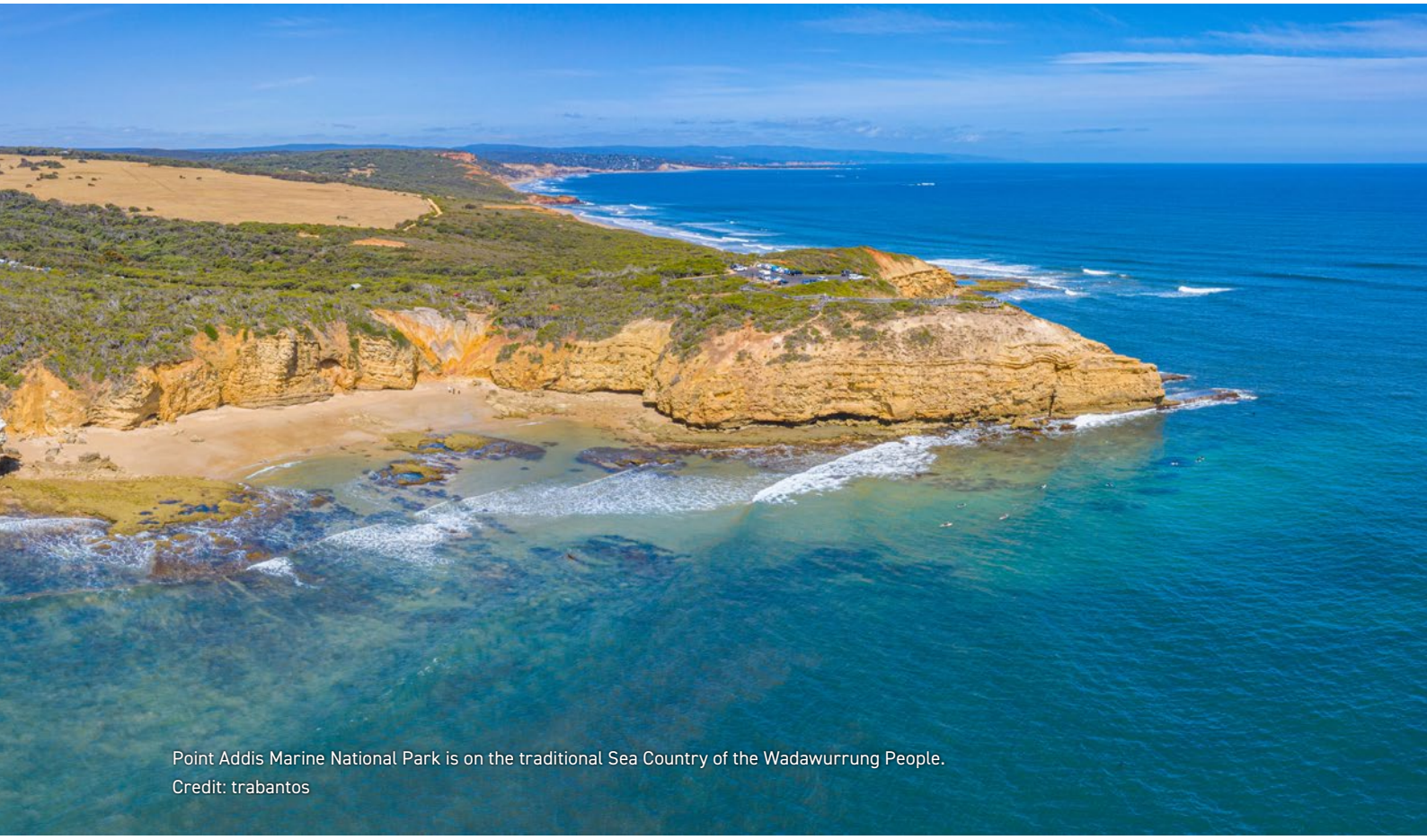
Commissioner *for* Environmental Sustainability Victoria

State of the Great Ocean Road Coast and Parks 2025 Report

Summary Report

VICTORIA State Government



Point Addis Marine National Park is on the traditional Sea Country of the Wadawurrung People. Credit: trabantos

Traditional Owners

We acknowledge and respect Victoria's Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and their deep spiritual connection to it.

We honour Elders past and present, whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

Commissioner *for* Environmental Sustainability Victoria

Cover Image: The Twelve Apostles on the Great Ocean Road. Credit: NXiao

Commissioner's foreword

I am pleased to present the inaugural State of the Great Ocean Road Coast and Parks 2025 Report (SGORCP 2025 Report), a study of the health of marine and coastal environments in the significant area of Victoria's coast managed by the Great Ocean Road Coast and Parks Authority (GORCPA).

This report complements the State of the Marine and Coastal Environment 2024 Report (SMCE 2024 Report) and provides a regional analysis of the indicators and scientific baseline presented in that report. Similarly, this SGORCP report recognises the environmental, social and economic values of Victoria's marine and coastal environments, and their importance to our health, happiness and prosperity.

This report is prepared according to the *Great Ocean Road and Environs Protection Act 2020* (Vic) that requires the Commissioner for Environmental Sustainability (The Commissioner) to issue a 5-yearly SGORCP report on "the environmental condition of the Great Ocean Road coast and parks" (s.72(i)).

Also, in accordance with the Act, the Department of Energy, Environment and Climate Action (DEECA) is currently engaging with responsible public entities and the Victorian community to develop the Great Ocean Road Strategic Framework Plan (SFP). This is a critical undertaking that will deliver an overarching regional view of land use planning for the region, aligning state planning with regional and local strategies. The SFP will have a 50-year outlook and will identify the values, priorities and preferences of the Victorian community in relation to the Great Ocean Road Coast and Parks (GORCP). The science and recommendations presented in this SGORCP report are targeted to improve the evidence base for decision making in the region, informing future iterations of the SFP. It is also anticipated that the next SGORCP report will be informed by the scope and priorities of the SFP following its release.

The SGORCP 2025 Report compiles scientific and other information from many sources: the GORCPA, Commonwealth and Victorian government agencies, local governments, catchment management authorities, universities, citizen scientists and non-government organisations.

The table below provides a high-level overview of the status, trend and confidence assessments for all 74 indicators presented in this report. Some indicators have multiple assessments — for example, for 'Indicator 11: Litter and plastics', a total of 13 assessments were conducted — therefore the total number of assessments exceeds the total number of indicators. A total of 109 status assessments, 108 trend assessments and 113 confidence assessments were completed for the 74 indicators. You will note that the indicator numbers in this report are not sequential. That is because we have adopted numbering consistent with the SMCE 2024 Report to make cross-referencing and comparisons easier for the reader.[1] SMCE indicators that could not be assessed regionally for the GORCP appear in Table 1 in the 'Indicator assessments in the SGORCP 2025 Report' section of Part 3: Scientific Assessments.

Proportion of status assessments (%)		Proportion of trend assessments (%)		Proportion of confidence assessments (%)	
Good	18	Improving	11	High	13
Fair	37	Stable	29	Moderate	38
Poor	26	Deteriorating	21	Low	34
Unknown	19	Unclear	39	Insufficient	15

Similar to the SMCE 2024 Report, this report includes some challenging findings and aims to highlight areas where interventions and practical actions are needed to improve environmental outcomes. For example, and consistent with the findings of the recently released State of the Climate 2024 Report (published in October 2024) and Victoria's Climate Science Report 2024 (published in November 2024), none of the climate and climate change impact indicators in this report were

1. The three Inland Biodiversity indicators (83, 84 and 85) were not included in the SMCE 2024 Report and are assessed in this report because the *Great Ocean Road and Environs Protection Act 2020* requires a geographical scope that includes inland areas.

assessed as good, with all trends for that theme assessed as deteriorating or unclear.[2,3]

Nevertheless, this report highlights some areas where interventions are improving the environment. For example, the Wild Otways Initiative (2020-2023), delivered by the Corangamite Catchment Management Authority in partnership with key land managers and researchers, applied a cross-tenure, landscape-scale approach for addressing land management issues and improving biodiversity values in the Otways. Through on-ground conservation action, applied research and knowledge sharing, the collective outcomes of the initiative have made significant contributions towards the recovery of threatened native small mammals and their habitats in the region.

Six recommendations are presented in this report. The recommendations aim to help focus effort to achieve better outcomes for the GORCP environment as stated in the current legislative and policy frameworks, including the *Great Ocean Road and Environs Protection Act 2020*, the *Marine and Coastal Act 2018*, the Marine and Coastal Policy, the Marine and Coastal Strategy, Marine Spatial Planning Framework, the Environment Reference Standard, Protecting Victoria's Environment – Biodiversity 2037 and Water for Victoria.

The need for strong action to mitigate, adapt and protect our marine and coastal environments and communities against the effects of climate change is critical (Recommendation 1 and 2).

It is also important that Victoria maintains a 'catchment to reefs' philosophy, as asserted within the SMCE 2024 Report. Many of the pressures on our coasts, bays, estuaries, lakes and ocean are linked to activities on land, therefore, management and regulatory actions that connect activities in our catchments to benefits for Victoria's marine and coastal environment are critical. The challenge for Victorians is to take full advantage of the potential of the enabling marine and coastal legislation and policy, and to continually strive for a whole-of-system approach to guide action.

This will require the tools presented by the reform to be coherent and coordinated. They should be applied holistically: integrated water quality, adaptation to climate change, pest management and environmental management and restoration priorities (Recommendations 3 and 4). This undertaking is twofold. It requires that commitments be kept, and that the policies established under the legislative and policy framework lead to continuing improvement and protection of our marine and coastal environments.

One area where a holistic and coordinated approach has the potential to improve outcomes is tourism and visitor management. While the spectacular coasts and wonderful nature of the Great Ocean Road are a drawcard for visitors and a valuable tourism asset, excessive levels of visitation can have negative environmental and social impacts (Recommendation 5). The Great Ocean Road Strategic Framework Plan, when completed by DEECA, may provide guidance on implementing a systems approach to better balance environmental and tourism outcomes.

Good data, interrogated for understanding, is the foundation for evidence-based environmental policy, regulation and management. The legislative obligations of the *Great Ocean Road and Environs Protection Act 2020* and the *Marine and Coastal Act 2018* will be better achieved when agencies collaborate with data and analytical capacity. A strategic approach for the GORCP would support GORCPA with the evidence base required to make broad landscape-scale decisions to improve environmental outcomes. The first step is to develop environmental monitoring programs and capabilities commensurate with these obligations and establish a data integration strategy for the region (Recommendation 6).

The rights of the Wadawurrung and Eastern Maar Traditional Owners and the restoration of traditional knowledge systems into the management of the GORCP are supported. There is no stand-alone Traditional Owner recommendation in this report.

2. Bureau of Meteorology (BoM), Commonwealth Scientific and Industrial Research Organisation (CSIRO) 2024, 'State of the Climate 2024', http://www.bom.gov.au/state-of-the-climate/2024/documents/2024-state-of-the-climate.pdf Accessed 9 December 2024.
3. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Victoria's Climate Science Report 2024', https://www.climatechange.vic.gov.au/victorias-changing-climate/Victorias-Climate-Science-Report-2024.pdf Accessed 9 December 2024.

However, the recent State of the Environment 2023 recommendation (1) aimed at collaborating with Traditional Owners on the development of biocultural indicators, will progress Traditional Owner rights and aspirations.

It is a privilege to have led the scientific analysis and consultation to deliver this SGORCP 2025 Report — a report that has been made possible only by the collaboration of many talented people. My team and I acknowledge and thank everyone who has generously contributed their time and effort to help prepare and review this report.

Also, we thank our dedicated colleagues from across the DEECA and other agencies, without whom we cannot do our work. Finally, my sincere thanks to my team for their tireless efforts in preparing this report.

The SGORCP 2025 Report is available to view and/or download online at www.ces.vic.gov.au/sgorcp-2025.

Helen Vaughan PSM

Commissioner
for Environmental Sustainability, Victoria

Acknowledgements

Sincere thanks to my dedicated team of science writers who, under the skilful guidance of Dr Scott Rawlings, Director of Science and Reporting and Michael Reid, Director of Office, have worked with me to prepare this State of the Great Ocean Road Coast and Parks 2025 Report. I am extremely grateful for your commitment and expertise.

I am deeply grateful to the Great Ocean Road Coast and Parks Authority for critical and timely advice. Thanks also to those individuals and organisations who have generously volunteered their time and expertise for this report, including:

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Corangamite Catchment Management Authority	Safe Transport Victoria
Corangamite Shire Council	Surf Coast Shire Council
Environmental Protection Authority Victoria	Trust for Nature
Glenelg Hopkins Catchment Management Authority	Victorian Department of Energy, Environment and Climate Action
Great Ocean Road Coast and Parks Authority	Victorian Department of Jobs, Skills, Industry and Regions
Moyne Shire Council	Victorian Department of Premier and Cabinet
Parks Victoria	Victorian Department of Transport and Planning
Phillip Island Nature Parks	Victorian Environmental Assessment Council
Ports Victoria	Victorian Fisheries Authority

Non-government Stakeholder Technical Advisory Group	
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Conservation Ecology Centre	Victorian Farmers Federation
Great Ocean Road Regional Tourism	Victorian National Parks Association
Marine Mammal Foundation	

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Twelve Apostles. Credit: Jarrod Andrews, © Visit Victoria

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Port Campbell National Park Credit: Christian Pearson ©Parks Victoria

About this report

Victoria's *Commissioner for Environmental Sustainability Act 2003* (CES Act) was amended with the assenting of the *Great Ocean Road and Environs Protection Act 2020* in June 2020, requiring the Commissioner for Environmental Sustainability (CES) to 'prepare and submit to the Minister [for Environment] a periodical Report on the State of the Great Ocean Road Coast and Parks of Victoria prepared at intervals not exceeding five years'.

In addition to requiring the CES to report periodically on the environmental condition of the Great Ocean Road coast and parks as part of the Victorian environmental condition reporting program, the *Great Ocean Road and Environs Protection Act 2020* established a dedicated parks management body called the Great Ocean Road Coast and Parks Authority (GORCPA). This landmark reform acknowledges the significance of this special part of our state, recognising the need for dedicated and targeted management arrangements. This reform also strengthens the involvement of Traditional Owners in governance of the coast and parks. The new legislation includes a bilingual preamble by the Eastern Marr and the Wadawurrung/Wathaurong. It is envisioned that the GORCPA will bring a more coordinated approach to public land management along the Great Ocean Road.

This inaugural State of the Great Ocean Road Coast and Parks (SGORCP) 2025 Report provides a comprehensive scientific baseline analysis on the environmental condition of the Great Ocean Road Coast and Parks, and the pressures and challenges ahead. The approach to reporting is authorised through the Framework for the Victorian State of the Environment 2023 Report — Science for Sustainable Development (the Framework), tabled in the Parliament of Victoria in June 2020, as required by the CES Act and exercising the authority under the Act.

The scientific evidence base presented in this report enables the CES to exercise the authority under the CES Act to confidently recommend and prioritise actions that influence and inform the focus, effort and investment by the Victorian Government over the next decade and beyond, with the aim of improving Victoria's environmental condition and outcomes for the Great Ocean Road coast and parks.

This report makes six recommendations. The CES Act requires the Minister to, within 12 months of tabling this report in the Parliament of Victoria, cause a statement of the Victorian Government's response to be laid before each House of Parliament, specifying the actions (if any) the Government proposes to take in response to the recommendations.

Report structure

The report is in three parts. This Summary Report (Part 1) presents a comprehensive overview of the science and strategic analyses of the complete report.

Part 1: Summary Report

Part 1 – the SGORCP 2025 Summary Report begins with a definition of the geographic scope of the Great Ocean Road Coast and Parks. A summary of Part 2 and the key findings for each theme in Part 3 are then presented, followed by six recommendations informed by the analyses presented in Part 2 and 3. The indicator assessment dashboard provides a synopsis of the assessments for the SGORCP 2025 indicator suite as a whole and traffic light assessments for each of the 74 indicator assessments by theme. The Summary Report concludes with the legislative and policy context for the management of the coast and parks along the Great Ocean Road.

Part 2: Strategic Reporting

Part 2 and Part 3 are in a separate document from the Summary Report.

Part 2 – Strategic Reporting commences with cultural landscape health and management and the critical role of Traditional Owners in managing and protecting Sea Country and coastal environments. It then reviews the application of space and spatial technologies and international frameworks — the United Nations (UN) Sustainable Development Goals and System of Environmental Economic Accounting — to advance future state of the marine and coastal reporting.

Part 3: Scientific Assessments

Part 3 – Scientific Assessments presents the detailed scientific assessments for each of the 74 SGORCP 2025 indicators presented across 10 themes of ecosystem health and social science:

- Theme 1: Water quality and catchment inputs
- Theme 2: Litter and pollution
- Theme 3: Marine and coastal biodiversity
- Theme 4: Seafloor integrity and health
- Theme 5: Pests and invasive species
- Theme 6: Climate and climate change impacts
- Theme 7: Managing coastal hazard risks
- Theme 8: Communities
- Theme 9: Stewardship and collaborative management
- Theme 10: Inland biodiversity.

You will note that the indicator numbers in this report are not sequential. That is because we have adopted numbering consistent with the SMCE 2024 Report to make cross-referencing and comparisons easier for the reader.[4] SMCE indicators that could not be assessed regionally for the GORCP appear in Table 1 in the 'Indicator assessments in the SGORCP 2025 Report' section of Part 3: Scientific Assessments.

The indicator assessments have been conducted on a regional scale, based on the localisation of the impacts associated with each indicator and the spatial scale of the available evidence. Given this regional structure, the multiple assessments for some of the 74 indicators has resulted in a total of 110 and 109 individual status and trend assessments, respectively.

The indicator assessments rely on publicly available scientific data found in reports, journal articles, submissions to parliamentary and other government inquiries, citizen science projects and interviews. The data are assessed and synthesised by the CES science team, followed by a rigorous peer review process conducted by subject-area experts. Collectively, the indicator assessments provide a comprehensive, evidence-based evaluation of the health of the coast and parks environment.

Each indicator's scientific assessment includes:

- an indicator assessment report card that presents the:
  - 2025 traffic-light summary
  - region covered by the indicator
  - measures used to evaluate the status and trend
  - data source(s)
  - reason for assessing the indicator
  - criteria used for determining the status of each indicator, where relevant
  - rationale and summary of the indicator assessment
- the critical data used for the 2025 assessment
- commentary to support the 2025 assessment.

4. The three Inland Biodiversity indicators (83, 84 and 85) were not included in the SMCE 2024 Report and are assessed in this report because the *Great Ocean Road and Environs Protection Act 2020* requires a geographical scope that includes inland areas.

Winding seaside road with an ocean background on the Great Ocean Road.
Credit: theartofocean

Geographic scope of this report

The geographic scope of the State of the Great Ocean Road reporting is established by the *Commissioner for Environmental Sustainability Act 2003* (CES Act), which states that the reporting is to provide an account of the 'environmental condition of the Great Ocean Road coast and parks.' The definition of Great Ocean Road Coast and Parks under the CES Act aligns with that of the *Great Ocean Road and Environs Protection Act 2020* (section 9) and includes:

- public land and water between the outer limit of Victorian coastal waters and the Great Ocean Road
- public land and water between the Great Ocean Road and inland of the Great Ocean Road that is within the municipal districts of the following municipal councils:
  - Moyne Shire Council
  - Warrnambool City Council
  - Surf Coast Shire Council
  - Colac Otway Shire Council
  - Corangamite Shire Council.

For the purposes of this report, the outer perimeter of the GORCPA, as shown in Figure 1, has been selected as the geographic scope of this report. This study region will be referred to as the 'Great Ocean Road Coast and Parks' (GORCP). The outer coastal perimeter of this region is defined by the *Constitutional Powers (Coastal Waters) Act 1980*, which defines the outer limit of Victorian coastal waters as three nautical miles (5.56 km) from land at lowest astronomical tide.[5] The inland perimeter refers to the boundary of reserve and park land parcels that GORCPA will manage following the final transfer of additional land management responsibilities in the next phase of reforms over the coming years. Note that local governments and Parks Victoria will continue to be land managers for Crown Land parcels.[6]

Additionally, while this discussion of the GORCP has focused on public land, the studies referenced in this report include data collected or modelled from both public and private land. Efforts have been made to localise data to the region where possible; however, the geographic scope of some studies may extend beyond the boundary shown in Figure 1.

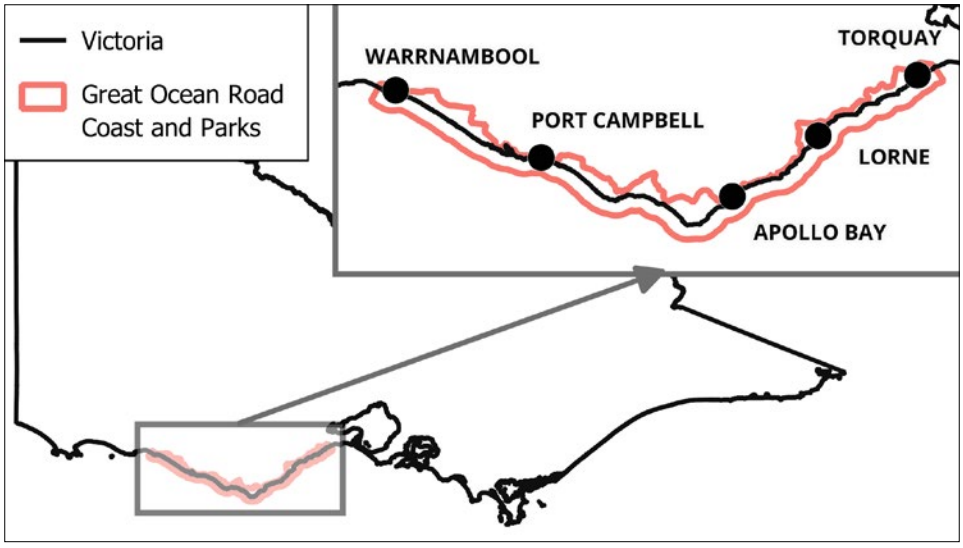


Figure 1: The geographic scope of the Status of the Great Ocean Road Coast and Parks 2025 Report.

5. Geoscience Australia 2014, 'Maritime Boundary Definitions', https://www.ga.gov.au/scientific-topics/marine/jurisdiction/maritime-boundary-definitions Accessed 6 February 2025
6. Great Ocean Road Coast and Parks Authority, personal communication, 11 March 2025.

The sun sets along the Great Ocean Road. Credit: ArtamaPhotography

Key findings

Cultural landscapes health and management

The knowledge system of Traditional Owners is complex and inexorably linked with culture and Country, with healthy Country essential to retaining such knowledge.[7] Bio-cultural indicators seek to reflect and capture this interconnectedness in a way that enables meaningful reporting to inform management actions.[8]

Cultural Values Assessments have been undertaken by the Eastern Maar Aboriginal Corporation and the Wadawurrung Traditional Owners Aboriginal Corporation as part of the development of the Great Ocean Road Strategic Framework Plan, identifying areas of cultural heritage significance and proposing recommendations for their protection.[9]

Through the Statement of Expectations and Partnership Agreements the Great Ocean Road Coast and Parks Authority (GORCPA) will aim to support and resource Traditional Owners to seek clarity and realise their own bio-cultural indicators, which may be included in the next State of the Great Ocean Road Coast and Parks Report.

Space and spatial analysis

Scientific assessments, including the State of the Environment 2023 and the State of the Marine and Coastal Environment 2024 reports, confirm a sustained decline in Victoria's biodiversity. Inland ecosystems — particularly heathy woodlands — are experiencing reductions in small native mammal populations due to the cumulative effects of climate change, invasive species, habitat degradation and loss of genetic diversity. Marine and coastal ecosystems are also facing significant reductions in ecological vegetation class (EVC) extent and condition. Despite existing commitments under Biodiversity 2037, Victoria lacks the comprehensive data infrastructure required to effectively monitor, report on and respond to these trends.

A key limitation is the absence of a centralised spatial system for managing environmental data, resulting in fragmented, inconsistent and externally dependent data analysis across government agencies. The current spatial information landscape is characterised by underutilised tools, limited technical capacity and a lack of coordination in data collection and interpretation. This undermines the ability to produce reliable indicator assessments and hinders evidence-based decision-making. While spatial datasets such as the Department of Energy, Environment and Climate Action's (DEECA's) Land Cover Timeseries and the Department of Transport and Planning's recent land cover classification exist, their limitations — ranging from outdated coverage to the absence of field validation — prevent them from being fully adopted for biodiversity planning and reporting.

Spatial information and technology present a significant opportunity to strengthen biodiversity monitoring through improved data integration, high-resolution imagery, predictive modelling and real-time observation. These capabilities can enhance the accuracy, efficiency and scalability of ecosystem assessments. However, without consistent methodologies, shared standards and sustained investment, the benefits of these tools remain largely unrealised. Regional efforts, such as the adoption of Floristic Map Units by the Corangamite Catchment Management Authority and the application of high-resolution imagery by Parks Victoria, demonstrate innovative approaches that could be scaled more broadly if better coordinated and resourced.

Engagement with agencies in the Great Ocean Road Coast and Parks (GORCP) highlighted systemic issues in data quality, duplication and accessibility. The lack of accurate, ground-verified EVC and wetland condition data, along with inconsistencies in

7. Paraphrasing Dr Teagan Shields speaking at the Trust For Nature and Bush Heritage International Women's Day Breakfast, https://www.youtube.com/watch?app=desktop&v=8CLLiWUtVpQ (~ 1:08) Accessed April 2025.
8. Bio-cultural indicators are specific to the Country they reflect. For example, the approach taken by Taungurung Land & Waters Council in their 'Rapid Biocultural Expressions Assessment' assessed biocultural health of Country by considering biophysical values along with the intactness of biocultural relationships (such as culturally identified flora and fauna, cultural stories, kinship with landscape entities, song lines, travel routes, lore and obligation) and whether there was Traditional Owner-led governance or management in place. Reference: M. Hansby, L. Riches, M. Nurse, 2023, 'Rapid Biocultural Expressions Assessment of the State Forests within the Central Highlands Regional Forest Agreement (CHRFA) area occurring on Taungurung Country', Taungurung Land and Waters Council, Alexandra, Victoria. Another example is the Wadawurrug Country Plan (Paleert Tjaara Dja) which identifies specific indicators across 9 key values. These include, for example, the following indicators for Warre – Sea Country: % of kelp forest and dependent sea life; % of sea grass with sea grass dependent fish; % of Wadawurrung people accessing sea resources. Reference: Wadawurrung Traditional Owners Aboriginal Corporation 2020, 'Paleert Tjaara Dja - let's make Country good together 2020-2030 - Wadawurrung Country Plan'. Geelong, Victoria.
9. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Great Ocean Road Strategic Framework Plan – Fact Sheet', East Melbourne, Victoria.

spatial coverage and reporting standards, constrains local biodiversity management. Participants also identified challenges in aligning legislative obligations with available data and noted the voluntary, policy-based nature of spatial data use in biodiversity governance. While pilot data-sharing platforms (e.g. ArcGIS Online collaborations) offer promise, their success depends on cross-agency commitment and standardised monitoring frameworks.

