Marine Investigation
Final Report

April 2014

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VEAC
Victorian Environmental Assessment Council

WHAT IS THE VICTORIAN ENVIRONMENTAL ASSESSMENT COUNCIL?

The Victorian Environmental Assessment Council (VEAC) was established in 2001 under the *Victorian Environmental Assessment Council Act 2001*. It provides the State Government of Victoria with independent advice on protection and management of the environment and natural resources of public land.

The five Council members are:

Hon. Phil Honeywood *(Chairperson)*

Mr Ian Harris

Dr Charles Meredith

Mr Ian Munro PSM

Ms Angela Reidy

SCIENTIFIC ADVISORY COMMITTEE

The Marine Investigation Scientific Advisory Committee is independently chaired by Mr Rod Gowans PSM.

Committee members are:

Dr Alan Butler

Dr Scott Condie

Professor Allan Curtis

Professor Peter Fairweather

Professor Gregory Jenkins

Professor Michael Keough

Associate Professor Susan Moore

Dr Mark Norman

Associate Professor Mardie Townsend

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COMMUNITY REFERENCE GROUP

The Marine Investigation Community Reference Group is independently chaired by Assoc Prof John Sherwood.

Members of the group are:

Mr Simon Branigan,
Victorian National Parks Association

Mr Rodney Carter,
Victorian Aboriginal Heritage Council
(from December 2013)

Mr Andrew Christie,
NMIT Bachelor of Aquaculture program

Mr Geoff Fisher,
VRFish

Ms Katrina Hall,
Australian Petroleum and Production Exploration Association (From October 2012 to October 2013)

Dr John Hawkins,
Scuba Divers Federation of Victoria

Mr Ray Lewis,
Victorian Environment Friends Network

Ms Denise Lovett,
Victorian Aboriginal Heritage Council
(to December 2013)

Mr David Lucas,
Native Title Services Victoria

Mr Andrew Mathers,
Australian Petroleum and Production Exploration Association (to October 2012)

Ms Kimberley Millers,
Australian Marine Sciences Association (Victorian branch)
(from December 2012)

Cr Michael Norris,
Municipal Association of Victoria
(to December 2012)

Mr Chris Smyth,
Australian Conservation Foundation
(to December 2012)

Ms Renee Vajtauer,
Seafood Industry Victoria

Ms Kat Vcekla,
Dive Industry of Victoria Association

Mr Andy Warner,
Boating Industry Association of Victoria

Mr Jeff Weir,
Dolphin Research Institute

Mr Joel Williams,
Australian Marine Sciences Association (Victorian branch)
(to December 2012)

Victorian Environmental Assessment Council

30 April 2014

The Hon Ryan Smith MP

Minister for Environment and Climate Change

8 Nicholson St

East Melbourne VIC 3002

Dear Minister

MARINE INVESTIGATION

In accordance with the requirements of Section 23 of the *Victorian Environmental Assessment Council Act 2001*, the Victorian Environmental Assessment Council (VEAC) is pleased to submit to you the report on the Marine Investigation and copies of each submission received in relation to the investigation.

I extend my thanks to my fellow Council members, past members and VEAC staff for their contributions to this investigation. I would also like to gratefully acknowledge the assistance to Council throughout the investigation from the Community Reference Group and Scientific Advisory Committee.

Yours sincerely

Phil Honeywood

Chairperson

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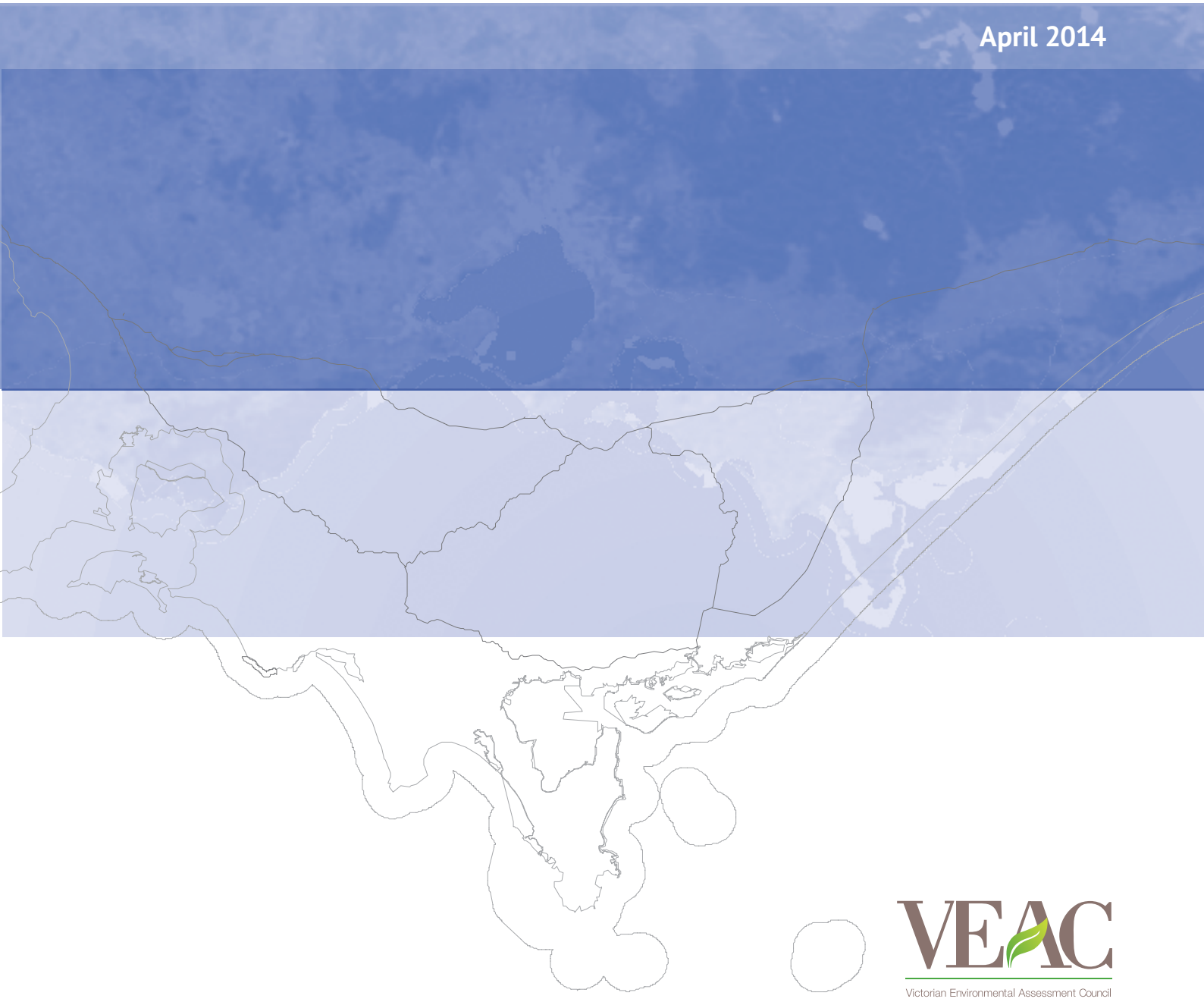


VEAC
Victorian Environmental Assessment Council

Foreword

The Marine Investigation has been an opportunity for government and the community to consider how Victoria's existing marine protected areas are performing in meeting the purposes for which they were established, how they are managed, and the threats and challenges they may face in the future. This report is the third and final report for the investigation. It provides a formal evaluation of performance and management and VEAC's recommendations to government.

Victoria's 24 marine national parks and marine sanctuaries and six multiple-use areas provide the foundation for marine biodiversity protection in the state, in the same way that national parks do for protection of terrestrial biodiversity. The establishment of the system of marine national parks and sanctuaries in 2002 put Victoria at the forefront of marine conservation at that time, according to national and international observers.

This investigation has been carried out during a period when the exclusion of extractive uses - primarily fishing - from no-take marine protected areas is being challenged in some parts of Australia. On the other hand, scientists are reporting internationally that one of the five key success factors for effective marine protected areas is the exclusion of fishing.

Council takes this opportunity to reaffirm that the primary purpose for which Victoria's no-take marine national parks and sanctuaries were established was to protect examples of Victoria's biodiversity in as natural condition as possible, for the long term. In practical terms, meeting this purpose means reducing the manageable threats to natural biodiversity as far as possible. Removing fish and other flora and fauna alters the ecosystems in which they live, and is a disturbance that can be avoided. Increases in the diversity of marine species, or in the numbers or size of edible fish or shellfish, are not required to be demonstrated in order to achieve the purposes of the no-take areas, although in some cases this may be an incidental effect of protection.

Acknowledgment of Country

The Victorian Environmental Assessment Council acknowledges and pays its respects to Victoria's Native Title Holders and Traditional Owners within the investigation area, and the rich cultural and intrinsic connection they have to Country. The Council also recognises and acknowledges the contribution and interest of other Aboriginal peoples and organisations in the management of land and natural resources.

Foreword

For the no-take areas VEAC has found broadly that biodiversity has been maintained and that there is no evidence of major increases in the impact of threats since the areas were established, except for the establishment of marine pests and a pathogen in several locations.

For the multiple-use areas, management to protect significant natural ecosystems is required to be carried out in a way that accommodates sustainable use of resources. Council notes that the requirement to accommodate extractive uses – primarily fishing - in the multiple-use marine protected areas fundamentally affects the degree to which biodiversity values can be protected and natural condition achieved.

The absence of an effective legal and governance basis for the multiple-use areas impedes effective planning and management, and few specific biodiversity goals and objectives have been identified. Until these matters are addressed and resolved, only a partial evaluation of management and performance is possible. With this qualification, VEAC concluded that the values of the multiple-use areas appear to be retained for those components of the ecosystem - primarily birds - for which evidence is available.

Climate change is expected to increasingly change the biodiversity of all the marine protected areas, but Council does not consider that this will diminish the value of the areas in terms of their ecological purposes.

A secondary purpose of most protected areas including Victoria's marine protected areas, is to provide opportunities for enjoyment, appreciation and understanding of the natural environment.

Council found many examples of excellent programs and materials that enhance awareness and engagement in the no-take marine protected areas, although there is scope for a more strategic focus for these activities while still being responsive to and supporting community-led initiatives. There was less evidence for targeted programs in the multiple-use areas.

The engagement of Traditional Owners in management and in educating the community about cultural heritage is an opportunity to enhance awareness and engagement in the future, and would contribute to the recognition of Indigenous interests in marine protected areas.

Council notes that recent changes to organisational structures and staffing levels in parks and fisheries agencies may reduce management and research capacity. Resourcing of management requires attention over the long term.

On behalf of the Council, I would like to thank Parks Victoria and other management agencies for the provision of information and for their cooperation with the investigation. Council was fortunate to have the expert advice of a Scientific Advisory Committee throughout the investigation, and I extend my gratitude to the members of that committee for their knowledge and insights. Council has also been assisted in the investigation by its Community Reference Group, and I thank the members of the group for their valuable input and advice. Finally, I want to thank the individuals and organisations who made written submissions to one or more of the three formal consultation periods. Council appreciates the time and effort taken to provide VEAC with a wide range of information and perspectives on Victoria's marine protected areas. The written submissions were carefully considered and taken into account in the preparation of this report.

Phil Honeywood

Chairperson

Structure of this report

This is the third and final report published for the Marine Investigation.

A discussion paper and a draft proposals paper were published for public comment in November 2012 and November 2013 respectively.

This report is presented in such a way that readers can quickly access the parts of the report of most interest to them.

Overview and final recommendations

This section at the beginning of the report presents the major outcomes of the investigation and Council's final recommendations.

Part A **Chapters 1 to 3**

Part A provides background to the investigation and explains VEAC's role and the scope of the investigation. It outlines the terms of reference and other matters to be taken into account, describes the investigation process, gives some policy context and provides a summary of community and stakeholder views and other advice submitted to VEAC following the release of the draft proposals paper.

Part B **Chapters 4 to 10**

Part B presents the full technical assessment of performance and management of Victoria's existing marine protected areas. Links to the relevant recommendations are indicated as appropriate.

References References are provided at the end of the report in the order of citation.

Appendix This provides a list of all submissions received during the investigation.

Part A

Part B

OVERVIEW

Victoria's 30 marine protected areas – extending from Discovery Bay Marine National Park west of Portland to Cape Howe Marine National Park in the east – are important natural assets for the state and the nation.

Most of these areas have highly significant ecological and landscape values, some have important cultural and heritage features, and many are popular recreational locations. The marine national parks and sanctuaries have been in place for more than a decade and the other marine parks and reserves for much longer.

This Marine Investigation evaluated the performance and management of Victoria's marine protected areas in meeting the purposes for which they were established. It focused on the ecological and biodiversity outcomes of the marine protected areas, along with identification of ongoing threats or challenges to their effective management.

The investigation was conducted by the Victorian Environmental Assessment Council (VEAC) at the request of the Minister for Environment and Climate Change, the Hon Ryan Smith. This is the third and final report of the investigation, and contains VEAC's evaluation and Council's recommendations to government. The recommendations address threats and challenges, guiding management to achieve the purposes of these marine protected areas for future generations.

The investigation involved three formal periods of community consultation. Council was assisted with advice from a Community Reference Group, a Scientific Advisory Committee and specialist consultancies.

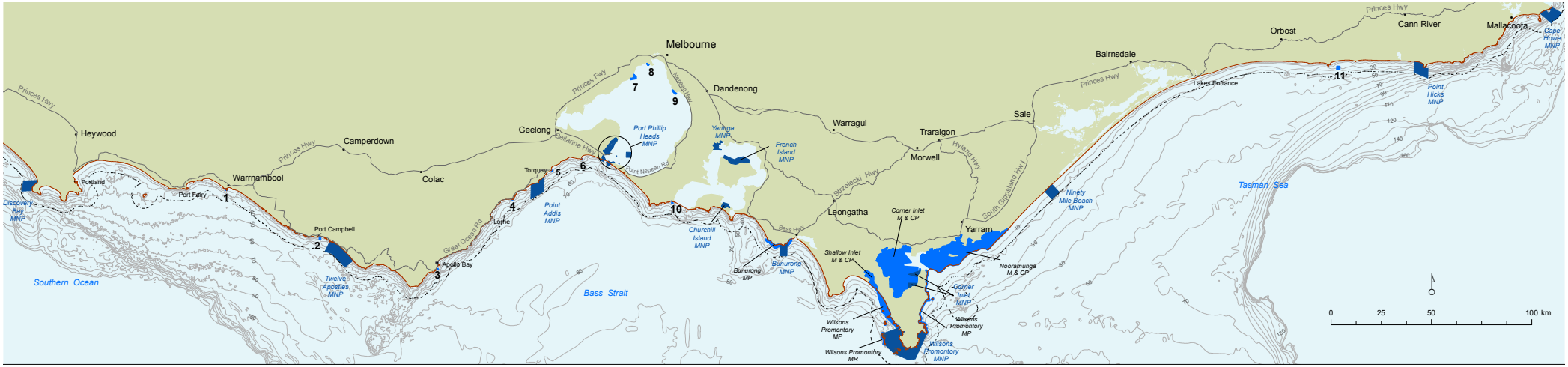
Victoria's marine protected areas

Victoria's marine protected areas are shown in figure 1 and consist of:

- 13 marine national parks and 11 marine sanctuaries that were established as no-take marine protected areas in 2002 (the 'no-take areas')
- 6 marine parks, marine reserves and marine and coastal parks that were established as multiple-use marine protected areas in 1986 and 1991 (the 'multiple-use areas'). Some of these areas contain coastal land.

These areas were set up for several purposes. It is against these purposes that their management and performance has been, and should continue to be, evaluated.

Figure 1
Victoria's marine protected areas



Purposes for which Victoria's no-take marine protected areas were established

The primary ecological purpose of the no-take areas (i.e. marine national parks and marine sanctuaries) is to maintain examples of Victoria's biodiversity and associated ecological processes, including their variation in space and time, in a relatively natural condition for their intrinsic value to future generations.

In meeting this purpose, the marine national parks were also intended to serve as benchmarks against which other marine areas may be compared.

The areas were not designed or intended to rehabilitate biodiversity or fish stocks.

In common with national parks on land, the no-take areas also have a social purpose in providing opportunities for enjoyment, appreciation and understanding of the natural environment. The marine sanctuaries were intended to provide special opportunities for environmentally-focused recreation and education.

Purposes for which Victoria's multiple-use marine protected areas were established

The primary purpose for which the multiple-use areas were established was to protect biodiversity to the extent possible while accommodating a variety of uses, including fishing. Their primary ecological purpose is to protect areas containing significant natural ecosystems.

Like the no-take areas, these areas have a social purpose of providing opportunities for enjoyment, appreciation and understanding of the natural environment.

Council notes that the requirement to accommodate extractive uses – primarily fishing – in the multiple-use marine protected areas fundamentally affects the degree to which biodiversity values can be protected and natural condition achieved.

Traditional Owner interests in the marine protected areas

The marine protected areas include environment, resources and cultural values important to Traditional Owners. The investigation explored some of the management tools that have been, or could be, used to recognise these interests. Describing these values, evaluating their current management and exploring the aspirations of Traditional Owners for the marine protected areas were beyond the scope of the investigation.

