern Pacific seastar has been detected at Tidal River.
- The northern Pacific seastar was detected in the Gippsland Lakes in 2015 and 2019. It was removed on both occasions.

Key findings by theme

Climate and Climate Change Impacts 1

- None of the Climate and Climate Change Impacts indicators in this report were assessed as having a good status. Indeed, deteriorating trends were observed for 21 of the 22 regional indicators where the trend was assessed.
- Tidal gauge measurements show that sea levels at Williamstown have been rising by approximately 1.8cm per decade since 1981, and at Stony Point by 3.5cm per decade since 1981.
- Research published in 2020 found significant change in shoreline position along 13% of the Victorian coast between 1986 and 2017. Erosion hotspots extend along 76.6 kilometres of the coastline, equivalent to approximately 6.2% of the Victorian coast. 100 kilometres of the Gippsland coastline is highly vulnerable to coastal erosion.

Key findings by theme

Climate and Climate Change Impacts 2

- Victoria's coasts have already warmed by more than 1°C, with areas of the Port Phillip Bay coastline with temperatures approximately 1.5°C warmer than an indicative pre–industrial era baseline.
- The increasing frequency of marine heatwaves around Australia in recent years has irreversibly changed marine ecosystem health, habitats and species. Effects include depleted kelp forests and seagrasses, a poleward shift in some marine species, and increased occurrence of disease.
- A reduction in annual rainfall of 7–12% has been observed along the Port Phillip Bay coastline during the 21st century, and a 13–20% reduction in cool-season rainfall. Notably, the biggest percentage rainfall reductions have occurred on the western side of Port Phillip Bay, which is also projected to have faster population growth in coming decades, placing increasing pressure on water resources.

Key findings by theme

Managing Coastal Hazard Risks

- The Department of Environment, Land, Water and Planning (DELWP) analysed the extent and quality of Victorian councils' consideration of climate change in land-use planning. Coastal councils were three times more likely than inland councils to have an intermediate, high or advanced consideration of climate change. Nevertheless, 30% of coastal councils in 2018 had no or only basic integration of climate change in land-use planning.

- All catchment management authorities (CMAs) are implementing climate change adaptation plans or strategies. These are based on CSIRO's latest climate change projections and developed with research organisations.

- Blue carbon ecosystems (mangroves, marshes, seagrass) can sequester carbon, offset greenhouse gas emissions, improve fisheries and increase coastal resilience to rising sea levels and storm surges.

- Allowing coastal wetlands in Victoria to naturally retreat with sea-level rise could sequester 1.6 million tonnes of carbon by 2050 with a value of $65 million.

Key findings by theme

Communities

- Recent rates of coastal population growth (1.6%) have been lower than for non-coastal areas (2.2%). Population growth in coastal suburbs of Melbourne has been rapid, while coastal locations near Melbourne and Geelong (Bellarine Peninsula, Torquay) also had rapid growth.
- A recent study estimated that recreational fishing and boating in Victoria in 2018/19 generated 55,780 combined direct and indirect full-time equivalent jobs, including 25,058 direct jobs.
- While Victoria's systems for managing commercial fisheries are generally effective, threats include overfishing, illegal/unreported fishing, introduction of pests, bycatch, and entanglements.
- Aquaculture is an increasingly important source of seafood in Victoria, for both the domestic and export markets. The main species farmed in Victorian coastal waters are abalone and blue mussels.

Key findings by theme

Stewardship and Collaborative Management

- DELWP has developed a Marine and Coastal Stewardship Index. Benchmark data is being collected for Port Phillip Bay and could provide a model for future reporting.
- Volunteers contribute to protecting and improving marine and coastal environments, but fewer than 6% of Australian volunteers are involved in environmental activities.
- 42% of respondents to a 2018 survey were interested in joining a coastal volunteer group, while 39% indicated willingness to contribute financially to improve coastal management.
- Coastcare activities include revegetating coastal areas, building boardwalks and tracks, fencing, monitoring native shorebirds and animals, presenting educational and awareness-raising sessions, planting, landscaping and protecting cultural sites. 13,444 people participated in in 2019-20, an increase from 10,500 the previous financial year.

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Future priorities

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Future priorities

1. Use spatial information and Earth observation to help identify and protect Victoria's marine assets.
2. Update Victoria's Marine and Coastal Knowledge Framework to reflect the scientific assessments of this report.
3. Develop thresholds to improve future reporting.
4. Ensure that the Victorian Government continues to implement existing policies and management plans to benefit the environment.
5. Trial different models and ways to represent the complex interlinkages between selected sustainable development goal (SDG) targets, to fully understand the interactions between Victoria's environment, community and economy.

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THANK YOU

Dr Gillian Sparkes AM LinkedIn

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