These findings reinforce several recommendations from recent statutory reports by the Commissioner for Environmental Sustainability. There is a pressing need to establish a coordinated data integration strategy, strengthen spatial data validation and quality assurance, and expand collaborative data-sharing initiatives. The development of an environmental Digital Twin for Victoria, biennial reporting on biodiversity targets, and a comprehensive biodiversity monitoring program are critical steps. Without these measures, Victoria will continue its fragmented approach, undermining efforts to protect and enhance its natural assets.

Localising the Sustainable Development Goals for the Great Ocean Road Coast and Parks

An ambition of the Science for Sustainable Development Framework was to track Victoria's progress against selected Sustainable Development Goal targets by prototyping and testing the veracity of using localised indicators that are meaningful at a state, regional, precinct or ecosystem scale. Eight indicators were selected based on the significance of the issue represented by the indicator and the degree to which a difference can be made at the local level.

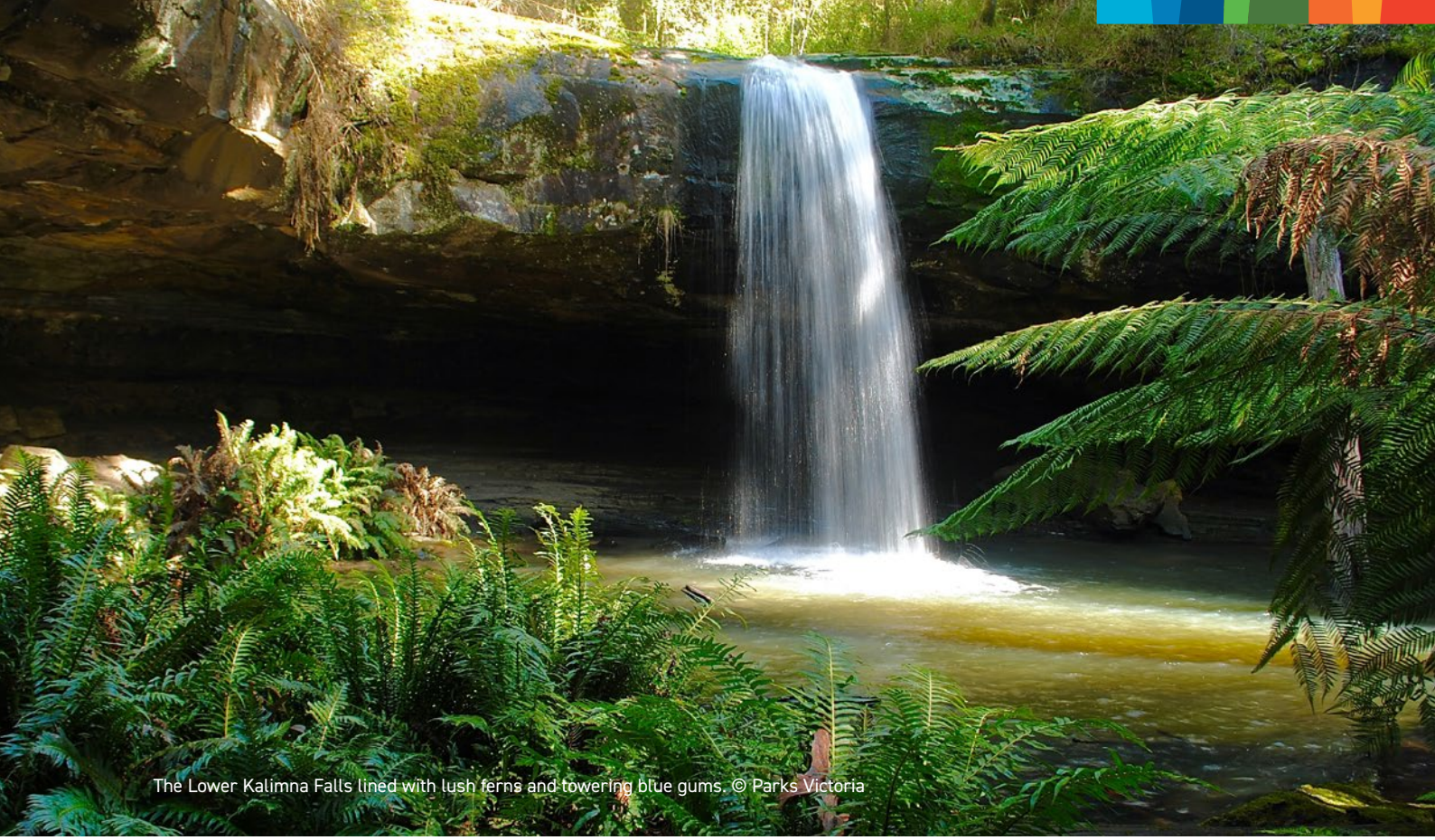
In this inaugural State of the Great Ocean Road 2025 Report, we provide the first assessments of eight uniform local indicators for the GORCP.

The assessments of these uniform local indicators highlight that 'Climate change impacts on infrastructure' is a critical local issue for the GORCP. Research shows that by 2100, almost every community along Victoria's coastline, including those in the GORCP, will be affected by sea level rise and storm surges.[10] Given the estimated economic costs without mitigation are several billions of dollars by 2040, action needs to be taken in the immediate future to reduce these impacts. This critical local issue is addressed within Recommendation 1 of this report: that DEECA updates and publishes statewide coastal inundation spatial layers.

Two significant knowledge gaps emerged during this process: 'Formal partnerships between Traditional Owners and local authorities' and 'Inputs from catchment impacting ecosystem health'. A detailed discussion on Traditional Owners can be found in the 'Cultural landscapes health and management' section of this report. Meanwhile 'Inputs from catchment impacting ecosystem health' is detailed in the 'Water quality and catchment inputs', which infers that water quality and catchment inputs are not significant issues for the marine environment along the Great Ocean Road. However, stakeholder feedback has raised concerns about the condition of estuaries, specifically related to the artificial opening of estuary mouths. This has informed the inclusion of Recommendation 2: that the Victorian Government provide long-term implementation guidance for managing estuary mouth openings and protecting estuarine health in the GORCP.

The intent of the localised reporting presented in this section is to inform and empower local stakeholders to identify and address critical local issues and knowledge gaps. It is important that this work is seen as an ongoing and collaborative approach.

10. Kompas T, Mallon K, Bojko M, Nhu Che T, Strain B, McKinlay M, Van Ha P, Grafton Q, Stoeckl N 2022, 'Economic Impacts from Sea Level Rise and Storm Surge in Victoria, Australia over the 21st Century'. Report prepared for the Victorian Marine and Coastal Council (VMaCC), with support from the Department of Energy, Environment and Climate Action (DEECA) and Life Saving Victoria, Centre for Environmental and Economic Research, University of Melbourne, Melbourne, Victoria, and Climate Risk Pty Ltd, Sydney, New South Wales.



The Lower Kalimna Falls lined with lush ferns and towering blue gums. © Parks Victoria

Environmental-economic accounts

There is growing concern about the effect of economic activity on both the local and global environment, alongside increasing recognition that ongoing economic growth and human wellbeing depend on the health of the environment.[11] DEECA has recently completed an environmental-economic account for the GORCP, providing the GORCPA with an evidence base to inform its land management strategy, planning and investment decisions.[12] This will also strengthen the ability of local government, business, not-for-profit and community stakeholders to recognise benefits of protecting and investing in the coast and parks environment.

Water quality and catchment inputs

The primary finding for the 'Water quality and catchment inputs' theme is that there is a lack of data to support indicator assessments for the GORCP.

Of the 10 indicators in this theme:

- the status was assessed as unknown for six indicators
- the trend was assessed as unclear for nine indicators
- the confidence in the assessments was assessed as low or insufficient for all assessments, except for the status assessments of water quality (estuaries), enterococci bacteria for estuaries and coastal acid sulfate soils for Anglesea River.

'Water quality and catchment inputs' datasets that were available to inform indicator assessments within the GORCP were:

- the Index of Estuary Condition 2021
- a global chlorophyll-a database developed by the European Space Agency
- the Colac Otway Shire Council's water quality monitoring program, which tests for enterococci and E. coli at the Wye and Kennett River estuaries
- the Department of Jobs, Skills, Industry and Regions' spatial layer of coastal lands with the potential for coastal acid sulfate soils, which was completed in 2010.

11. United Nations 2014, 'System of Environmental-Economic Accounting 2012 – Central Framework', New York, USA, para 1.22.
12. Department of Energy, Environment, and Climate Action (DEECA) 2025, 'Accounting for the environment', https://www.environment.vic.gov.au/accounting-for-the-environment Accessed 13 March 2025.

It is likely that water quality is not a significant issue for the marine environment along the Great Ocean Road. This is because the well-mixed marine waters along the Great Ocean Road coastline are likely effective at diluting pollution, as the open coast of Victoria is one of the highest wave-energy coastlines in the world.[13] Therefore, it is reasonable that there are few datasets available to inform water quality covering the marine environment of the GORCP.

For the coastal environment, the Index of Estuary Condition's 2021 water quality sub-index scores for estuaries along the Great Ocean Road coastline provided a rigorous assessment of estuarine water quality.[14] In 2021, the water quality in estuaries along the Great Ocean Road coastline was assessed as above average compared to estuaries in other regions of the Victorian coastline. The average water quality rating in estuaries along the Great Ocean Road coastline was 8.4 (Good), compared to a rating of 6.4 (Moderate) for the rest of Victoria.

Despite the favourable water quality sub-index scores for estuaries along the Great Ocean Road coastline, data collected through the Colac Otway Shire's water quality monitoring program highlighted several instances of poor water quality at the Wye River and Kennett River estuaries. This occurred during the most recent season of monitoring (October 2024 to March 2025), with short-term objectives for enterococci and E. coli frequently exceeded.

The Anglesea River is a location within the GORCP known to be significantly impacted by acid sulfate soils. Periods of water acidity in the Anglesea River, particularly in the estuary, have resulted in fish death events, the degradation of habitats such as seagrass and water quality conditions unsuitable for recreational use of the waterway. This has led to impacts on the estuary ecosystem, as well as on the social, cultural and potentially economic values supported by the Anglesea River. The key source of acidity in the Anglesea River is understood to be acid sulfate soils.[15]

Catchment inputs to the marine environment along the Great Ocean Road represent a significant knowledge gap, with only limited quantitative analysis available to understand the extent to which regulated discharges impact the receiving marine environments. No data was available for the stormwater volume and quality, as well as total nutrient and sediment loads.

The largest wastewater discharge in the GORCP comes from the Warrnambool Sewage Treatment Plant. This is highlighted in 'Indicator 6: Regulated point source discharges'. The plant, which has been operating in Warrnambool since 1997, treats a combination of domestic and industrial wastewater from the region.[16] Prior to 2021, the plant was approaching its design capacity and had, at times, failed to fully treat all wastewater, resulting in what are termed dirty decants and some non-compliance with regulatory conditions.[17, 18, 19] In 2021, the Environment Protection Authority Victoria issued a Development Licence, subject to conditions, to Wannon Water to upgrade their sewage treatment plant in Warrnambool.[20]

Litter and pollution

Comprehensive monitoring is vital for understanding litter loads in a region. Within the GORCP, community-led programs not only provided the most comprehensive litter data in terms of geographic scope and composition but, unlike the monitoring approach used by Government, they also contributed to improving environmental outcomes by collecting the litter found during surveys. However, these and other available data sources used in this indicator assessment were largely limited to terrestrial sites within urbanised environments, with only limited

13. McSweeney S 2020, 'Temporal and spatial variability of the open coast wave climate of Victoria, Australia', *Marine and Freshwater Research*, *71*, pp. 394–413.
14. Department of Environment, Land, Water and Planning (DELWP) 2021, 'Assessment of Victoria's estuaries using the Index of Estuary Condition: Results 2021', East Melbourne, Victoria.
15. Smith CDM 2023, 'Anglesea River Management Options Investigation', https://ccma.vic.gov.au/wp-content/uploads/2023/11/1001376-000-R-02-Anglesea-Estuary-Options-Investigation-Report-Final.pdf Accessed 26 March 2025.
16. Environment Protection Authority (EPA) Victoria 2021, 'Assessment Report', Application No. 1003877, Proposal: Upgrade to the Warrnambool Sewage Treatment Plant, https://engage.vic.gov.au/download/document/4688 Accessed 21 August 2024.
17. Environment Protection Authority (EPA) Victoria 2021, 'Assessment Report', Application No. 1003877, Proposal: Upgrade to the Warrnambool Sewage Treatment Plant, https://engage.vic.gov.au/download/document/4688 Accessed 21 August 2024.
18. Dirty decants generally occur when the sludge is dominated by filamentous bacteria, which are more prone to bulking than activated sludge, making it difficult to settle and causing foaming. Treatment plant operators manually hold back decants and extend settling times in an attempt to improve sludge settling and effluent quality. However, they eventually need to discharge partially settled wastewater to the outfall to avoid hydraulically overloading the treatment plant.
19. Environment Protection Authority (EPA) Victoria 2021, 'Assessment Report', Application No. 1003877, Proposal: Upgrade to the Warrnambool Sewage Treatment Plant, https://engage.vic.gov.au/download/document/4688 Accessed 21 August 2024.
20. Environment Protection Authority (EPA) Victoria 2021, 'EPA approves Wannon Water sewage upgrade', https://www.epa.vic.gov.au/about-epa/news-media-and-updates/media-releases-and-news/epa-approves-wannon-water-sewage-upgrade Accessed 21 August 2024.

information from waterways and no data from natural areas or the marine environment. Moving forward, monitoring programs in the region could consider expanding survey sites to include data-deficient areas and targeting sources of microplastic pollution, such as from road runoff. This information would improve understanding of litter transport pathways and identify hotspots requiring targeted mitigation strategies that could help reduce impacts on high-value ecosystems.

The status of terrestrial litter density and composition within the GORCP have been assessed based on the established Litter Index thresholds used for evaluating litter loads under the Port Phillip Bay Environmental Management Plan. Using these established thresholds, litter density within the GORCP was assessed as fair; however, as litter loads were comprised primarily of plastic, the status for the litter composition metric was assessed as poor. Between 2021 and 2024, there was an increase in the density of terrestrial litter, although this metric remained within the fair threshold. This increasing pattern was also observed in the volume of litter collected by litter traps, as well as in the density of litter types that pose particularly high risks to wildlife, such as fishing gear and microplastics. In contrast, the proportional contribution of plastic litter within the terrestrial environment remained relatively stable over this period.

An increasing amount of data are becoming available to improve understanding of the generally low levels of air, land, and light pollution along the Great Ocean Road coastline. However, there are few studies that use this data to investigate the potential impacts from these types of pollution.

Adverse biodiversity and socio-economic effects associated with light pollution have been observed at places along Victoria's coastline. However, this research has not covered the GORCP, therefore the status of the light pollution indicator is unknown. There did not appear to be any significant changes in night-time light emissions across the GORCP from 2014 to 2021, with emissions changing by less than 1%.[21]

The status of the contaminated land indicator was assessed as good. This was because only a small number of sites along the Great Ocean Road coastline are contaminated or are the location of current activity involving a relatively high risk of contamination.[22] The risk of contaminated land in the GORCP is much lower than in some other coastal regions with higher levels of urban development, such as the Port Phillip Bay coastline.

Air quality (measured as the pollutant $PM_{2.5}$) met the annual standards at all monitored locations along the Great Ocean Road coastline in 2023, with only two days of poor air quality recorded in the region during the year — both at Lorne and most likely due to smoke from planned burns.[23, 24]

Research has found adverse biodiversity effects associated with marine noise at places along Victoria's coastline, although there has been no specific research conducted in marine and coastal waters along the Great Ocean Road. This has resulted in the status and trend of this indicator being assessed as unknown and unclear, respectively.

Marine and coastal biodiversity

Coastal and marine ecosystems

Coastal ecosystems in the GORCP, including dunes and coastal saltmarshes, have experienced a long history of land use change, altered hydrological and fire regimes, and introduced species following colonisation. The environmental damage associated with these legacy impacts as well as ongoing disturbances have induced a shift in EVC composition, distribution, and condition. As of 2005 (the most recent EVC mapping at a regional scale), approximately 46% of the region's coastal and inland native vegetation had been lost overall, with nearly half of the remaining EVCs occurring in a modified or degraded state.[25] These losses were not uniform across the landscape, with areas outside the protected area network exhibiting a far greater level of reduction (68%) in the historical

21. Jurij Stare, 'Radiance light trends', https://lighttrends.lightpollutionmap.info/ Accessed 19 August 2024.
22. Department of Environment, Land, Water and Planning (DELWP) 2019, 'Victoria Unearthed', East Melbourne, Victoria, https://www.environment.vic.gov.au/__data/assets/pdf_file/0019/430471/VictoriaUnearthed_FactSheet_v2.1_Aug2019.pdf Accessed 12 June 2024.
23. Data supplied by EPA Victoria.
24. Note that the results have not yet been validated and may contain erroneous data, but they are still useful for providing indicative air quality concentrations at these coastal locations.
25. Depletion is based on analyses using the NV1750 EVCBCS and NV2005 EVCBCS shapefiles obtained from DEECA's DataShare catalogue.

The Prison, The Arches, Twelve Apostles Marine National Park.
Credit: Chris Hayward. © Parks Victoria

distribution of EVCs compared to protected areas (3%). This pattern suggests that the management of protected areas — particularly national parks — has been effective in conserving ecosystems. However, climate change is expected to exacerbate the pressures already impacting on coastal ecosystems, potentially reducing their capacity to adapt and recover from disturbances as well as for delivering ecosystem services.

Despite clear patterns of change in the distribution and condition of ecosystems within the GORCP, the lack of contemporary EVC mapping at the regional scale resulted in low confidence in the fair status assessments for these indicators and prevented the assessment of trends. Contemporary data would help improve understanding of the impacts of anthropogenic threats and the intensification of disturbance regimes (e.g. fire) under climate change, which have continued to alter coastal systems since the development of the 2005 statewide mapping. This information is critical for evaluating changes in EVC extent and condition, identifying endangered EVCs lacking representation within the state's protected area network, and assessing potential cascading impacts on biodiversity and ecosystem function.

Estuarine vegetation within the GORCP was in fair condition based on the Index of Estuary Condition (IEC) flora sub-index scores. Most estuaries were scored as moderate to good. However, half of the estuaries were dominated by macroalgae, with some to no seagrass present. With only a single IEC assessment being undertaken, trend could not be assessed. Also unknown are the effects that artificial openings may have had on estuarine vegetation. Several of the region's estuaries have been subject to artificial openings but no monitoring has been undertaken regarding impacts of this practice on estuarine values.

Marine- and coast-dependent species of conservation value

Human activities, combined with the impacts of anthropogenic climate change, are accelerating species extinctions beyond average background extinction rates. Enacting protective legislation, supported by species-specific conservation programs, are key strategies for preventing further extinctions. However, data deficiency can act as a barrier to assessing the conservation status of species.

This issue is well demonstrated for the 158 marine- and coastal-dependent species of conservation value occurring in the GORCP, particularly among invertebrates and reptiles. This group has low representation under the *Flora and Fauna Guarantee Act 1988* and the *Environment Protection and Biodiversity Conservation Act 1999*, which likely reflects fundamental knowledge gaps rather than the true number of species in need of formal listing. Similarly, most species lack current action statements and are not represented in genetic health analyses. Greater attention needs to be given to recognising the conservation needs of these species to help reduce the rate of biodiversity loss in the region and across the state more broadly.

Marine invertebrates and reef fish

Marine invertebrates comprise most of all marine biodiversity and serve as keystone species, playing an integral role in the structure, health, and functioning of marine ecosystems. The loss of these ecosystem engineers has been proposed to drive widespread biodiversity decline and potentially even ecosystem collapse. Reef fish also play an important role in the function of marine ecosystems through herbivory (plant consumption), predation and serving as prey resources.

There is a paucity of contemporary, long-term quantitative data for marine invertebrates and reef fish from across the GORCP, and the state more broadly. Assessments for these taxa in the region are limited to relatively few marine protected areas (MPAs) and adjacent reference sites in unprotected waters that are currently monitored under Parks Victoria programs.

Survey results indicated that the overall abundance of subtidal macroinvertebrates in Point Addis Marine National Park and its associated reference sites was in fair condition. Abundance remained within the limits of acceptable change from 2012 to 2018 (the most recent survey year) in the park, although the trend outside the park was unclear due to variability in species abundance across survey years. By contrast, quantitative surveys for intertidal macroinvertebrates do not form part of long-term monitoring programs, therefore, the condition and trend of sessile and mobile intertidal invertebrates within the GORCP could not be assessed.[26]

Among key reef fish species within Point Addis Marine National Park, overall abundance and body size were in good condition as of 2018 (the most recent survey), a status that had been maintained since surveys began in 2003. The condition of most of the species of reef fish within reference sites, by contrast, exhibited an improvement in condition across the survey period, increasing from below their limits of acceptable change to a good condition.

Establishing a long-term monitoring program for high-value marine ecosystems and species that is delivered across the region — covering both unprotected areas as well as the full suite of MPAs — would provide the vital information needed to enable a more comprehensive understanding of the current condition of intertidal and subtidal communities across the GORCP and support effective decision-making for their conservation. Ongoing data collection is currently limited to that undertaken by Parks Victoria within MPAs, which cover only a relatively small proportion of the region's intertidal and subtidal environments. Survey coverage is further reduced, as only three MPAs are monitored under the Signs of Healthy Parks and Rapid Health Assessment programs. However, the Conservation Ecology Centre has initiated the collaborative project Otways Marine Ecosystem Resilience, involving Otway Ocean Care volunteers and Traditional Owners, which will contribute towards filling this critical knowledge gap by collecting essential ecological baseline data for vulnerable intertidal and subtidal communities along

26. Intertidal macroinvertebrates are monitored under Parks Victoria's Rapid Health Assessment program; however, the qualitative and semi-quantitative measures used in these surveys limit the utility of the data for comparative analyses.

the Otway coast. In partnering with the Eastern Maar Aboriginal Corporation, the project will also increase understanding of the condition of culturally significant entities within Sea Country, which are largely absent in standard marine monitoring programs.

Diadromous fish

The life history strategy of diadromous fish presents major risks to their survival, as the spatial scale and diversity of aquatic habitats over which these species migrate are increasingly impacted by anthropogenic stressors. The indicator assessment illustrates a novel targeted data pipeline approach developed by the Applied Aquatic Ecology Research Hub at Arthur Rylah Institute aimed at streamlining standard reporting tasks and facilitating high-level research and synthesis. Although data on catch-per-unit-effort (CPUE) are available, information on the key health indicators of recruitment and size-class representation is required to evaluate the condition of diadromous fish populations within the GORCP.

Commercially and recreationally important invertebrates and fish

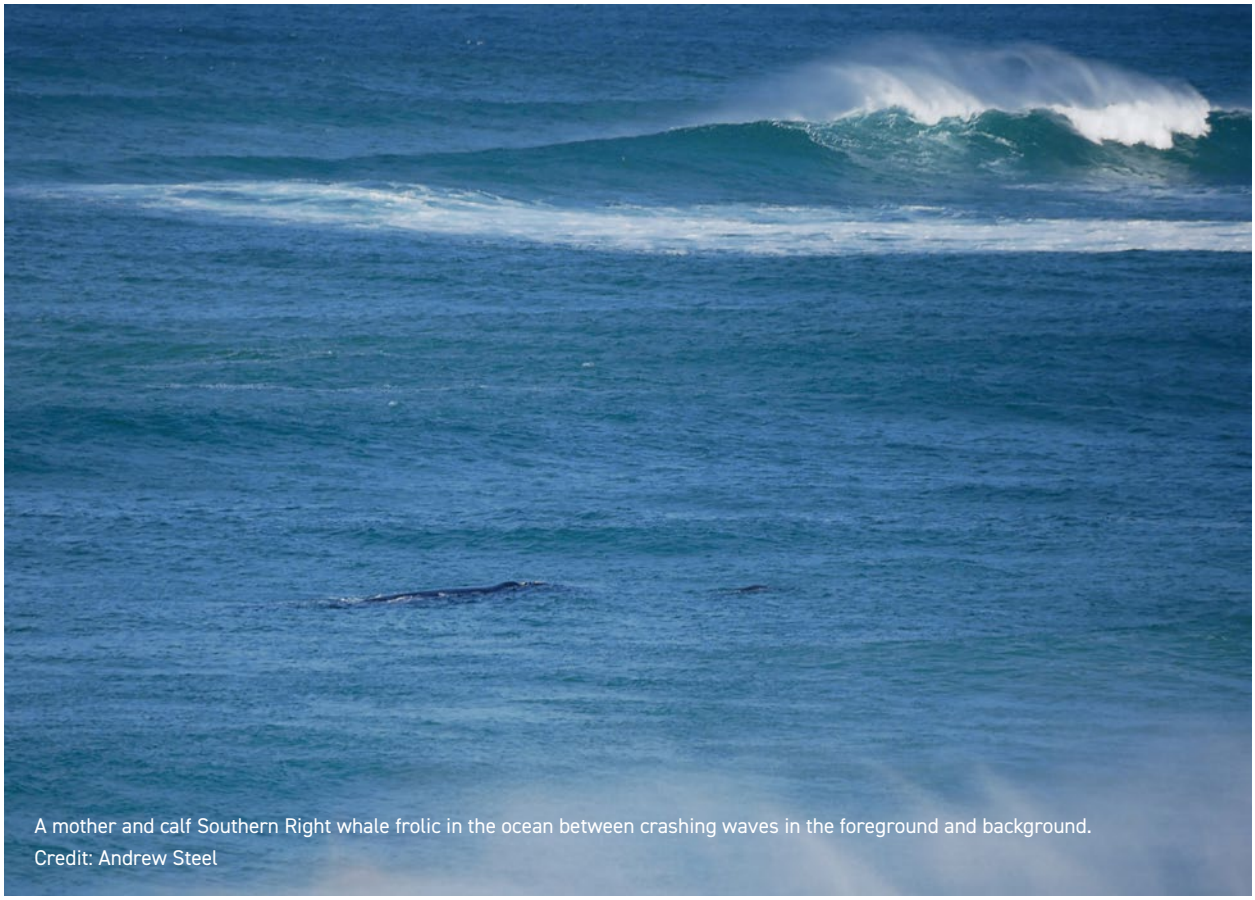
Five commercially and recreationally important species of invertebrates or fish were assessed for the GORCP. Blacklip abalone and southern rock lobster were both assessed as having a poor status, while the lack of regionally specific data for southern calamari, snapper and King George whiting resulted in their status being classified as unknown.