Instead, an overview is provided of the legal and governance context within which recognition and engagement of Traditional Owners in use and management of the marine protected areas can take place.

Council has made recommendations about models for joint management and other collaborative frameworks being explored as a means of developing partnerships with Traditional Owners.

VEAC'S EVALUATION OF MANAGEMENT AND PERFORMANCE

VEAC used an internationally recognised framework to guide its evaluation. This framework was developed by the International Union for Conservation of Nature and the World Commission on Protected Areas. The evaluation focused on how best to manage Victoria's marine protected areas, taking into account their purposes and ecology. The Scientific Advisory Committee advised on how best to evaluate the ecological performance of the marine protected areas in the light of the available information.

The important threats for management

Threats to the marine protected areas come both from within and beyond their boundaries. VEAC commissioned detailed assessments of the current and future threats to each marine protected area. The threats can arise from activities in marine waters and on land. The threats can vary between marine protected areas and over time.

Current threats

Oil spills and marine pests or diseases are the biggest current threats across the marine protected areas because they can have major impacts on biodiversity. Most of these threats are relatively unlikely to occur, but can come from shipping, fishing, tourism and recreation. Fishing poses a major or moderate potential threat to the biodiversity of a number of no-take and multiple-use areas, despite its legal exclusion from the no-take areas. Marine protected areas in bays and inlets are vulnerable to a variety of other types of threats, stemming from catchment-based stormwater or agriculture, dredging and coastal development. Marine protected areas on the central and western coast or near regional cities can be affected by similar threats but are less vulnerable environments. Remote marine protected areas tend to be least threatened.

Future threats

Climate change is expected to increasingly change the biodiversity of the marine protected areas. Council does not consider that this will diminish the value of the areas in terms of their ecological purposes. The no-take areas may be less affected by climate change due to their greater degree of naturalness, supporting their value as benchmarks. Threats linked to population growth may be an increasing issue for some marine protected areas. These may include threats from tourism and recreation, and threats to water quality from stormwater, agriculture, sewage and development.

Are the no-take areas being effectively managed to protect biodiversity?

Achieving the ecological purposes of the no-take areas requires no increase in, or ideally a reduction of, levels of threats. Not all threats can be completely controlled, as is well understood for terrestrial national parks. For example, eradication of some marine pests may not be feasible. Marine pests are established in a number of the no-take areas. Council is of the view that this is undesirable but does not undermine the value of the no-take areas in terms of their ecological purposes.

The Victorian Auditor-General's Office (VAGO) audited the environmental management of Victoria's marine protected areas in 2011. It made recommendations for improving resource allocation, planning and implementation of management of the no-take areas.

Planning

Parks Victoria's improvements to management planning for the no-take areas are still in progress. These approaches were not sufficiently developed and documented for Council to evaluate. The policy that guides this planning has gaps that need to be addressed to deal with the changing climate.

Council has made recommendations about updating policy and completing planning for management of the no-take areas.

Managing threats

Many agencies and stakeholders play a part in managing and/or generating threats to the no-take areas from within and beyond their boundaries. This management includes ensuring compliance with the prohibition of fishing in the no-take areas. Controlling threats requires adequate and well-targeted resources. Resourcing for the no-take areas was increased in Parks Victoria after the 2011 VAGO audit, but requires long-term attention across relevant agencies and stakeholders. Actions have been implemented by several agencies that will have benefited the no-take areas, but Council identified several opportunities to improve ongoing threat management.

Council has made a number of recommendations about resourcing and priorities for managing the no-take areas and threats, including enforcing fishing prohibitions, managing marine pests and wider marine management.

Research and monitoring

Parks Victoria has maintained significant research and monitoring for the no-take areas. It also encourages contributions from interested community members and other stakeholders. Council supports long-term continuation of these programs but identified opportunities for their better targeting and use to guide future management of threats.

Council has made several recommendations about improving research and monitoring.

Future evaluations of management

Managing the no-take areas will require long-term attention. Concerns about management of the no-take areas were identified in the 2011 VAGO audit and submissions to this investigation. VEAC's investigation has also identified a number of opportunities for improvement to address current and future challenges. Quality assurance processes, public reporting and independent reviews can all play key roles in ensuring sustained and effective management.

Council has made recommendations about improved public reporting. It has also recommended annual interim audits of progress with the relevant recommendations of this investigation that are accepted by Government, prior to a further independent review of marine protected area management by end 2018. This recommendation applies across management of the no-take and multiple use areas to achieve their ecological and social purposes.

Are the no-take areas achieving their ecological purposes?

Achieving the ecological purposes of the no-take areas means maintaining, but not necessarily improving, the condition of all their biodiversity in the long term. Demonstrated increases in the diversity of marine species, or in the numbers or size of edible fish or shellfish, are not required, nor are they necessarily predicted for Victoria's no-take areas.

The no-take areas were intended to protect examples of biodiversity, as far as possible, for current and future generations. Comprehensively measuring the biodiversity of the areas can present scientific and logistic challenges. Progress with controlling threats can provide an alternative indication of ecological performance but requires careful interpretation. Other factors could also affect whether the ecological purposes are achieved. VEAC used a combination of these measures, guided by the advice of the Scientific Advisory Committee, to provide the best possible evaluation from the information available.

Has biodiversity been maintained?

The marine habitats in the no-take areas, including some seaweeds and seagrasses found in these habitats, have a substantial influence on biodiversity and were important in the design of the no-take areas. VEAC's evaluation found that these ecological values were present in the most recent surveys of each of the no-take areas.

More detailed evaluation of the ecological performance of the no-take areas is not yet possible due to limitations in available information and scientific understanding. Long-term monitoring of reef biodiversity is conducted in several no-take and comparison areas in Victoria, but has not yet been suitably analysed for performance evaluation.

Have threats been controlled?

VEAC found no evidence of major increases in the impact of threats since the no-take areas were established, apart from establishment of marine pests and the abalone virus in several locations. Cessation of fishing in the no-take areas will have led to more natural biodiversity at some time and space scales. No major oil spills, pipelines or seabed

cables have affected the no-take areas, and only one approval has been granted for transit of a seismic survey vessel.

The impacts of catchment-based pollution on no-take areas since their establishment are likely to have been limited by drought conditions and by action on inputs to Port Phillip Bay. The combination of the drought breaking and population growth in catchments may have increased the impacts. Changes in the impacts of other threats, including tourism, recreation and coastal development, could not be reasonably evaluated from the available information.

Other factors affecting performance

Performance of the no-take areas may also be affected by their design, and by the condition and management of surrounding marine waters. While detailed evaluation of these factors was not within the scope of this investigation, Council has made recommendations about management of the wider marine environment.

Future evaluations of performance

Council has made recommendations about improvements to monitoring, analysis and reporting that should improve future evaluations.

Are the multiple-use areas being effectively managed to protect biodiversity?

There are some major differences between the no-take and the multiple-use areas, notably time since establishment, the inclusion of coastal land and islands in three of the multiple-use areas, and the presence of extractive uses such as fishing. Nonetheless, many of Council's conclusions for no-take areas also apply to the multiple-use areas.

The absence of an effective legal framework for all the multiple-use areas impedes effective planning. In particular, properly defined boundaries are not settled for the three marine and coastal parks and, therefore, there is no sound basis for effective governance and management.

The natural values and broad ecological purposes of the multiple-use areas are generally clearly identified. A significant challenge is the translation of the broad ecological purposes of the multiple-use areas into specific biodiversity goals and actions for on-ground management that would protect ecological values as far as possible while accommodating extractive uses, such as fishing. Effective planning for the multiple-use areas can take place once these specific goals are established.

Council observed that while there is some evidence of active management in the marine components of the multiple-use areas, these areas are managed in a manner that is indistinguishable from the management of natural values in the surrounding marine environment. This reflects the uncertainty about the legal and governance frameworks, and the absence of biodiversity goals that accommodate extractive uses such as fishing.

Other than in the Corner Inlet Ramsar site, there was little evidence of integration of planning and management. Planning and management of fisheries in particular are carried out independently of other uses.

Council has made recommendations about an appropriate process to develop biodiversity goals for the multiple-use areas.

Management of the terrestrial components of the marine and coastal parks is impeded by poor boundary definition, and absence of appropriate regulations.

Council has made several recommendations about boundary definition and legal status of the multiple-use areas.

Future evaluations of management

Further evaluation of management to achieve the ecological purposes of the multiple-use areas is not meaningful until these matters are addressed and resolved. Council has recommended a further independent review in 2018 which will allow progress to be evaluated.

Are the multiple-use areas achieving their ecological purposes?

Council's evaluation indicated that the biodiversity of the three marine and coastal parks has been broadly maintained, based on the aspects of ecological performance that could be assessed. There are good data to conclude that a key ecological value of the three marine and coastal parks - the habitat of international migratory waders - has been maintained. There is insufficient information upon which to base an assessment of the three open coast multiple-use areas, although there are no reports to suggest that there has been any change to the presence of the major marine habitats in these areas.

Based on the available information, Council found no evidence of major increases in the impact of threats to the multiple-use areas since establishment, apart from establishment of marine pests. However there is insufficient information to determine the impacts of several acknowledged threats, such as water quality stress.

Victoria's changing climate will affect all the marine protected areas and some effects of climate change seem to be occurring already. The range of uses in the multiple-use areas, including extractive uses, means that their biodiversity may not be as resilient to some climate effects as the more natural biodiversity of the no-take areas.

Are Victoria's marine protected areas achieving their social purposes?

Providing opportunities for enjoyment, appreciation and understanding of natural environments is a major secondary purpose of establishment common to almost all protected areas.

Evaluation of management

VEAC identified a number of valuable programs and projects in place in the no-take areas relating to visitor use and community awareness and engagement . However, linkages between these programs and projects and the numerous plans and strategies are largely absent. As for management to achieve the ecological purposes, clear linkages are required between planning and implementation of management actions. Community involvement in monitoring of birds is a longstanding and valuable activity in the three marine and coastal parks.

Coordination between agencies and the community for education and engagement activities was evident, but not as apparent for recreational activities.

While a range of visitor data and market research are available for no-take areas regarding levels of appreciation and understanding among users and the general public (i.e. the social purposes), there are no such data available for multiple-use areas. Visitor research can assist managers in achieving objectives relating to the social purposes of the marine protected areas.

Council has recommended that visitor research and monitoring be extended to the multiple-use areas.

Evaluation of performance

Providing opportunities for enjoyment, appreciation and understanding is usually understood to involve provision of a range of recreational and educational activities and preparation and distribution of information materials.

Council's evaluation is that a range of recreation opportunities and opportunities for community involvement are provided in the marine protected areas. This is particularly the case for the no-take areas. The multiple-use parks appear to be heavily used for recreation but management is dispersed, and there is little evidence of management of recreation and education targeted at enjoyment and appreciation of natural environments in these areas.

There is a wealth of information and education materials that have been developed by Parks Victoria, in partnership with the community organisations and government agencies, for the no-take areas. There are further opportunities to strategically focus education, engagement and interpretation programs on a subset of no-take areas that will profile the role and function of the marine national parks and sanctuaries.

Final recommendations

Council recommends that:

R1	The long-term protection of biodiversity be explicitly recognised as the primary objective of management of the marine national parks and marine sanctuaries.
R2	Strategy and policy to guide management of the marine national parks and marine sanctuaries be updated by end 2015.
R3	Parks Victoria prepare, in consultation with stakeholders, plans specifying priority management actions for each marine national park and marine sanctuary by end 2016.
R4	The research strategy for marine national parks and marine sanctuaries be revised by Parks Victoria and peer reviewed by end 2015 to specify more clearly the priority research topics to guide management.
R5	Adequate funding be provided and maintained, and Parks Victoria ensure that resources are focused on minimising the important, avoidable threats to biodiversity of the marine national parks and marine sanctuaries.
R6	Parks Victoria establish systematic and regular public reporting by end 2015 that includes: a. estimated levels of threats to marine national parks and marine sanctuaries, b. progress in delivery of achievable actions on threats, c. progress on planning, and d. resourcing.
R7	The results of research conducted in the marine national parks and marine sanctuaries be publicly available.
R8	Research with potential to adversely affect biodiversity not be permitted in the marine national parks or marine sanctuaries, unless the research is critical for achieving their ecological purposes and there is no feasible alternative.
R9	Parks Victoria ensures that all data from the reef monitoring program for the marine national parks and marine sanctuaries be statistically analysed by end 2015 using methods that compare sites within and outside of these areas.
R10	Parks Victoria conduct a review considering extension of the reef monitoring program to include other marine habitats within marine national parks and marine sanctuaries, and threats to achieving their ecological purposes, by end 2016.
R11	Community volunteers be supported by Parks Victoria with appropriate advice and tools to assist them to provide observations and data that are most practically useful for management.
R12	Parks Victoria conducts an initial audit to assist in prioritising ongoing maintenance programs to ensure that boundaries and fishing prohibitions are clearly communicated for the marine national parks and marine sanctuaries.
R13	Education, engagement and interpretation be used to inform the broader community about the boundaries, ecological values and purposes of marine national parks and marine sanctuaries to encourage awareness of, and compliance with, fishing prohibitions.

R14	Parks Victoria develops a publicly available strategy and ensures an effective ongoing program is in place for enforcing fishing prohibitions in the marine national parks and marine sanctuaries by end 2015.
R15	The *National Parks Act 1975* be amended to improve consistency with the provisions for terrestrial national parks by (i) adding the requirement to obtain the advice of the National Parks Advisory Council prior to giving consent to petroleum exploration in marine national parks and marine sanctuaries, and (ii) providing for similar tabling and disallowance provisions.
R16	Appropriate amendments be made to the *National Parks Act 1975* to reflect the current policy that does not allow discharge of seismic sources within marine national parks and marine sanctuaries.
R17	The development of statewide policy be prioritised, in consultation with stakeholders, to guide ecologically sustainable management and use of Victoria's marine environment.
R18	The existing policy, objectives and targets for marine water quality in Victoria be updated as soon as practicable, giving priority to targets for embayments.
R19	High priority be given to preventing translocation of new marine pests to the marine national parks and marine sanctuaries, and for quickly eradicating new pests where it is practically feasible.
R20	Management approaches be established to reduce the threat posed by biofouling in Victoria, while national approaches are developing.
R21	Appropriate administrative arrangements and resourcing be established, integrated with Victoria's wider biosecurity arrangements, for responding to marine pest emergencies.
R22	The boundaries of the Nooramunga Marine and Coastal Park be formally defined to include the marine areas to the mean high water mark, the pre-existing Nooramunga State Faunal Reserve, and historic sites at Old Settlement Beach and Tarraville.
R23	The boundaries of the Corner Inlet Marine and Coastal Park be formally defined to include the marine areas to the mean high water mark (except where adjacent to Wilsons Promontory National Park), all islands in the inlet (except those in the Wilsons Promontory National Park), and coastal Crown land north and south of Yanakie Landing but excluding Yanakie caravan park and boat ramp (see note). Note: A timeframe for removal of boat sheds at Red Bluff in accordance with previous government decisions should be developed.
R24	The boundaries of the Shallow Inlet Marine and Coastal Park be formally defined to include the marine areas to the mean high water mark, the sand spit, the beach and foreshore on the western side of the inlet and that part of the foreshore on the eastern side of the inlet south of and including the Shallow Inlet camping reserve area and boat ramp until it adjoins Wilsons Promontory National Park.
R25	The remaining adjacent coastal Crown land not referred to in R22 to R24 and initially intended for inclusion in the marine and coastal parks be managed in a complementary way and, as resources permit, be assessed and boundaries defined for possible incorporation of areas to the relevant marine and coastal park in the future.
R26	Management agreements with landowners adjacent to the marine and coastal parks be developed where the private land/Crown land boundary bisects areas of saltmarsh, mangroves and mudflats.

R27	Wilsons Promontory Marine Reserve be incorporated into the Wilsons Promontory Marine Park.
R28	The following areas be moved to Schedule Three of the *National Parks Act 1975* (see note): a. Nooramunga, Corner Inlet and Shallow Inlet marine and coastal parks (with boundaries defined as in recommendations R22 to R24) b. Bunurong Marine Park c. Wilsons Promontory Marine Park (including the marine reserve in accordance with recommendation R27). Note: the parks are currently managed as though they were Schedule Three parks and no changes to the current uses are proposed.
R29	A process be commenced by end 2015, involving all relevant managing agencies and the community, to provide advice to government on biodiversity goals and objectives for the multiple-use marine protected areas.
R30	Parks Victoria publishes Marine Natural Values reports that cover all multiple-use marine protected areas by end 2016 to support the implementation of recommendation R29.
R31	Relevant management plans and integrated management arrangements be developed and/or updated consistent with the agreed objectives arising from implementation of recommendation R29.
R32	A research strategy be developed and peer reviewed for multiple-use marine protected areas by end 2016 to specify the priority research topics to inform management.
R33	Parks Victoria strategically focuses education, engagement and interpretation on a selected subset of marine national parks and marine sanctuaries, and that these areas be used to profile the role and function of the no-take system.
R34	Parks Victoria continues to support community groups (e.g. Marine Care and Friends groups) in educating the broader community about the boundaries and ecological values of some of the no-take areas, and supports Traditional Owners in extending education activities to include education about Aboriginal cultural heritage values.
R35	Visitor research and monitoring be extended by Parks Victoria to include the multiple-use marine protected areas by end 2016.
R36	Models for joint management established in the Traditional Owner Settlement Act be extended as appropriate to marine protected areas as the framework for developing partnerships with Traditional Owners.
R37	Non-legislative collaborative frameworks be explored for developing partnerships with Traditional Owners in the multiple-use marine protected areas.
R38	An independent review of the effectiveness of management of the marine protected areas be conducted by end 2018. Commencing in 2015 and until this review has been completed, an interim audit of progress with relevant recommendations of this investigation that are accepted by Government be included as an annex to each 'annual report on the working of the *National Parks Act 1975*' (see note). Note: The relevant recommendations that should be audited are R2–R5, R9-R12, R14-R16, R22-R32, R35.