As part of the Fisheries Research and Development Corporation's 2023 stock assessments, and based on catch, CPUE and fishery-independent surveys, the Victorian blacklip abalone stock in the Victoria Central Zone Fishery — which includes the GORCP — was assessed as depleting.[27] A stock assessment report from the Victorian Fisheries Authority, completed in 2024, found that although the spatial extent of the central zone abalone fishery has contracted substantially over the past two decades, there is evidence suggesting the fishery has stabilised in recent years.[28]

For southern rock lobster, CPUE has only been marginally improving in recent years from the low levels observed during the 2010s in the western zone of the Victorian fishery.[29]

Wreck Beach, Great Ocean Walk. © Parks Victoria

27. Fisheries Research and Development Corporation (FRDC), 'Blacklip abalone (2023)', https://www.fish.gov.au/Archived-Reports/2023/Blacklip%20Abalone%20(2023).pdf Accessed 8 October 2024.
28. Dixon CD, Lowe J 2024, 'Draft Stock Assessment for the Central Zone of the Victorian Abalone Fishery 2022/23', MRAG Asia Pacific, Brisbane, Queensland.
29. Victorian Fisheries Authority (VFA) 2024, 'Victorian Rock Lobster Fishery Stock Assessment Report — 2022/23 Season', https://vfa.vic.gov.au/__data/assets/pdf_file/0018/1020825/RL-Stock-Assessment-Report-2022_23_Final.pdf Accessed 7 June 2024.



A mother and calf Southern Right whale frolic in the ocean between crashing waves in the foreground and background.
Credit: Andrew Steel

Marine mammals

Logans Beach within the GORCP represents the only established calving and nursery ground for the eastern sub-population of southern right whales, making it critical habitat for the persistence of this species. The status of this population has been assessed as poor, as its size remains much smaller than pre-harvest levels and there has been an absence of mother-calf sightings in recent years. Furthermore, given the species' low reproductive rate and high site fidelity to a single calving ground, the small population is particularly vulnerable to the impacts of climate change and anthropogenic threats, such as entanglement in fishing gear, with the reporting rate increasing in recent years.

Like whales, Australian fur seals have suffered a long history of over-exploitation and even with the cessation of the sealing industry, human activities remain the greatest threat to fur seals. Marengo Reefs is the only known active Australian fur seal breeding site in the GORCP. The population size and breeding activity at this site are low compared to other colonies and have shown little change. Further recovery of this colony is likely to be hindered by climate change impacts and the cumulative impacts of entanglements, pollution and emerging diseases, whose effects are intensified by the small population size. As a result, the status of this colony has been assessed as poor, yet the trend is unclear due to limited time series data.

The GORCP does not have any resident populations of dolphins, although the common bottlenose dolphin is an offshore species that inhabits the broader Bass Strait region and utilises the coastal waters along the Great Ocean Road. The status of common dolphins in the region is assessed as poor due to research indicating that mercury is bioaccumulating in this population at globally significant levels. Additionally, the region has the highest concentration of dolphin stranding records compared to other coastal regions in the state.

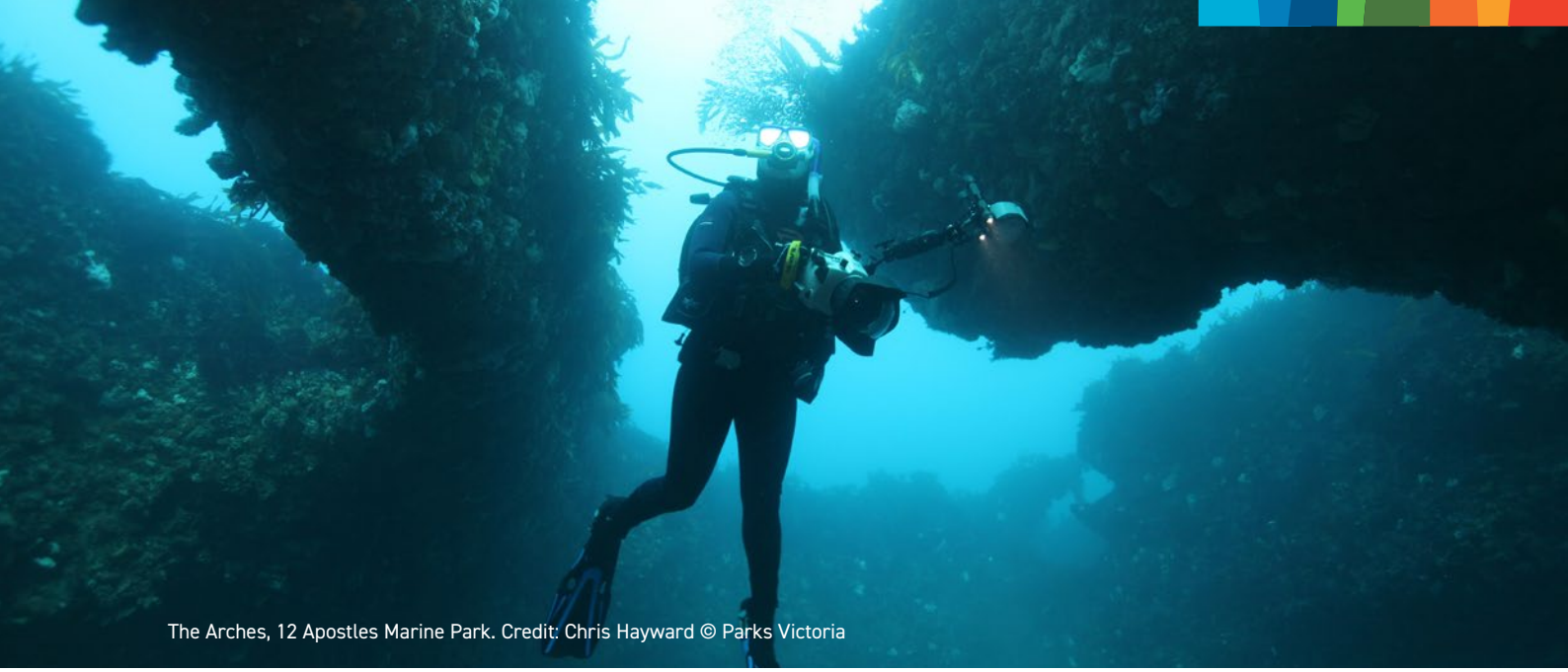
Resident shorebirds

Resident shorebirds nesting on the beaches of the GORCP are confronted with the challenge of sharing their breeding and foraging habitat with people, dogs and invasive predators which can lead to reduced breeding success and mortality. Weed infestations are also known to contribute towards a reduction in breeding performance.

Data for resident shorebirds within the region are limited to a single species: the hooded plover. The density of the Great Ocean Road hooded plover population varied across biennial count surveys (2012-2022) but has remained relatively stable between 2020 and 2022. Results from the targeted breeding monitoring program also demonstrated a variable pattern for chick survival, hatching success and the proportion of fledglings for each breeding pair (breeding success metric) between 2016-17 to 2023-24. Although the population achieved the breeding success target (at least 0.4 to 0.5 fledglings per breeding pair) during the 2021-22 and 2023-24 breeding seasons, the target was only met for a total of three seasons across the 8-year period due to low hatching success and/or chick survival.

Among the little penguin breeding colonies within the GORCP, Middle Island is the only site having long-term data. The status of this colony has been assessed as poor with a deteriorating trend, as its population size and breeding performance during the last monitoring period (2020–2021) showed no signs of recovery from the impacts of fox predation. Additionally, the body condition and breeding success of Middle Island penguins are increasingly threatened by the effects of climate change.

The Hooded Plover bird is found around the Australian coastline. Credit: MarkPiovesan



The Arches, 12 Apostles Marine Park. Credit: Chris Hayward © Parks Victoria

Seafloor integrity and health

Intertidal and subtidal communities

The Great Ocean Road coastal environment supports approximately 132 hectares of seagrass communities. However, region-wide analyses of their health or potential changes in extent are hampered by the lack of historical mapping and condition assessments. This is particularly critical for understanding potential impacts arising from artificial openings among the region's estuaries, as research demonstrates that these practices can reduce seagrass health.

Intertidal and subtidal macroalgae communities play a critical role as ecosystem engineers in the marine environment, creating structurally complex forests that support high species diversity and abundance, and sustain the health, function and stability of marine systems.[30, 31] However, climate change impacts are posing a severe risk to the long-term persistence of macroalgae, with Victoria recognised as an ocean-warming hotspot. The loss of foundational macroalgae, which exert a strong bottom-up influence in shaping intertidal communities, is likely to lead to severe declines of associated species and ecological function.[32]

Climate driven impacts were demonstrated by a recent investigation revealing severe declines in the cover of two key habitat-forming species from 1998 to 2018 across the Great Ocean Road's marine environment, although to a lesser extent within the region's marine protected areas (MPAs). With further changes to the physical ocean climate, this trend is expected to continue.[33] However, marine national parks and sanctuaries offer the opportunity to ensure the long-term persistence of macroalgae by protecting climate refuges. Five MPAs within the GORCP were among those identified as supporting the greatest area of climate refugia among the state's MPA network and potentially within offshore areas around Cape Otway and the Shipwreck Coast. These findings highlight the importance of these areas not only for the long-term protection of these habitat-forming macroalgae species, but also for maintaining the ecosystem services and functions they provide.

Unlike in the subtidal zone, intertidal macroalgae have received a relatively lower level of monitoring and research focus with data limited to relatively few select MPAs and adjacent reference sites in the region. Percent cover of macroalgae within the intertidal zone of Point Addis Marine National Park generally remained above the lower limit of acceptable change between 2005 and 2019, resulting in a status assessment of good with a stable trend.

30. Harley CD 2006, 'Effects of physical ecosystem engineering and herbivory on intertidal community structure', *Marine Ecology Progress Series*, *317*, pp. 29–39.
31. Pocklington JB, Keough MJ, O'Hara TD, Bellgrove A 2019, 'The influence of canopy cover on the ecological function of a key autogenic ecosystem engineer', *Diversity*, *11*(5), p. 79.
32. Campbell AH, Kendrick GA, Russell BD, Steinberg P 2009, 'Macroalgae and temperate rocky reefs'.
33. Young MA, Critchell K, Miller AD, Treml EA, Sams M, Carvalho R, Ierodiaconou D 2023, 'Mapping the impacts of multiple stressors on the decline in kelps along the coast of Victoria, Australia', *Diversity and Distributions*, *29*(1), pp. 199–220.

Pests and invasive species

Invasive species are a global issue and have become a major driver of ecosystem decline in Victoria, with many species already widespread and others rapidly expanding their range.[34] With impacts exceeding those of habitat loss and climate change, invasive species affect the largest number of the country's threatened taxa and have been the dominant driver in nearly all extinctions for the past six decades.[35, 36] Effectively controlling invasive species and reducing their impacts is challenged by their interconnectedness, with their interacting impacts further exacerbated by threatening processes like fire and climate change.

To combat this issue within the marine environment, several surveillance and monitoring activities have been implemented to build an understanding of the occurrence and spread of marine invasive species. These are supported by a range of community education programs aimed at increasing awareness and reducing the introduction of these pest species. These efforts are delivering positive outcomes, with marine protected areas within the GORCP remaining largely free of marine invasive species, and only a single species confirmed within one regional port since 2021.

Within the terrestrial environment of the GORCP and broader Great Otways landscape, the Victorian Government has invested in a suite of invasive species control programs that support the implementation of Biodiversity 2037 and achieving its 'hectares of action' targets within priority areas, primarily on public land. These projects have been complemented by Australian Government initiatives and Conservation Ecology Centre–led projects aimed at reducing invasive species and their impacts.

For invasive plants in the GORCP, the status was largely considered fair with an improving trend, as there was an increase in the area receiving weed control treatments as well as a reduction in the cover and diversity of weeds. However, confidence in this assessment was low due to a general lack of monitoring for these projects and the absence of an impact reduction evaluation. In contrast, the status of invasive plants and pathogens within the Great Otways region is poor, with monitoring results from the Otway Eden project revealing that half of the weeds present at project sites have a high-risk rating. Furthermore, the plant pathogen *Phytophthora cinnamomi*, a major contributor to small mammal declines, has been found to be widespread. Fortunately, the outlook is improving, with the number of high-risk weeds showing signs of decline and trials for managing *Phytophthora cinnamomi* having been undertaken to assist in the containment of the pathogen and its impacts. As the management of *Phytophthora* is considered one of the most critical actions for biodiversity conservation in the Otways, it is integral that it be a key component of an integrated invasive species control program.

Invasive predators are another management focus in the region due to their severe impacts on native small mammal populations. Fox control has been carried out within the Great Otways National Park since 2016 under the Otway Ark project, which aims to reduce fox occupancy by 75% and improve outcomes for native prey species. Although there is some evidence that control treatments have been effective in reducing fox occupancy in certain focal areas, the overall status remains poor, as most studies have found no significant improvements in native mammal populations. The baiting regime, in terms of spatial scale, baiting density, and frequency, was shown to be inadequate for controlling the population growth of foxes. Furthermore, compensatory increases in feral cat abundance and predation have been detected and have likely diminished the benefits of fox control efforts for small mammals. This is concerning as feral cats were found to be much more prevalent than expected and control of them in the Otways is limited. Effective control of invasive predators requires expanding control treatments onto private land and modifying the baiting regime coupled with identifying effective and humane control techniques for feral cats.

34. Invasive Species Council 2021, 'Are Victoria's ecosystems in terminal decline?', https://invasives.org.au/blog/are-victorias-ecosystems-in-terminal-decline/ Accessed 5 May 2025.
35. Sheppard A, Glanznig A 2021, 'Fighting plagues and predators Australia's path towards a pest and weed-free future', Commonwealth Scientific and Industrial Research Organisation (CSIRO), Canberra, Australia.
36. Kearney SG, Carwardine J, Reside AE, Fisher DO, Maron M, Doherty TS, Legge S, Silcock J, Woinarski JC, Garnett ST, Wintle BA 2019, 'Corrigendum to: The threats to Australia's imperilled species and implications for a national conservation response', *Pacific Conservation Biology*, *25*(3), p. 328.

The Conservation Ecology Centre, in partnership with a network of land managers and private land holders, have been actively managing feral pigs across land-tenures in the Great Otways region since 2018. By employing a range of monitoring techniques, it was found that the density of feral pigs in the region was higher than anticipated, causing severe impacts on both natural and agricultural areas. However, the control program has resulted in a marked population reduction across the region, leading to improvements in habitat and conditions for native and endangered species.

The distribution of deer in the Otways is widespread and rapidly expanding, particularly for fallow deer. Recent surveys provide evidence of their ecological impacts, including reduced native woody understory and an increased risk of weed invasions. The recently released West Victoria Deer Control Plan 2023-2028 identified priority areas to guide deer control actions in the region. However, despite a monitoring program being in place to evaluate the effectiveness of the regional plan, and the Victorian Deer Control Program more broadly, it is unclear how effective it has been in reducing deer populations in the region as no data have been made available.

Despite these invasive species control programs delivering some positive outcomes, the continued impacts on ecosystems and the decline of many threatened species indicate that these efforts have not been enough. To improve outcomes, investment is needed to support the planning and long-term implementation of programs, while expanding their scope to fully encompass all affected landscapes would serve in averting secondary consequences that undermine control efforts.[37] Additionally, as invasive species can create conditions that promote the increased abundance or spread of others, shifting from a single-species or taxonomic group (animals or plants) approach to one that broadly considers the interconnected impacts from across invasive species is also crucial.

Establishing a funded, integrated, cross-tenure invasive species control program also needs to be complemented by the collection of baseline information on invasive species densities, along with clear, outcomes-based objectives and monitoring. Counting the number of individuals removed or the area treated is not a reliable indicator of efficacy, rather performance needs to be evaluated in terms of the specific impacts it aims to address and improve.

37. Invasive Species Council 2021, 'Are Victoria's ecosystems in terminal decline?', https://invasives.org.au/blog/are-victorias-ecosystems-in-terminal-decline/ Accessed 5 May 2025.

Teddys Lookout Lorne. Credit: Robert Balckburn. © Great Ocean Road Marketing

Climate and climate change impacts

Erosion and inundation are expected to increase along the Great Ocean Road coastline during this century, which is highly likely to cause widespread impacts, as detailed in 'Indicator 51: Climate change impacts on marine and coastal infrastructure'.

The mean sea level at Lorne has risen by 2.1 cm per decade since the early 1990s — this is based on the 10-year rolling average of annual mean sea level increasing by 4.4 cm from 1993-2002 to 2014-2023.[38] The gradual but consistently increasing mean and maximum sea levels are exerting pressure on human coastal settlements and infrastructure. Without successful flood risk mitigation, future increases in sea levels will lead to significant coastal inundation and flooding of coastal communities along the Great Ocean Road.

During storms, ocean waves break in the surf zone and run up the beach face, contributing to elevated total water levels that can cause coastal erosion and inundation events. Sea level rise will cause an exponential increase in the frequency of extreme total water level events. The increase in frequency of these events depends on current-day exposure. For example, locations with low current-day exposure to extreme water levels will experience a greater increase in the frequency of extreme events due to sea level rise. As the coast west of Cape Otway is more directly exposed to Southern Ocean storm waves than the east, sea level rise is expected to have a greater influence on wave-driven coastal impact events along the eastern coast of the GORCP. This influence of sea level rise on waves is the basis of trend assessments of stable for the area west of Cape Otway and deteriorating for the area east of Cape Otway for 'Indicator 47: Wave climate'.

Research shows that by 2100, almost every community along Victoria's coastline, including those in the GORCP, will be affected by sea level rise and storm surges. The impacts on land and property along the Victorian coast are predicted to reach a cumulative loss of $337 billion by 2100 (2.68% of the projected gross state product of Victoria), with a further loss of up to $105 billion for wetlands.[39] Of the $337 billion loss for Victoria by 2100, there is a predicted loss of $49.2 billion across the two coastal zones that contain the GORCP, with a further loss for those two zones of up to $40.2 billion for wetlands. It is important to note that these two zones include several significant subregions outside the GORCP boundary (e.g. all subregions within the City of Greater Geelong); therefore, the economic loss within the GORCP boundary is likely to be much less than $89 billion across those two zones. Given the estimated economic costs without mitigation are in the several billions of dollars by 2040, action needs to be taken in the immediate future to reduce the impacts.

Sea surface temperatures along the Great Ocean Road coastline are increasing, with the 10-year rolling average rising by 0.34°C from 1985-1994 to 2012-2021.[40] Due to this increase, coupled with the increasing frequency of marine heatwaves across Victorian marine waters, the status and trend are assessed as poor and deteriorating, respectively, for 'Indicator 43: Water temperature'.

Ocean surface waters along the Great Ocean Road coastline have increased in acidity by 17% from 1982 to 2022.[41] The increase in acidity has been most rapid in the past decade (2013-2022), so the trend is assessed as deteriorating for 'Indicator 44: Ocean acidification'. However, there are no studies on the current impacts of ocean acidification along the Great Ocean Road coastline, and only limited studies elsewhere in Victoria's marine environment.

'Indicator 41: Rainfall' is the only 'Climate and climate change impacts' indicator with a good status assessment. The annual average rainfall at Cape Otway for the 21st century has been 1% more than the annual average rainfall at Cape Otway for the 20th century.[42]

The analysis in 'Indicator 42: Air temperature' shows that the annual average of daily maximum

38. Bureau of Meteorology (BOM), 'Monthly sea levels for Lorne - 1993 to 2024', http://www.bom.gov.au/ntc/IDO70000/IDO70000_60790_SLD.shtml Accessed 31 July 2024.
39. Kompas T, Mallon K, Bojko M, Che TN, Strain B, McKinlay M, Pham VH, Grafton Q, Stoeckl N 2022, 'Economic Impacts from Sea Level Rise and Storm Surge in Victoria, Australia over the 21st Century'. Report prepared for the Victorian Marine and Coastal Council (VMACC), with support from the Department of Energy, Environment and Climate Action (DEECA) and Life Saving Victoria.
40. National Oceanic and Atmospheric Administration (NOAA) Coral Reef Watch 2018, 'NOAA Coral Reef Watch Version 3.1 Daily 5 km Satellite Time Series Data', College Park, Maryland, USA, https://www.ncei.noaa.gov/data/oceans/crw/5km/v3.1/nc/v1.0/annual/ Accessed 16 July 2024.
41. Gregor L, Gruber N 2020, 'OceanSODA-ETHZ: A global gridded data set of the surface ocean carbonate system for seasonal to decadal studies of ocean acidification', v2023, NCEI Accession 0220059, NOAA National Centers for Environmental Information Dataset, https://doi.org/10.25921/m5wx-ja34
42. Bureau of Meteorology (BoM), 'Climate data online', http://www.bom.gov.au/climate/data
43. Bureau of Meteorology (BoM), ACORN-SAT Australia v2.4, Australian Climate Observations Reference Network - surface air temperature (1910-2022).

temperatures at Cape Otway in several recent years has been more than 1°C warmer than the indicative pre-industrial era temperature.[43] Three years (2007, 2013 and 2014) have been more than 1.3°C warmer than the indicative pre-industrial era baseline. The warming observed in Cape Otway has been consistent with most other coastal locations in Victoria.

From the 1970s to the 2000s, there was a gradual increase in the amount of land burned within the GORCP boundary by prescribed burns.[44] There was then a significant increase in the amount of land burnt during the 2010s, which has generally been sustained so far in the 2020s. However, this has been balanced by a generally small amount of land being burnt by bushfires, resulting in a status assessment of fair for 'Indicator 50: Frequency and impact of fire'.

There was insufficient data available to provide status and trend assessments for 'Indicator 49: Seawater intrusion into coastal aquifers'.

Managing coastal hazard risks

Analysis by DEECA (2017) reported in the State of the Marine and Coastal Environment 2024 Report indicated the extent that Victorian councils consider climate change in land-use planning and the quality of their considerations. Of the five GORCP councils, two had a high level of integration of climate change into land-use planning (Warrnambool and Colac Otway), two had an intermediate level (Moyne and Surf Coast), and one had only a basic level of integration (Corangamite).[45] While no such analysis has been recently undertaken, it is worth noting that local government areas (LGAs) are currently pursuing numerous relevant projects.

Local governments are at the forefront of responding to climate change impacts, including forward planning and future proofing. All GORCP LGAs have a climate change adaptation or action plan, or in the case of Corangamite, are currently developing one. Catchment Management Authorities also have a key role in helping Victoria adapt to climate change, with all 10 Catchment Management Authorities — including Corangamite and Glenelg-Hopkins — having developed and implemented climate change adaptation plans or strategies.[46, 47] These were developed using the latest climate change projections by the Commonwealth Scientific and Industrial Research Organisation and in conjunction with key research organisations across Australia.

Many coastal hazards, including coastal flooding and erosion, are expected to increase under climate change, and this needs to be incorporated into emergency management planning. All GORCP councils have Municipal Emergency Management Plans, which must include a Municipal Flood Emergency Plan. This approach to emergency preparedness is driven by the Victorian Preparedness Framework under the *Emergency Management Act 2013*.

In its management of coastal hazards, the GORCPA is following the directions of the Marine and Coastal Policy 2020 and Victoria's Resilient Coast – Adapting for 2100+, and is preparing a Regional Coastal Adaptation Plan, along with local adaptation plans at key localities to guide coastal hazard risk mitigation and future development.[48, 49]

Protecting and restoring coastal blue carbon cosystems, such as mangroves, tidal marshes and seagrasses, offers opportunities for carbon sequestration. Better management of blue carbon ecosystems can also improve fisheries and increase a coastline's resilience to rising sea levels and storm tides. While such carbon sequestration benefits in the GORCP are valuable — estimated at 1,032 tonnes of CO_2 equivalent per year and worth $171,000 annually — the role of coastal ecosystems in providing coastal protection is even more significant.[50] Seagrass, saltmarsh and mangroves and/or geomorphology in coastal margins provide coastal protection along 239 km of the 243 km coastline for which the GORCPA is responsible, with a monetary value of $2.6 million to $10.3 million per year based on estimated infrastructure replacement costs.[51, 52]

For statewide information on these indicators, please refer to the State of the Marine and Coastal Environment 2024 Report.

44. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Fire History Records of Fires across Victoria showing the fire scars', https://datashare.maps.vic.gov.au/search?md=18d5e2ab-b2d1-522e-bf0e-3052a55d1893 Accessed 30 May 2024.
45. These are the LGAs that the GORCP overlaps: Moyne Shire, Warrnambool City Council, Corangamite Shire, Colac Otway Shire and Surf Coast Shire Council.
46. Commissioner for Environmental Sustainability (CES) Victoria 2021, 'State of Marine and Coastal Environment 2021 Report', East Melbourne, Victoria.
47. Victorian Catchment Management Authorities, Department of Environment, Land, Water and Planning (DELWP), 'Regional natural resource management climate change adaption Victorian priorities'.
48. Great Ocean Road Coast and Parks Authority (GORCPA) 2024, 'Climate Action and Resilience', https://www.greatoceanroadauthority.vic.gov.au/Environment/Climate-Action-and-Resilience Accessed 18 February 2025.
49. Department of Energy, Environment and Climate Action (DEECA), personal communication, 2 April 2025.
50. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Great Ocean Road Coast and Parks Environmental-Economic Account', East Melbourne, Victoria.
51. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Great Ocean Road Coast and Parks Environmental-Economic Account', East Melbourne, Victoria, p. 140.
52. Great Ocean Road Coast and Parks Authority (GORCPA) 2023, 'Annual Report 2022-23', Torquay, Victoria, p. 3.

Front Beach at Point Danger, Torquay. Credit: Ikonya

Communities

The 'Communities' theme focuses on activities undertaken by, and the liveability of, Great Ocean Road communities.

Approximately 24,000 people live along the Great Ocean Road, including in 21 discrete communities from Torquay to Warrnambool.[53] The development of coastal settlements represents a significant change in land use, potentially reducing natural habitat and introducing impervious surfaces. It is often assumed that population in coastal areas is increasing faster than non-coastal areas. In Victoria this is not the case.[54] Varied rates of resident population growth are projected for different locations in the GORCP boundary. These range from 1.8% growth in Torquay (greater than the projected statewide average growth rate of 1.7%) to negative growth in Corangamite-South.[55] In the GORCP, a greater proportion of new residential development is being concentrated in existing coastal settlements compared to both statewide regional Victoria and coastal regional Victoria.[56]

Protection is afforded to significant landscapes in areas subject to development pressure through the Significant Landscape Overlay (currently being updated for the GORCP) and the Surf Coast Distinctive Areas and Landscapes declared area, which overlaps with a small part of the GORCPA boundary to the north-east.[57] Although planning controls are being strengthened to protect important landscapes, there are no monitoring systems in place to determine whether the outcomes are being achieved in terms of protecting the qualities of these significant landscapes. The Great Ocean Road Strategic Framework Plan, currently under

53. Great Ocean Road Coast and Parks Authority (GORCPA) 2023, 'Annual Report 2022-23', Torquay, Victoria, p. 6.
54. Commissioner for Environmental Sustainability (CES) Victoria 2025, 'State of the Marine and Coastal Environment Report Part 2: Scientific Assessments', East Melbourne, Victoria.
55. Department of Transport and Planning (DTP) 2023, 'Victoria in Future. The official Victorian state government projection of population and households', https://www.planning.vic.gov.au/guides-and-resources/Data-spatial-and-insights/discover-and-access-planning-open-data/victoria-in-future Accessed 13 June 2024.
56. Department of Transport and Planning (DTP), personal communication, 13 February 2025.
57. Department of Energy, Environment and Climate Action (DEECA), personal communication, 3 September 2024.

development, provides an opportunity to identify areas for greater protection.

The Eastern Maar and Wadawurrung are the Traditional Owners of the lands and waters of the GORCP and have been for millennia.[58] This is recognised by the *Great Ocean Road and Environs Protection Act 2020*, which also protects and promotes the values, rights and interests of the Eastern Maar and Wadawurrung. Additionally, legislative protection is given to a range of cultural heritage in both land and marine environments. While cultural heritage can be assessed quantitatively, monitoring the qualitative status of sites and the degree to which investment is supporting their preservation and protection is important. On 30 June 2024, there were 665 registered places and 169 cultural heritage management plans approved and lodged on the Victorian Aboriginal Heritage Register for the GORCP.[59] As of March 2025, there were 19 Victorian Heritage Register places and 38 Heritage Inventory sites within the GORCP.[60] Additionally, Cultural Values Assessments have been undertaken by the Wadawurrung Traditional Owners Aboriginal Corporation and Eastern Maar Aboriginal Corporation as part of the Great Ocean Road Strategic Framework Plan, which is currently under development. These identify Aboriginal cultural heritage on a landscape scale and will be used to identify any additional protections needed for Aboriginal cultural heritage in the GORCP.[61]

The Great Ocean Road is Victoria's most significant tourism asset, attracting more visitors than the Great Barrier Reef and Uluru combined.[62] The visitor economy is a significant source of employment in the GORCP, providing 17.2% of filled jobs in the region (11.9% direct and 5.3% indirect) in 2022–23.[63] Like all tourism regions across the state, the GORCP was impacted by the COVID-19 pandemic. In the year ending September 2024, there were approximately 5.6 million visitors to the GORCP, with a total spend of $2 billion.[64] While total visitor spend is up compared to the pre-pandemic levels of 2019, total visitors are approximately 80% of 2019.[65]

The natural environment is particularly important, as it is what draws most visitors to the region. However, the number and behaviour of tourists can potentially have negative environmental and social impacts. High visitation can cause some locations to experience significant fluctuations in population levels, resulting in road congestion and damage, increased litter, and overuse of facilities such as toilets and other amenities. The Great Ocean Road Strategic Framework Plan will include a Visitor Management Framework to guide tourism investment priorities.[66]

Recreational boating is a popular activity, with many boaters also participating in recreational fishing.[67, 68] In many cases, boat access points are close to significant protected areas, warranting heightened attention being given to the management issues outlined in the State of the Marine and Coastal Environment 2024 Report. Of the 33 boat access points in the GORCP, 26 are within one kilometre of a marine and coastal national park or sanctuary, and 22 are within one kilometre of a marine asset of local, bioregional or state significance.[69, 70, 71]

The fishing industry that operates from the Port of Apollo Bay generates approximately $6.5 million per year and is one of the larger primary production employers in the GORCPA.[72] The two main commercial fisheries in the region that are managed by the State of Victoria are the Victorian Rock Lobster Fishery and the central zone of the Victorian Abalone Fishery.[73] Although there has been

58. Great Ocean Road Coast and Parks Authority (GORCPA), 'The Traditional Owners', https://www.greatoceanroadauthority.vic.gov.au/About-Us/The-Traditional-Owners Accessed 22 August 2024.
59. First Peoples – State Relations Group 2025, unpublished data, Melbourne Victoria.
60. Department of Transport and Planning (DTP) 2025, unpublished data.
61. Department of Energy, Environment and Climate Action (DEECA), personal communication, 2 April 2025.
62. Great Ocean Road Coast and Parks Authority (GORCPA) 2023, 'Annual Report 2022-23', Torquay, Victoria.
63. Department of Jobs, Skills, Industry and Regions 2023, 'Economic data dashboard' https://djsir.vic.gov.au/tourism-industry-support/research/economic-data Accessed 24 April 2025.
64. Great Ocean Road Regional Tourism (GORRT) 2024, 'Tourism Australia Year Ending (YE) September 2024 International and Domestic Visitor Survey Data'.
65. This is calculated as the proportion of 2024 total visitors (5,646,301) relative to 2019 total visitors (6,828,646) = ~80%
66. Department of Energy, Environment and Climate Action (DEECA), personal communication, 3 September 2024.
67. Victorian Fisheries Authority (VFA) 2020, 'The economic value of recreational fishing and boating in Victoria'. Report prepared by Ernst and Young Pty Ltd, p. 5.
68. Department of Energy, Environment and Climate Action (DEECA), unpublished data, East Melbourne, Victoria.
69. Boating Victoria 2025, 'Ramp List' map layer, https://www.boating.vic.gov.au/ramps/#/ Accessed 20 February 2025.
70. DataVic 2024, 'Marine national park - public land management' map layer, https://discover.data.vic.gov.au/dataset/public-land-management-plm25 Accessed 20 February 2025.
71. DataVic 2024, 'Marine assets', map layer, https://discover.data.vic.gov.au/dataset/marine-assets#/ Accessed 20 February 2025.
72. Great Ocean Road Coast and Parks Authority (GORCPA) 2025, 'Port of Apollo Bay', https://www.greatoceanroadauthority.vic.gov.au/Land-We-Manage/Ports/Port-of-Apollo-Bay Accessed 16 January 2025.
73. Victorian Fisheries Authority, personal communication, 6 August 2024.

a long-term decline in southern rock lobster and blacklip abalone populations, these fisheries appear to be managed sustainably through annual catch quotas and other measures.

Gas production in the GORCP contributes to Victoria's energy sector and export markets. Contributions to renewable energy from the region remain limited, chiefly to land-based wind farms. Although Victoria does not currently have any offshore wind generation, one of two offshore renewable energy zones in Victoria lies offshore from the GORCP.

Agriculture represents a major land use within the GORCP, occupying an estimated 27,394 hectares and including a range of crops, dairy and livestock. It produced approximately $11.4 million in 2019–20.[74, 75] Agriculture involves environmental risks, such as the impact of water runoff, which may carry high nutrient loads or toxins from fertilisers; however, little data is available for the area. Loss of agriculture to urbanisation is largely confined to the urban centres of Surf Coast and Warrnambool.

Like the rest of Victoria's coast and marine environments, coastal infrastructure remains under threat from climate change due to sea level rise and the increasing frequency of severe weather events. To manage this and support climate adaptation, GORCPA is implementing a risk-based adaptation framework to respond to climate change impacts, along with a Climate Change Management Framework that includes identifying natural and built assets vulnerable to climate change and developing adaptive responses.[76]

Responsibility for enforcing and ensuring compliance with environmental protection regulations is vested across numerous authorities and agencies, as well as across a large geographic area. Additionally, the large number of visitors to the area presents a challenge for conducting effective education and enforcement activities, particularly with respect to time and cost.[77] GORCPA is currently developing its enforcement function and actively working towards a structured education and enforcement approach.[78]

Stewardship and collaborative management

This 'Stewardship and collaborative management' theme ranges from participation in local stewardship activities to legislative and policy measures arising from the implementation of the Great Ocean Road Action Plan. Collaborative approaches, in contrast to 'top-down' approaches, promote co-management and participatory decision-making, with management shared among stakeholders. By working in partnership, the GORCPA and Great Ocean Road communities can create policy that leads to strong stewardship of Victoria's marine and coastal environments.

While it is relatively easy to measure numbers of participants involved in a program, it is more difficult to measure institutional characteristics or the effectiveness of policies and processes. For this reason, some of the indicators within this theme provide a narrative rather than specific assessments or precise measurements. For others, as the indicators used in this report are aligned with the statewide reporting in the State of the Marine and Coastal Environment report, there are currently no equivalent GORCP-level available to enable an assessment.

Simply put, environmental stewardship refers to an ethic of taking care of the natural environment. This can include efforts to manage and protect land by fostering a sense of responsibility among landowners and resource users.[79] At a more fundamental level, it relates to a particular relationship with the environment — a shift from the Western perspective of humans dominating or conquering the natural world to one in which humans are essentially part of the environment.[80]

There is a growing recognition of the importance of people being connected to nature. In the GORCP, stewardship activities involve many participants, including farmers and other land managers, fishers and those who rely on marine industries, and various volunteer groups involved in environmental protection and improvement. A range of government

74. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Great Ocean Road Coast and Parks Environmental-Economic Account', Melbourne, Victoria, p. 44.
75. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Great Ocean Road Coast and Parks Environmental-Economic Account', Melbourne, Victoria, pp. 107-108.
76. Great Ocean Road Coast and Parks Authority (GORCPA) 2023, 'Asset Management Strategy 2023', Torquay, Victoria, p. 46.
77. Great Ocean Road Coast and Parks Authority (GORCAPA), personal communication, 25 March 2025.
78. Great Ocean Road Coast and Parks Authority (GORCAPA), personal communication, 7 March 2025.
79. Plieninger T, Bieling C 2017, 'The emergence of landscape stewardship in practice, policy and research'. In: C Bieling, T Plieninger (eds), 'The Science and Practice of Landscape Stewardship: Chapter 1', Cambridge University Press, Cambridge, UK, pp. 1–17, https://doi.org/10.1017/9781316499016.007
80. Leopold A 1949, 'A Sand County Almanac', excerpt reproduced in D Peterson Del Mar 2011, 'Environmentalism', Taylor and Francis, London, UK.

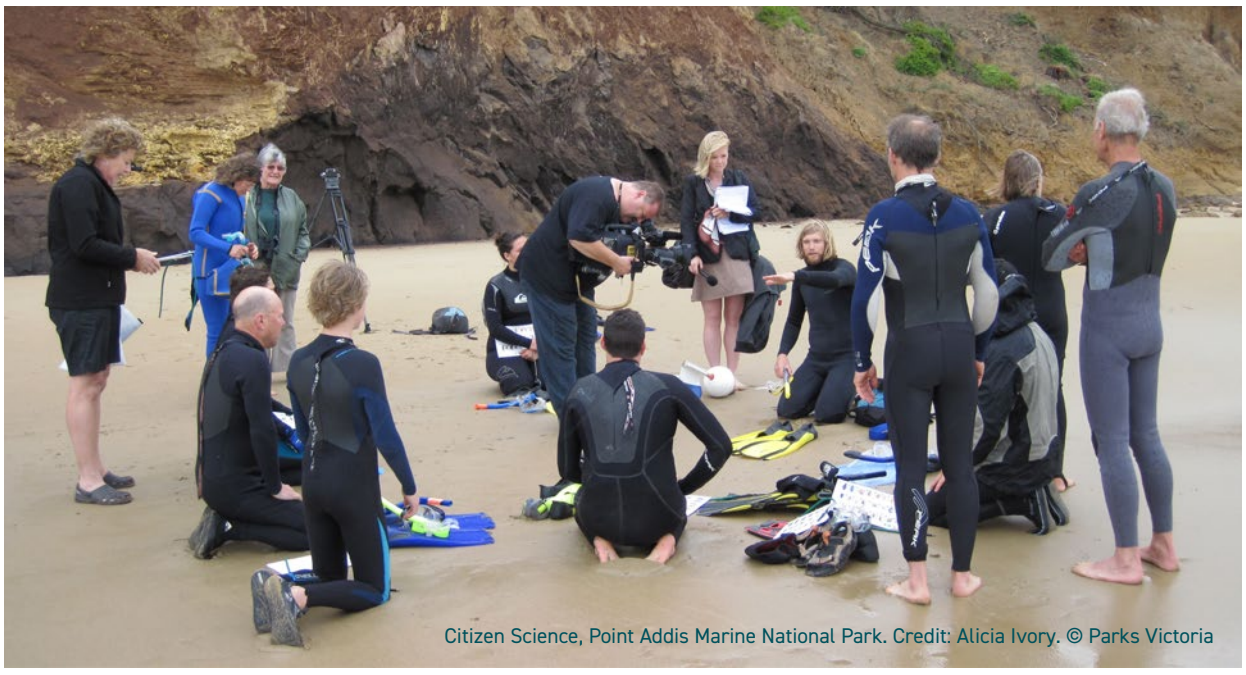
agencies are also involved in stewardship activities through funding processes, policy making and program management. Principal among these has been GORCPA, whose role has included delivering a variety of environmental education programs to students of all ages and to visitors, aimed at imparting knowledge and encouraging care and appreciation for the area's nature. However, the scope of GORCPA's education delivery has evolved and these activities are no longer delivered.[81]

While stewardship is difficult to define or measure, the DEECA has made progress through the development of a Marine and Coastal Stewardship Index. Although data is currently only available for Port Phillip Bay, this may be an effective model for use in other regions, such as the GORCP.

It is also important to acknowledge the intrinsic connection of the Eastern Maar and Wadawurrung Traditional Owners to the land and Sea Country of the Great Ocean Road, and their critical role in Caring for Sea Country. This is discussed in Part 2 of this report.

Volunteering is one activity for which data are available. Rates of volunteering in the community have gradually declined over the past twenty years, with a rapid decline during the COVID-19 pandemic.[82] While pandemic-related restrictions have been lifted, volunteering rates across the wider sector remain below pre-pandemic rates.[83] Despite this, environmental volunteering in Victoria has increased in terms of participant numbers.

Annual data on environmental volunteering in Victoria have been maintained and published by DEECA since 2018–19. In 2023–24, 908 environmental volunteers contributed 12,404 hours in the GORCP.[84] The data indicate that environmental volunteering in the region was impacted by COVID-19 lockdowns and restrictions, but by 2021–22 had risen well above the pre-COVID-19 levels of 2018-19. However, there was a decline in 2023–24, which is partly (but not wholly) attributable to a change in how WaterWatch/EstuaryWatch classifies and reports figures. This trend is also seen in the statewide data.[85]



Citizen Science, Point Addis Marine National Park. Credit: Alicia Ivory. © Parks Victoria

81. Great Ocean Road Coast and Parks Authority (GORCPA), personal communication, 25 March 2025.
82. Biddle N, Boyer C, Gray M, Jahromi M 2022, 'Volunteering in Australia: The Volunteer Perspective. Volunteering Australia', https://volunteeringstrategy.org.au/wp-content/uploads/2022/10/Volunteering-in-Australia-2022-The-Volunteer-Perspective.pdf
83. Biddle N, Boyer C, Gray M, Jahromi M 2022, 'Volunteering in Australia: The Volunteer Perspective. Volunteering Australia', https://volunteeringstrategy.org.au/wpcontent/uploads/2022/10/Volunteering-in-Australia-2022-The-Volunteer-Perspective.pdf
84. An indication of volunteer work relevant to the GORCP was obtained by reviewing a sub-sample of the data reported in the SMCE 2024, which includes 31 volunteer groups based within 5 km of the coast, between the western and eastern boundaries of the GORCP, and who reported undertaking environmental volunteering projects.
85. Department of Energy, Environment and Climate Action (DEECA), personal communication, 24 January 2025.
86. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Great Ocean Road Strategic Framework Plan – Factsheet', East Melbourne, Victoria, https://www.marineandcoasts.vic.gov.au/__data/assets/pdf_file/0028/710857/Fact-Sheet-GOR-SFP-June-2024.pdf

Wild kangaroos, 2022 on the Great Ocean Road. Credit: Ben Savage © Visit Victoria

This report's assessment takes a narrative form in exploring the planning and implementation of the Great Ocean Road Action Plan. The implementation of the Action Plan's reforms is progressing, with legislation created specifically for the area, the establishment of GORCPA, and the subsequent transfer of land management responsibilities to it. Another key element of these reforms is the development of the Great Ocean Road Strategic Framework Plan, which is underway and expected to be released for public comment and submissions in late 2025.[86]

While delivery and implementation are critical aspects of any policy or program, the evaluation of policy effectiveness is more difficult to determine. Although no specific evaluation plan is yet in place, it will be important to establish a clear evaluation process.

Inland Biodiversity

Small native mammals may have a relatively low profile in our national awareness; however, these species are vital components of ecosystems, performing a dual role as bioindicators of forest health and as modifiers of landscapes through their various ecological functions, particularly as ecosystem engineers. Shifts in their populations can act as precursory signals of ecological change, while their digging actions enhance ecological processes that maintain the health, function and resilience of ecosystems.

Project 4 of the Wild Otways Initiative investigated the occurrence and threats of six listed small mammal species in the Great Otways region listed under the *Environment Protection and Biodiversity Conservation Act 1999*, many of which serve as ecosystem engineers. The findings of this project confirmed their decline in the region over the past decade, driven by the cumulative and interacting impacts of invasive and feral animals, inappropriate fire regimes, Phytophthora dieback, reduced genetic diversity, and climate change. Several conservation actions were identified as critical for supporting the recovery of these small native mammals and addressing key knowledge gaps through research, all of which are outlined in species-specific recovery and management plans developed under the initiative. Managing threatening processes within identified refuges was one of the key recommended priorities to promote population recovery, enhance resilience, and restore habitats. Trial reintroductions into safe havens (predator-free exclosures) and genetic rescue were also recommended for species experiencing severe declines and fitness-related impacts from habitat fragmentation, where without such interventions, their continued persistence in the region would be uncertain.

With the cessation of the Wild Otways Initiative, additional long-term monitoring of small mammals across the region is vital for supporting evidence-based decision-making and evaluating the efficacy of threat abatement programs and other conservation actions. Continued monitoring is also essential for understanding population responses to forest management operations, including prescribed burning, as well as the climate-induced impacts.

Koalas, on the other hand, are among the most recognisable and iconic Australian wildlife species. Their high consumption rate of vegetation reduces the biomass that fuels intense and frequent fires, while also increasing light penetration to promote post fire regeneration. Following a period of sharp population decline due to hunting pressure, land clearance, wildfires and disease, koalas were reintroduced into Cape Otway. Optimal conditions allowed the population to significantly increase, resulting in an over-abundance of koalas. The high densities led to over-browsing, particularly of manna gums, and created a welfare emergency for the species. The implementation of a koala management program reduced the population to a more sustainable level and improved their physical health. While koala numbers still exceed optimal levels at some sites, the overall status was assessed as fair with an improving trend.

Kennett River. Credit: Belinda VanZanen. © Great Ocean Road Tourism

Recommendations

The recommendations are informed by the science and analyses presented in Part 3 – Scientific Assessments and the 'Key findings' of this report. They are intended to support ecological sustainable development in the Great Ocean Road Coast and Parks (GORCP) over the next decade and beyond. Although most of the recommendations do not specify delivery timelines, except where noted, it is anticipated that they would be fully implemented by 2035, with clear progress evident within five years, recognising that the next report is due in 2030.

The Commissioner for Environmental Sustainability (CES) acknowledges that the Department of Energy, Environment and Climate Action (DEECA) is currently engaging with responsible public entities and the Victorian community to develop the Great Ocean Road Strategic Framework Plan (SFP). The recommendations presented here are targeted to improve the evidence base for decision-making in the GORCP, informing future iterations of the SFP. It is also anticipated that the next State of the Great Ocean Road Coast and Parks report (SGORCP) will be informed by the scope and priorities of the SFP following its release.

Several of the recommendations in the State of the Marine and Coastal Environment 2024 Report apply to the GORCP. Two are reiterated in this report (concerning coastal inundation spatial layers (Recommendation 1) and tourism (Recommendation 5) to include additional information relevant to the GORCP.

The six recommendations proposed in this report do not include specific recommendations related to the strategic reporting initiatives described in Part 2 of this Report: cultural landscape health and management, space and spatial analysis, and applying international frameworks (including the United Nations System of Environmental-Economic Accounting). However, as explained elsewhere, the SGORCP is a significant, but single, reporting product within the Commissioner's commitment to improving the evidence base and supporting decision-making in the region. The Commissioner will continue to partner with, and support, stakeholders to progress the tools and strategies that improve our understanding of ecologically sustainable development in the region.

The recommendations presented here:

- prioritise actions that improve multiple environmental outcomes
- focus on improving the evidence base to deliver key policy and legislative actions and targets
- are informed by the findings of other respected reports
- identify actions to achieve ecologically sustainable development and UN Sustainable Development Goals targets by 2030.

The *Commissioner for Environmental Sustainability Act 2003* (CES Act) requires the Victorian Government to respond to all recommendations within 12 months of the report being tabled in the Parliament of Victoria.

Table 1 provides a summary of the recommendations, the challenges they propose to overcome and their status in relation to the SGORCP 2025 Report recommendations.

Climate change

Recommendation 1: That DEECA updates and publishes statewide coastal inundation spatial layers.

Challenges this recommendation addresses

Sea level rise is one of the most significant threats to coastal areas associated with climate change. Coastal communities along the Great Ocean Road and the entire Victorian coastline are already experiencing some of the impacts associated with sea level rise.

These impacts are expected to intensify this century and include:

- more frequent and extensive inundation of low-lying areas, with the impacts exacerbated by storm surges
- loss of coastal habitat, such as roosting and nesting sites for shorebirds and seabirds
- accelerated cliff retreat and shoreline recession
- altered saltmarsh and mangrove habitats.[87]

Without successful flood risk mitigation, future increases in coastal flooding will lead to coastal floods occurring more often.[88]

The Victorian Coastal Inundation Dataset is a digital dataset comprising eight spatial layers that model the extent of land subject to coastal inundation due to projected sea level rise from 2009 to 2100.[89] This is the current dataset being used by the Victorian Government to plan for sea level rise. It projects an 82 cm sea level rise by 2100; however, it is 15 years old and requires updating with contemporary data to inform decision-making.

Action 3.9 of the Victorian Marine and Coastal Strategy (2022) committed to reviewing and updating planning benchmarks for sea level rise in line with Intergovernmental Panel on Climate Change (IPCC) reports by 2023.[90] As of the completion of this report, the new benchmarks have not been ann

ounced.

Context

In 2022, the University of Melbourne and Climate Risk Pty Ltd modelled the physical damage and potential economic cost of sea level rise and storm surge on Victoria's bays and coastal and marine areas, including coastal and marine areas in the GORCP. The final report, Economic Impacts from Sea Level Rise and Storm Surge in Victoria, Australia over the 21st Century (subsequently referred to in this section as the Kompas report), was prepared for the Victorian Marine and Coastal Council with support from Life Saving Victoria and the DEECA.[91] Researchers modelled scenarios (applied for 2040, 2070 and 2100) to calculate results if adequate adaptation measures are not implemented.[92] The modelling was underpinned by the Victorian Coastal Inundation Dataset, which projected an 82 cm sea level rise by 2100 but is now 15 years old.

As part of the IPCC Sixth Assessment Report (IPCC AR6), the IPCC projected sea level for a range of scenarios, including a projection of beyond one metre (relative to 1995–2014) by 2100, with medium confidence.[93] In 2022, a group of 28 sea-level scientists and practitioners from the World Climate Research Programme Grand Challenge on Regional Sea Level and its Impacts projected a high-end global mean sea level rise of 1.3 to 1.6 metres under a strong warming scenario by 2100.[94] These high-end projections, while complementary to the

87. Victorian Coastal Council (VCC) 2018, 'Victoria's coast and marine environments under projected climate change: Impacts, research gaps and priorities'.
88. Hague BS, Talke SA 2024, 'The influence of future changes in tidal range, storm surge, and mean sea level on the emergence of chronic flooding', *Earth's Future, 12*, e2023EF003993, https://doi.org/10.1029/2023EF003993 Accessed 28 April 2025.
89. Data Vic, 'Victorian Coastal Inundation', https://discover.data.vic.gov.au/dataset/victorian-coastal-inundation Accessed 28 April 2025.
90. Department of Environment, Land, Water and Planning (DELWP) 2022, 'Marine and Coastal Strategy', https://www.marineandcoasts.vic.gov.au/__data/assets/pdf_file/0029/571817/Marine-and-Coastal-Strategy_May-2022.pdf Accessed 7 May 2025.
91. Victorian Marine and Coastal Council (VMaCC), Life Saving Victoria 2022', 'A general summary of the report Economic Impacts from Sea Level Rise and Storm Surge in Victoria, Australia over the 21st century by Kompas, T. et al (2022),' VMaCC, East Melbourne.
92. Kompas T, Mallon K, Bojko M, Che TN, Strain B, McKinlay M, Van Ha P, Grafton Q, Stoeckl N 2022, 'Economic Impacts from Sea Level Rise and Storm Surge in Victoria, Australia over the 21st Century', Report prepared for the Victorian Marine and Coastal Council (VMaCC), with support from the Department of Energy, Environment and Climate Action (DEECA), Life Saving Victoria, Centre for Environmental and Economic Research, University of Melbourne, and Climate Risk Pty Ltd.
93. Intergovernmental Panel on Climate Change (IPCC) 2023, 'Summary for Policymakers', In: Climate Change 2023: Synthesis Report, Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Core Writing Team, H Lee, J Romero (eds), IPCC, Geneva, Switzerland, pp. 1–34, doi: 10.59327/IPCC/ AR6-9789291691647.001
94. Van de Wal RSW, Nicholls RJ, Behar D, McInnes K, Stammer D, Lowe JA, Church A, DeConto R, Fettweis X, Goelzer H, Haasnoot M, Haigh ID, Hinkel J, Horton BP, James TS, Jenkins A, LeCozannet G, Levermann A, Lipscomb WH, Marzeion B, Pattyn F, Payne AJ, Pfeffer WT, Price SF, Seroussi H, Sun S, Veatch W, White K 2022, 'A high-end estimate of sea level rise for practitioners', *Earth's Future, 10*, e2022EF002751 https://doi.org/10.1029/2022EF002751 Accessed 28 April 2025.

IPCC AR6 Report, represent plausible upper-bound scenarios of what could occur, rather than the most likely outcomes. They are of particular interest to stakeholders engaged in long-term adaption planning where such uncertainties are important, such as long-life infrastructure projects or coastal land use. The new estimates are based on multiple lines of evidence and the physical plausibility for each sea-level component, including the critical Antarctic ice sheet contribution.