1. Introduction

PART A

1.1 Background to the investigation

The coastal and marine environments of Victoria are part of a richly diverse coastline, with most species of marine flora and fauna found only in southern or south-eastern Australia. Victoria's marine waters cover more than 10,000 square kilometres, extending three nautical miles (about 5.5 kilometres) from the coastline. They include bays, inlets and estuaries, as well as the exposed waters of Bass Strait and the open ocean. Most waters are shallow, although some areas reach depths of more than 100 metres.

Victoria's existing marine protected areas date from 1979 when the Harold Holt Marine Reserves in Port Phillip Bay were established following a proposal from the Scuba Divers Federation of Victoria in the early 1970s. Several more marine protected areas were established between 1981 and 1991, mainly in South Gippsland. In 1991, the then Land Conservation Council began a statewide investigation that culminated in the establishment of a system of no-take marine national parks and marine sanctuaries in 2002 covering 5.3 per cent of Victorian state waters. In total, the existing marine protected areas in Victoria cover about 11.7 per cent of Victorian waters (see figure 2).

The marine protected areas are defined, nationally and internationally, as areas of sea (which may include land, the seabed and subsoil under the sea) established by law for the protection and maintenance of biological diversity and of natural and associated cultural resources.[1] Different names are used around Australia for the marine protected areas, including marine reserve, marine park and marine national park.

While all the marine protected areas in Victoria are managed for multiple uses, for the purposes of this investigation a distinction is made between highly protected or 'no-take' areas, where extractive uses are not permitted, and 'multiple-use' marine protected areas, where extractive uses such as fishing are usually allowed.

In October 2011, the Victorian Government requested that the Victorian Environmental Assessment Council (VEAC) carry out an investigation into the outcomes of the establishment of Victoria's existing marine protected areas. The terms of reference for the investigation are set out in box 1.

In November 2012, VEAC released a discussion paper that outlined its proposed approach to conducting the assessment requested in the terms of reference and invited public comments. A draft proposals paper containing Council's draft recommendations was released for public comment in November 2013.

Box 1 Terms of reference

Pursuant to section 15 of the *Victorian Environmental Assessment Council Act 2001*, the Minister for Environment and Climate Change requests the Council to carry out an investigation into the outcomes of the establishment of Victoria's existing marine protected areas[#].

The purpose of the marine investigation is to examine and provide assessment of:

(a) the performance and management of existing marine protected areas in meeting the purposes for which they were established, particularly the protection of the natural environment, indigenous flora and fauna and other natural and historic values; and

(b) any ongoing threats or challenges to the effective management of existing marine protected areas, particularly in relation to the biodiversity and ecological outcomes.

In addition to the considerations in section 18 of the *Victorian Environmental Assessment Council Act 2001*, the Council must take into account the following matters:

i. all relevant State Government policies and strategies, Ministerial statements and reports by the Victorian Auditor-General;

ii. all relevant national and international agreements, policies and strategies, including ecosystem-based management approaches; and

iii. relevant regional programs, strategies and plans.

Three public submission periods are to be held and a discussion paper and a draft proposals paper are to be prepared.

The Council must report on the completed investigation by February 2014.[1]

[#] For this investigation, the marine protected areas means the 13 marine national parks, 11 marine sanctuaries, and six marine parks, marine reserves or marine and coastal parks established under schedules seven, eight and four respectively of the *National Parks Act 1975*.

[1] In August 2013 the Minister extended the completion date for the investigation to 30 April 2014.

1.2 The Victorian Environmental Assessment Council

The *Victorian Environmental Assessment Council Act 2001* (VEAC Act) repealed the *Environment Conservation Council Act 1997* and established the Victorian Environmental Assessment Council to conduct investigations and make recommendations relating to the protection and ecologically sustainable management of the environment and natural resources of public land.

The current five members appointed to VEAC are Hon. Phil Honeywood (Chairperson), Mr Ian Harris, Dr Charles Meredith, Mr Ian Munro PSM and Ms Angela Reidy. A brief biography of each of the Council members can be found on VEAC's website. The Council is supported by a small research, policy and administrative secretariat.

The VEAC Act requires the Council to consult with departments and public authorities, and requires departments and public authorities to give practicable assistance to the Council in carrying out investigations. However, VEAC papers and reports are prepared independently.

The Council conducts its affairs in accordance with the VEAC Act. In particular, section 18 specifies that: Council must have regard to the following considerations in carrying out an investigation and in making recommendations to the Minister:

a. the principles of ecologically sustainable development;

b. the need to conserve and protect biological diversity;

c. the need to conserve and protect any areas which have ecological, natural, landscape or cultural interest or significance, recreational value or geological or geomorphological significance;

d. the need to provide for the creation and preservation of a comprehensive, adequate and representative system of parks and reserves within Victoria;

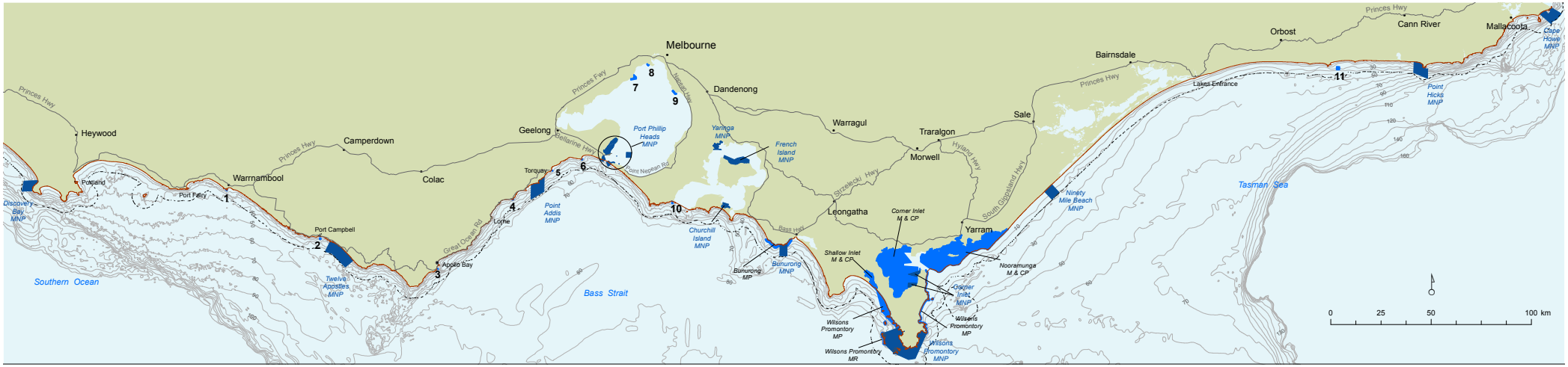
e. the existence of any international treaty ratified by the Commonwealth of Australia which is relevant to the investigation;

f. any agreement at a national, interstate or local government level into which the Government of Victoria has entered, or under which the Government of Victoria has undertaken any obligation in conjunction with the Commonwealth, a State, Territory or municipal council, which relates to the subject matter of the investigation;

g. the potential environmental, social and economic consequences of implementing the proposed recommendations; and

h. any existing or proposed use of the environment or natural resources

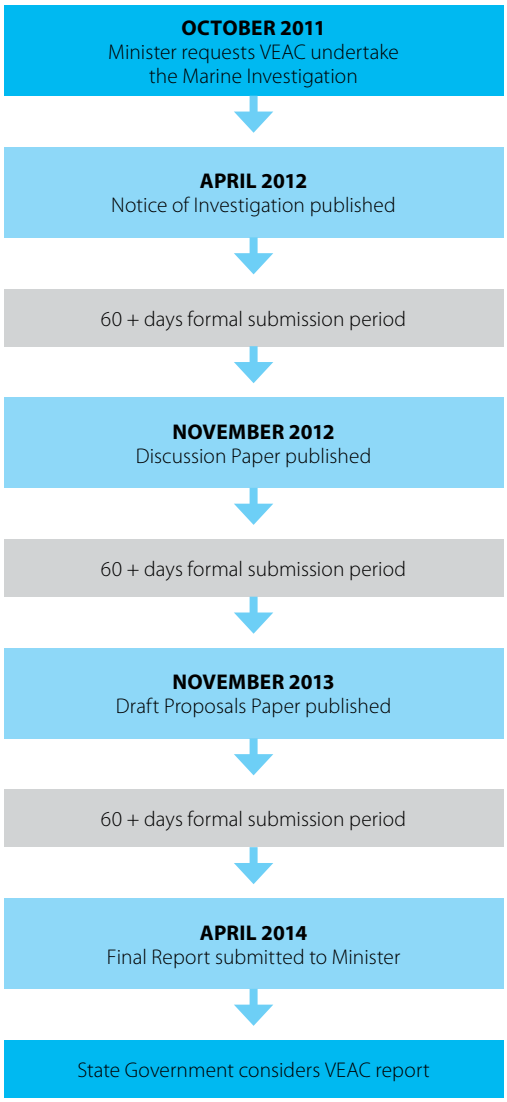
Figure 2
Victoria's marine protected areas



1.3 The investigation process

The process for this investigation is specified in both the VEAC Act and the terms of reference for the investigation. The process and timeline are shown in figure 3 and include three formal submission periods of more than the minimum 60 days required under the Act. The terms of reference specify that VEAC is to release a discussion paper, a draft proposals paper and submit a final report.

Figure 3
Investigation process and timeline



Under section 13 of the VEAC Act, a Community Reference Group (CRG) is required to be established for each of VEAC's investigations. Members are listed on the inside front cover of this report. See section 3.1.2 for more information about the CRG for the Marine Investigation.

Under section 12 of the VEAC Act, the Council may appoint any committees that it considers necessary. For the Marine Investigation, VEAC has established a Scientific Advisory Committee. Members are listed on the inside front cover of this report. See section 3.2.1 for more information about the Scientific Advisory Committee.

1.3.1 STRUCTURE OF THIS REPORT IN RELATION TO THE TERMS OF REFERENCE

Term of reference (a) requires an assessment of performance and management of Victoria's marine protected areas in meeting the purposes for which they were established. The emphasis is on purposes relating to protection of ecological values.

- Assessment of management towards achieving ecological purposes is provided in:
  - chapter 6 for no-take areas
  - chapter 8 for multiple-use areas.
- Assessment of performance towards achieving ecological purposes is provided in chapters 7 and 8. Assessment of management and performance towards achieving social purposes is provided in chapter 9.
- Term of reference (b) requires an assessment of ongoing threats and challenges to the effective management of Victoria's marine protected areas. Again, the emphasis is on the ecological objectives of establishing these areas.
- Assessment of environmental threats to achieving ecological purposes is provided in section 5.3.
- Assessment of management challenges towards achieving ecological purposes is included in chapter 6.

The terms of reference also required several matters to be taken into account.

- National, international, State and regional policies and strategies are outlined in chapter 2.
- Reports by the Victorian Auditor-General and other relevant reports, programs and plans are drawn on throughout the report.

1.4 Scope of the investigation

The Victorian Government requested that VEAC investigate the outcomes of the establishment of Victoria's existing marine protected areas. Broadly, and with particular emphasis on ecological aspects, VEAC was asked to examine and assess:

- the performance and management of existing marine protected areas in meeting the purposes for which they were established
- any ongoing threats and challenges to the effective management of existing marine protected areas.

Unless otherwise determined by legislation, State governments are responsible for marine environments up to three nautical miles (about 5.5 kilometres) seaward from the territorial sea baseline. The territorial sea baseline depends on the shape of the coastline in any given locality, but along most of Australia's coast it is the low water mark.

The terms of reference specify the existing marine protected areas within Victorian waters that are subject to the assessment. It should be noted that some of the marine and coastal parks include substantial areas of land. The public land between high and low water within Victoria's terrestrial parks system is not part of the investigation unless it is within a marine protected area listed in the terms of reference. Commonwealth marine reserves offshore from Victoria are not within the scope of the investigation. However, the broader marine environment, as well as the coast and catchments, were considered to the extent that they were relevant to examining management effectiveness or threats and challenges arising from outside the boundary of the marine protected areas.

This investigation is not typical of previous VEAC investigations, which have focused on public land use in an area, resulting in recommendations for specific areas of public land or water to be used for a range of specific purposes. Rather, it is an evaluation of the performance and management of part of Victoria's existing public land estate, and an assessment of any threats and challenges to effective management.

1.4.1 VICTORIA'S EXISTING MARINE PROTECTED AREAS

The existing marine protected areas in Victoria cover about 11.7 per cent of Victorian waters (see figure 2). While all the marine protected areas in Victoria are managed for multiple uses, for the purposes of this investigation VEAC has distinguished between highly protected or 'no-take' areas, where no extractive uses are permitted, and 'multiple-use' marine protected areas, where extractive uses such as fishing are usually allowed.

The existing marine protected areas considered in this investigation are:

- no-take areas: 13 marine national parks and 11 marine sanctuaries
- multiple-use areas: three marine and coastal parks, two marine parks and one marine reserve.

All the marine protected areas in Victoria are 'parks' under the *National Parks Act 1975* and are managed by Parks Victoria. Commercial and recreational fishing in the multiple-use areas is managed under the *Fisheries Act 1995* by the Department of Environment and Primary Industries

The first marine protected areas declared in Victoria were the five small Harold Holt Marine Reserves at the southern end of Port Phillip Bay that were established in 1979 under fisheries legislation. An additional reserve was created in 1982 under fisheries legislation on the western shoreline of Port Phillip Bay at Point Cook.

In 1982, the Land Conservation Council recommended that one marine reserve and three marine and wildlife reserves be established around Wilsons Promontory. The Victorian Government announced its intention to establish these reserves and conducted further consultation before establishing five large marine protected areas in 1986 under Crown lands and national parks legislation.

The Bunurong Marine Park near Inverloch was established in 1991 using a mosaic of Crown lands, national parks and fisheries legislation.

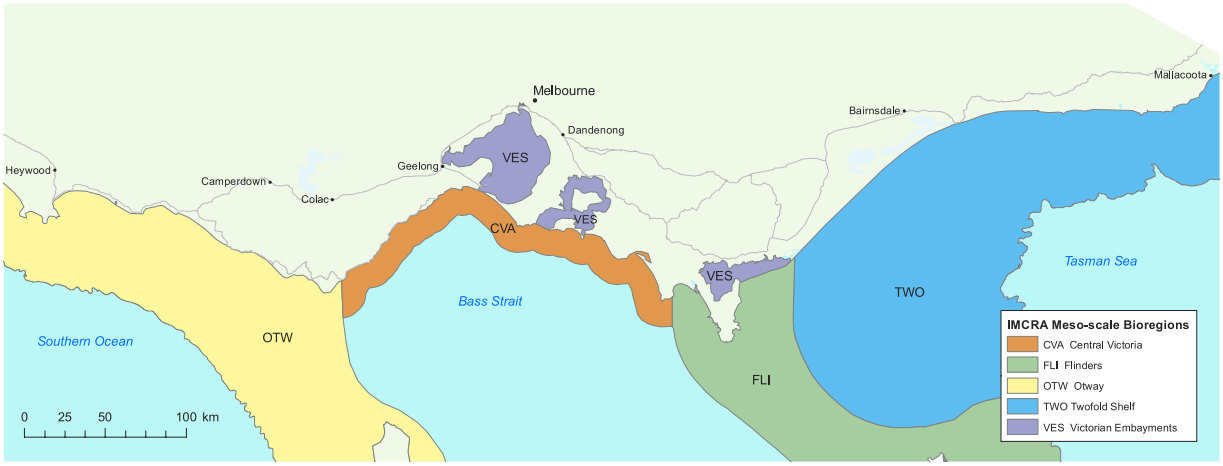
Victoria's no-take marine protected areas system was established in 2002 following the recommendations of the then Environment Conservation Council (ECC) in its *Marine, Coastal and Estuarine Investigation Final Report*. Important factors in the ECC's recommendations for a comprehensive, adequate and representative system of the marine protected areas were that the range of habitats within each of the five biophysical regions in Victoria was represented (comprehensiveness) and that more than one example of major habitats was included to incorporate the range of variability within each habitat type (representativeness) and to guard against loss due to unforeseen or catastrophic events (adequacy).