Based on the evidence presented above, the Victorian Coastal Inundation Dataset will almost certainly not adequately capture the upper range of current sea level rise projections and requires updating to inform contemporary planning and decision-making.

The Marine and Coastal Policy (2020) provides the policy and strategic direction for responding to coastal hazard risks in the context of climate change. It identifies the need to plan for a sea level rise of no less than 0.8 metres by 2100 and to account for the combined effects of tides, storm surges, coastal processes and local conditions such as topography and geology when assessing climate change risks and impacts.[95]

Action 3.9 of the Victorian Marine and Coastal Strategy committed to reviewing and updating planning benchmarks in line with IPCC reports by 2023. As of the completion of this report, the new benchmarks have not been announced.

The need for updated statewide coastal inundation spatial layers is also demonstrated by Infrastructure Victoria's draft 30-year strategy, published in March 2025. Recommendation 28 of that draft strategy proposes the use of new flood maps to revise planning schemes:

> *'Produce a common set of flood projections based on the latest climate data. Use this information to update flood studies and maps and apply them in planning schemes. Minimise building in areas at high risk of flooding.'* [96]

Furthermore, as part of their response to 'Question[s] taken on notice' at a hearing for the Legislative Council Environment and Planning Committee's Inquiry into Climate Resilience, the Victorian Marine and Coastal Council (VMaCC) highlighted the opportunity to utilise existing modelling of physical damages and the potential economic costs of sea level rise and storm surge on Victoria marine and coastal areas.[97] An extract from VMaCC's response to the 'Question[s] taken on notice' is provided below:

> *'The Victorian Marine and Coastal Council is currently considering commissioning a few case studies across Victoria, to support greater understanding of the Kompas Report, and support translation of the modelling into local planning and decision-making.*
> *The question posed during the Inquiry Hearing highlighted the value of providing some more practical examples of the Kompas report at a local scale, looking at the changes in impact with different resilience and mitigation measures.'* [98]

Flood investigation studies in the GORCP are being undertaken in the absence of updated planning benchmarks. For example, Warrnambool City Council and the Glenelg Hopkins Catchment Management Authority are updating existing riverine flood risk modelling and developing new storm tide risk mapping for South Warrnambool and Dennington – these two areas are highlighted in 'Indicator 46: Coastal inundation' as being projected to experience relatively large inundation extents for urban areas within the GORCP by 2040. The flood risk work for South Warrnambool and Dennington was completed in February 2025, using 1.2 metres of sea level rise as the basis for the analysis.[99]

95. Department of Environment, Land, Water and Planning (DELWP) 2020, 'Marine and Coastal Policy', Melbourne, Victoria https://www.marineandcoasts.vic.gov.au/__data/assets/pdf_file/0027/456534/Marine-and-Coastal-Policy_Full.pdf Accessed 28 April 2025.
96. Infrastructure Victoria 2025, 'Victoria's draft 30-year infrastructure strategy', https://assets.infrastructurevictoria.com.au/assets/Victorias-draft-30-year-infrastructure-strategy.pdf Accessed 7 May 2025.
97. Legislative Council Environment and Planning Committee, 'Inquiry into Climate Resilience Aireys Inlet – Wednesday 23 October 2024', https://www.parliament.vic.gov.au/4ae85e/contentassets/b3ad588e1ba4417f908a8a2025e80af0/2.-final-vmacc-23102024.pdf Accessed 18 March 2025.
98. Legislative Council Environment and Planning Committee, 'Question[s] taken on notice', https://www.parliament.vic.gov.au/4ae85f/contentassets/0a143285ca104a82a2102a2ede65854e/reply-qon_2.-vmacc_23102024---vmacc-response.pdf Accessed 18 March 2025.
99. Venant Solutions Pty Ltd 2025, 'South Warrnambool and Dennington Flood Investigation Summary Report', https://www.ghcma.vic.gov.au/wp-content/uploads/2025/03/R.M00407.005.01_Summary-reduced.pdf Accessed 28 April 2025. Note that in June 2025, the Warrnambool City Council voted to not refer the flood investigation to the state government's planning panel for changes to planning schemes.

To support planning and decision-making for coastal areas, including those along the Great Ocean Road, it is critical that the Victorian Coastal Inundation Dataset is updated to incorporate contemporary sea level rise projections. Furthermore, there is an opportunity to apply existing modelling from the Kompas report to support local planning and decision-making in the GORCP by analysing the physical damage and potential economic cost of sea level rise.

Managing and restoring ecosystems

Recommendation 2: That the Victorian Government provide long-term implementation guidance for managing estuary mouth openings and protecting estuarine health in the Great Ocean Road Coast and Parks.

Challenges this recommendation addresses

Water levels can rise within a closed estuary, potentially inundating the surrounding landscape. However, natural openings do not always occur before assets such as roads and bridges are at risk of flooding. This prompts managers to consider the need for interrupting the natural cycle by artificially opening an estuary to mitigate flood risk.[100] However, artificial openings can cause adverse ecological effects, particularly when the practice is performed during low flow conditions or at high frequencies.[101] These effects include declines in water quality, fish deaths, modifications to vegetation communities and reduced seagrass health.

Climate change and the expanding footprint of built assets across the region increase the need to balance the maintenance of natural ecological processes with reducing flood risk as part of artificially opening estuaries. An independent review of the Victorian Waterway Management Strategy (VWMS) completed in 2021 found that a more effective long-term approach is required to manage estuary mouth openings and protect estuarine health.[102] This finding was supported by stakeholder consultation in 2023, which indicated that the current roles and responsibilities for artificial estuary openings are unclear and complex.[103]

Context

Estuaries are dynamic systems and feature prominently along the Great Ocean Road coastline. Many of these estuaries, like those elsewhere in Victoria, naturally close from time to time. This cycle is important for maintaining the health of estuarine ecosystems and adjacent floodplains, as well as supporting the plants and animals that inhabit them.

As detailed in 'Indicator 41: Rainfall', there is high confidence that extreme rainfall events will, on average, become more intense throughout the century. The projected increase in the intensity of extreme rainfall events will likely elevate the risk of flooding near estuaries. The data provided in 'Indicator 59: Coastal settlements' shows there is an expanding footprint of built assets across the region, with some of those assets likely to be exposed to the increased flood risk. The increasing intensity of extreme rainfall events and the growth in urbanisation amplify the existing challenges faced by estuarine managers. Specifically, the difficulty of balancing the competing priorities of maintaining natural ecological processes while reducing flood risk as part of artificially opening estuaries.

A history of unpermitted estuary entrance openings and community concern about the lack of clear and consistent guidelines, coupled with the adverse ecological effects associated with artificial estuary openings, led the Victorian Government to develop the Estuary Entrance Management Support System (EEMSS) in 2006.[104] The EEMSS was designed to provide estuary managers with a tool to consider impacts on the environmental, social and economic values of an estuary, and to account for the likely risks involved in decisions to artificially open (or not open) an estuary. In addition to its role as a

100. Corangamite Catchment Management Authority, Glenelg Hopkins Catchment Management Authority, West Gippsland Catchment Management Authority, Department of Environment, Land Water and Planning (DELWP), 'Should an estuary be opened or closed?', https://ccma.vic.gov.au/wp-content/uploads/2022/07/Estuary-Low-Catchment-Water-Fact-Sheet-v17-singlepage.pdf Accessed 9 April 2025.
101. Lloyd L 2025, 'Literature review and factsheet on the known adverse environmental impacts of artificial estuary openings'. Report prepared for Corangamite Catchment Management Authority (CCMA) Project No. COR-230, Colac, Victoria.
102. RM Consulting Group Pty Ltd 2021, 'Independent Review of the Victorian Waterway Management Strategy – Summary', https://www.water.vic.gov.au/__data/assets/pdf_file/0032/666653/independent-review-of-the-victorian-waterway-management-strategy.pdf Accessed 9 April 2025.
103. Think HQ Pty Ltd 2024, 'Victorian Waterways Management Strategy (Public Consultation) What we heard report', https://www.water.vic.gov.au/__data/assets/pdf_file/0035/698048/VWMS-what-we-heard-public-consultation-2023.pdf Accessed 9 April 2025.
104. Arundel H 2006, 'EEMSS Background Report and User Manual. Estuary Entrance Management Support System'.

decision-support tool, the EEMSS also provides guidance for the ongoing management of estuaries by establishing baseline data such as records of estuary entrance openings, water levels, water quality data, and species lists.

The current VWMS was completed in 2013, providing a detailed policy for managing Victoria's waterways over an 8-year period.[105] As the strategy concluded, its priorities, strengths and limitations were independently reviewed. The findings of the independent review were published in 2021, with recommendations to guide the development of a new VWMS.[106] One of the review's findings was that a more effective long-term approach was required to manage estuary mouth openings and protect estuarine health.

To further inform the development of a new VWMS, consultation sessions with a range of stakeholders were conducted in 2023. Stakeholders were given the opportunity to provide written submissions, with many supporting the findings of the independent review and suggesting that a comprehensive and updated approach to estuary management was required. Submissions highlighted the detrimental environmental impacts of artificial estuary openings as they reduce resilience to urbanisation and climate change. Stakeholders also indicated that current roles and responsibilities in artificial estuary openings are unclear and complex.[107]

In this report, estuarine water quality was assessed as having a good status and estuarine vegetation was assessed as having a fair status — see 'Indicator 03: Water quality (estuaries)' and 'Indicator 18: Wetland and estuarine vegetation'. These assessments were based on data reported in the Index of Estuary Condition 2021 Report.[108] The status assessments of good and fair for these indicators reflects that current estuarine management is adequately maintaining acceptable water quality and vegetation in the GORCP.

However, further research is required to determine the specific impacts that artificial estuary mouth openings may have on estuarine health in the region. This knowledge will be critical as climate change is expected to lead to generally drier conditions with more extreme rainfall events that become more intense over time.[109] These intense rainfall events are likely to increase the risk of flooding and increase the pressure to artificially open estuaries to alleviate the flood risk.

The updating of the VWMS, scheduled for 2025, presents an opportunity to improve the process for guiding artificial estuary openings, including:

- clarifying the roles and responsibilities for artificial estuary openings
- providing an effective long-term approach for managing estuary mouth openings and protecting estuarine health.

Recommendation 3: That the Great Ocean Road Coast and Parks Authority prioritise monitoring and threat management in and around identified climate refuges in the network of marine protected areas to enable active management of remnant kelp forests under changing environmental conditions.

Challenges this recommendation addresses

Globally, evidence suggests that kelp species are in decline and are threatened by the impacts of climate change.[110] The reduction of ecosystem engineers like kelp is significant, as it also impacts the flora and fauna species they support, leading to cascading effects on the function and resilience of reef ecosystems, as well as the loss of ecosystem services.[111]

The GORCP's coastal and marine environments are in the Great Southern Reef — a biodiverse temperate reef system extending along southern Australia. The reef is a global hotspot of endemism (species

105. Department of Environment and Primary Industries (DEPI) 2013, 'Victorian Waterway Management Strategy', https://www.water.vic.gov.au/waterways/victorian-waterway-management-program/victorian-waterway-management-strategy Accessed 9 April 2025.
106. RM Consulting Group Pty Ltd 2021, 'Independent Review of the Victorian Waterway Management Strategy – Summary', https://www.water.vic.gov.au/__data/assets/pdf_file/0032/666653/independent-review-of-the-victorian-waterway-management-strategy.pdf Accessed 9 April 2025.
107. Think HQ Pty Ltd 2024, 'Victorian Waterways Management Strategy (Public Consultation) What we heard report', https://www.water.vic.gov.au/__data/assets/pdf_file/0035/698048/VWMS-what-we-heard-public-consultation-2023.pdf Accessed 9 April 2025.
108. Department of Environment, Land, Water and Planning (DELWP) 2021, 'Assessment of Victoria's estuaries using the Index of Estuary Condition: Results 2021', East Melbourne, Victoria.
109. Department of Energy, Environment and Climate Action (DEECA) 2025, 'Great South Coast Climate Projections 2024', https://www.climatechange.vic.gov.au/__data/assets/pdf_file/0024/732381/Victorian-Climate-Science-Report-Collateral-Regional-Reports-Great-South-Coast.pdf Accessed 12 February 2025.
110. Young MA, Critchell K, Miller AD, Treml EA, Sams M, Carvalho R, Ierodiaconou D 2023, 'Mapping the impacts of multiple stressors on the decline in kelps along the coast of Victoria, Australia', *Diversity and Distributions, 29*(1), pp. 199-220.
111. Carnell PE, Keough MJ 2019, 'Reconstructing historical marine populations reveals major decline of a kelp forest ecosystem in Australia', *Estuaries and Coasts, 42*(3), pp. 765–778.

that exist only in one location), and the Victorian stretch of the Reef is recognised as a climate change hotspot, with sea surface temperatures estimated to be rising at a rate four times the global average.[112]

Sharp declines in two habitat-forming kelp species have been recorded across the GORCP. It is predicted that reductions in both macroalgae species will continue in response to the projected changes in the physical ocean climate.[113] Identifying tools and strategies that promote their long-term persistence is a priority conservation action for Victoria's marine environment.

Context

Canopy-forming macroalgae, such as kelp, play a vital role as ecosystem engineers and sustain the health and function of temperate marine ecosystems. Like the trees of a forest, kelp creates intricate forested habitats that are among the most productive and ecologically valuable ecosystems. This high productivity, along with the benign conditions provided by kelp forests, serves as critical nursery habitat, refugia and a resource base that supports diverse populations of marine species and underpins reef and coastal food webs. Kelp forests also help protect against coastal erosion by dampening ocean swell, mitigate the risks of eutrophication through nutrient cycling and contribute to long-term carbon sequestration.

Climate change is impacting macroalgae and contributing to their global decline.[114] In the ocean-warming hotspot of south-east Australia, dramatic reductions in temperate kelp species have been recorded, linked to the region's relatively higher rate of warming and climate-driven changes to ocean conditions.[115] Rising ocean temperatures and marine heat waves are causing physiological stress and direct mortality, while increased wave energy from more intense storm events results in physical damage. Additionally, altered currents are disrupting recruitment patterns. As the cover of temperate, habitat-forming kelps decline, these empty niches are being taken up by less complex turf communities, with negative implications for biodiversity and the provision of ecosystem service.

Despite the predicted losses confronting kelp species in the GORCP, refugia can offer protection against climate change impacts by maintaining favourable abiotic (physical) conditions, enabling species to persist even as surrounding waters exceed their thermal tolerances and become inhospitable. There has been growing focus on these areas within terrestrial and marine landscapes that resist the effects of ongoing climate change, leading to climate refugia being proposed as a conservation strategy for maintaining species and establishing resilient ecosystems in a rapidly changing environment. Identifying refuges and understanding their dynamics is therefore imperative, especially for habitat-forming species like kelp.

Recent research has identified climate refuges for habitat-forming kelp within some of the marine protected areas of the GORCP, with some adjacent areas also potentially offering significant refugia.[116] Prioritising management interventions in these future climate refugia — minimising the risk of marine pest incursions and improving catchment water quality — will help futureproof these areas from additional stressors and ensure limited resources are dedicated to actions with the highest conservation return.

Threat reduction strategies must also be complemented by long-term monitoring to continuously validate predictions of climate refugia in the region and to determine the management interventions needed to minimise current and future losses of habitat-forming kelps. Ongoing data collection will also inform managers whether the positioning of refuges is adequately connected to support recruitment and maintain the genetic diversity necessary for long-term population viability.[117] Furthermore, there

112. Young MA, Critchell K, Miller AD, Treml EA, Sams M, Carvalho R, Ierodiaconou D 2023, 'Mapping the impacts of multiple stressors on the decline in kelps along the coast of Victoria, Australia', *Diversity and Distributions, 29*(1), pp. 199-220.
113. Young MA, Critchell K, Miller AD, Treml EA, Sams M, Carvalho R, Ierodiaconou D 2023, 'Mapping the impacts of multiple stressors on the decline in kelps along the coast of Victoria, Australia', *Diversity and Distributions, 29*(1), pp. 199–220.
114. Hanley ME, Firth LB, Foggo A 2024, 'Victim of changes? Marine macroalgae in a changing world', *Annals of Botany, 133*(1), pp. 1-6.
115. Young MA, Critchell K, Miller AD, Treml EA, Sams M, Carvalho R, Ierodiaconou D 2023, 'Mapping the impacts of multiple stressors on the decline in kelps along the coast of Victoria, Australia', *Diversity and Distributions, 29*(1), pp. 199–220.
116. Young MA, Critchell K, Sams MA 2025, 'Using predictive models to identify kelp refuges in marine protected areas for management prioritization', *Ecological Applications, 35*(1), e3084.
117. Schneider CL 2018, 'Marine refugia past, present, and future: Lessons from ancient geologic crises for modern marine ecosystem conservation', *Marine Conservation Paleobiology*, pp. 163-208.

may be scope to expand upon the current modelling approach used to identifying climate refugia in the region — considered a form of 'avoidance' refugia against climate-driven stressors — to include other life-history and evolutionary metrics as a way of determining the locations of 'resistance' and/or 'recovery' refugia.[118] This emerging concept has recently been explored among corals, where a trait-based approach drawing on existing life histories was used to identify resistance sites that promote the persistence of stress-tolerant species.[119] Broadening predictive models through the integration of life history data would build a more resilient and diversified portfolio of refugia, potentially improving the strategic conservation and active management of habitat-forming kelps in a rapidly changing climate.[120]

Recommendation 4: That the Great Ocean Road Coast and Parks Authority and other agencies work in partnership with Traditional Owners to implement high-priority conservation and management actions in and around identified refuge sites and dispersal corridors, including an integrated cross-tenure invasive species control program.

Challenges this recommendation addresses

With impacts exceeding those of habitat loss and climate change, invasive species affect the largest number (82%) of the Australia's threatened taxa and have been the dominant driver in nearly all extinctions over the past six decades.[121, 122] Globally, Australia's native fauna experience some of the highest rates of predation by feral and pest species, with an estimated 75% of mammal extinctions attributed to invasive predators.[123] Mammal species within the preferred weight range of feral cats and foxes (35 g – 5.5 kg) are particularly vulnerable, with susceptibility further heightened for species that are ground dwelling and/or utilise open habitats. As invasive species are now present in almost every part of Australia, much of the landscape has become effectively unsuitable for extant, predator-susceptible native species.[124] Invasive herbivores and plant pathogens also play a significant role in the decline of small mammals by altering habitat structure.

Several species of small digging mammals in the GORCP and broader Otways landscape have been substantially reduced by invasive species. As the bioturbation actions of these species contribute to the function of ecosystems, their extinction could trigger a cascade of long-term negative impacts.[125, 126]

Context

Small native ground-dwelling mammals perform important ecological roles, ranging from pollinators to regulators of invertebrate populations. Species that dig are regarded as ecosystem engineers as they have distinct and substantial effects on ecosystem processes and increase resource availability for sympatric (coexisting) species. When digging mammals occur at natural densities, their bioturbation actions (stirring and churning of sediments) create localised disturbances that cumulatively benefit broader-scale ecosystem processes and function. Their mechanical manipulation of the substrate initiates positive shifts in the soil, significantly contributing to the maintenance of healthy and resilient ecosystems.

Digging mammals native to the GORCP and broader Greater Otways landscape have suffered sharp population declines in recent decades, primarily due to invasive predators. While critical weight range is a significant factor to these species' high level of predation, other threatening processes that remove protective understory vegetation cover are also important drivers — including invasive herbivores and pathogens, fire, and climate change.

118. McClanahan TR, Darling ES, Beger M, Fox HE, Grantham HS, Jupiter SD, Logan CA, Mcleod E, McManus LC, Oddenyo RM, Surya GS 2024, 'Diversification of refugia types needed to secure the future of coral reefs subject to climate change', *Conservation Biology, 38*(1), e14108.
119. Schwarz A 2023, 'Identifying climate refuges for coral reefs with a life histories approach', Master's thesis, University of Toronto, Canada.
120. McClanahan TR, Darling ES, Beger M, Fox HE, Grantham HS, Jupiter SD, Logan CA, Mcleod E, McManus LC, Oddenyo RM, Surya GS 2024, 'Diversification of refugia types needed to secure the future of coral reefs subject to climate change', *Conservation Biology, 38*(1), e14108.
121. Sheppard A, Glanznig A 2021, 'Fighting plagues and predators Australia's path towards a pest and weed-free future', Commonwealth Scientific and Industrial Research Organisation (CSIRO), Canberra, ACT.
122. Kearney SG, Carwardine J, Reside AE, Fisher DO, Maron M, Doherty TS, Legge S, Silcock J, Woinarski JC, Garnett ST, Wintle BA 2019, 'Corrigendum to: The threats to Australia's imperilled species and implications for a national conservation response', *Pacific Conservation Biology, 25*(3), p. 328.
123. Invasive Species Council 2021, 'Are Victoria's ecosystems in terminal decline?', https://invasives.org.au/blog/are-victorias-ecosystems-in-terminal-decline/ Accessed 5 May 2025.
124. Legge S, Woinarski JC, Burbidge AA, Palmer R, Ringma J, Radford JQ, Mitchell N, Bode M, Wintle B, Baseler M, Bentley J 2018, 'Havens for threatened Australian mammals: The contributions of fenced areas and offshore islands to the protection of mammal species susceptible to introduced predators', *Wildlife Research, 45*(7), pp. 627-644.
125. Halstead LM, Sutherland DR, Valentine LE, Rendall AR, Coetsee AL, Ritchie EG 2020, 'Digging up the dirt: Quantifying the effects on soil of a translocated ecosystem engineer', *Austral Ecology, 45*(1), pp. 97-108.
126. Fleming PA, Anderson H, Prendergast AS, Bretz MR, Valentine LE, Hardy GE 2014, 'Is the loss of Australian digging mammals contributing to a deterioration in ecosystem function?', *Mammal Review, 44*(2), pp. 94-108.

Fire, whether naturally occurring or prescribed, increases predation risk for small mammals through the reduction of understory vegetation, direct mortality and disruption of demographic processes that heighten genetic risks. Post-fire mortality is exacerbated by behavioural shifts among foxes and cats, which preferentially hunt in burnt areas.[127] With a changing climate, not only are the frequency and severity of disturbance regimes anticipated to intensify, but the distribution of invasive species, which act as vectors for invasive pathogens and weeds, is also expected to expand.

Where invasive predators co-occur, such as foxes and feral cats, targeting only the dominant predator can increase predation by subordinate species. An integrated invasive species control program must therefore be consistently implemented across the landscape. Foxes in the region have been controlled under the Otway Ark since 2016, while the control of feral cats remains limited. Moreover, the program is generally confined to public land, and its baiting regime (in terms of density and replacement frequency) has proven inadequate for reducing fox population growth.[128] Evidence of mammal prey recovery is also lacking, likely due to the increased predation by feral cats following fox suppression and other consequences, such as immigration from untreated areas.[129, 130]

Currently, the most effective technique for controlling feral cats has been exclusion fencing.[131] Safe haven networks have successfully prevented further extinctions of predator-susceptible species, with many Australian taxa in the critical weight range now only persisting within these fenced exclosures.[132, 133] As a result, the reintroduction of small mammals into predator-free safe havens was recommended as a conservation action under the Wild Otways Initiative.[134, 135] Active genetic management is another key consideration for any reintroduction program to mitigate the genetic impacts arising from population fragmentation and reduced population sizes. Significant work and Traditional Owner engagement has already been undertaken through the Initiative's Rewilding project and Zoos Victoria's Wildlife Conservation Master Plan, including a reintroduction feasibility study. These efforts provide a model for species reintroductions into safe havens and to accelerate translocation approval processes. The establishment of safe havens was recommended in the State of the Environment 2023 Report (Recommendation 6) to reduce key threats to species and restore critical habitats.[136] However, at the time of writing this report, a response from the Victorian Government had not been released.

Refuges are a complementary conservation intervention to predator-free exclosures, aimed at restoring viable, self-sustaining populations by establishing continuous threat control around their perimeters rather than fencing. Evidence suggests that refuges are critical for averting local extinctions and promoting the regional persistence of small mammal populations.[137] Small mammals retreat to refuge habitats to escape unfavourable environmental conditions in the wider landscape. These small areas maintain stable properties that act in alleviating stressors by providing reliable water resources that buffer against extreme weather events, patchy fuel loads that enable survival during fire events, and maintain vegetation structure that reduces predation pressure. As environmental conditions improve, refuges act as source areas for individuals to recolonise surrounding habitats. The Wild Otways Initiative has identified small mammal refuges and connective

127. Pla ML, Hradsky BA, Di Stefano J, Farley-Lehmer TC, Birnbaum EK, Pascoe JH 2024, 'High site fidelity and reduced survival of a mycophagous mammal after prescribed fire', *Biodiversity and Conservation, 33*(13), pp. 3799-3820.
128. Francis L, Robley A, Hradsky B 2020, 'Evaluating fox management strategies using a spatially explicit population model', Arthur Rylah Institute (ARI) for Environmental Research Technical Report Series No. 304, Department of Environment, Land, Water and Planning (DEWLP), Heidelberg, Victoria.
129. MacKenzie, DI 2021, 'Analysis of the Otway Ark Camera Monitoring Data'. Report for Parks Victoria (PV), Proteus Client Report: 2021-06, Proteus, Outram, New Zealand.
130. Rees MW, Pascoe JH, Le Pla M, Robley A, Birnbaum EK, Wintle BA, Hradsky BA 2023, 'Mesopredator release among invasive predators: Controlling red foxes can increase feral cat density and alter their behaviour', *Journal of Applied Ecology, 60*(6), pp. 1100-1114.
131. Sharp T 2012, 'National code of practice for the humane control of feral cats', https://pestsmart.org.au/toolkit-resource/code-of-practice-feral-cats Accessed 29 April 2025.
132. National Environmental Science Program (NESP) Threatened Species Recovery Hub 2021, 'Re-establishing critical weight range mammals in the northern wheatbelt of Western Australia: Reintroductions to a safe haven free of introduced predators', Project 4.1.11 research findings factsheet.
133. Legge S, Woinarski JC, Burbidge AA, Palmer R, Ringma J, Radford JQ, Mitchell N, Bode M, Wintle B, Baseler M, Bentley J 2018, 'Havens for threatened Australian mammals: The contributions of fenced areas and offshore islands to the protection of mammal species susceptible to introduced predators', *Wildlife Research, 45*(7), pp. 627-644.
134. Wilson B, Garkaklis MJ 2023, 'Recovery management guidelines for the threatened swamp antechinus, *Antechinus minimus maritimus*, in the Otways'. Report prepared for the Corangamite Catchment Management Authority, Colac, Victoria.
135. Wilson B, Garkaklis MJ 2023, 'Recovery management guidelines for the threatened New Holland mouse (pookila/koornam), *Pseudomys novaehollandiae*, in the Otways'. Report prepared for the Corangamite Catchment Management Authority, Colac, Victoria.
136. Commissioner for Environmental Sustainability Victoria (CES) 2023, 'State of the Environment Report', Melbourne, Victoria.
137. Reside AE, Briscoe NJ, Dickman CR, Greenville AC, Hradsky BA, Kark S, Kearney MR, Kutt AS, Nimmo DG, Pavey CR, Read JL 2019, 'Persistence through tough times: fixed and shifting refuges in threatened species conservation', *Biodiversity and Conservation, 28*(6), pp. 1303-1330.

features within gully, coastal dune and heathland sites across the region, which maintain higher populations despite overall regional declines.[138]

Key to supporting these identified refuges is the establishment and maintenance of an integrated, cross-tenure invasive species control program, using best-practice techniques across the landscape to manage invasive predators and herbivores (including *Phytophthora cinnamomi*). This proposed integration would incorporate refuge site locations and targeted invasive predator control protocols into fuel reduction burn plans to retain a heterogenous mosaic of mature, dense vegetation with thick ground cover and to increase small mammal survival during and after prescribed burns. To complement threat abatement activities, robust monitoring of both populations and habitat is essential to assess the effectiveness of conservation actions and to inform adaptive management.

This recommendation will require strong collaboration across government, conservation groups, academics and Traditional Owners to secure small mammal populations, manage their genetic health and promote viable, self-sustaining populations in open landscapes. Furthermore, by reducing the impacts of invasive species and increasing the abundance of threatened digging mammals within their former distribution, these actions will also benefit non-target species and restore lost ecosystem processes and functions.[139]

Potoroo, Great Ocean Road. Credit and © Doug Gimesy, Wildlife Wonders. Source: Visit Victoria

138. Wilson BA, Garkaklis MJ 2023, 'Conserving threatened small mammals in the Otway Ranges, Bells Beach (Ironbark Basin) and Great Ocean Road hinterland'. Report prepared for the Corangamite Catchment Management Authority, Colac, Victoria.
139. Palmer BJ, Valentine LE, Page M, Hobbs RJ 2020, 'Translocations of digging mammals and their potential for ecosystem restoration: A review of goals and monitoring programmes', *Mammal Review, 50*(4), pp. 382-398.

Tourism

Recommendation 5: That DEECA evaluates the effectiveness of the Visitor Management Framework in the Great Ocean Road Strategic Framework Plan, in consultation with other agencies, to achieve sustainable tourism outcomes and identify improvements and how similar approaches could be adopted to manage tourism more broadly across Victorian coastal regions.

Challenges this recommendation addresses

The Great Ocean Road is one of the world's most scenic coastal touring routes, attracting more than five million visitors each year. [140, 141] These visitors are not only important to the Victorian economy as a whole but also to local economies, providing a vital source of income and employment.[142] The natural environment and the region's tourism attractions are key drawcards for visitors.[143, 144]

However, the region is experiencing pressure from increased visitor numbers, which places greater demands on the local environment, infrastructure and services.[145] This pressure is forecast to grow and be further compounded by climate change impacts.[146] Yet, with effective management, the attractions and landscapes of the area can continue to drive economic prosperity in a way that is environmentally, socially and economically sustainable.[147]

Context

In 2017 the Victorian Government commissioned a bipartisan taskforce review of the Great Ocean Road regional governance arrangements, which delivered the Great Ocean Road Action Plan and the *Great Ocean Road and Environs Protection Act 2020*.

The Great Ocean Road Taskforce co-chairs report identified the importance not only of having a sustainable visitation management plan but also of establishing a single point of accountability to lead the protection of the area and facilitate sustainable tourism that delivers a great visitor experience.[148]

As a result, the GORCPA was formed in 2020, assuming responsibility for the management of public land along the Great Ocean Road and simplifying governance that was previously shared across numerous responsible public entities. Among other things, this includes having responsibilities for both the promotion of visitation, as well as protecting and managing the natural environment.[149] This arrangement enables the holistic and balanced management of what might otherwise be conflicting objectives.

Additionally, a key output of the *Great Ocean Road and Environs Protection Act 2020* is the Great Ocean Road Strategic Framework Plan (SFP). A draft SFP is expected to be released by early 2026. Among other priorities, the SFP aims to address visitation pressures in the region through the development of a visitor management framework designed to actively and sustainably manage visitation and guide tourism investment priorities. While the Great Ocean Road is unique, many of its challenges may also be shared by other Victorian coastal tourism regions, meaning the lessons learned locally may provide valuable insights that can be adopted elsewhere. [150]

Following implementation of the SFP and visitor management framework, it will be important to evaluate how effective the approach has been in achieving sustainable tourism outcomes. Community consultation will be a critical component of this evaluation to ensure that the aspirations and rights of all local stakeholders are respected and inform ongoing management.[151]

140. Great Ocean Road Coast and Parks Authority (GORCPA) 2025, 'Our Story', https://www.greatoceanroadauthority.vic.gov.au/About-Us/Our-Story Accessed 22 April 2025.
141. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
142. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
143. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
144. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Great Ocean Road Coast and Parks Environmental-Economic Account', East Melbourne, Victoria, p. 69.
145. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
146. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
147. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
148. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Protecting our iconic coasts and parks, Governance of the Great Ocean Road, its land and seascapes. Independent Co-Chairs Final Report', Melbourne, Victoria, https://www.marineandcoasts.vic.gov.au/__data/assets/pdf_file/0026/630188/GreatOceanRoad_FinalReport_web.pdf
149. Great Ocean Road Coast and Parks Authority (GORCPA) 2023, 'Annual Report 2022-23', Torquay, Victoria, p. 39.
150. Commissioner for Environmental Sustainability Victoria 2025, 'State of the Marine and Coastal Environment Summary Report', East Melbourne, Victoria, Recommendation 6.
151. Department of Energy, Environment and Climate Action (DEECA) 2018, 'Great Ocean Road Action Plan', East Melbourne, Victoria, https://www.marineandcoasts.vic.gov.au/__data/assets/pdf_file/0018/630180/GreatOceanRoad_ActionPlan.pdf Accessed 28 January 2025.

Data integration and reporting

Recommendation 6: That the Victorian Government delivers an integrated strategy for environmental data and monitoring for the Great Ocean Road Coast and Parks, including data standardisation, acquisition and coordination across responsible authorities.

Challenges this recommendation addresses

Currently, organisations responsible for managing environmental values for the GORCP have inconsistent data acquisition regimes. Legislative obligations may be more effectively met when agencies collaborate, sharing data and analytical capacity. A strategic approach for the GORCP would provide the GORCPA with the evidence base required to make broad, landscape-scale decisions that improve environmental outcomes.

This report has also identified the need for a consistent approach to data collection in monitoring programs. There is an opportunity to build on work currently undertaken by the DEECA to compare datasets across programs and conduct regional-scale assessments of biodiversity condition.

A data integration strategy for the GORCP could also provide valuable insights to address data and monitoring challenges in other Victorian regions and at the state scale.

Context

High-quality data, when interrogated for understanding underpins evidence-based environmental policy and management. The Commissioner's previous statutory reports have consistently concluded that Victoria's biodiversity is in decline. The scientific assessments presented in this report reinforce those findings and are consistent with prior state-level evaluations, including the State of the Environment 2023 Report and the State of the Marine and Coastal Environment 2024 Report.

This report provides clear evidence that inland biodiversity — particularly small native mammals — has declined over the past decade. This trend is especially pronounced in heathy woodlands, where biodiversity has been adversely impacted by the cumulative and interacting effects of multiple pressures, including invasive predators and herbivores, invasive pathogens (e.g. *Phytophthora*), climate change, fire and flood. Furthermore, marine and coastal ecosystems have experienced significant reductions in Ecological Vegetation Class (EVC) extent, as well as a degradation in EVC condition.

While the scientific assessments in this report underscore a decline in biodiversity condition across the region, a persistent challenge in undertaking regional-scale assessments is the lack of data standardisation and coordination across responsible authorities. This issue was confirmed through engagement with regional data custodians during the development of this report, who noted that many agencies operate in silos regarding data collection, and that many monitoring processes are short term.

This fragmented approach results in inconsistent field data and presents challenges in aligning datasets across organisations and establishing trend assessments. One example is vegetation extent and condition information. This report concluded that the current EVC mapping in the region often fails to capture the unique and diverse plant communities that exist within broader vegetation classes. To address this gap, some agencies have adopted a new mapping approach using Floristic Mapping Units,[152] which provides accurate information on vegetation extent and condition, but this approach is not adopted consistently across the region.

An integrated strategy will also need to consider the diverse sources of information in contemporary environmental management. This includes not only technological advances — citizen science, space and spatial information — but also conventional and cultural obstacles, such as data sharing arrangements with academics and consultancies. To overcome these limitations, it is important that the Victorian Government takes a leadership role in facilitating data standardisation and coordination.

152. D'Ombrain T 2020, 'Vegetation of Victoria: Vegetation community handbook - introduction to the Series', Victorian GeoVeg Series Volume 1.

This leadership will support more comprehensive, region-scale biodiversity assessments for GORCPA and foster enhanced collaboration with partner agencies in adjoining regions to better understand emerging issues and biodiversity assets at a landscape scale. Strengthening these partnerships will help improve data consistency, acquisition and interpretation, enhance comparability between datasets, and support more integrated assessments of biodiversity condition in the GORCP. This, in turn, will improve the evidence base for decision-making. Identified improvements to data and monitoring regimes may then be considered for other Victorian regions or at the state scale.

Artillery Rock, Great Ocean Road. Credit: Belinda VanZanen © Great Ocean Road Tourism

Recommendations in summary

Table 1 provides a summary of the six recommendations made in this report. The summary describes each recommendation in full, as well as:

- the theme to which the recommendation relates
- the challenges the recommendation aims to overcome.

Table 1: State of the Great Ocean Road Coast and Parks 2025 recommendations and challenges by theme.

Lead theme	
Recommendation 1	**That DEECA updates and publishes statewide coastal inundation spatial layers.**
Recommendation category	Climate change
Challenges this recommendation addresses	Sea level rise is one of the most significant threats to coastal areas associated with climate change. Coastal communities along the Great Ocean Road and the entire Victorian coastline are already experiencing some of the impacts associated with sea level rise. These impacts are expected to intensify this century and include: more frequent and extensive inundation of low-lying areas, with the impacts exacerbated by storm surges loss of coastal habitat, such as roosting and nesting sites for shorebirds and seabirds accelerated cliff retreat and shoreline recession • altered saltmarsh and mangrove habitats.[153] Without successful flood risk mitigation, future increases in coastal flooding will lead to coastal floods occurring more often.[154] The Victorian Coastal Inundation Dataset is a digital dataset comprising eight spatial layers that model the extent of land subject to coastal inundation due to projected sea level rise from 2009 to 2100.[155] This is the current dataset being used by the Victorian Government to plan for sea level rise. It projects an 82 cm sea level rise by 2100; however, it is 15 years old and requires updating with contemporary data to inform decision-making. Action 3.9 of the Victorian Marine and Coastal Strategy (2022) committed to reviewing and updating planning benchmarks for sea level rise in line with Intergovernmental Panel on Climate Change reports by 2023.[156] As of the completion of this report, the new benchmarks have not been announced.

153. Victorian Coastal Council (VCC) 2018, 'Victoria's coast and marine environments under projected climate change: Impacts, research gaps and priorities'.
154. Hague BS, Talke SA 2024, 'The influence of future changes in tidal range, storm surge, and mean sea level on the emergence of chronic flooding', *Earth's Future, 12*, e2023EF003993, https://doi.org/10.1029/2023EF003993 Accessed 28 April 2025.
155. Data Vic, 'Victorian Coastal Inundation', https://discover.data.vic.gov.au/dataset/victorian-coastal-inundation Accessed 28 April 2025.
156. Department of Environment, Land, Water and Planning (DELWP) 2022, 'Marine and Coastal Strategy', https://www.marineandcoasts.vic.gov.au/__data/assets/pdf_file/0029/571817/Marine-and-Coastal-Strategy_May-2022.pdf Accessed 7 May 2025.

Recommendation 2	**That the Victorian Government provide long-term implementation guidance for managing estuary mouth openings and protecting estuarine health in the Great Ocean Road Coast and Parks.**
Recommendation category	Managing and restoring ecosystems
Challenges this recommendation addresses	Water levels can rise within a closed estuary, potentially inundating the surrounding landscape. However, natural openings do not always occur before assets such as roads and bridges are at risk of flooding. This prompts managers to consider the need for interrupting the natural cycle by artificially opening an estuary to mitigate flood risk.[157] However, artificial openings can cause adverse ecological effects, particularly when the practice is performed during low flow conditions or at high frequencies.[158] These effects include declines in water quality, fish deaths, modifications to vegetation communities and reduced seagrass health. Climate change and the expanding footprint of built assets across the region increase the need to balance the maintenance of natural ecological processes with reducing flood risk as part of artificially opening estuaries. An independent review of the Victorian Waterway Management Strategy (VWMS) completed in 2021 found that a more effective long-term approach is required to manage estuary mouth openings and protect estuarine health.[159] This finding was supported by stakeholder consultation in 2023, which indicated that the current roles and responsibilities for artificial estuary openings are unclear and complex.[160]
Recommendation 3	**That the Great Ocean Road Coast and Parks Authority prioritise monitoring and threat management in and around identified climate refuges in the network of marine protected areas to enable active management of remnant kelp forests under changing environmental conditions.**
Recommendation category	Managing and restoring ecosystems
Challenges this recommendation addresses	Globally, evidence suggests that kelp species are in decline and are threatened by the impacts of climate change.[161] The reduction of ecosystem engineers like kelp is significant, as it also impacts the flora and fauna species they support, leading to cascading effects on the function and resilience of reef ecosystems, as well as the loss of ecosystem services.[162] The Great Ocean Road Coast and Park's (GORCP's) coastal and marine environments are in the Great Southern Reef — a biodiverse temperate reef system extending along southern Australia. The Reef is a global hotspot of endemism (species that exist only in one location), and the Victorian stretch of the Reef is recognised as a climate change hotspot, with sea surface temperatures estimated to be rising at a rate four times the global average.[163] Sharp declines in two habitat-forming kelp species have been recorded across the GORCP. It is predicted that reductions in both macroalgae species will continue in response to the projected changes in the physical ocean climate.[164] Identifying tools and strategies that promote their long-term persistence is a priority conservation action for Victoria's marine environment.

157. Corangamite Catchment Management Authority, Glenelg Hopkins Catchment Management Authority, West Gippsland Catchment Management Authority, Department of Environment, Land Water and Planning (DELWP), 'Should an estuary be opened or closed?', https://ccma.vic.gov.au/wp-content/uploads/2022/07/Estuary-Low-Catchment-Water-Fact-Sheet-v17-singlepage.pdf Accessed 9 April 2025.
158. Lloyd L 2025, 'Literature review and factsheet on the known adverse environmental impacts of artificial estuary openings'. Report prepared for Corangamite Catchment Management Authority (CCMA) Project No. COR-230, Colac, Victoria.
159. RM Consulting Group Pty Ltd 2021, 'Independent Review of the Victorian Waterway Management Strategy – Summary', https://www.water.vic.gov.au/__data/assets/pdf_file/0032/666653/independent-review-of-the-victorian-waterway-management-strategy.pdf Accessed 9 April 2025.
160. Think HQ Pty Ltd 2024, 'Victorian Waterways Management Strategy (Public Consultation) What we heard report', https://www.water.vic.gov.au/__data/assets/pdf_file/0035/698048/VWMS-what-we-heard-public-consultation-2023.pdf Accessed 9 April 2025.
161. Young MA, Critchell K, Miller AD, Treml EA, Sams M, Carvalho R, Ierodiaconou D 2023, 'Mapping the impacts of multiple stressors on the decline in kelps along the coast of Victoria, Australia', *Diversity and Distributions*, *29*(1), pp. 199-220.
162. Carnell PE, Keough MJ 2019, 'Reconstructing historical marine populations reveals major decline of a kelp forest ecosystem in Australia', *Estuaries and Coasts*, *42*(3), pp. 765–778.
163. Young MA, Critchell K, Miller AD, Treml EA, Sams M, Carvalho R, Ierodiaconou D 2023, 'Mapping the impacts of multiple stressors on the decline in kelps along the coast of Victoria, Australia', *Diversity and Distributions*, *29*(1), pp. 199-220.
164. Young MA, Critchell K, Miller AD, Treml EA, Sams M, Carvalho R, Ierodiaconou D 2023, 'Mapping the impacts of multiple stressors on the decline in kelps along the coast of Victoria, Australia', *Diversity and Distributions*, *29*(1), pp. 199–220.

Recommendation 4	**That the Great Ocean Road Coast and Parks Authority and other agencies work in partnership with Traditional Owners to implement high-priority conservation and management actions in and around identified refuge sites and dispersal corridors, including an integrated cross-tenure invasive species control program.**
Recommendation category	Managing and restoring ecosystems
Challenges this recommendation addresses	With impacts exceeding those of habitat loss and climate change, invasive species affect the largest number (82%) of the Australia's threatened taxa and have been the dominant driver in nearly all extinctions over the past six decades.[165, 166] Globally, Australia's native fauna experience some of the highest rates of predation by feral and pest species, with an estimated 75% of mammal extinctions attributed to invasive predators.[167] Mammal species within the preferred weight range of feral cats and foxes (35 g–5.5 kg) are particularly vulnerable, with susceptibility further heightened for species that are ground dwelling and/or utilise open habitats. As invasive species are now present in almost every part of Australia, much of the landscape has become effectively unsuitable for extant, predator-susceptible native species.[168] Invasive herbivores and plant pathogens also play a significant role in the decline of small mammals by altering habitat structure. Several species of small digging mammals in the GORCP and broader Otways landscape have been substantially reduced by invasive species. As the bioturbation actions of these species contribute to the function of ecosystems, their extinction could trigger a cascade of long-term negative impacts.[169, 170]
Recommendation 5	**That DEECA evaluates the effectiveness of the Visitor Management Framework in the Great Ocean Road Strategic Framework Plan, in consultation with other agencies, to achieve sustainable tourism outcomes and identify improvements and how similar approaches could be adopted to manage tourism more broadly across Victorian coastal regions.**
Recommendation category	Tourism
Challenges this recommendation addresses	The Great Ocean Road is one of the world's most scenic coastal touring routes, attracting more than five million visitors each year.[171, 172] These visitors are not only important to the Victorian economy as a whole but also to local economies, providing a vital source of income and employment.[173] The natural environment and the region's tourism attractions are key drawcards for visitors.[174, 175] However, the region is experiencing pressure from increased visitor numbers, which places greater demands on the local environment, infrastructure and services.[176] This pressure is forecast to grow and be further compounded by climate change impacts.[177] Yet, with effective management, the attractions and landscapes of the area can continue to drive economic prosperity in a way that is environmentally, socially and economically sustainable.[178]

165. Sheppard A, Glanznig A 2021, 'Fighting plagues and predators Australia's path towards a pest and weed-free future', Commonwealth Scientific and Industrial Research Organisation (CSIRO), Canberra, ACT.
166. Kearney SG, Carwardine J, Reside AE, Fisher DO, Maron M, Doherty TS, Legge S, Silcock J, Woinarski JC, Garnett ST, Wintle BA 2019, 'Corrigendum to: The threats to Australia's imperilled species and implications for a national conservation response', *Pacific Conservation Biology*, *25*(3), p. 328.
167. Invasive Species Council 2021, 'Are Victoria's ecosystems in terminal decline?', https://invasives.org.au/blog/are-victorias-ecosystems-in-terminal-decline/ Accessed 5 May 2025.
168. Legge S, Woinarski JC, Burbidge AA, Palmer R, Ringma J, Radford JQ, Mitchell N, Bode M, Wintle B, Baseler M, Bentley J 2018, 'Havens for threatened Australian mammals: The contributions of fenced areas and offshore islands to the protection of mammal species susceptible to introduced predators', *Wildlife Research*, 45(7), pp. 627-644.
169. Halstead LM, Sutherland DR, Valentine LE, Rendall AR, Coetsee AL, Ritchie EG 2020, 'Digging up the dirt: Quantifying the effects on soil of a translocated ecosystem engineer', *Austral Ecology*, *45*(1), pp. 97-108.
170. Fleming PA, Anderson H, Prendergast AS, Bretz MR, Valentine LE, Hardy GE 2014, 'Is the loss of Australian digging mammals contributing to a deterioration in ecosystem function?', *Mammal Review*, *44*(2), pp. 94-108.
171. Great Ocean Road Coast and Parks Authority (GORCPA) 2025, 'Our Story', https://www.greatoceanroadauthority.vic.gov.au/About-Us/Our-Story Accessed 22 April 2025.
172. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
173. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
174. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
175. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Great Ocean Road Coast and Parks Environmental-Economic Account', East Melbourne, Victoria, p. 69.
176. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
177. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.
178. Department of Environment, Land, Water and Planning (DELWP) 2018, 'Governance of the Great Ocean Road Issues Paper', East Melbourne, Victoria.

Recommendation 6	**That the Victorian Government delivers an integrated strategy for environmental data and monitoring for the Great Ocean Road Coast and Parks, including data standardisation, acquisition and coordination across responsible authorities.**
Recommendation category	Data integration and reporting
Challenges this recommendation addresses	Currently, organisations responsible for managing environmental values for the GORCP have inconsistent data acquisition regimes. Legislative obligations may be more effectively met when agencies collaborate, sharing data and analytical capacity. A strategic approach for the GORCP would provide the GORCPA with the evidence base required to make broad, landscape-scale decisions that improve environmental outcomes. This report has also identified the need for a consistent approach to data collection in monitoring programs. There is an opportunity to build on work currently undertaken by the DEECA to compare datasets across programs and conduct regional-scale assessments of biodiversity condition. A data integration strategy for the GORCP could also provide valuable insights to address data and monitoring challenges in other Victorian regions and at the state scale.

Port Campbell National Park. Credit: Rob Blackburn. © Parks Victoria

Peterborough Golf Club, Shipwreck Coast, Great Ocean Road. Credit: William Watt. © Visit Victoria

Indicator assessment dashboard

The indicator assessment dashboard provides a high-level overview of the status, trend and confidence assessments for all indicators assessed in this State of the Great Ocean Road Coast and Parks 2025 Report (SGORCP), followed by a summary of the indicator assessment report cards.[179] There are 74 indicators included in this report. Because some indicators have multiple assessments — for example, for multiple local government areas — the total number of assessments exceeds the total number of indicators. A total of 109 status assessments, 108 trend assessments and 113 data confidence assessments were conducted for the 74 SGORCP 2025 indicators.

Overall summary of status assessments

Status assessments were made for 66 of the 74 SGORCP 2025 indicators and resulted in a total of 109 assessments (Table 2). Overall, there were slightly more status assessments assessed as poor (26%) than good (18%). The most common status assessment was fair (37%), with the remainder (19%) assessed as unknown (Figure 2).

When considering the status assessments by theme, indicators within the 'Inland biodiversity' theme have the lowest performance. Eighty-six percent of 'Inland biodiversity' status assessments have a poor ranking, with no assessments for that theme assessed as good. The 'Pests and invasive species' theme has the second highest proportion of status assessments assessed as poor (44%).

The 'Stewardship and collaborative management' theme had the best performance, with 60% of the status assessments for that theme assessed as good. This was the only theme that had more than one third of the status assessments assessed as good.

One of the key findings of this report is the contrast between status assessments for themes with an emphasis on environmental condition and the three themes focussed on management of the environment and marine and coastal communities (i.e. 'Managing coastal hazard risks', 'Communities' and 'Stewardship and collaborative management'). None of the status assessments for indicators in the 'Managing coastal hazard risks', 'Communities' and 'Stewardship and collaborative management' themes were assessed as poor or unknown. This was significantly more positive than the assessments for the environmental condition themes, with 54% of status assessments for indicators in those themes assessed as poor (31%) or unknown (23%).

Plans and strategies to manage, protect and enhance the Great Ocean Road Coast and Parks (GORCP) have been developed and led to the generally positive status assessments in these three themes. These plans and strategies are analysed in further detail in 'Indicator 78: Planning and implementation'.

While the status results for the 'Managing coastal hazard risks', 'Communities' and 'Stewardship and collaborative management' themes are positive, the overall success of the progress that has been made in those themes (e.g. development of legislation, plans and strategies) is dependent on successful implementation.

Notably, the 'Water quality and catchment inputs' theme had the highest proportion of knowledge gaps, with 58% of status assessments for this theme being assessed as unknown. 'Seafloor integrity and health' (43%) also had a significant percentage of unknown status assessments. For the 'Water quality and catchment inputs' theme, unknown status assessments included water quality (marine), toxicants, plankton, stormwater, nutrient loads and sediment loads.

179. Note that 12 indicators included in the Victorian State of the Marine and Coastal Environment 2024 Report have not been assessed locally in this State of the Great Ocean Road Coast and Parks 2025 Report. Further detail is provided in Indicator Assessments in the State of the Great Ocean Road Coast and Parks 2025 Report' in 'Part 3: Scientific assessments'.

Table 2: Summary of status assessments for State of the Great Ocean Road Coast and Parks 2025 indicators.

Theme	Good	Fair	Poor	Unknown	Total
Water quality and catchment inputs	2	1	2	7	12
Litter and pollution	3	5	6	3	17
Marine and coastal biodiversity	3	8	6	7	24
Seafloor integrity and health	1	2	1	3	7
Pests and invasive species	2	3	4	0	9
Climate and climate change impacts	2	8	3	1	14
Managing coastal hazard risks	1	2	0	0	3
Communities	3	8	0	0	11
Stewardship and collaborative management	3	2	0	0	5
Inland biodiversity	0	1	6	0	7
Total	**20**	**40**	**28**	**21**	**109**

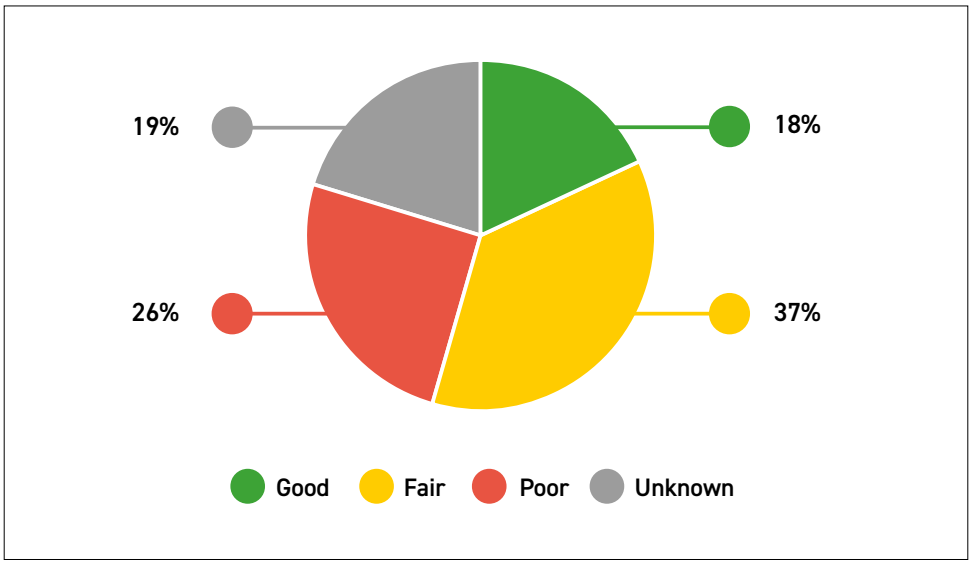


Figure 2: Breakdown of status assessments for State of the Great Ocean Road Coast and Parks 2025 indicators.