The ECC recommendations took into account a nationally agreed regional ecosystem-based classification for the Australian marine environment that recognises five biophysical regions in Victoria. The classification known then as the Interim Marine and Coastal Regionalisation of Australia (IMCRA version 3.3) and now as the Integrated Marine and Coastal Regionalisation of Australia (IMCRA version 4.0) is a spatial framework for classifying Australia's marine environment into bioregions at a scale useful for regional planning. The five IMCRA bioregions in Victoria are: Otway, Central Victoria, Victorian Embayments, Flinders and Twofold Shelf (see figure 4).

The multiple-use areas are concentrated in South Gippsland, within the Central Victorian, Flinders, and Victorian Embayment marine bioregions.

Further information about the history of Victoria's marine protected areas can be found in VEAC's discussion paper published in 2012.

Figure 4
IMCRA bioregions in Victoria



1.4.2 PROTECTED AREA ESTABLISHMENT PURPOSES

For the purposes of this investigation, specific establishment purposes for Victoria's existing marine protected areas were consolidated into two broad categories: ecological purposes and social purposes.

These purposes are identified in a number of source documents and were expressed in a number of different ways. The specific establishment purposes for the no-take marine protected areas are broadly interpreted as to:

- protect natural ecosystems including biodiversity, natural processes, indigenous flora and fauna, and features of scenic, archaeological, ecological, geological, historic or other scientific interest
- provide opportunities for recreation and education associated with enjoyment and understanding of natural environments where consistent with the above.

Maintenance of natural ecosystems as a reference for comparison with unprotected areas was an additional explicit purpose of the marine national parks. The no-take marine protected areas were also intended to contribute to the national representative system of the marine protected areas.

The purposes of the multiple-use marine protected areas can also be drawn from a number of authorities. Unlike the no-take marine protected areas, there are individual differences between multiple-use marine protected areas in the documented purposes for which they were established. The specific details relevant to each multiple-use marine protected area were explored in the discussion paper for the investigation.

The establishment purposes for the multiple-use marine protected areas were consolidated as to:

- protect areas containing significant natural ecosystems (including the habitat of international migratory waders in Nooramunga, Corner Inlet and Shallow Inlet) for their ecological significance, natural interest or beauty, scientific history and/or archaeological interest
- provide opportunities for recreation and education associated with enjoyment and understanding of natural environments.

Integral to the establishment of these areas was recognition of significant ecological values that need to be managed in a way that accommodates extractive use of resources, including – but not limited to – commercial and recreational fishing. These areas are also considered to supplement Victoria's contribution to the national representative system of the marine protected areas.

Although not specifically referred to in the purposes of establishment, the investigation provides a timely opportunity to consider best practice approaches to recognising Aboriginal interests in the marine protected areas and ways to engage Aboriginal people in management of the areas.

2. Policy context

The terms of reference for the investigation require that Council take into account all relevant State Government policies and strategies, Ministerial statements and reports by the Victorian Auditor-General; all relevant national and international agreements, policies and strategies, including ecosystem-based management approaches; and relevant regional programs, strategies and plans.

Many international, national, state and regional government policies and strategies have informed the investigation. Key policies, strategies and programs particularly relevant to the terms of reference – and that were considered during the investigation – are set out in table 1.

Table 1
Policy context

	Policy/strategy	Description
International and national context	**Convention on Biological Diversity and National Representative System of Marine Protected Areas (NRSMPA)**	Australia signed the Convention on Biological Diversity in 1992 and ratified it in June 1993. The NRSMPA helps to meet Australia's responsibilities and obligations as a signatory to the Convention and the major components of the Jakarta Mandate developed under that Convention. The NRSMPA reflected Australia's commitment to establish a representative network of marine reserves by 2012 and supported other national commitments under the Inter-governmental Agreement on the Environment (1992). The NRSMPA is implemented through the National Strategy for Ecologically Sustainable Development (1992) and the National Strategy for the Conservation of Australia's Biological Diversity (1996). Some state jurisdictions have created networks or marine reserves; others continue to work towards their establishment. The South-east Commonwealth Marine Reserves Network was established in 2007 and is made up of 14 marine reserves in Commonwealth waters, including three reserves adjacent to Victoria. More information on the policy basis for the NRSMPA can be found at www.environment.gov.au.

International and national context	Policy/strategy	Description
	Ramsar Convention and other international agreements to protect migratory shorebirds and their habitat	The Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) was signed in Ramsar, Iran, in 1971. It aims to halt the worldwide loss of wetlands and to conserve those that remain. Victoria has 11 Ramsar sites, five of which are marine and coastal: Corner Inlet, Gippsland Lakes, Port Phillip Bay (Western Shoreline) and Bellarine Peninsula, Edithvale-Seaford Wetlands and Western Port. A Strategic Directions Statement (2002) and management plans for individual Ramsar sites can be found at www.depi.vic.gov.au. The Australian Government signed the Convention on Migratory Species in 1991 and is also a party to bilateral migratory bird agreements with Japan, China and the Republic of Korea. The East Asian-Australasian Flyway Partnership (launched in 2006) aims to identify and conserve migratory waterbirds in the East Asian – Australasian Flyway. Shallow Inlet, Corner Inlet, Western Port, the western shoreline of Port Phillip Bay and the Bellarine Peninsula, and Discovery Bay are listed as shorebird sites on the East Asian-Australasian Flyway Site Network. The *Environment Protection and Biodiversity Act 1999* (EPBC Act) provides for protection of migratory waterbirds in Australia as a matter of national environmental significance. The Act also provides for the development of plans to conserve listed species, of which the Wildlife Conservation Plan for Migratory Shorebirds was the first to be made in February 2006. Although without legal status, 20 marine and coastal areas in Victoria have been identified by Birdlife International and Birds Australia as Important Bird Areas. Many of these coincide with Ramsar sites.
	Fisheries management	Victoria's export fisheries include abalone, giant crab, rock lobster, scallop and sea urchin. The EPBC Act requires the Australian Government to assess the environmental performance of fisheries and promote ecologically sustainable fisheries management. An independent assessment of all fisheries managed under Commonwealth legislation and all state export fisheries is required. Assessments are conducted against the 2nd edition of the Guidelines for the Ecologically Sustainable Management of Fisheries, revised in 2007. Without a satisfactory assessment, the fishery will not gain an export permit. To date, all Victorian export fisheries have gained approval. Annual Commonwealth fishery status reports are released by the Australian Bureau of Agricultural and Resource Economics. Assessments of selected fisheries are provided in the 2012 Key Australian fish stocks report released by the Fisheries Research and Development Corporation, available from www.frdc.com.au.
	Planning for climate change	The National Climate Change Adaptation Framework (the COAG Framework) guides government action on adaptation over the five to seven year period from 2007 and was endorsed by the Council of Australian Governments (COAG) in April 2007. The National Climate Change Action Plan for Fisheries and Aquaculture was endorsed by the Natural Resource Management Ministerial Council in November 2010. More information can be found at www.daff.gov.au. Consistent with this approach, Fisheries Victoria prepared the Victorian Climate Change Strategy for Fisheries and Aquaculture 2008-2018, which covers all commercial, recreational and Indigenous fishing as well as aquaculture. The strategy is available at www.depi.vic.gov.au.

	Policy/strategy	Description
International and national context	**Commonwealth marine bioregional planning**	The South-east Marine Region covers only Commonwealth waters. The region extends from waters offshore of southern New South Wales to eastern South Australia and includes waters adjacent to Victoria, Tasmania and Macquarie Island. Marine Bioregional Plans aim to improve the way decisions are made under the EPBC Act, particularly in relation to the protection of marine biodiversity and the sustainable use of Australia's oceans and their resources by marine based industries. A Regional Marine Plan for the South-east Marine Region was completed in 2004 (under an earlier regional marine planning process). A network of Commonwealth marine reserves for the South-east Marine Region was established in 2007. Three reserves are adjacent to Victoria: the Apollo Commonwealth Marine Reserve (off Apollo Bay on Victoria's west coast), Beagle Commonwealth Marine Reserve (within Bass Strait, with its north-western edge abutting Victorian waters to the south-east of Wilsons Promontory) and the East Gippsland Commonwealth Marine Reserve (lying offshore of the north-east corner of Victoria on the continental shelf and escarpment). The reserves are managed through the South-east Commonwealth Marine Reserves Network Management Plan 2013-23, which sets out the zoning, allowable activities and rules for use within the reserves. The plan can be found at www.environment.gov.au.
	State of the Environment reporting	The national State of the Environment 2011 report contained separate sections on marine and coastal environments, using a variety of environmental indicators to assess trends in marine and coastal biodiversity and ecosystem health. The report also considered pressures on these environments and the effectiveness of their management. The report is available from www.environment.gov.au.
State and regional context	**Victorian Auditor-General's reports**	The performance audit delivered in March 2011 and undertaken by the Victorian Auditor-General's Office (VAGO) – *Environmental management of marine protected areas* – examined how effectively the marine protected areas have been managed to protect biodiversity. It assessed Parks Victoria on its planning frameworks, management activities and monitoring, evaluation and reporting activities relevant to the marine protected areas. It also assessed the then Department of Sustainability and Environment's role in marine policy and marine biosecurity, and fishing compliance activities performed by the then Department of Primary Industries in the marine protected areas. Other relevant VAGO performance audits include *Environment and Sustainability Sector: Performance Reporting* (June 2013), *Effectiveness of Compliance Activities: Departments of Primary Industries and Sustainability and Environment* (October 2012) and *Control of Invasive Plants and Animals in Victoria's Parks* (May 2010). All audits are available from www.audit.vic.gov.au.

State and regional context

Policy/strategy	Description
Environment protection policies	State environment protection policies (SEPPs) are subordinate legislation prepared by the Environment Protection Authority under the provisions of the *Environment Protection Act 1970*. These policies aim to safeguard environmental values and human activities (beneficial uses) that need protection from the effect of pollution and waste. The SEPP (Waters of Victoria) sets the framework for the protection and rehabilitation of Victoria's surface water environments. Like SEPPs, waste management policies are legal tools made under the Environment Protection Act. The Waste Management Policy (Ships' Ballast Water) aims to protect Victoria's environment from marine pests introduced via domestic ballast water and applies to all ships entering the state's waters.
Climate change programs	A number of Victorian policies and programs relate to climate change (see www.climatechange.vic.gov.au). The *Climate Change Act 2010* recognises that Victoria's climate is changing and prescribes a biennial report on climate change and greenhouse gas emissions in Victoria, the first of which was tabled in 2012. The Victorian Climate Change Strategy for Fisheries and Aquaculture 2008-2018 provides future direction for activities related to climate change. The Future Coasts Program, completed in 2013, aimed to improve understanding of and planning for the risks associated with sea level rise and storm surge. The Victorian Coastal Inundation Dataset and the Victorian Coastal Hazard Guide are now available and provide mapping and guidance about the potential risks from sea level rise along the Victorian coast.
Victorian Coastal Strategy	The Victorian Coastal Strategy is prepared for the Victorian Government by the Victorian Coastal Council under the provisions of the *Coastal Management Act 1995*. The draft Victorian Coastal Strategy 2013 sets a long-term vision for the coast and proposes policies and actions to guide decisions about its management over the next five years. The draft strategy identifies a number of priority actions to progress knowledge, capacity and effectiveness in maintaining a healthy coastal and marine environment. This strategy applies to all Victorian coastal waters and all private and coastal Crown land directly influenced by the sea or directly influencing the coastline. Amongst other responsibilities, regional coastal boards develop coastal action plans and support implementation of the strategy. The draft 2013 strategy is available at http://vcc.leadingedgehosting.com.au.
Environmental partnerships	The Victorian Government's Environmental Partnerships Program covers a range of government, corporate and community projects aimed at protecting and conserving the environment. One of the program's eight key principles is to 'maintain healthy biodiversity and productive landscapes from catchment to coast'. The launch of the Cleaner Yarra River and Port Phillip Bay Plan of Action in October 2012, the completion of 21 pollution hotspots investigations and the preparation and release of the Port Phillip Bay Algal Bloom Response Protocol are part of implementing that key principle.

State and regional context

Policy/strategy	Description
Victorian Waterway Management Strategy	The Victorian Waterway Management Strategy is an integrated management framework for Victoria's rivers, estuaries and wetlands. The framework, developed by the Department of Environment and Primary Industries in 2013, aims to create the level of environmental condition needed to sustain key environmental, social and economic values. Management actions are targeted towards protecting or improving the environmental condition of priority waterways to provide public benefits. For estuaries, the strategy aims to integrate their management with rivers and wetlands, clarify organisational responsibilities, improve their environmental condition, set water quality objectives, enhance knowledge and engage the community in estuary management. Estuary management plans are being prepared as part of regional waterway strategies.
Regional catchment strategies	Regional catchment strategies cover the development, management and conservation of land and water resources in each of the ten catchment regions in Victoria. Five catchment regions are coastal: Glenelg Hopkins, Corangamite, Port Phillip and Westernport, West Gippsland and East Gippsland. The strategies are prepared by catchment management authorities under the *Catchment and Land Protection Act 1994* and set objectives and measures to improve the quality of the land and water resources of the catchments in the region and treat land degradation. Revised regional catchment strategies for those regions with coastal boundaries were approved in 2013 for all but Port Phillip and Westernport, which currently awaits approval.
Fisheries management	Under the *Fisheries Act 1995*, Fisheries Victoria is tasked with managing fisheries resources 'in an effective and ecologically sustainable manner' and working 'to protect and conserve fisheries resources, habitats and ecosystems'. In 2011, the agency released a draft Future Fisheries Strategy: proposal for reform, which sets out a 15-year vision for fisheries management. The strategy is on hold, pending further review, and has been replaced by a draft Fisheries Positioning Statement that sets out three strategic directions – securing the fish, sharing the fish and growing the value – underpinned by the principles of ecologically sustainable development. The statement can be found at www.depi.vic.gov.au.
State of the Environment reporting	The 2013 Victorian State of the Environment Report was prepared under the *Commissioner for Environmental Sustainability Act 2003* and contains a section on marine and coastal environments. The purpose of the report is to 'inform the Victorian community about the health of the natural environment and influence government to achieve environmental, social, cultural and economic sustainability', and it contains a number of goals with recommendations on organisational, regulatory and policy changes. Under the Act, the Victorian Government must respond to the recommendations within 12 months of the tabling of the report. The 2013 report is available at www.ces.vic.gov.au.

3. Community views and specialist advice

Consultation with the community, scientists and government authorities was an important aspect of the investigation. VEAC sought input from a number of sources and the information gained from all these sources provided valuable information and insights relevant to the terms of reference for the investigation.

3.1 Public consultation

3.1.1 WRITTEN SUBMISSIONS

The submissions process is one of the key methods used by VEAC to seek community views about an investigation. There were three formal public submission periods for the Marine Investigation.

- Following the advertisement of the notice of investigation in April 2012, VEAC received 104 submissions. The submissions covered a wide range of issues relating to Victoria's marine protected areas and marine environment.
- The second submission period followed publication of the discussion paper in November 2012. Thirty-eight submissions were received in response to the discussion paper. These submissions were taken into account in the preparation of the draft proposals paper for the investigation, released for public comment in November 2013.
- VEAC received 177 submissions during the third submission period in response to the draft proposals paper. A summary of the comments and issues from the third submission period is provided below.

3.1.2 COMMUNITY REFERENCE GROUP

VEAC also sought community views through a Community Reference Group, which was established in accordance with section 13 of the VEAC Act. The group's members represented a broad range of interests related to the investigation, and provided advice and input to VEAC on many issues. Members are listed on the inside front cover of this report. Input from the Community Reference Group is included in the discussion below.

3.1.3 OVERVIEW OF COMMENTS AND ISSUES RAISED IN PUBLIC CONSULTATION

More than 150 of the 177 submissions received in response to the draft proposals paper were from individuals. The remaining submissions were from organisations including commercial fishing groups, environment groups, Friends groups, businesses, Aboriginal organisations, and Victorian Government departments and agencies. Submissions can be viewed at VEAC's website.

A number of the submissions were from individuals concerned about the increasing popularity of pipi harvesting at Venus Bay. Pipi harvesting has been an escalating issue for the Venus Bay community in recent years. Concerns were expressed not only about the impact of this activity on the small coastal community, but also about the unsustainable harvesting of pipis.

3.1.4 COMMUNITY VIEWS ON DRAFT RECOMMENDATIONS

The submissions provided VEAC with valuable community feedback on the 19 recommendations in the draft proposals paper. Around 90 per cent of submissions commented on the draft recommendations. VEAC also received a number of submissions covering wider issues relating to Victoria's marine protected areas and marine environment.

Draft recommendation R7, which addressed monitoring to guide adaptive management, received the most comments. Friends, conservation and recreation groups showed a particular interest in this recommendation and were keen to demonstrate how community groups could play a greater role in monitoring activities and conditions.

The CRG met five times during the investigation and were an important part of VEAC's public consultation program. The CRG provided advice to Council on the benefits of community involvement in monitoring programs. The group also made a valuable contribution to the development of communication strategies by assisting Council with ways to engage the local community.