Overall summary of trend assessments

Trend assessments were made for 65 of the 74 SGORCP 2025 indicators and resulted in a total of 108 assessments (Table 3). More than one third (39%) of the trend assessments were assessed as unclear, highlighting a limited evidence base to determine trends for several indicators. Only 11% of trend assessments were assessed as improving, compared to 21% assessed as deteriorating (Figure 3).

Similar to the overall summary of status assessments, 'Inland biodiversity' is the worst performing theme for trend assessments. Nearly three quarters (71%) of all 'Inland biodiversity' trend assessments were assessed as deteriorating. The next lowest performing theme was 'Climate and climate change impacts' with half (50%) of its trend assessments assessed as deteriorating. 'Climate and climate change impacts' was also one of only three themes without any trend assessments assessed as improving.

The 'Climate and climate change impacts' theme is challenging for environmental managers, which is why Recommendation 1 of this report is focussed on improving data on coastal inundation to inform flood risk mitigation.

The best performing theme for trend assessments was the 'Pests and invasive species' theme. More than half (56%) of the trend assessments for this theme were assessed as improving, which included several assessments for the coastal invasive plant and animal indicators.

Table 3: Summary of trend assessments for State of the Great Ocean Road Coast and Parks 2025 indicators.

Theme	Improving	Stable	Deteriorating	Unclear	Total
Water quality and catchment inputs	0	1	0	11	12
Litter and pollution	1	10	3	3	17
Marine and coastal biodiversity	2	4	3	15	24
Seafloor integrity and health	0	1	3	3	7
Pests and invasive species	5	2	2	0	9
Climate and climate change impacts	0	3	7	4	14
Managing coastal hazard risks	1	1	0	1	3
Communities	1	6	0	3	10
Stewardship and collaborative management	1	3	0	1	5
Inland biodiversity	1	0	5	1	7
Total	**12**	**31**	**23**	**42**	**108**

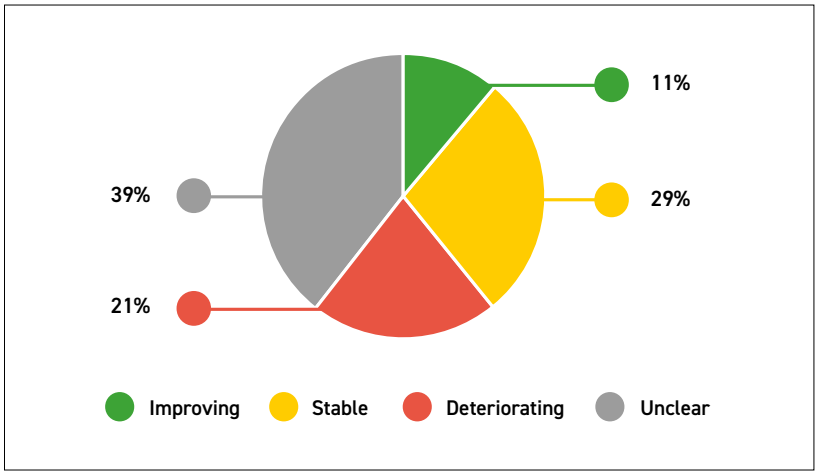


Figure 3: Breakdown of trend assessments for State of the Great Ocean Road Coast and Parks 2025 indicators.

Overall summary of confidence assessments

Confidence assessments were made for 70 of the 74 SGORCP 2025 indicators and resulted in a total of 113 assessments (Table 4). Nearly half (49%) of the confidence assessments were assessed as low or insufficient. Only 13% of status and trend assessments in this report were made with high confidence (Figure 4).

Comparing confidence assessments by theme can identify themes with a higher proportion of knowledge gaps. Low and insufficient confidence assessments highlight areas for which there is a limited evidence base for determining status and trend.

All the confidence assessments for the 'Seafloor integrity and health' theme were assessed as low or insufficient, highlighting this theme as a major knowledge gap for the GORCP. The 'Water quality and catchment inputs' and 'Marine and coastal biodiversity' themes also have extensive knowledge gaps, with 83% and 79% of the indicators, respectively, in those themes assessed with low or insufficient confidence.

Conversely, none of the confidence assessments for the 'Managing coastal hazard risks', and 'Communities' themes were assessed as low or insufficient — all confidence assessments for these themes were assessed as high or moderate.

Table 4: Summary of data confidence assessments for State of the Great Ocean Road Coast and Parks 2025 indicators.

Theme	High	Moderate	Low	Insufficient	Total
Water quality and catchment inputs	0	2	4	6	12
Litter and pollution	0	7	9	1	17
Biodiversity	1	4	13	6	24
Seafloor integrity and health	0	0	4	3	7
Pests and invasive species	0	6	3	0	9
Climate and climate change impacts	1	9	3	1	14
Managing coastal hazard risks	0	4	0	0	4
Communities	7	7	0	0	14
Stewardship and collaborative management	1	3	1	0	5
Inland biodiversity	5	1	1	0	7
Total	**15**	**43**	**38**	**17**	**113**

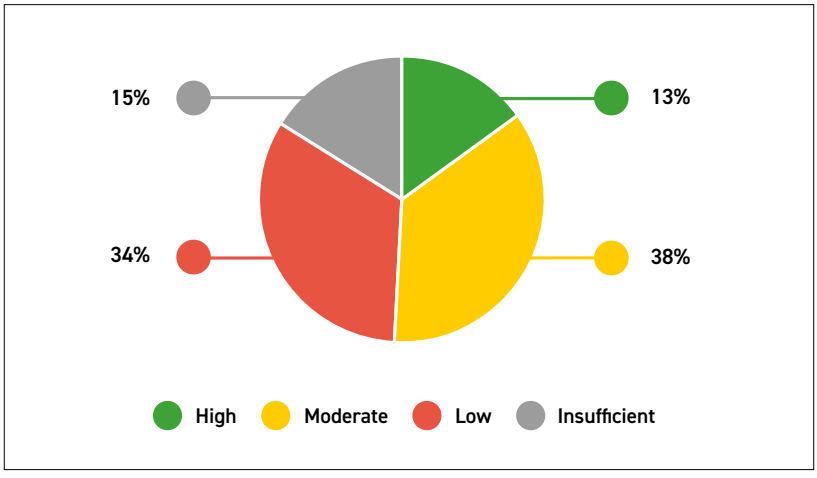


Figure 4: Breakdown of confidence assessments for State of the Great Ocean Road Coast and Parks 2025 indicators.

Port Fairy lighthouse. © Parks Victoria

Indicator assessment report cards

Key to report cards

The colour and symbol keys for the indicator assessment report cards are provided below, with the full scientific assessment for each indicator presented in Part 3.

Key to status

Good

Fair

Poor

Unknown

Narrative but not assessed

Not applicable

Key to trend

Improving

Stable

Deteriorating

Unclear

Narrative but not assessed

Not applicable

Key to confidence

High

Moderate

Low

Insufficient

Narrative but not assessed

Not applicable

Water quality and catchment inputs

01: Water quality (marine)

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks	?	?	?

02: Toxicants

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks	?	?	?

03: Water quality (estuaries)

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks		?	(status) ? (trend)

04: Plankton

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks	?	→	(status) ? (trend)

05: Enterococci bacteria

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks (beaches)		?	(status) ? (trend)
Great Ocean Road Coast and Parks (estuaries)		?	(status) ? (trend)

06: Regulated point source discharges to marine waters

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks		?	(status) ? (trend)

07: Stormwater

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks	?	?	?

08: Total nutrient loads

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks	?	?	?

09: Total sediment loads

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks	?	?	?

10: Coastal acid sulfate soils

Extent of information	2025 status	2025 trend	2025 confidence
Anglesea River	●	?	● (status) ? (trend)
Elsewhere within the Great Ocean Road Coast and Parks	?	?	?

Litter and pollution

11: Litter and plastics			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks (density)			
Great Ocean Road Coast and Parks (composition)			
Great Ocean Road Coast and Parks (entanglements)			
Moyne Shire (density)			
Moyne Shire (composition)			
Warrnambool City Council (density)			
Warrnambool City Council (composition)			
Corangamite Shire (density)			
Corangamite Shire (composition)			
Colac Otway Shire (density)			
Colac Otway Shire (composition)			
Surf Coast Shire (density)			
Surf Coast Shire (composition)			

12a: Light pollution			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			(status) (trend)

12b: Marine noise			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

13: Coastal contaminated land			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

14: Coastal air quality			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			 (status)  (trend)

Marine and coastal biodiversity

15: Conservation of coastal and inland ecosystems in protected areas

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks (IUCN protected areas)*			
Great Ocean Road Coast and Parks (dune EVCs)			

*Inland ecosystems were included within this indicator assessment as the conservation of communities through the designation of a protection area does not make a distinction between coastal and inland systems.

16: Coastal saltmarsh

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

18: Wetland and estuarine vegetation

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

19: Marine- and coastal-dependent species of conservation value

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

20: Mobile invertebrates on intertidal reefs

Extent of information	2025 status	2025 trend	2025 confidence
Eagle Rock Marine Sanctuary			

21: Sessile invertebrates on intertidal reefs

Extent of information	2025 status	2025 trend	2025 confidence
Eagle Rock Marine Sanctuary			

22: Invertebrates on subtidal reefs

Extent of information	2025 status	2025 trend	2025 confidence
Point Addis Marine National Park			
Point Addis reference sites (outside Marine Protected Area)*			

* Four reference sites were established under the Subtidal Reef Monitoring Program within unprotected waters adjacent to the Point Addis Marine National Park: Anglesea Reef (Site 3907), Phyco's Reef (Site 3908), Rocky Point (Site 3915) and Torquay Offshore (Site 9016).

23a: Southern calamari

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

23b: Blacklip abalone

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

23c: Southern rock lobster

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

24a: Snapper

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

24b: King George whiting

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

25: Subtidal reef fish			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Point Addis Marine National Park			
Point Addis reference sites (outside Marine Protected Area)*			

* Four reference sites were established under the Subtidal Reef Monitoring Program within unprotected waters adjacent to the Point Addis Marine National Park: Anglesea Reef (Site 3907), Phyco's Reef (Site 3908), Rocky Point (Site 3915) and Torquay Offshore (Site 3916).

26: Diadromous fish			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

27: Coastal waterbirds and resident shorebirds			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks (hooded plover)			

30: Little penguins			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

31a: Marine mammals (whales)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks (population and breeding)			
Great Ocean Road Coast and Parks (entanglements)			
Great Ocean Road Coast and Parks (strandings)			

31b: Marine mammals (dolphins)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

31c: Marine mammals (seals)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

Australian fur seal.
Credit: Julian Finn © Museum Victoria

Seafloor integrity and health

34: Seagrass			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks	?	?	?

36: Macroalgae on intertidal reefs			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Eagle Rock Marine Sanctuary	?	?	?
Point Addis Marine National Park		→	

37: Macroalgae dominated subtidal reefs			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks		↘	
Point Addis Marine National Park		↘	
Point Addis reference sites (outside Marine Protected Area)*		↘	

* Four reference sites were established under the Subtidal Reef Monitoring Program within unprotected waters adjacent to the Point Addis Marine National Park: Anglesea Reef (Site 3907), Phyco's Reef (Site 3908), Rocky Point (Site 3915) and Torquay Offshore (Site 3916).

Point Addis Marine National Park. © Parks Victoria

Pests and invasive species

*The assessment is at the scale of management as well as the data which covers the entirety of the Great Otways region and is, therefore, not confined to only the Great Ocean Road Coast and Parks.

38: Invasive marine species

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks (regional ports)			
Great Ocean Road Coast and Parks (Marine Protect Areas)			

39: Coastal invasive plants and plant pathogens

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks (Authority-managed Crown land)			
Corangamite Catchment Management Authority region			
Great Otways region*			

40: Coastal invasive animals

Extent of information	2025 status	2025 trend	2025 confidence
Corangamite Catchment Management Authority			
Great Otways region (invasive predators)*			
Great Otways region (feral pigs)*			
Great Otways region (deer)*			

Climate and climate change impacts

41: Rainfall			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

42: Air temperature			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

43: Water temperature			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

44: Ocean acidification			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			 (status)  (trend)

45: Sea level			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

46: Coastal inundation			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

47: Wave climate

Extent of information	2024 status	2024 trend	2024 confidence
Great Ocean Road Coast and Parks (west of Cape Otway)			
Great Ocean Road Coast and Parks (east of Cape Otway)			

48: Coastal erosion

Extent of information	2025 status	2025 trend	2025 confidence
Anglesea (beaches)			 (status)  (trend)
Elsewhere within the Great Ocean Road Coast and Parks (beaches)			 (status)  (trend)
Great Ocean Road Coast and Parks (cliffs)			 (status)  (trend)

49: Seawater intrusion into coastal aquifers

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

50: Frequency and impact of fire

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

51: Climate change impact on marine and coastal infrastructure

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

Managing coastal hazard risks

52: Considering climate change risks in land use planning			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

53: Climate change adaptation plans			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

54: Nature-based adaptation (coastal and marine)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

55: Emergency planning and preparedness			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

Communities

56: Coastal population (resident)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks	N	N	

57: Coastal population (visitors)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks	N	N	

58: Significant landscapes			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks		N/A	

59: Coastal settlements			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks	N	N	

60: Cultural heritage			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks		→	

61: Use of marine and coastal areas			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks		→	

62: Tourism			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks		→	

64: Recreational boating			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

67: Commercial fishing			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

69: Resources and energy generation			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

70: Agriculture			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

71: Built and public benefit infrastructure			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

72: Recreational boating infrastructure			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

73: Illegal activities			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Ocean Road Coast and Parks			

Stewardship and collaborative management

74: Stewardship

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks	N	N	N

75: Community connection to the coast

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

76: Volunteering

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

77: Citizen science

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

78: Planning and implementation

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks	N	N	N

80: Institutional knowledge and capacity

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

81: Engagement, inclusiveness, and environmental justice

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks			

82: Delivery and accountability

Extent of information	2025 status	2025 trend	2025 confidence
Great Ocean Road Coast and Parks	N	N	N

Inland biodiversity

*The assessment is at the scale of the data, as well as the species conservation and threat management programs, which covers the entirety of the Great Otways region and is, therefore, not confined to only the Great Ocean Road Coast and Parks.

83: Forest resilience			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Otways region	N	N	N

84a: Small mammals (broad-toothed rat)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Otways region*			

84b: Small mammals (New Holland mouse)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Otways region*			

84c: Small mammals (smoky mouse)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Otways region*			

84d: Small mammals (swamp antechinus)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Otways region*			

84e: Small mammals (southern brown bandicoot)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Otways region*			

84f: Small mammals (long-nosed potoroo)			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Great Otways region			

85: Koalas			
Extent of information	**2025 status**	**2025 trend**	**2025 confidence**
Cape Otway			

Koala sitting tree, Great Ocean Road region
Credit: Phil Hines. © Wildlife Wonders. Source: Visit Victoria

Policy and legislative settings

International, national, Victorian and Traditional Owner policies and legislation are of direct relevance to this State of the Great Ocean Road Coast and Parks 2025 Report. Prominent policies and legislative obligations are briefly described below. Greater detail for relevant policies, including how they relate to the Great Ocean Road Coast and Parks' environmental condition and management, is provided in the indicator narratives of Part 3 – Scientific Assessments.

International context

The following are conventions, frameworks or agendas relevant to the scope of this report.

Convention on Biological Diversity

In 2010, during the meeting of the parties to the United Nations Convention on Biological Diversity (CBD) in Aichi, Japan, they adopted the Strategic Plan for Biodiversity 2011–2020. This plan outlined five strategic goals and 20 targets aimed at slowing and reversing biodiversity loss during the United Nations Decade on Biodiversity. Among these targets was the goal to conserve 10% of marine areas. The targets, along with the CBD Strategic Plan for Biodiversity, concluded in 2020.

Kunming-Montreal Global Biodiversity Framework

In December 2022, the global community renewed biodiversity targets under the Kunming-Montreal Global Biodiversity Framework (GBF) 2030 at the 15th Conference of Parties to the CBD. Target 3 of the GBF 2030 is to scale up area-based conservation to ensure and enable that by 2030 at least 30% of terrestrial, inland water, and marine and coastal areas are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas (commonly referred to as '30 by 30').[180] The GBF 2030 targets have been included in Australia's National Strategy for Nature.[181]

'Indicator 32: Conservation of marine ecosystems in protected areas' contains an analysis of the GORCP's extent of marine protected areas against international benchmarks for levels of protection, such as the Sustainable Development Goals (SDGs). The SDG Target 14.5 aims for at least 10% of coastal and marine areas to be conserved.

National context

Several national policies, strategies, plans and laws are relevant to the scope of this report.

Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is Australia's most important piece of environmental legislation and covers environment and heritage protection, and biodiversity conservation.[182] Actions that will lead to changes in land use or land management in any state or territory may be subject to its provisions.

The EPBC Act provides protection for the National Heritage-listed 'Great Ocean Road and Scenic Environs' (Place ID: 105875).

The EPBC Act protects nine 'matters of national environmental significance', including:

- listed threatened species and communities
- listed migratory species
- Ramsar wetlands of international importance
- world heritage areas
- national heritage places.

180. Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2024, 'Australia's National Biodiversity Strategy and Action Plan', https://www.dcceew.gov.au/environment/biodiversity/conservation/strategy Accessed 31 October 2024.
181. Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2024, 'Australia's National Biodiversity Strategy and Action Plan', https://www.dcceew.gov.au/environment/biodiversity/conservation/strategy Accessed 31 October 2024.
182. Federal Government of Australia, 'Environment Protection and Biodiversity Conservation Act 1999'', https://www.legislation.gov.au/C2004A00485/latest/text Accessed 31 October 2024.

Strategy for Nature 2024–2030

The Australian Government has recently updated Australia's Strategy for Nature 2024–2030 (Australia's national biodiversity strategy and action plan) to reflect Australia's contributions to the Kunming-Montreal Global Biodiversity Framework 2030.[183] This establishes six new targets and three enablers of change to halt and reverse biodiversity loss in Australia.

National Climate Resilience and Adaptation Strategy 2021–2025

The National Climate Resilience and Adaptation Strategy 2021–2025 seeks to position Australia to better anticipate, manage and adapt to climate change by supporting governments, communities and businesses to better prepare to climate change.

The Strategy operates across the natural, built, social and economic domains to drive adaptation and recognises that effective adaptation must be:

- informed by the best available science and information
- delivered through partnerships and investments, and
- guided by effective governance and coordination.[184]

The Strategy details three objectives to enable effective adaptation:

- drive investment and action through collaboration
- improve climate information and services
- assess progress and improve over time.[185]

Shipping and ports legislation and policy

Various standards, guidelines and strategies have been developed to mitigate risks associated with shipping and ports. The International Convention for the Control and Management of Ships' Ballast Water and Sediment places obligations on vessels to manage ballast water to reduce the translocation of invasive marine species.[186] The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention for addressing ship sourced pollution. MARPOL includes regulations aimed at preventing both accidental pollution and pollution from routine vessel operations. Australia implements MARPOL through the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* and the *Navigation Act 2012*.[187]

The *Biosecurity Act 2015* deals with ballast water and marine pests.[188, 189] The Australian Ballast Water Management Requirements set out the obligations on vessel operators for the management of ballast water and ballast tank sediment when operating in Australian seas.[190] Similarly, the Australian biofouling management requirements set out operator obligations for the management of biofouling.[191] National guidelines provide guidance on dealing with problems such as biofouling (Anti-Fouling and In-water Cleaning Guidelines 2015, that are currently being revised).[192, 193]

183. Federal Government of Australia 2024, 'Australia's Strategy for Nature 2024–2030', https://www.dcceew.gov.au/environment/biodiversity/conservation/publications/australias-strategy-for-nature Accessed 31 October 2024.
184. Department of Agriculture, Water and the Environment (DAWE) 2021, 'National Climate Resilience and Adaptation Strategy 2021 to 2025: Positioning Australia to better anticipate, manage and adapt to our changing climate', Canberra, ACT.
185. Department of Agriculture, Water and the Environment (DAWE) 2021, 'National Climate Resilience and Adaptation Strategy 2021 to 2025: Positioning Australia to better anticipate, manage and adapt to our changing climate', Canberra, ACT.
186. International Maritime Organisation 2004, 'International convention for the control and management of ships' ballast water and sediments', Adoption: 13 February 2004; Entry into force: 8 September 2017, https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships%27-Ballast-Water-and-Sediments-(BWM).aspx Accessed 31 October 2024.
187. Australian Maritime Safety Authority, 'MARPOL and its implementation in Australia', https://www.amsa.gov.au/marine-environment/marine-pollution/marpol-and-its-implementation-australia Accessed 16 April 20025.
188. Australian Maritime Safety Authority 2021, 'National standard for commercial vessels (NSCV)', Canberra, ACT, https://www.amsa.gov.au/nscv Accessed 31 October 2024.
189. Federal Government of Australia, 'Biosecurity Act 2015', https://www.legislation.gov.au/C2015A00061/latest/text Accessed 31 October 2024.
190. Department of Agriculture, Water and the Environment (DAWE) 2020, 'Australian ballast water management requirements: version 8', Canberra, ACT.
191. Department of Agriculture, Water and the Environment (DAWE), 'Australian biofouling requirements', https://www.agriculture.gov.au/biosecurity-trade/aircraft-vessels-military/vessels/marine-pest-biosecurity/biofouling/australian-biofouling-requirements
192. Department of Agriculture, Department of Environment (DAWE) 2015, 'Anti-fouling and in-water cleaning guidelines', Canberra, ACT.
193. Department of Agriculture, Forestry and Fisheries (DAFF) 2024, 'Australian anti-fouling and in-water cleaning guidelines: exposure draft', Canberra, ACT, July, CC BY 4.0.

MarinePestPlan 2018–2023

To minimise the risks associated with marine pests, the Australian Government, in conjunction with state and territory governments, industry, research organisations and non-government organisations introduced MarinePestPlan 2018–2023 that concluded on 30 June 2023 (and is currently being reviewed).[194, 195] One outcome of MarinePestPlan was the National Marine Pest Surveillance Strategy, that 'outlines priority requirements for enhancing surveillance of marine pests in Australia' and 'aims to improve coordination and implementation of these surveillance activities.' [196] The National Marine Pest Surveillance Strategy identifies four objectives for marine pest surveillance:

- define the need, objectives and scope for surveillance
- describe the different components and types of surveillance required to meet those objectives
- outline a nationally agreed approach to marine pest surveillance
- outline stakeholder roles and responsibilities, including identification of lead agencies for surveillance and communications.[197]

National Light Pollution Guidelines for Wildlife

The National Light Pollution Guidelines for Wildlife was published by the Australian Government in January 2020 and updated in 2023.[198] In the introduction to these guidelines, natural darkness was described as providing a conservation value in the same way that clean water, air and soil have intrinsic value.

Sustainable Ocean Plan

Under development is a Sustainable Ocean Plan for Australia that aims to facilitate cooperation across governments, industries, research organisations, conservation groups and communities to better manage Australia's oceans.[199] As a member of the 18-nation Ocean Panel, Australia's Prime Minister committed to developing the plan to guide 100% sustainable management of the ocean under the Australian Government's jurisdiction, with the plan due to be finalised in 2025.[200]

Pollution and litter policies

The National Plastics Harmonisation initiative brings together governments across Australia (except for Queensland) in a shared commitment to reduce the impacts of plastic pollution. By aligning efforts on problematic and unnecessary plastics, the initiative aims to achieve consistent action across jurisdictions wherever possible.

The 2024 National Waste Policy Action Plan outlines key investment priorities to support the transition of Australia's waste and resource recovery sector towards a safe and sustainable circular economy, in alignment with the 2018 National Waste Policy and the 2024 National Circular Economy Framework.

Finally, in 2023, the Reform of Packaging Regulations marked a significant step toward a safer, circular economy, with Environment Ministers agreeing to implement a new regulatory scheme that holds industry responsible for the packaging they place on the market.

194. Department of Agriculture and Water Resources (DAWR) 2018, 'MarinePestPlan 2018–2023: The national strategic plan for marine pest biosecurity', Canberra, ACT.
195. Department of Agriculture, Forestry and Fisheries (DAFF) 2024, 'MarinePestPlan 2018–2023', https://www.marinepests.gov.au/what-we-do/publications/marine-pest-plan Accessed 1 November 2024.
196. Department of Agriculture, Marine Pest Sectoral Committee 2019, 'National Marine Pest Surveillance Strategy', Canberra, ACT, December, CC BY 4.0., p. 5.
197. Department of Agriculture, Marine Pest Sectoral Committee 2019, 'National Marine Pest Surveillance Strategy', Canberra, ACT, December, CC BY 4.0., p. 5.
198. Department of the Climate Change, Energy, the Environment and Water (DCCEEW), Department of Biodiversity, Conservation and Attractions 2023, 'National light pollution guidelines for wildlife'.
199. Department of Climate Change, Energy, the Environment and Water (DCCEEW), 'Draft Sustainable Ocean Plan', https://consult.dcceew.gov.au/draft-sustainable-ocean-plan Accessed 31 October 2024.
200. Department of Climate Change, Energy, the Environment and Water (DCCEEW), 'Sustainable Ocean Plan', https://www.dcceew.gov.au/environment/marine/sustainable-ocean-plan Accessed 16 April 2025.

Victorian context

Several Victorian Government agencies and organisations form the governance arrangements that influence biodiversity conservation and bushfire management and recovery. They interact with a diverse and complex set of policies, laws, regulations, strategies, plans and monitoring frameworks.

Most directly relevant to this report is the *Great Ocean Road and Environs Protection Act 2020*, and the policies and activities established by this Act are briefly outlined below (see Table 5 for a complete list of the Victorian legislation and policies relevant to the SGORCP 2025 Report). Several other relevant acts and policies are also outlined.

Great Ocean Road and Environs Protection Act 2020

In 2020, the Victorian Government passed the *Great Ocean Road and Environs Protection Act 2020* to acknowledge the vital role the Great Ocean Road and its surrounding landscapes play in the economic prosperity and liveability of Victoria. The Act recognizes the area as a cohesive, living natural entity, emphasizing the importance of its protection. This legislation, which incorporates Traditional Owner language, reformed the management of the Great Ocean Road and its environs by establishing the Great Ocean Road Coast and Parks Authority (GORCPA). It also ensured that Traditional Owner knowledge and culture are integrated into the management of public lands.

Great Ocean Road Coast and Parks Authority

The GORCPA is a State Government entity established by the *Great Ocean Road and Environs Protection Act 2020* and in accordance with the Great Ocean Road Action Plan 2018. Its primary mission is to protect, conserve, enhance, and manage public land along the GORCP.

The GORCPA began operations on 1 December 2020, initially managing around 950 hectares of coastal reserves between Point Impossible and Marengo. It is now undergoing a significant expansion of its responsibilities. By 1 November 2025, GORCPA will oversee 170,000 ha of parks and coastal reserves, including 355 km of coastline, several National Parks, high-traffic sites like the Cape Otway Lightstation and the Twelve Apostles Visitor Experience, as well as marine land extending to the edge of Victorian waters.

The authority reports to the Minister for the Environment, working to meet the priorities outlined in the *Great Ocean Road and Environs Protection Act 2020* and the Minister's Statement of Expectations, issued on 23 December 2024. These priorities include operational excellence in park management, supporting First People's self-determination, enhancing visitor experiences, fostering community engagement, and ensuring long-term financial sustainability.

All revenue generated from the land GORCPA manages is reinvested back into the GORCP to preserve and enhance them for current and future generations.

Coastal Vegetation Strategy

The Coastal Vegetation Strategy (CVS) leads the GORCPA's conservation work and provides technical guidance to improve conservation outcomes along the coastal land the GORCPA manages between Point Impossible, near Torquay, to Marengo.

The third edition of the strategy is a five-year action plan fundamental to improving the health of Crown land reserves, covering around 1,090 ha, and supports significant landscapes such as sandy beaches, dune systems, cliffs, heathlands, shore platforms and estuaries.

The CVS was developed with support from the Wadawurrung Traditional Owner Aboriginal Corporation and Eastern Maar Aboriginal Corporation, and GORCPA will continue to engage with each of these groups in the delivery of actions outlined in the plans.

Marine and Coastal Act 2018

The *Marine and Coastal Act 2018* aims to protect Victoria's marine and coastal environment now and into the future, and outlines the following objectives and guiding principles for the planning and management of the marine and coastal environment:

- to protect and enhance the marine and coastal environment
- to promote the resilience of marine and coastal ecosystems, communities and assets to climate change
- to respect natural processes in planning for and managing current and future risks to people and assets from coastal hazards and climate change
- to acknowledge Traditional Owner groups' knowledge, rights and aspirations for land and Sea Country
- to promote a diversity of experiences in the marine and coastal environment
- to promote the ecologically sustainable use and development of the marine and coastal environment and its resources in appropriate areas
- to improve community, user group and industry stewardship and understanding of the marine and coastal environment
- to engage with specified Aboriginal parties, the community, user groups and industry in marine and coastal planning, management and protection
- to build scientific understanding of the marine and coastal environment.

The *Marine and Coastal Act 2018* is complemented by the Marine and Coastal Policy 2020, that includes the Marine Spatial Planning Framework and the Marine and Coastal Strategy 2022.[201, 202, 203]

Marine and Coastal Policy 2020

The *Marine and Coastal Act 2018* requires the Minister to make a marine and coastal policy that:

- sets out policies for planning and managing the marine and coastal environment
- provides guidance to decision-makers in delivering the objectives of the *Marine and Coastal Act 2018*
- includes a Marine Spatial Planning Framework that establishes a process for achieving integrated and coordinated planning and management of Victoria's marine environment.

The Victorian Government, with guidance from the Victorian Marine and Coastal Council, developed the Victorian Marine and Coastal Policy, released in March 2020.[204] An important focus of the policy is to manage the health of the marine and coastal environment for ecosystems, communities and built assets to be as resilient as possible in the face of future change.

Marine and Coastal Strategy 2022

The *Marine and Coastal Act 2018* requires the relevant Victorian Government minister to make a marine and coastal strategy within 12 months of making a marine and coastal policy. The Marine and Coastal 2022, outlines six actions to be achieved over the next five years to 2027:

Action 1: Traditional Owners determine how their rights and obligations are embedded into planning and management of the marine and coastal environment

Action 2: Improve the condition and ecological connectivity of habitats and respect and care for our marine and coastal areas

Action 3: Adapt to climate change

Action 4: Support sustainable use and development of the marine and coastal environment

Action 5: Implement the Marine Spatial Planning Framework

Action 6: Identify resource needs for sustainable marine and coastal management.[205]

201. Department of Energy, Environment and Climate Action (DEECA), 'Marine and Coastal Policy', https://www.marineandcoasts.vic.gov.au/marine-coastal-management/marine-and-coastal-policy Accessed 31 October 2024.
202. Department of Energy, Environment and Climate Action (DEECA), 'Marine Spatial Planning', https://www.marineandcoasts.vic.gov.au/marine/marine-spatial-planning Accessed 31 October 2024.
203. Department of Energy, Environment and Climate Action (DEECA), 'Marine and Coastal Strategy', https://www.marineandcoasts.vic.gov.au/marine-coastal-management/marine-and-coastal-strategy Accessed 31 October 2024.
204. Department of Environment, Land Water and Planning (DELWP) 2020, 'Marine and coastal policy', East Melbourne, Victoria.
205. Department of Energy, Environment and Climate Action (DEECA), 'Marine and Coastal Strategy', https://www.marineandcoasts.vic.gov.au/marine-coastal-management/marine-and-coastal-strategy Accessed 31 October 2024.

Marine Spatial Planning Framework

The Marine and Coastal Policy 2020 includes a Marine Spatial Planning (MSP) Framework. The MSP Framework guides integrated planning and management of Victoria's marine environment. It also sets out Victoria's approach to marine spatial planning. The MSP Framework consists of two parts:

> Part A - provides guidance and policies for marine planning and management decisions in Victoria, whether undertaking marine spatial planning or not.
>
> Part B - outlines how to initiate, approve and undertake marine spatial planning in Victoria.

Implementation of the MSP Framework is being led by the DEECA, and has commenced through the development of statewide marine planning areas and marine spatial planning guidelines.[206, 207] The GORCP is located within marine planning areas two and three.[208]

Victorian Resilient Coast Framework

Victoria's Resilient Coast – Adapting for 2100+ provides a framework, guidelines and support for Local Government, land managers and their communities in accordance with under section 41 of the *Marine and Coastal Act 2018*. These guidelines must be followed when planning for, assessing or managing coastal hazard risk under the Marine and Coastal Policy 2020. GORCPA lead regional and place-based coastal hazard risk management and adaptation planning aligned to this framework.

Coastal and Marine Management Plan 2020-2025

The *Marine and Coastal Act 2018* enables the Minister to specify that a Coastal and Marine Management Plan (CMMP) be made for a particular area of marine and coastal Crown land to provide direction for the future local management of the land. The GORCPA's current CMMP (2020-2025) combines the plans previously developed by its predecessors, the Great Ocean Road Coast Committee and the Otway Coast Committee.

The CMMP outlines strategic actions designed to address the region's challenges while aligning with the objectives, vision and guiding principles of both the *Marine and Coastal Act 2018* and the Great Ocean Road Action Plan 2018. Each strategic action has a designated timeframe and partner, with the 5-year outcomes detailing the goals the GORCPA aims to achieve across the following seven themes:

- natural environment
- community and partnerships
- education and awareness
- planning and adaptation
- facilities and infrastructure
- sustainable funding
- governance and organisation.

The CMMP also directs the GORCPA's daily operations to ensure these objectives and outcomes are met. The *Marine and Coastal Act 2018* requires CMMPs to be reviewed every 5 years after commencement.

Victorian Marine and Coastal Council

A Marine and Coastal Council, appointed under the *Marine and Coastal Act 2018* since August 2018, provides independent advice to the government on a range of matters including:

- the development and implementation of statewide policy and strategy, and other plans developed under the *Marine and Coastal Act 2018*
- significant decisions relating to the marine and coastal environment
- matters requiring scientific research.

206. Department of Energy, Environment and Climate Action (DEECA) 2023, 'Victoria's Marine Planning Areas', https://www.marineandcoasts.vic.gov.au/__data/assets/pdf_file/0032/681935/Victorias-Marine-Planning-Areas_FINAL.pdf Accessed 16 April 2025.
207. Department of Energy, Environment and Climate Action (DEECA) 2023, 'Marine Spatial Planning Guidelines', https://www.marineandcoasts.vic.gov.au/__data/assets/pdf_file/0031/681934/MSP-Guidelines-_FINAL.pdf Accessed 16 April 2025.
208. Department of Energy, Environment and Climate Action (DEECA), 'Victoria's Marine Planning Areas', https://www.marineandcoasts.vic.gov.au/__data/assets/pdf_file/0032/681935/Victorias-Marine-Planning-Areas_FINAL.pdf Accessed 16 April 2025.

Flora and Fauna Guarantee Act 1988 and Flora and Fauna Guarantee Amendment Act 2019

The *Flora and Fauna Guarantee Act 1988* (FFG Act) is Victoria's primary legislation for protecting threatened species and ecological communities, and for managing activities that may pose a threat to them. The Act provides for the protection and, where possible, recovery or restoration of marine and coastal species. Protecting Victoria's Environment – Biodiversity 2037 steps out the long-term approaches and strategies for achieving this objective. Several threatened marine species and communities are protected under the FFG Act (e.g. San Remo Marine Community; Port Phillip Bay Entrance Deep Canyon Marine Community and Western Port Bryozoan Reef Community).[209]

The FFG Act was amended in 2019 to provide a modern, strengthened framework for protecting Victoria's biodiversity. The *Flora and Fauna Guarantee Amendment Act 2019* (the Amendment Act) came into effect on 1 June 2020. It introduces several key changes:

- principles to guide the implementation of the FFG Act, including the recognition of Traditional Owners' rights and interests, and the consideration of climate change impacts
- requirements for biodiversity to be considered across all areas of government, ensuring that decisions and policies account for potential impacts on biodiversity
- clarification of powers related to the designation of critical habitat and strengthens protections through cooperative management approaches
- adoption of the Common Assessment Method for listing threatened species, supporting a consistent national approach, reducing duplication across jurisdictions, and improving conservation monitoring and reporting
- modernisation of the enforcement framework, including the introduction of stronger penalties for non-compliance.[210]

Great Otway Parks Conservation Action Plan

Parks Victoria's Great Otway Parks Conservation Action Plan aims to enhance the resilience of natural assets within the Great Otway Parks landscape and sustain vital ecosystem services in the face of climate change. Led by Parks Victoria's Western Victoria regional team in partnership with Traditional Owners, the Plan outlines conservation strategies focused on mitigating threats posed by invasive species.

Other relevant legislation and policy

The *Wildlife Act 1975* and its associated regulations establish a framework for community members who wish to control, possess, display, breed, trade or otherwise interact with wildlife. They also set out the legal foundation for the rescue and rehabilitation of wildlife by authorised volunteers, shelters, and foster carers.[211] 'Critical habitat' can be declared under this Act, and it can enable enforcement and subsequent consequences for wildlife disturbance or harm.

209. Department of Environment, Land, Water and Planning (DELWP) 2017, 'Protecting Victoria's Environment — Biodiversity 2037', East Melbourne, Victoria.
210. Department of Energy, Environment and Climate Action (DEECA), 'Victoria's Framework for Conserving Threatened Species', https://www.environment.vic.gov.au/conserving-threatened-species/victorias-framework-for-conserving-threatened-species Accessed 16 April 2025.
211. State Government of Victoria, 'The regulatory framework for wildlife protection', https://www.vic.gov.au/regulating-protection-wildlife/regulatory-framework-wildlife-protection Accessed 16 April 2025.

The Invasive Plants and Animals Policy Framework presents the overarching Victorian Government approach to the management of existing and potential invasive species. The Framework incorporates a biosecurity approach aimed at ensuring Victoria maintains a comprehensive planning framework to guide future policy, planning and community activity specific to invasive species. The document sets out a vision for outcomes that invasive species management can achieve for Victoria, and a framework for working towards that vision. Response to invasive pests is also part of the State Emergency Management Plan Animal, Plant, Marine and Environmental Biosecurity Sub-Plan, that contains information on biosecurity mitigation, preparedness, response, relief and recovery.[212] The Plan is aligned with national arrangements and reflects an integrated approach and shared responsibility for biosecurity management between government, agencies, industries, businesses, Traditional Owners and the community.[213]

In July 2021, the *Environment Protection Act 2017* came into effect, incorporating findings from the Victorian 2016 Inquiry into the Environment Protection Authority Victoria.[214] This Act's subordinate legislation includes Environment Protection Regulations 2021 and the Environmental Reference Standard (ERS).[215, 216] The ERS is a new tool that identifies environmental values that Victorians want to achieve and maintain, and enables the assessment of these values across Victoria.[217] A key element of this reform was the introduction of the General Environmental Duty. This requires all Victorians to take reasonable and practical steps to reduce the human and environmental health risks of their activities.[218]

Victoria's Climate Change Strategy, released in 2021, is a roadmap to net-zero greenhouse gas emissions and a climate-resilient Victoria by 2050. Since releasing the Strategy, the Victorian Government has brought forward its commitment to achieve net zero from 2050 to 2045 and enshrined it in legislation.[219]

Additionally, Recycling Victoria: A New Economy (2020) is the Victorian Government's 10-year plan to transform the state's economy by reducing waste and using resources more efficiently.[220] As part of its circular economy policy, the plan emphasizes waste avoidance, reduction, and minimizing environmental harm caused by waste, including litter. Key initiatives under the policy include Victoria's single-use plastic ban, which specifically targets the reduction of plastic litter.

Finally, several sites within the GORCP are listed on the Victorian Heritage Register (VHR) and are protected under the *Heritage Act 2017*. These include the Great Ocean Road (VHR 2261), as well as archaeological sites, shipwrecks, and maritime heritage places.[221]

212. Department of Energy, Environment and Climate Action (DEECA) 2024, 'State Emergency Management Plan Animal, Plant, Marine and Environmental Biosecurity Sub Plan', East Melbourne, Victoria.
213. Department of Energy, Environment and Climate Action (DEECA) 2024, 'State Emergency Management Plan Animal, Plant, Marine and Environmental Biosecurity Sub Plan', East Melbourne, Victoria.
214. Environmental Protection Authority (EPA) Victoria 2021, 'New laws to better protect the environment', https://engage.vic.gov.au/new-environmental-laws Accessed 2 August 2021.
215. Environmental Protection Authority (EPA) Victoria 2021, 'Laws and regulations', https://www.epa.vic.gov.au/about-epa/laws Accessed 1 November 2024.
216. Environmental Protection Authority (EPA) Victoria 2024, 'The Environment Reference Standard', https://www.epa.vic.gov.au/environment-reference-standard Accessed 1 November 2024.
217. Environmental Protection Authority (EPA) Victoria 2024, 'The Environment Reference Standard', https://www.epa.vic.gov.au/environment-reference-standard Accessed 1 November 2024.
218. Department of Energy, Environment and Climate Action (DEECA), 'Environment Protection Act 2017 and subordinate legislation', https://www.environment.vic.gov.au/sustainability/ep-act-2017 Accessed 31 October 2024.
219. Department of Energy, Environment and Climate Action (DEECA) 2024, 'Victoria's climate change strategy', https://www.climatechange.vic.gov.au/victorias-climate-change-strategy Accessed 1 November 2024.
220. Department of Environment, Land, Water and Planning (DELWP) 2020, 'Recycling Victoria: A new economy', https://www.vic.gov.au/sites/default/files/2020-03/02032020%20Circular%20Economy%20Policy%20-%20Final%20policy%20-%20Word%20Accessible%20version%20.pdf Accessed 14 April 2025.
221. Regions, Environment, Climate Action and First Peoples, personal communication, 12 March 2025.

Table 5: Victorian legislation and policies relevant to the State of the Great Ocean Road Coast and Parks 2025 Report.

Theme	Legislation and policies
Water quality and catchment inputs	• *Water Act 1989* • *Catchment and Land Protection Act 1994* • *Environment Protection Act 2017* • *Great Ocean Road and Environs Protection Act 2020* • Marine and Coastal Policy 2020 • Coastal and Marine Management Plan 2020-2025 • Coastcare Victoria Strategy 2021–2026 • Environment Reference Standards 2021 • Central and Gippsland Sustainable Water Strategy • Corangamite Regional Catchment Strategy • Glenelg Hopkins Regional Catchment Strategy
Litter and pollution	• *Environment Protection Act 2017* • *Great Ocean Road and Environs Protection Act 2020* • Coastal and Marine Management Plan 2020-2025 • Environment Protection Regulations 2021
Marine and coastal biodiversity	• *National Parks Act 1975* • *Wildlife Act 1975* • *Planning and Environment Act 1987* • *Flora and Fauna Guarantee Act 1988* • *Water Act 1989* • *Fisheries Act 1995* • *Environment Protection Act 2017* • *Parks Victoria Act 2018* • *Flora and Fauna Guarantee Amendment Act 2019* • *Great Ocean Road and Environs Protection Act 2020* • Victorian Fisheries Regulations 2009 • Wildlife (Marine Mammal) Regulations 2019 • Coastal and Marine Management Plan 2020-2025 • Environment Reference Standards 2021 • Coastcare Victoria Strategy 2021–2026 • Coastal Vegetation Strategy 2022 • Wildlife Regulations 2024 • Protecting Victoria's Environment – Biodiversity 2037
Seafloor integrity and health	• *Land Act 1958* • *National Parks Act 1975* • Protecting Victoria's Environment – Biodiversity 2037

Theme	Legislation and policies
Pests and invasive species	• *National Parks Act 1975* • *Flora and Fauna Guarantee Act 1988* • *Catchment and Land Protection Act 1994* • *Fisheries Act 1995* • *Flora and Fauna Guarantee Amendment Act 2019* • *Great Ocean Road and Environs Protection Act 2020* • Coastal and Marine Management Plan 2020-2025 • Coastal Vegetation Strategy 2022 • Protecting Victoria's Environment – Biodiversity 2037 • State Emergency Management Plan Biosecurity Sub-plan • Invasive Plants and Animals Policy Framework
Climate and climate change impact	• *Climate Action Act 2017* • *Great Ocean Road and Environs Protection Act 2020* • Coastal and Marine Management Plan 2020-2025 • Victoria's Draft 30-Year Infrastructure Strategy 2020 • Siting and Design Guidelines for Structures on the Victorian Coast, May 2020 • Barwon South West Regional Climate Adaptation Strategy 2020-2025 • Victoria's Climate Change Strategy 2021
Managing coastal hazards and risks	• *Planning and Environment Act 1987* • *Water Act 1989* • *Emergency Management Act 2013* • *Climate Action Act 2017* • *Great Ocean Road and Environs Protection Act 2020* • Victorian Waterway Management Strategy 2013 • Coastal and Marine Management Plan 2020-2025 • Victoria's Climate Change Strategy 2021 • Marine and Coastal Policy 2022, Chapter 6 – Managing Coastal Hazard Risk • Victoria's Resilient Coast – Adapting for 2100+
Communities	• *Prevention of Cruelty to Animals Act 1986* • *Planning and Environment Act 1987* • *Mineral Resources (Sustainable Development) Act 1990* • *Fisheries Act 1995* • *Port Management Act 1995* • *Petroleum Act 1998* • *Aboriginal Heritage Act 2006* • *Offshore Petroleum and Greenhouse Gas Storage Act 2010* • *Heritage Act 2017* • *Environment Protection Act 2017* • *Planning and Environment Amendment (Distinctive Areas and Landscapes) Act 2018* • *Marine and Coastal Act 2018*

Theme	Legislation and policies

Communities (cont'd)	• *Great Ocean Road and Environs Protection Act 2020*
	• Heritage (Underwater Cultural Heritage) Regulations 2017
	• State Emergency Management Plan Biosecurity Sub-plan
	• Siting and Design Guidelines for Structures on the Victorian Coast May 2020
	• Marine and Coastal Policy 2020
	• Victoria's Climate Change Strategy 2021
	• Coastcare Victoria Strategy 2021–2026
	• Marine and Coastal Strategy 2022
	• Marine Spatial Planning Framework, including:
	  • Marine Spatial Planning Guidelines 2023
	  • Marine Planning Areas 2023
	• Victoria Planning Provisions
	• Victoria's Resilient Coast – Adapting for 2100+

Stewardship and collaborative management	• *Crown Land Reserves Act 1978*
	• *Coastal Waters (State Title) Act 1980*
	• *Catchment and Land Protection Act 1994*
	• *Environment Protection Act 2017*
	• *Marine and Coastal Act 2018*
	• *Great Ocean Road and Environs Protection Act 2020*
	• Marine and Coastal Policy 2020
	• Coastal and Marine Management Plan 2020-2025
	• Coastcare Victoria Strategy 2021–2026
	• Marine and Coastal Strategy 2022
	• Marine Spatial Planning Framework, including:
	  • Marine Spatial Planning Guidelines 2023
	  • Marine Planning Areas 2023

Inland biodiversity	• *National Parks Act 1975* • *Wildlife Act 1975* • *Flora and Fauna Guarantee Act 1988* • *Fisheries Act 1995* • *Environment Protection Act 2017* • *Parks Victoria Act 2018* • *Flora and Fauna Guarantee Amendment Act 2019* • *Great Ocean Road and Environs Protection Act 2020* • Victorian Fisheries Regulations 2009 • Environment Reference Standards 2021 • Wildlife Regulations 2024 • Protecting Victoria's Environment – Biodiversity 2037

Traditional Owner context

Traditional Owners have the authority to guide the strategic direction for caring for Country. One way they do this is by developing a Country Plan — a foundational document that outlines their goals and vision for managing Country.

Below are the Country Plans developed by the two Traditional Owner corporations whose Country includes the GORCP.

Eastern Maar Country Plan

The Eastern Maar Country Plan, which encompasses Sea Country and other landscapes, is focused on ensuring the health of Eastern Maar Country and the sustainable management and use of its natural resources.[222] The Eastern Maar peoples have always approached their Country with deep respect — taking only what was needed and managing natural systems to maintain their health and productivity.

Since European settlement, significant land degradation has occurred. In response, the Country Plan emphasises the importance of building strong, collaborative partnerships to support the proper care of Country. At the heart of Eastern Maar philosophy is the principle of sustainable use. This includes responsible resource extraction and utilisation, guided by cultural values and environmental understanding — an approach that underpins their partnerships with other organisations.

For generations, Eastern Maar ancestors used fire strategically to manage the landscape, enhancing both the environment and their way of life in a fire-prone region. To carry this knowledge forward, the Plan aims to increase the involvement of Eastern Maar citizens in fire management. This includes delivering contract fire management services and contributing to the ongoing development of a culturally-informed fire regime.

Today, Eastern Maar play a vital role in fire management as a partner fire-fighting agency, working alongside the DEECA and the Country Fire Authority.

Wadawurrung Country Plan

The Wadawurrung Country Plan encompasses both Coastal and Sea Country. It identifies and ranks key threats to Country, including urban development, the lack of recognition of Wadawurrung people in decision-making processes, and the impact of introduced species.[223] To address these threats, the Plan outlines a strategic approach focused on partnerships and stakeholder engagement. Through collaboration with land and water managers, the Wadawurrung Country team works to reduce the impact of priority threats across culturally significant places and landscapes.

Strengthening relationships with landholders and management authorities is essential. These partnerships will create more opportunities for access, influence, and active involvement in caring for Country. Initial focus is placed on the Barwon and Moorabool Rivers and their tributaries — vital waterways that hold cultural significance and have been heavily impacted. These areas will be a priority for water management efforts.

The Bostock Reservoir will serve as a site for skill-building in contemporary land management, enabling Wadawurrung to enhance and integrate these practices with their traditional knowledge. This approach supports more effective responses to modern environmental challenges.

Wadawurrung Traditional Owners are also revitalising cultural burning practices to renew the landscape, strengthen cultural identity, and heal both Country and people. They are committed to sharing and expanding this knowledge in collaboration with other land management bodies, including the DEECA, Parks Victoria, Fire Rescue Victoria, and the Country Fire Authority.

222. Eastern Maar Aboriginal Corporation 2015, ' Meerreengeeye ngakeepoorryeeyt - our Country far seeing - Eastern Maar Country Plan, North Melbourne, Victoria, https://easternmaar.com.au/wp-content/uploads/2020/01/eastern-maar-country-plan.pdf Accessed 21 April 2025.
223. Wadawurrung Traditional Owners Aboriginal Corporation 2020, 'Paleert Tjaara Dja - let's make Country good together 2020-2030 - Wadawurrung Country Plan', Geelong, Victoria, https://www.wadawurrung.org.au/_files/ugd/d96c4e_72611327c6a54d3198c0499ac5c26e54.pdf Accessed 21 April 2025.

Port Campbell National Park. Credit: Rob Blackburn ©Parks Victoria

Abbreviations and Acronyms

CES	Commissioner for Environmental Sustainability
CES Act	*Commissioner for Environmental Sustainability Act 2003*
CMMP	Coastal and Marine Management Plan
CPUE	catch-per-unit-effort
CVS	coastal vegetation strategy
DEECA	Department of Energy, Environment and Climate Action
EEMSS	Estuary Entrance Management Support System
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERS	Environmental Reference Standard
EVC	Ecological Vegetation Class
FFG Act	*Flora and Fauna Guarantee Act 1988*
GBF	Kunming-Montreal Global Biodiversity Framework
GORCP	Great Ocean Road Coast and Parks
GORCPA	Great Ocean Road Coast and Parks Authority
IEC	Index of Estuary Condition
IPCC	Intergovernmental Panel on Climate Change
LGA	local government area
MARPOL	International Convention for the Prevention of Pollution from Ships
MPA	marine protected area
MSP	Marine Spatial Planning
$PM_{2.5}$	particles with a diameter of 2.5 micrometres or less
SDG	Sustainable Development Goals
SFP	Strategic Framework Plan
SGORCP	State of the Great Ocean Road Coast and Parks
SHP	Signs of Healthy Parks
SMCE	State of the Marine and Coast Environment Report
SMP	Strategic Management Prospects
UN	United Nations
VHR	Victorian Heritage Register
VMaCC	Victorian Marine and Coast Council
VWMS	Victorian Waterway Management Strategy

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