The CRG advised Council that its stakeholder groups wanted an authoritative assessment developed with support from the scientific community. The group felt that the wider community would be more interested in the broad outcomes of the assessment.

In preparing its final report, Council has carefully considered all public submissions and advice from the CRG, paying particular attention to major issues of concern and interest within the scope of the terms of reference for the investigation. As a result, a number of recommendations proposed in the draft report have been simplified or clarified.

3.2 Specialist advice

Because of the technical complexity of the investigation, its scientific inputs and associated quality assurance processes were important (see chapter 4 for more information).

3.2.1 SCIENTIFIC ADVISORY COMMITTEE

VEAC obtained expert advice to inform the investigation through a Scientific Advisory Committee (SAC). It advised on current scientific research and data applicable to the investigation, techniques and approaches that would assist VEAC in the conduct of the investigation, and key gaps in any relevant scientific knowledge that could be addressed by research in the short or long term. Members are listed on the inside front cover of this report. The SAC provided input to the investigation during three formal meetings and via out-of-session correspondence.

3.2.2 SPECIALIST CONSULTANCIES

VEAC commissioned nine consultancies to provide specific technical reviews and/or undertake projects to inform the investigation. Funding for these consultancies was provided by the Victorian Government's Natural Resources Investment Program in 2011-12. Peer review processes were used for quality assurance, including review by the Scientific Advisory Committee where relevant. As well as informing the investigation, the consultancy reports listed below will be a useful ongoing resource for protected area management.

- Carnell, P and Longmore, A (2014) *Resilience of Victorian reefs to climate change: an investigation utilising the sub-tidal reef monitoring program*
- Curtis, A. and Davidson, P. (2013) *A review of the concepts of enjoyment, appreciation and understanding as applied to Victoria's marine protected areas*
- Fairweather, P. (2012) *Assessing the outcomes of Victoria's existing marine protected areas for biodiversity and ecological processes – a critical review of contemporary relevant scientific approaches and literature,* 'Part 1: Attributes and indicators for assessing the outcomes from Victoria's marine protected areas'
- Fairweather, P. (2012) *Assessing the outcomes of Victoria's existing marine protected areas for biodiversity and ecological processes – a critical review of contemporary relevant scientific approaches and literature,* 'Part 2: Review of existing scientific assessments of ecological outcomes from marine protected areas'
- Jenkins, G. (2013a) *Assessment of anthropogenic threats to priority areas in Victoria's marine environment – refined threat assessment approach,* Edition 2
- Jenkins, G. (2013b) *Assessment of anthropogenic threats to marine protected areas in Victoria*
- Longmore, A. (2013) *Spatial and temporal scales of key ecological processes important to biodiversity in marine protected areas*
- Morris, L. and Bathgate, R. (2013) *Potential effects of climate change in Victoria's marine protected areas*
- Smyth, D. (2013) *Best practice recognition and engagement of Aboriginal Traditional Owners and other Indigenous people in the use and management of Victoria's marine protected areas: A discussion paper for the Victorian Environment Assessment Council*
- Wakelin-King, G. and White, S. (2013) *Sites of geological and geomorphological significance in the VEAC Marine Investigation area: a report to the Victorian Environmental Assessment Council*

These reports are available on VEAC's website.

4. How performance and management were assessed

PART B

This chapter describes how the management and performance of the marine protected areas were assessed. This includes how VEAC:

- grouped the marine protected areas for assessment
- considered the different purposes of the areas (ecological and social)
- assessed the management and performance of each group of areas in achieving each purpose.

The assessment was guided by the international framework for evaluating the effectiveness of protected area management, developed by the International Union for Conservation of Nature (IUCN), with the World Commission on Protected Areas (WCPA).[2] The framework provides a broad, common structure for examining each stage of the adaptive management cycle, including outcome or performance. The IUCN-WCPA intended that suitable methods for individual assessments would be tailored within this broad framework. This chapter provides an overview of the IUCN-WCPA framework and how it was applied to VEAC's assessment.

4.1 Grouping areas and purposes for assessment

Clear objectives are fundamental for assessing management and performance. Victoria's marine protected areas fall into two groups: no-take areas and multiple-use areas. No-take areas are Victoria's 13 marine national parks and 11 marine sanctuaries; multiple-use areas are the three marine and coastal parks, two marine parks and one marine reserve in the Gippsland area (see figure 2 in Part A). Each group of areas was established to achieve several purposes.

As discussed earlier in the report, VEAC distinguished three groups of purposes for its assessment. Some of these groups were similar for the no-take and multiple-use areas. Other purposes differed significantly. This influenced whether the no-take and multiple use areas were considered together or separately in VEAC's assessment of management and performance in achieving each group of purposes. The purposes for which Victoria's existing marine protected areas were established are documented in several places with different sources of authority.[3] The most authoritative definition is in the *National Parks Act 1975*. Drawing on this information, VEAC used two groups of purposes as a focus for the investigation:

- ecological purposes: broadly expressed as conservation of biodiversity and ecological processes
- social purposes: relate to enjoyment, appreciation and understanding of the natural environment.

While these groups of purposes apply to both no-take and multiple-use areas, there is an important difference. The biodiversity and ecological processes of the multiple-use areas are intended to be conserved in a way that accommodates extractive use of resources including fishing. Extraction of flora and fauna, including fish, is not allowed in the no-take areas.

The IUCN-WCPA framework emphasises the need to focus assessments on clear management objectives.[2] For these reasons, VEAC considered ecological and social purposes separately and developed specific definitions of purposes in consultation with scientific experts for use in the assessment.

Aboriginal cultural interests

While Aboriginal cultural interests were not among the stated purposes for establishing Victoria's marine protected areas, Section 18(c) of the VEAC Act requires the Council to have regard to 'the need to conserve and protect any areas which have ecological, natural, landscape or cultural interest or significance, recreational value or geological or geomorphological significance' in carrying out an investigation. For the Marine Investigation, this includes the interests of Aboriginal people in the environment, resources and cultural sites of their sea country in the marine protected areas.

The relationship between Aboriginal people and the biodiversity of these areas is not well documented. The extensive consultation required to describe this relationship, and explore the aspirations of Aboriginal people for the marine protected areas, was beyond the scope of this investigation. Rather than assessing management of the marine protected areas with respect to Aboriginal cultural interest or significance, VEAC explored some of the tools that have been, or could be, applied to recognising the interests of Aboriginal people to inform future consultation and management.

4.1.1 THE GROUPINGS USED FOR THE ASSESSMENT

There are significant differences in ecological purposes, management regimes and history between the no-take and multiple-use areas. VEAC separately assessed the management and performance of each group of areas in achieving its ecological purposes. A common assessment was applied to their common social purposes. Table 2 summarises how VEAC grouped the areas and purposes for assessment.

While VEAC focused on the groups of no-take and multiple-use areas, and not on individual areas, significant smaller scale management issues were highlighted. For example, some multiple-use areas contain coastal land while others include only marine waters. These areas have similar ecological purposes and were assessed together. Any effects of differences in the composition, names, histories or boundaries on management of the areas were factored into VEAC's assessment.

Table 2 Summary of how the establishment purposes and types of marine protected areas were considered in VEAC's assessment

Establishment purpose	Assessment conducted
Ecological purposes	Assessment for no-take areas (chapters 5 to 7) Assessment for multiple-use areas (chapter 8)
Social purposes	Common assessment across no-take and multiple-use areas (chapter 9)
Aboriginal cultural interests	Not assessed. Explored in chapter 10 to inform future consultation and management.

4.2 International management evaluation framework for protected areas

4.2.1 ABOUT THE IUCN-WCPA FRAMEWORK

The IUCN-WCPA framework for evaluating management effectiveness is part of a series of best practice guidelines for protected area management. It provides a structure for evaluating management effectiveness, using the stages of the adaptive management cycle. The framework was developed to support progress towards the goal of evaluating and improving protected area management, as set in the Convention on Biological Diversity.

The framework provides for tailoring suitable methods for individual assessments, taking into account the assessment's purpose, audience and circumstances. IUCN-WCPA has developed guidelines to assist in using the framework, but emphasises that individual assessments should focus on the specific purpose that management is aiming to achieve.

The IUCN-WCPA framework provides an assessment structure with six distinct stages: context, planning, inputs, processes, outputs and outcomes. The consecutive stages of the cycle are not independent and each stage is a means to an end, not an end in itself.

Global experience in protected area management evaluation

Thousands of assessments have been conducted globally using the IUCN-WCPA framework. Most have been performed by managers of areas to guide their programs or by investors in conservation to identify funding priorities. Usually, these assessments have been relatively quick and simple exercises and several supporting guides have been developed.[4-9] Detailed assessments of management effectiveness for protected areas, such as this investigation, are rare due to the substantial time and resources required.

The purpose, audience and circumstances of the Marine Investigation differ from most other case studies. VEAC adapted relevant measures from a global compilation of case studies to meet the needs of this assessment.[4]

The IUCN and WCPA

The International Union for Conservation of Nature (IUCN) is the world's largest professional global conservation network and is considered a leading authority on the environment. The IUCN administers the World Commission on Protected Areas (WCPA), which is considered the global leader in protected area expertise.

4.2.2 TAILORING A SPECIFIC ASSESSMENT METHOD WITHIN THE FRAMEWORK

VEAC's assessment method was guided by the terms of reference for the investigation but drew on the key IUCN-WCPA resource documents and case studies.

The effectiveness of protected area management can be assessed at a variety of levels, depending on the purpose. The IUCN-WCPA framework is often used by park managers to evaluate the effectiveness of their own short-term management programs and to guide continual improvement. The Marine Investigation differed from these evaluations in several ways. It was conducted by an independent Council reporting directly to government. The terms of reference for the investigation focused on long-term management across all of Victoria's marine protected areas, and required identification of ongoing threats and challenges to effective management. Rapid assessment methods or generic evaluation measures are not appropriate in these circumstances. Accordingly, VEAC's assessment focused on the management systems currently applied to the no-take and to the multiple-use areas. It considered the capacity of these management systems to address both current and future threats and challenges.

4.2.3 GATHERING AND INTERPRETING INFORMATION

VEAC gathered the information necessary for its qualitative assessment of each of the management stages by investigation, enquiry and engaging expert advice. It focused on information that was:

- relevant, i.e. aligned with the purpose and terms of reference of the assessment
- clear and well documented
- representative of the broader marine protected area system or its management.

Where it was not possible to find information that met these criteria, VEAC adapted its approach (for example, by using interviews and case studies). The Victorian Auditor-General's relatively recent audits of the marine protected area management and compliance provided important information for the assessment.[10] [11]

Expert advice and quality assurance

The quality of technical information used in the assessment was critical, particularly for assessing the performance of the marine protected areas. VEAC assured the quality of the technical information used in the investigation by:

- using the IUCN-WCPA framework and associated resources for evaluating management effectiveness
- obtaining advice and review from a committee of scientists with nationally and internationally recognised expertise relating to the marine protected areas
- commissioning expert technical consultancies, supported by peer review wherever possible, to provide specific information inputs.

4.3 Assessment method

4.3.1 THE STAGES OF THE MANAGEMENT CYCLE ASSESSED

VEAC structured its assessment using the stages of the IUCN-WCPA management cycle, but combined some stages to align with the terms of reference. The management stages of the IUCN-WCPA framework are:

- **context:** background information required for planning
- **planning:** objectives and how they will be achieved
- **inputs:** resources available for adequate management
- **process:** the way in which management is conducted
- **outputs:** what has been done
- **outcomes:** what has been achieved, i.e. the impacts or end results of management.

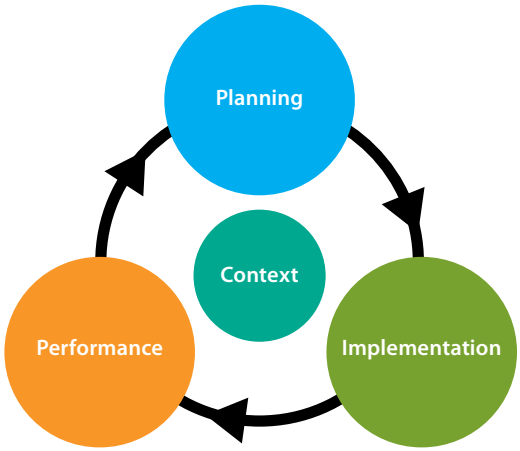
The terms of reference for the investigation specify:

- assessment of management, but not the design, of the marine protected areas
- assessment of the performance of the marine protected areas
- identification of ongoing threats and challenges to effective management.

VEAC grouped some of the IUCN-WCPA management stages (see figure 5), focusing on the:

- **context** in which management of the marine protected areas occurs
- **planning** to guide management of the areas to achieve their purposes
- **implementation** of management activities
- **performance** towards establishment purposes.

Figure 5
Components of VEAC's assessment of performance and management of Victoria's marine protected areas



'Context' was a clear priority for the investigation as the terms of reference focus on both the purposes for which the marine protected areas were established and the ongoing challenges for their management.

'Implementation' of management was also a fundamental aspect of VEAC's assessment. In assessing 'implementation', VEAC consolidated three stages of the IUCN-WCPA framework: 'inputs', 'processes' and 'outputs'. These elements were significantly interlinked over the long period considered by VEAC's investigation. VEAC assessed **'performance'** separately, consistent with the investigation's terms of reference

Council focused its evaluation on identifying the key challenges for management of Victoria's marine protected areas, and on opportunities to address these challenges. The evaluation involved a two-tiered assessment approach. This approach was modelled on an evaluation conducted for the protected area system in Finland. That evaluation involved a preliminary rapid screening, followed by more detailed consideration of issues identified through the screening process.[12] A systematic initial scan was used to identify key issues for further analysis. The measures used in the scan were based on a global review of evaluations of protected area management effectiveness, but adapted to the context within which Victoria's marine protected areas exist and are managed.[4]

How the existing State of the Parks reports relate to VEAC's management assessment

The management system applied to Victoria's no-take marine protected areas includes a periodic management effectiveness assessment conducted by the parks' manager, Parks Victoria. This assessment, which also draws on the IUCN-WCPA framework, has a different focus to this VEAC assessment in many ways. The State of the Parks report is a self-assessment intended to regularly assess Parks Victoria's management effectiveness for the entire estate it manages. In its assessment, VEAC considered these State of the Parks reports as part of the 'implementation' phase of the management systems for the no-take marine protected areas.

4.3.2 APPROACH TO 'CONTEXT'

Most of the key background information for management of Victoria's marine protected areas was available but required consolidation and analysis to guide VEAC's evaluation.

VEAC's analysis included the management context within which Victoria's marine protected areas were established and are managed, and the ecological context within which the areas exist.

Addressing the threats to achieving these purposes is a crucial aspect of management. VEAC conducted new analyses of the current and future threats to the biodiversity of the areas to guide its assessment. Victoria's changing climate is now an important aspect of the ecological context for Victoria's marine protected areas, and was an important element of VEAC's analysis.

IUCN-WCPA envisaged the context element of management effectiveness assessments within its framework to, broadly, include 'the relevant background information needed to plan and implement management and to shape and focus an evaluation on the most important aspects of management.'[2]

4.3.3 APPROACH TO ASSESSMENT OF 'PLANNING'

The role of planning in adaptive management is to guide the implementation of management activities towards desired outcomes. Planning directs management, research, monitoring and reporting. In turn, the implementation of this research, monitoring and reporting guides future planning (see figure 5).

> Management planning involves 'establishing vision, goals, objectives and strategies to conserve values and reduce threats'.[2]

The following aspects of management planning were considered in VEAC's assessment:

- the appropriateness of existing policy to guide current and future planning
- the appropriateness of existing planning to guide mitigation of key threats
- the appropriateness of existing planning to guide research and monitoring.

Many assessments of planning within the IUCN-WCPA framework also consider the design of the protected areas, but this was outside the scope of VEAC's investigation.

VEAC assessed the appropriateness of current policy and planning for guiding current and future management of the marine protected areas towards the purposes for which they were established. While the evaluation drew on international experience with applying the IUCN-WCPA framework, the aim was not simply to compare the approaches applied in Victoria to those commonly applied in other jurisdictions. Rather, VEAC's evaluation looked towards the best practices that could be applied in the long term in Victoria, taking into account the specific context in which Victoria's marine protected areas are situated and managed.

VEAC assessed whether existing planning for Victoria's marine protected areas:

- reflects the ecological and legislative context within which they are situated and managed, and aligns with their ecological purposes
- focuses management on understanding and reducing the most important and treatable threats to achieving the ecological purposes
- responds to relevant legislation and is guided by appropriate policy statements
- is complete, timely, transparent and involves the relevant stakeholders
- is guided by international best practice, best available science and the results of relevant audits and reviews.

The Victorian Auditor-General's Office audited the environmental management of Victoria's marine protected areas in 2011. Progress with the relevant recommendations of this audit was an important consideration for VEAC's assessment. Development of a new planning approach to address these recommendations is still in progress. This affected the extent to which Council could assess current planning as well as the nature of Council's recommendations.

4.3.4 APPROACH TO ASSESSMENT OF 'IMPLEMENTATION'

The role of implementation in adaptive management is to allocate resources, implement activities and deliver outputs towards desired outcomes (i.e. the ecological purposes). It includes implementation of research, monitoring, reporting and review to guide adaptive management.

> Management allocates inputs to work towards objectives, implements management actions according to accepted processes and eventually produces outputs (goods and services which should usually be outlined in management plans and work plans).[2]

As previously discussed, the 'implementation' stage of VEAC's assessment includes the 'inputs', 'processes' and 'outputs' elements of the IUCN-WCPA management cycle. IUCN-WCPA envisaged that these elements of the management cycle would consider, broadly, the resources and processes applied to implementing protected area management, and whether management achieved its intentions.

Implementation of management for the no-take areas is guided by the planning that is evaluated in section 6.1. Due to the interconnected nature of marine ecosystems, it includes some management activities implemented outside, as well as within, the no-take areas.

The following aspects of implementation of management were considered in VEAC's assessment:

- processes for resource allocation to most effectively address the ecological purposes
- processes for reporting, communication and review
- implementation of research and monitoring to guide adaptive management
- management of threats to address specific provisions of the National Parks Act
- implementation of management to address external threats.

In conducting an integrated evaluation of implementation, VEAC drew on international experience in assessing the 'inputs', 'processes' and 'outputs' elements of the IUCN-WCPA framework.[4] As with planning, VEAC's evaluation looked towards the best practices that could be applied to achieving the ecological purposes of Victoria's no-take areas into the long term, taking into account the specific context in which the areas are situated and managed.

In assessing the effectiveness of implementation, VEAC specifically looked for:

- systematic and efficient implementation of management plans and any other necessary actions to mitigate avoidable threats, comply with legislation and inform adaptive management
- adequate and sustained investment in management, and prioritisation among management activities that takes into account their relative impact on achieving the ecological purposes
- efficient delivery of scientifically sound research and monitoring, informed by planning and supported by effective quality assurance
- application of the results of research, monitoring, reporting and reviews to inform effective adaptive management towards ecological purposes
- advocacy, facilitation and delivery of management of external marine ecosystems and threats as required to achieving the ecological purposes.

4.3.5 APPROACH TO ASSESSMENT OF 'PERFORMANCE'

The appropriate approach and indicators for assessing the marine protected area performance depend on:

- the purpose against which performance is being assessed
- characteristics of the area
- the extent and nature of available data.

VEAC used separate approaches for evaluating performance towards the ecological and social purposes for which the no-take and multiple-use marine protected areas were established.

Box 2

Performance of the marine protected areas towards their ecological purposes was evaluated separately

While performance is part of the IUCN-WCPA framework, it is emphasised separately in the investigation's terms of reference and is of particular interest to many stakeholders. Accordingly, VEAC separated its performance and management assessments.

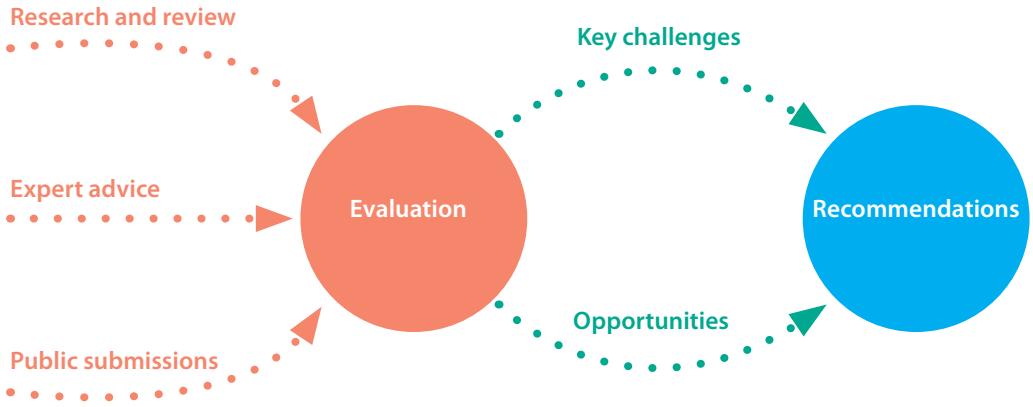
VEAC's evaluation of the performance of the no-take and multiple-use marine protected areas is presented in **chapters 7** and **8**. The specific methods applied to each performance assessment are described in these chapters. Quality assurance processes are described in **section 4.2.3**.

4.3.6 OUTPUTS OF VEAC'S ASSESSMENT

VEAC evaluated management and performance of the marine protected areas, focusing on each of the management stages described above. The output of this qualitative assessment is descriptive, with a particular focus on highlighting key challenges and opportunities for effective management of the marine protected areas into the future in the face of a changing climate, population impacts and a range of associated threats. These opportunities formed the basis for Council's recommendations (see figure 6).

While scoring approaches are often used in evaluations of protected area management effectiveness, they were not suitable for this investigation due to their relatively subjective nature and potential for misinterpretation. VEAC's descriptive assessment of performance was informed by some quantitative analysis where practically feasible and where suitable data were available.

Figure 6
Outputs of VEAC's investigation



5. No-take marine protected areas: management context and threats

This chapter presents VEAC's analysis of the context (or setting) within which Victorian's marine national parks and marine sanctuaries are managed.

5.1 Management context

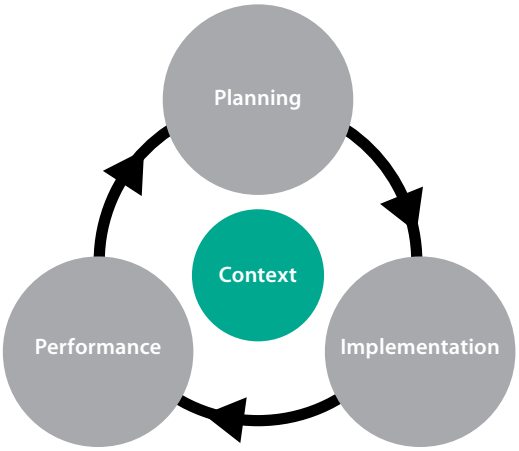
VEAC analysed the following aspects of the no-take areas to guide its assessment:

- how the areas were established
- key legislation that prescribes their management
- governance and administrative arrangements
- relevant management arrangements for marine ecosystems and threats outside the areas
- relevant audits of the management of the marine protected areas.

5.1.1 ESTABLISHMENT OF THE NO-TAKE AREAS

The terms of reference for the investigation focus on assessing the existing marine protected areas and do not include investigating the process by which the areas were designed or established. However, a broad understanding of these processes is important to understand the context for the no-take areas, including their ecological purposes.

The no-take marine national parks and sanctuaries were established through a systematic public process. VEAC's predecessors, the Environment Conservation Council (ECC), and prior to that, the Land Conservation Council, undertook a nine-year statewide Marine, Coastal and Estuarine Investigation. During this investigation, Victoria's entire coast was surveyed and six public consultation periods were held, amassing more than 4,500 public submissions. The ECC recommended the protection of a series of areas that were in relatively good condition to preserve representative examples of Victoria's marine biodiversity, as understood at that time.



Parts of **sections 5.2** and **5.3** are relevant to the multiple-use areas as well as no-take areas:

- the scales at which ecological processes affect the ecological values of the marine protected areas
- the implications of climate change to the ecological values of the marine protected areas
- threats to the ecological values of the marine protected areas.

Following delivery of the ECC's final report in 2000, the Victorian Government accepted its recommendations to establish the system of no-take marine protected areas. After much scrutiny and negotiation, these areas were established in 2002 through a single Act of Parliament, with bipartisan support. The *National Parks (Marine National Parks and Marine Sanctuaries) Act 2002* amended the *National Parks Act 1975* to include marine national parks and sanctuaries (in schedules 7 and 8 respectively) and banned fishing and petroleum extraction from these areas. The boundaries of some of the areas established by the Act were different to those recommended by the ECC. The Act's provisions for management of these areas are discussed further in the section below.

5.1.2 LEGISLATION UNDERPINNING ESTABLISHMENT AND MANAGEMENT

The *National Parks Act 1975* provides the legal underpinning for the no-take areas, setting objectives, defining boundaries and requiring management plans. The Act also prescribes management of particular activities to address some of the clear and ongoing biodiversity threats to the no-take areas. This includes provisions that:

- prohibit removal of flora and fauna
- promote prevention, eradication and control of exotic flora and fauna in the parks
- limit petroleum exploration and ban its extraction
- regulate permitting of pipelines and seafloor cables in these areas.

VEAC's assessment considered these functions of the Act, particularly those provisions covering compliance programs relating to the removal of flora and fauna from the no-take areas, reducing the threat posed by marine pests within the no-take areas, and management of earth resources and seabed infrastructure within the no-take areas

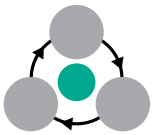
5.1.3 GOVERNANCE

A management services agreement between the Secretary to the Department of Environment and Primary Industries (DEPI), Parks Victoria and the Minister for Environment and Climate Change sets out principles for the delivery of park management services, lists the land to be managed and sets out the key functions of Parks Victoria and DEPI.

DEPI is responsible for policy development, regulation, setting objectives and permissible uses, prioritising and investing in strategic research, setting standards and establishing and overseeing management planning and monitoring and reporting frameworks. Parks Victoria is responsible for monitoring and research, management and operational planning for the areas it manages. Currently, there are no co-management or joint management arrangements in place for no-take areas.

VEAC's assessment took into account these governance arrangements, focusing largely on management by Parks Victoria for the no-take areas but also recognising the contribution and complementary activities of community and other stakeholders.

5.1.4 MANAGEMENT OF RELEVANT EXTERNAL MARINE WATERS AND THREATS



The ability to achieve the purposes of the marine protected areas can be affected by the management of some ecosystems, uses and threats outside their boundaries. Land and sea-based activities outside Victoria's marine protected areas can threaten their biodiversity. Several agencies play a role in managing these threats and/or the marine ecosystems outside the marine protected areas.

Accordingly, VEAC's assessment included the management of external ecosystems and threats where this is relevant to achieving the ecological purposes of the marine protected areas. The policies or tools that guide and coordinate activities by these agencies and users were also an important consideration for VEAC. These include State Environment Protection Policies under the *Environment Protection Act 1970*, marine pest trigger lists, emergency response arrangements, catchment management strategies and programs and ballast water regulation.

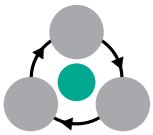
5.1.5 AUDITS ON THE MANAGEMENT OF THE MARINE PROTECTED AREAS

As discussed earlier in the report, the Victorian Auditor-General's Office (VAGO) has undertaken several recent audits relevant to the investigation. Most relevant was the 2011 performance audit, Environmental management of the marine protected areas.[10] VEAC's assessment considered the management processes implemented in response to VAGO's recommendations from this audit (see box 3). The scope of these audits includes the no-take and multiple-use areas. Aspects relevant to management of the multiple-use areas are considered in chapter 8.

The 2011 audit examined how effectively the marine protected areas have been managed to protect biodiversity. It assessed Parks Victoria, as the agency with primary responsibility, on its planning frameworks, management and monitoring, evaluation and reporting activities relevant to the marine protected areas. The audit also assessed the then Department of Sustainability and Environment's role in marine policy and marine biosecurity, and the fishing compliance activities by the then Department of Primary Industries in the marine protected areas.

The following audit reports were also relevant to this investigation:

- *Environment and Sustainability Sector: Performance Reporting* (2013)[13]
  - assessed the effectiveness of public performance reporting by DEPI, Parks Victoria and the Environment Protection Authority
  - identified that reporting focused on outputs and activities rather than outcomes
  - identified poor clarity, and in some cases poor public reporting, of performance indicators and measures
  - recommended improvements to collection, analysis and reporting of performance data, including quality assurance processes.
- *Effectiveness of Compliance Activities: Departments of Primary Industries and Sustainability and Environment* (2012)[11]
  - found that Fisheries Victoria has a comprehensive and transparent process for identifying high compliance risks, regularly evaluates performance and has been working towards better measuring the performance of compliance activities
  - found that Fisheries Victoria's planning of compliance activities was sufficient but that transparency could be improved.
- *Control of Invasive Plants and Animals in Victoria's Parks* (2010)[14]
  - identified several issues with the control of invasive species in Victoria's parks, including complicated and poorly coordinated governance, weak planning, poor oversight, data inadequacies, and inconsistent monitoring and evaluation
  - made many recommendations including the clarification and updating of roles and responsibilities; improvement in the allocation and tracking of resources
  - recommended that management planning for parks include: specific actions to manage threats, targets, performance indicators, monitoring, responsibilities for implementation.



Box 3
VAGO's recommendations for management of marine protected areas[10]

1. Parks Victoria should:
   - document its marine environmental management programs, including program logic, implementation plans, reporting frameworks and evaluation plans
   - implement a system to track time spent by staff on specific activities, particularly on activities related to protecting marine protected areas
   - allocate funding dedicated to the management of marine protected areas, to that activity, as intended
   - develop a capable and sufficient workforce to discharge its obligations to environmentally manage marine protected areas.
2. The Biosecurity Standing Committee should assign expertise to develop a marine pest biosecurity plan.
3. Parks Victoria should:
   - develop park management plans for all marine protected areas with supporting plans that specify actions, targets, performance indicators, accountabilities and time frames for delivery
   - develop management reporting that enables the assessment of performance against park management plans
   - regularly and routinely review its risk assessments, including prioritisation, for marine protected areas
   - as park manager, develop and lead collaboration with other agencies to better inform its planning
   - review, for effectiveness, *Victoria's System of Marine National Parks and Marine Sanctuaries: Management Strategy 2003–2010*, to inform the development of a new strategy.
4. The Department of Sustainability and Environment should implement a new services agreement with Parks Victoria that clearly specifies the responsibilities of both agencies.

5.2 Ecological context

VEAC analysed the following aspects of the ecology of the no-take areas:

- the ecological purposes for which the no-take areas were established
- the key ecological values of the no-take areas with respect to these purposes
- the scales of ecological processes important to the ecological values of the marine protected areas
- the implications of Victoria's changing climate for the ecology of the marine protected areas.

5.2.1 THE ECOLOGICAL PURPOSES OF THE NO-TAKE AREAS

Clear understanding of the ecological purposes of a marine protected area is fundamental to its management. It is also fundamental to assessing performance. The ecological purposes affect:

- selection and design of the area (including its initial natural values and condition)
- how it should be managed
- the ecological changes expected by scientists if the purposes are achieved (i.e. the ecological measure/s of success).

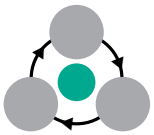
Both the IUCN-WCPA and the investigation's Scientific Advisory Committee (SAC) emphasised that management of protected areas, and assessments of management and performance, must focus on clearly and specifically defined purposes.

No-take marine protected areas have been established around the world for a range of reasons. These usually include one or more 'ecological purposes' that are broadly about protection of natural values within, and sometimes beyond, the protected areas' boundaries. Achieving these broad ecological aims can involve more specific, or operational, ecological purposes that range from:

- rehabilitating degraded biodiversity, sometimes including ecosystem services such as fisheries

to

- preserving biodiversity, that was initially in quite good condition, for future generations.



VEAC commissioned an expert review of studies that have measured changes to biodiversity within the marine protected areas in locations similar to Victoria.[15] A fundamental conclusion of both this review and the investigation's SAC was that scientists expect different types of changes to biodiversity to occur in the marine protected areas that were designed and managed to achieve these different ecological purposes.

This means that ecological purposes must be precisely defined. They must be clear about whether the purpose is rehabilitation or preservation, and whether the focus is on fish stocks or wider biodiversity. It also means that the measures used to judge performance must be specific to the areas and their purposes. They cannot be based on the changes observed in the marine protected areas elsewhere. Many factors can affect whether one marine protected area is likely to change in a similar way as another. One key factor is whether the areas were designed and managed to achieve comparable ecological purposes and, related to this, were in similar initial condition.

Despite their importance to management and perceived performance, the ecological purposes of the marine protected areas are often not described and communicated at this level of detail.[7]

The statutory basis for the ecological purposes of the no-take areas is found in the objects of the *National Parks Act 1975* 'to protect natural ecosystems including biodiversity, natural processes, indigenous flora and fauna, and features of scenic, archaeological, ecological, geological, historic or other scientific interest'. Essentially this means protecting biodiversity and ecological processes (hereafter together termed 'biodiversity') for their intrinsic value.
This description did not provide sufficient detail to guide the assessment.

VEAC worked with the SAC to describe the detailed ecological purposes in a suitable format, drawing on:

- the policy processes and recommendations that surrounded establishment
- the criteria used by the Environment Conservation Council (ECC) to design candidate areas
- scientific understanding relevant to the ecological purposes and performance assessment.

The policy that underpinned establishment

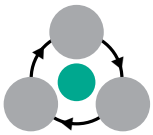
The main policy driving the establishment of Victoria's no-take areas was the commitment to a representative system of the marine protected areas that would protect examples of Victoria's marine biodiversity (as understood at the time) for their intrinsic value. This system was to contribute to the National Representative System of Marine Protected Areas, building on commitments made under the Convention on Biological Diversity (ratified in 1993). The design of the areas was based on recommendations to the Victorian Government by the then ECC. This design was intended to represent Victoria's broad marine bioregions and their broad marine habitat types. Australia's marine environments are classified in a nationally agreed regional ecosystem classification that recognises five biophysical regions in Victoria. This system is known as the Integrated Marine and Coastal Regionalisation of Australia (IMCRA).

The current management strategy for the no-take areas reflects this policy, noting that 'Victoria's system of Marine National Parks and Marine Sanctuaries has been established to protect and conserve representative examples of biodiversity, ecological processes and natural features. This system has many intrinsic values that create a wealth of natural capital for all Victorians. The system is principally valued for the health and integrity of its biodiversity and ecological processes, which must be maintained for future generations'.[16]

Both the marine national parks and marine sanctuaries were intended to contribute to this representative system, although the sanctuaries were generally smaller areas with special natural values or scientific significance. The marine national parks had a related further role of providing a potential reference, or benchmark, against which other marine areas could be compared.

In achieving these ecological purposes, all the no-take areas were also intended to achieve social purposes. The marine sanctuaries were considered to provide particular opportunities for environmentally focused recreation and education. Ensuring that recreational activities do not compromise the fundamental ecological purposes is an important consideration for management.

The criteria that guided design



The design criteria used by the ECC (see box 4) indicate that the no-take areas were intended to protect examples of Victoria's marine biodiversity that were already in relatively good condition, rather than rehabilitating degraded values. Where there was a choice between possible representative areas, the ECC chose areas with relatively undisturbed environments and catchments, and aimed to minimise flow-on effects for industry, users and local communities. The provisions of the National Parks Act prohibiting and/or limiting extractive uses were intended to maintain, and where possible improve, this relatively good condition. Because some of Victoria's marine bioregions and habitats only have populated or intensively used catchments, some no-take areas were, and will to some extent continue to be, more affected by human activities than others. None of the areas were substantially degraded.

Because the areas were not intended to build or rehabilitate fish stocks, the design criteria did not include important locations for fished species, such as known fish recruitment or spawning sites. While it is feasible that establishment and management of some no-take areas to protect examples of Victoria's biodiversity could result in larger or more abundant fish of some species within or beyond their boundaries, this would be a by-product of achieving their primary intended purpose.

Box 4

Factors considered by the ECC in identifying and selecting areas recommended for inclusion in the marine national parks system[17]

Priority was to include replicated representation of:

- biophysical regions
- broad marine habitats
- a range of sizes >5-7 kilometres of coast.

Where also possible:

- special or significant ecological values
- variation in orientation and wave energy within habitats
- range of depths and distances from shore to limit of State waters
- relatively undisturbed

while minimising impact on industry, users and local communities.

Scientifically interpreting the ecological purposes for performance assessment

The Scientific Advisory Committee (SAC) advised VEAC of two critical scientific issues in understanding the ecological purposes. These issues are important for assessing performance.

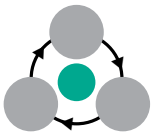
- *Marine biodiversity is naturally dynamic.* Marine ecosystems change over time due to natural ecological processes. Protecting the biodiversity of the marine protected areas means maintaining this natural variation, not trying to keep biodiversity constant. This variation is important for designing performance assessments. It should be communicated to stakeholders to help them interpret their observations and perceptions of the no-take areas.
- *Marine ecosystems that are in a more natural condition are predicted to have higher ecological resilience, or capacity to resist damage and recover quickly from disturbances it may face in the future.* This is a well-established scientific theory and supporting case studies are developing (see box 5). The theory underpins the potential for the no-take areas to act as benchmarks. Disturbances happen naturally, but some disturbances can cause major shifts to biodiversity. Threats can cause new types of disturbance or interact in new ways with natural disturbances.

The implications of these scientific issues to VEAC's approach for assessing the performance of the no-take areas are discussed in chapter 7.

More broadly, VEAC's assessment focused on:

- performance and management to achieve the ecological purpose of maintaining examples of Victoria's biodiversity and the associated ecological processes, including their variation in space and time, in a relatively natural condition for their intrinsic value to future generations
- performance and management of the marine national parks in also providing a benchmark for research and monitoring.

The assessment took into account the natural temporal dynamics of marine biodiversity and the view that achieving the ecological purposes did not require rehabilitation.



Box 5

Examples in which marine ecosystems that are in a more natural condition have been found to be more resilient to particular disturbances:

- Eastern Tasmania's kelp forest communities appear to be more resilient to the ecological effects of long spined sea urchins when lobster abundance is increased.[18]
- Crown of Thorns starfish outbreaks appear to occur less often in areas of the Great Barrier Reef Marine Park that are protected from fishing.[19]

5.2.2 THE BIODIVERSITY OF THE NO-TAKE AREAS

The no-take marine protected areas along Victoria's coast include examples of the biodiversity in each of Victoria's marine bioregions. An understanding of the biodiversity of the areas was important for focusing VEAC's assessment. The design of these areas was influenced by scientific understanding and negotiations with stakeholders at the time they were established. It reflects decisions by government that were intended to reflect the aspirations of the Victorian community. Reassessing the design of the no-take areas is outside the scope of this investigation.

Understanding of the biodiversity of the no-take areas

Understanding of the biodiversity of Victoria's no-take marine protected areas continues to grow and was summarised in the *Marine Natural Values Study Volume 1* in 2003, and updated in Volume 2 in 2012.[20 – 25]

Achieving the ecological purposes of the no-take areas means maintaining all aspects of their biological diversity (across genes, species and ecosystems) in a relatively natural condition, as far as realistically possible and taking into account natural dynamics.

The definition of biodiversity used in the Convention on Biological Diversity, the current global agreement on biodiversity, is 'the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems'.
(Convention on Biological Diversity 1993, available from www.cbd.int).

The biodiversity of Victoria's no-take areas is not completely known due to the logistical difficulties in directly cataloguing marine biodiversity.

Most global studies of the marine protected area performance have focused at the species level, on one or a few types of species – usually fish or other edible species – or groups of species that live on subtidal reefs.[15] [26] Scientific techniques to measure the genetic level of marine biodiversity are still developing internationally. They have not yet been used to assess the ecological outcomes of any no-take marine protected area. The supporting ecological processes are also not well understood.

Applying this understanding to management and performance assessment

Management strategies and monitoring obviously cannot be developed for each component of genetic, species and ecosystem diversity (even if they were known). Understanding which genes, species or ecosystems play key roles in maintaining natural biodiversity is useful to focus management and monitoring.

The relationships between species in Victoria's marine protected areas, as elsewhere, are not completely known. There is some information about some ecologically important species. Some seagrasses and seaweeds, like kelps and Neptune's necklace, are known to provide habitat for other species (see box 6). There are probably many other species whose significance is still to be discovered. Some species may be fundamental to ecological resilience or to the ability of some ecosystems to resist damage and quickly recover from some human impacts. As yet, there is little or no information on this aspect for Victoria's no-take areas.

Box 6
Case study – Neptune's necklace (*Hormosira banksii*)

Neptune's necklace is an ecologically important part of the biodiversity of intertidal reefs in some of Victoria's no-take marine protected areas.

Neptune's necklace is a type of seaweed that forms dense beds on areas of intertidal rock platforms. Its canopy provides habitat for marine snails to live in and around. Changes to its distribution and abundance can have cascading effects on the structure, diversity and resilience of the associated ecological community. Neptune's necklace is known to be vulnerable to people walking on it and to some types of pollution. Scientists have shown that Neptune's necklace can be slow to recover from such disturbances. This means the impacts of these threats on the ecological community can be long lasting.

By maintaining natural biodiversity within their boundaries, some of the no-take areas may contribute to protecting threatened species. However, this was not the primary purpose of the no-take areas and these ecological values are not the focus of this investigation. Achieving this purpose is likely to require additional or larger scale management strategies.

Managing the no-take areas to meet their ecological purposes requires a precautionary approach that focuses on controlling, or ideally reducing, levels of known or predicted threats. It does not require complete knowledge of their biodiversity. Management should be adaptive and informed by best available science and judgment. Adaptive management approaches that accommodate scientific uncertainty are well established internationally. They underpin the IUCN-WCPA management assessment framework and are recognised in the current management of Victorian's no-take areas.[27]

The Scientific Advisory Committee advised VEAC that definitively assessing whether the no-take areas are achieving their ecological purposes would require definitive, scientifically based

measures of the condition of the biodiversity in the no-take areas and such indicators cannot yet be confidently identified. The SAC's advice on alternative approaches for evaluating the ecological performance of the no-take areas is provided in chapter 7.

The SAC emphasised that achieving the ecological purposes does not necessarily require that the condition of their biodiversity becomes more natural or that their biodiversity becomes more resilient to disturbance. Even if resilience of the no-take areas has increased, it may not yet be measurable. While some changes to biodiversity of other marine protected areas have occurred within 10 years, others have taken longer to emerge. Some changes may not be evident until the areas are challenged by a relevant disturbance.[26][28]

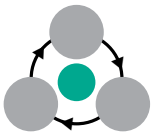
5.2.3 THE SCALES OF ECOLOGICAL PROCESSES AFFECTING THE BIODIVERSITY OF THE MARINE PROTECTED AREAS

Marine ecosystems (or biodiversity) in different places can be connected in many and complex ways. These connections can occur via physical, chemical and ecological processes that can change with time and occur at many spatial scales. This connectivity is well recognised in management of marine protected areas globally. Some species can go through their entire life cycle in a marine protected area, but the area's biodiversity is linked to various external marine ecosystems and can be affected by external threats.

These connections were acknowledged when the no-take areas were established and are recognised in the current statewide management strategy for the areas.[16]

VEAC commissioned an expert review to illustrate and better understand the important ecological connections for Victoria's marine biodiversity. This review provided case studies demonstrating the scales of some important processes. Two of these are summarised at right.

VEAC therefore conducted a general assessment of the management of external ecosystems, in addition to its detailed assessment of management using the IUCN-WCPA framework on the no-take areas. The assessment focused on broad opportunities to improve management of external marine waters and external threats to the marine protected areas.



Box 7

Case study – recruitment from surrounding marine waters may be crucial for replenishing intertidal snails, limpets and abalone in Victoria's marine protected areas[29]

Many species of marine gastropods, including snails, limpets and abalone, are found in no-take areas containing intertidal and shallow subtidal reefs (including Bunurong and Point Addis marine national parks and Jawbone and Mushroom Reef marine sanctuaries). Some of these gastropods reproduce by releasing larvae that disperse in the plankton before settling onto suitable habitat and developing into adults. This process is called recruitment. Its spatial scale varies between species and location, but can range from a few metres to tens of kilometres. This means that the replenishment, abundance and dynamics of some gastropods in the marine protected areas can depend on reproduction of gastropod populations and transport of their larvae in marine waters well outside the protected area boundaries.

Box 8

Case study – maintaining external nutrient cycling processes is critical to the biodiversity of the marine protected areas in Port Phillip Bay[29]

Port Phillip Bay and its marine protected areas are surrounded by a populated catchment. Nitrogen inputs from activities in the catchment reach the Bay via sewage, stormwater, waterways and atmosphere. Management of these inputs is critical in preventing algal blooms and other undesirable outcomes for the Bay's environment. Transformations carried out by microbes in the muddy sediments of Port Phillip Bay convert much of the nitrogen that currently enters the Bay into a harmless gas that is lost to the atmosphere. This is an example of a process that is critical to maintaining the ecological values of the marine protected areas in the Bay that does not occur to any extent within the protected areas themselves.

5.2.4 THE IMPLICATIONS OF CLIMATE CHANGE FOR THE BIODIVERSITY OF THE MARINE PROTECTED AREAS

Predicted effects of climate change on Victoria's marine environment

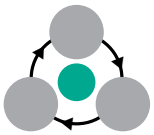
The changing climate is predicted to significantly affect Victoria's marine environment. There is evidence of some changes already.[30] Changes to physico-chemical characteristics of seawater are likely to lead to changes to biodiversity, including in the marine protected areas. Apart from the widely discussed sea level rise, many of the predicted changes to the physical and chemical characteristics of Victoria's marine waters are associated with projected strengthening of the East Australian Current, which transports warm, salty water down the east Australian coast.[31]

The East Australian Current has already increased in strength by 20 per cent and is predicted to further strengthen and increase its southern penetration under climate change scenarios. This may result in rapid salinity and temperature changes in Australian marine waters. Changes are also expected to other current systems, with predicted flow-on effects to the upwelling systems that can influence marine food webs. Projected rainfall changes are also likely to affect the bays, influencing salinity as well as the delivery of environmental pollutants. Increased greenhouse gas concentrations are also expected to acidify marine waters.

There is still significant uncertainty about many of these predicted changes, and even more uncertainty about their likely effects on biodiversity. These changes may interact with existing threats. Some ecosystems could change substantially. Climate-driven changes to the East Australian Current are widely believed to have already spread the long-spined sea urchin from New South Wales through coastal Victoria to Eastern Tasmania. This urchin is now playing a significant role in Eastern Victoria's subtidal reef ecosystems, including several no-take areas. It has significantly changed the dynamics of some kelp forest communities in eastern Tasmania.

Implications for managing the no-take areas towards their ecological purposes

The marine protected areas are part of Victoria's marine environment, and their biodiversity will change with Victoria's changing climate. Council does not consider that climate-related changes to the biodiversity of the no-take areas will undermine the value of these areas with respect to their ecological purposes. The more natural biodiversity of the no-take areas could increase its resilience to some effects of climate change, highlighting their value as benchmarks.



VEAC commissioned a review to better understand how climate change is expected to affect the marine protected areas. This review focused on Victoria's marine bioregions, providing a case study within each bioregion. One case study is summarised below and further details can be found in the consultancy report.

The key message from this review for VEAC's assessment was that the effects of climate change on the marine protected areas will be complex, involving direct and indirect impacts of many climate change stressors acting at once. These effects cannot be predicted with confidence. Reducing future misunderstandings about realistic management options will be challenging. The capacity of management to respond to emerging information will also be critical. The identification of opportunities to address these critical challenges was an important consideration for VEAC's assessment, including the adoption of an adaptive management approach and regular updating of policies.

Box 9

Case study – the biodiversity and ecological processes of the Discovery Bay Marine National Park is predicted to change in a variety of ways with Victoria's changing climate [32]

Discovery Bay Marine National Park contains high and low profile intertidal and subtidal reefs and extensive subtidal soft sediment habitat. Its biodiversity can experience very high wave energy and is also influenced by cold, nutrient rich upwelled water at some times of the year. It is still difficult to predict how the biodiversity and ecological processes of this area will change with Victoria's changing climate, but important changes are predicted to include:

- a change in the timing and extent of nutrient delivery
- a reduction in the connectivity between habitats
- a loss of habitat due to sea level rise and, when combined with increased wave action, a loss of subtidal seagrass habitat
- a reduction in kelp biomass and coverage due to increased temperatures and increased wave action
- a possible reduction in the diverse mollusc fauna due to increased acidification.

5.3 Threats to the ecological values of Victoria's marine protected areas

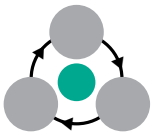
Management of the no-take areas towards their ecological purposes largely involves mitigating the important and treatable threats to ecological values. The *National Parks Act 1975* has specific provisions for managing some threats. Identifying other important threats is an important aspect of management. The important threats, and knowledge about them, can change over time. Adaptive management requires regular threat assessments, informed by research and monitoring.

An understanding of important current and future threats to the no-take areas was critical for the investigation. Parks Victoria assessed the threats to the no-take areas over 2004-06, drawing on the perceptions of local stakeholders.[33] VEAC commissioned updated assessments of the threats to each of Victoria's no-take areas, using a newly developed threat assessment approach. The scope of these threat assessments also includes the multiple-use areas. Aspects relevant to management of the multiple-use areas are considered in section 8.2.4.

5.3.1 APPROACH TO THE THREAT ASSESSMENT

The appropriate approach for a threat assessment depends on its purpose. The IUCN-WCPA framework does not provide specific advice on threat assessment approaches. The IUCN has developed, with the Conservation Measures Partnership, standard categories of sources of threat to terrestrial and aquatic biodiversity worldwide. These broad categories were considered in scoping VEAC's assessment, but a more detailed list of local threats sources was required. VEAC's threat assessment approach also drew on the list of threats included in previous threat assessments for Victoria's marine protected areas and the advice from the external peer reviewer. Relevance to Victoria's marine waters was also an important consideration.

Many different approaches have been used to assess threats to biodiversity. Some involve qualitative, judgement-based assessments while others involve quantitative assessments that include modelling. Detailed approaches consider both the potential consequences of a threat and the likelihood that the ecosystem will be exposed to it. A hierarchical threat assessment approach has been used in management of Australia's fisheries. This approach uses initial screening methods to identify important threats for more detailed assessment. It can therefore be adapted for a range of threat assessment purposes.



A broad, hierarchical approach for assessing threats to Victoria's marine ecosystems was developed during 2011-12 by the then Department of Sustainability and Environment, the CSIRO and scientists from the then Department of Primary Industries Fisheries Research Branch.[34] This approach was based on the Australian Standard Risk Assessment Guidelines and drew on the fisheries approach and other relevant approaches. VEAC commissioned a consultancy to refine this approach and apply it to the investigation. In applying the approach, VEAC identified those threats with the most potential to affect the biodiversity of each of the existing marine protected areas, but not the likelihood that these threats would occur.

A summary of the threat assessment approach used by VEAC

This sub-section provides an overview of the hierarchical threat assessment approach and how it was applied to VEAC's assessment. Definitions of key terms used in this threat assessment approach, are provided below.

Key terms used in VEAC's threat assessment approach

Attribute: a property or component of an ecosystem

Consequence: the level of impact of the threat (i.e. source and stressor) on the attribute

Likelihood: the chance that a threat (i.e. source and stressor) will have some impact on the attribute

Source of threat: a human activity expected to have an impact on an ecosystem

Stressor: the property of the source of threat that could affect the ecosystem

Risk: the combination of the likelihood and consequence of a threat

Threat: the combination of source of threat and stressor whose potential impact on the ecosystem is being considered

The approach involves rating of the relative importance of a range of possible threats (i.e. stressors from a range of threat sources, or human activities) to a particular marine location (see figure 7). The importance of the threats to up to three attributes of the ecosystem are separately considered: species and populations; communities and habitats; and overall ecosystem function.

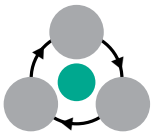


Figure 7
Threat sources and stressors considered in VEAC's assessment, adapted from Jenkins 2013 [35]

Human activities or threat sources	Stressors
Land uses	
Urban infrastructure, runoff, sewage outfall	• Increased nutrients • Increased sediment, turbidity, debris • Pesticides/ herbicides • Toxicants, heavy metals, petrochemicals • Pathogens
Natural resource utilisation, (e.g. forestry, water extraction, agriculture)	
Industry chemical pollution	
Marine based uses	
Commercial fisheries	• Altered currents • Pest plants and animals • Noise pollution • Extraction, over-harvesting, selective harvesting • Physical disturbance
Shipping	
Earth resources	
Tourism/ recreation/ boating	
Aquaculture	
Recreational fishing	
Marine infrastructure	
Coastal infrastructure	• Physical disturbance • Altered currents • Disruption to coastal processes • Noise pollution
Ports/ channels/ dredging	
Marine energy	
Artificial reefs	
Atmospheric pollution	
Global climate change	• Sea level rise • Ocean chemistry, acidity, salinity • Ocean temperature • Ultraviolet light • Altered wave climate

Two methods can be applied to the assessment. Uncertainties are documented in both.

- Method one rates the relative consequences of each threat to the location, irrespective of the likelihood that the threat will affect that location. Only threats that could feasibly affect the location are included. This narrows the range of possible threats to just those that could significantly affect the ecosystem.
- Method two rates the relative likelihood that each of the threats identified in Method one will affect the ecosystem.

How the approach was applied by VEAC

VEAC commissioned additional work to use this approach to assess the threats to Victoria's marine protected areas. The assessments were then peer-reviewed. The assessments drew on a variety of information sources including previous threats assessments for Victoria's marine protected areas.[35] [36] They also linked to the consultancy on climate change that was discussed in an earlier section.

It was clear that the important threats may vary between the marine protected areas. Separate assessments were conducted for each area and interpreted to provide a consolidated assessment.

Because the terms of reference for the investigation focus on ongoing threats and challenges, the important threats to each area were separately assessed for short (five-year) and long (60-year) timeframes. This allowed the emerging implications of climate change to be considered.

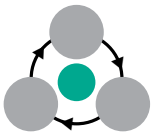
VEAC's threat assessments identified the threats that could significantly affect biodiversity of each marine protected area, in the short and long term, if the threat occurs and cannot be effectively mitigated. Method one of the threat assessment approach (which looks at consequence only) was applied to each relevant ecosystem attribute (up to three) of each no-take area at both five- and 60-year timeframes. This involved many analyses. Method two (which looks at the likelihood) was not applied by VEAC but would also be a useful to guide future management.

5.3.2 THE IMPORTANT THREATS TO THE NO-TAKE AREAS

Victoria's no-take areas are vulnerable to a variety of threats. General patterns from the threat assessments are described below. Detailed results are available in the consultancy report. It is important to bear in mind that all these conclusions are based on the potential ecological impacts of threats that could affect these areas; they do not take into account their likelihood.

Relatively few of the potential threats (see figure 7) stem from activities within the no-take areas that are managed directly by Parks Victoria. Nonetheless, external threats were an important consideration for VEAC's assessment. Parks Victoria's effectiveness in advocating for managers of external threats to take mitigating actions was an important consideration for VEAC's assessment.

Climate change cannot be managed at the local level and many of the projected changes over the next 60 years are now considered largely inevitable. Successful management of other anthropogenic threats may increase the resilience of the no-take areas to climate change impacts.



Important threats across the marine protected areas

Threats that could substantially affect no-take areas across all bioregions relate to:

- shipping (due to the possibility of major oil spills)
- introduction of new marine diseases and pests.

Shipping, commercial and recreational fishing, aquaculture, tourism and recreation all have potential to contribute to the threat that marine pests and diseases pose to the no-take areas. The potential significance of these threats for Victoria's marine ecosystems is widely recognised. The likelihood of these threats affecting the marine protected areas was not assessed, but is generally understood to be relatively low. Management arrangements are in place to further reduce their likelihood. VEAC considered broadly these management arrangements in its assessment, noting that they are not specific to the no-take areas.

In the longer term, climate change and its associated stressors were rated as critically important threats across all the no-take areas.

Threats that vary from place to place

The no-take areas in the embayments (bays and inlets) generally had a wider range of threats. This was due to the embayments generally having:

- more populated catchments, which affects urbanisation, industry, agriculture and coastal infrastructure
- more enclosed and sheltered environments
- marine protected areas with habitats that are vulnerable to these stressors, e.g. seagrass
- relatively large waterway inputs that can carry these stressors.

Important threats included nutrients and turbidity from stormwater or agriculture, turbidity from dredging or turbidity and settled sediments from coastal infrastructure.

Marine protected areas in open coastal waters of the central bioregion, or near large regional cities, could be affected by similar threats, but water flushing rates are greater and habitats are more resilient. Marine protected areas in the far eastern and western bioregions were generally the least threatened as they are remote from human populations and activities.

Fishing posed a major or moderate potential threat to biodiversity of a number of no-take and multiple-use areas, despite its prohibition in the no-take areas.

As the important threats can vary among the marine protected areas, identifying and acting on (or advocating for action on) threats to each marine protected area is crucial to achieve the ecological purposes. This was a major consideration for VEAC's assessment.

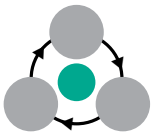
VEAC also examined the management approaches applied to the following threats, which have potential to affect a number of the marine protected areas:

- pollution inputs from catchments
- coastal and marine infrastructure
- tourism and recreation within the marine protected areas.

Threats that will increase over time, leading to future management challenges

Climate change and its stressors were rated as an increasingly important threat to all marine protected areas in the long and short term. Sea level rise (for intertidal habitats), increased temperature and introduction of new marine pests all had potential to cause future impacts.

Sea level rise held the biggest threat for marine protected areas with intertidal habitat, including intertidal reef platforms on the open coast and low salt marsh habitat in embayments. Increased temperature had a range of potential effects, including extending the distributional range of species like the long-spined sea urchin (*Centrostephanus rogersii*). This species may substantially affect the ecology of the marine protected areas in far eastern Victoria. Finally, climate change could increase the suitability of some marine protected areas for some marine pests.



Other threats with increased future potential to affect the marine protected areas were related to population growth, and its implications for urbanisation and coastal development. These are expected to particularly affect the embayments and central Victorian coast. Future threats to the embayments were mainly from increased nutrients and sediments in stormwater. Agricultural inputs may also affect areas such as Swan Bay.

Population growth was also expected to affect threats from tourism and recreation, except for the more remote marine protected areas. These threats were mainly related to disturbance of bird species, trampling on intertidal seaweeds (box 6) or removal of invertebrates from intertidal areas.

Clearly, climate change and population growth are critical future management challenges for the marine protected areas. The predicted changes to threats over time emphasise the importance of management approaches to identify and act on (or advocate for action on) threats to each marine protected area. Threat assessments must be regularly updated and inform adaptive management.

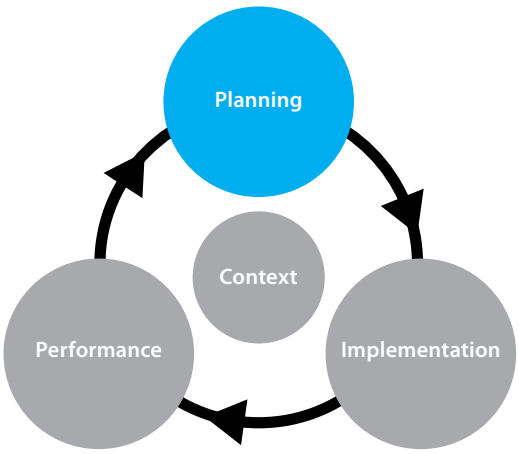
6. No-take marine protected areas: evaluation of management to achieve their ecological purposes

6.1 Planning to achieve the ecological purposes of the no-take marine protected areas

This chapter describes VEAC's evaluation of the planning approach, including the supporting policy, that guides management towards achieving the ecological purposes of Victoria's marine national parks and sanctuaries.

The evaluation focused on VEAC's interpretation of the primary ecological purposes of the no-take areas, as described at right. Future management planning and communication about no-take areas should be clearly focused on this purpose.

The method used for the evaluation was described in chapter 4 and the context that shaped VEAC's application of this method to Victoria's no-take areas was analysed in chapter 5.



The role of planning in the adaptive management cycle is to guide implementation and delivery of management activities towards desired outcomes (i.e. the ecological purposes). It directs research, management, monitoring and reporting. In turn, outputs from research, monitoring and reporting provide feedback to guide better future planning and management. Evaluations of protected area planning within the IUCN-WCPA framework often also consider the process by which the areas were designed, although this was outside the scope of VEAC's investigation.

Ecological purposes of the no-take areas

The primary ecological purpose of the no-take areas is to maintain examples of Victoria's biodiversity and the associated ecological processes, including their variation in time, in a relatively natural condition for their intrinsic value to future generations. The marine national parks have a further ecological purpose of providing benchmarks against which other marine areas may be compared.

SEE RECOMMENDATION R1

Parks Victoria is responsible for leading management planning for Victoria's no-take areas, although – as noted in chapter 5 – it does not have responsibility for acting on all the relevant threats.

VEAC evaluated three aspects of the planning approach applied to Victoria's no-take areas: the policy used to guide planning, the planning used to guide on-ground action, and the planning used to guide research and monitoring. While the evaluation drew on international experience with applying the IUCN-WCPA framework, the aim was not simply to compare the approaches applied in Victoria to those commonly applied in other jurisdictions. Instead, VEAC's evaluation looked towards the best practices for achieving the long-term ecological purposes of Victoria's no-take areas, taking into account the context in which the areas are situated and managed.

An important aspect of the evaluation was identifying the key challenges for future planning for management of the no-take areas in the face of a changing climate, a growing population and a range of associated threats. VEAC also identified key opportunities to address these challenges

and improve future planning. These opportunities formed the basis for Council's recommendations.

This section of the report discusses:

- appropriate policy and planning that will guide management to achieve the ecological purposes
- the appropriateness of existing policy to guide current and future planning
- the appropriateness of existing planning to guide on-ground action
- the appropriateness of existing planning to guide research and monitoring.

6.1.1 APPROPRIATE POLICY AND PLANNING TO GUIDE LONG-TERM MANAGEMENT OF THE NO-TAKE AREAS

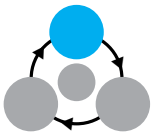
Addressing current and future threats to the no-take areas requires policy and planning that:

- reflects the ecological and legislative context within which the areas are situated and managed and, in particular, aligns with their ecological purposes
- focuses decisions and resources on understanding and acting on the most important and treatable threats to achieving the ecological purposes
- is guided by relevant international best practice, best available science and the results of relevant independent advice, audits and reviews
- is complete, timely, transparent and involves the relevant stakeholders.

VEAC considered all these aspects in evaluating the appropriateness of existing policy and planning approaches for guiding current and future management. Two aspects were considered fundamentally important: focusing on the ecological purposes and mitigating key threats.

Policy and planning that focuses on the ecological purposes

Achieving the ecological purposes of the no-take areas requires policy and planning that specifically focuses on, and communicates, these purposes. This means that the policy and planning must direct and prioritise management decisions and resources, including research and monitoring, according to their impact on achieving the purposes. It also means facilitating the responsible use of the marine national parks for monitoring and research consistent with their role as potential benchmarks.



Policy and planning that guides mitigation of key threats

Ongoing mitigation of key threats to the biodiversity of the no-take areas is fundamental to achieving the ecological purposes. The no-take areas are affected by threats generated outside, as well as inside, their boundaries. The important threats can vary between individual no-take areas and over time. Policy and planning must therefore guide:

- research and monitoring to identify, understand and track current threats, and predict emerging threats to individual no-take areas
- action to directly address existing threats, and prepare for future threats, generated within the areas
- advocacy for action by other managers and/or users to address external threats, supported by information gained through research and monitoring.

Effective planning prioritises activities and resources toward controlling, and ideally reducing, the key threats to each no-take area. This planning should be guided by consistent and transparent policy. Policy and planning must recognise that not all threats can be reduced. For example, eradication of some marine pests may be impractical. Climate change is also not amenable to local action, but successful management of other threats may increase the resilience of the no-take areas to its impacts.

The *National Parks Act 1975* contains provisions relating to several threats to the no-take areas. Planning must appropriately prioritise these provisions and guide coordinated, practical implementation. For example, planning to address provisions relating to marine pests should be coordinated with wider-scale marine pest management. Regular and rigorous threat assessments are vital to successful planning as some threats, and understanding of threats, can change over time.

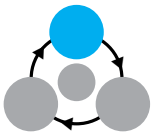
Targeting of research and monitoring investment is also a key part of effective planning. This research and monitoring can provide valuable information for adaptive management. For example, better understanding of threats and management options can directly guide work programs for actions and advocacy.

6.1.2 EVALUATION OF EXISTING POLICY FOR GUIDING CURRENT AND FUTURE PLANNING

A statewide strategy was developed in 2002 to guide planning for the management of the no-take areas from 2003 to 2010.[16] In its 2011 audit, the Victorian Auditor-General's Office (VAGO) noted that the effectiveness of this strategy and actions delivered under it had not been evaluated.[10] VAGO recommended that Parks Victoria review the effectiveness of the existing statewide strategy and use the review to inform development of a new strategy. Parks Victoria appropriately deferred review of the statewide strategy so that it could be informed by this investigation.

VEAC has identified several management issues that have arisen for the no-take areas and that are not thoroughly considered in the existing statewide strategy, including:

- species that are native to the no-take areas, but are perceived by some stakeholders to have reached unnaturally high densities in some areas (such as the native sea urchin *Heliocidaris erythrogramma*)
- species that have extended their range into some of the no-take areas due to Victoria's changing climate (such as the long-spined sea urchin *Centrostephanus rodgersii*).



Clear and documented policy does not appear to be available to guide management planning for these species (and to address stakeholder concerns) for the no-take areas. Decisions may be inconsistent or inadequately aligned with the ecological purposes. It is thus timely to update the policies that guide planning across the no-take areas. The policies should be aligned with other relevant government policy (e.g. the Victorian Climate Change Adaptation Plan, Victorian Coastal Strategy or Regional Catchment Strategies) to support integrated management, particularly for external threats. The updated policies need not necessarily form a separate marine protected area strategy. The policies do need to provide timely, appropriate and comprehensive guidance for planning.

Challenges and opportunities

Key challenge:

Ensuring policy is regularly updated to guide planning of long-term management of the no-take areas toward the ecological purposes

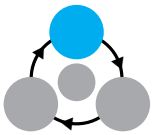
Both VAGO's 2011 audit and this investigation provide advice for updating the policies that guide management planning for the no-take areas. Regular review is critical to ensure that these policies thoroughly address relevant management issues, reflect current knowledge and link with current policies for external threats. Management issues can nonetheless arise between policy reviews and Victoria's changing climate is likely to lead to emerging management issues. Currently, there does not appear to be a system for developing and communicating policy direction on issues that emerge for the no-take areas during the life of the statewide management strategy.

Opportunity:

Updating existing policy to guide planning for current and anticipated future management of the no-take areas toward the ecological purposes

Updating of the current statewide strategy provides an opportunity to ensure comprehensive policies for the no-take areas. These policies should guide consistent, transparent decisions on all known and emerging issues, including issues relating to the changing climate. The strategy should be developed in consultation with other relevant managers to ensure a coordinated approach across Victoria's seascape. A system could also be established for documenting new policies for issues that arise during the life of the strategy.

SEE RECOMMENDATION R2



Box 10

Gap in policy to guide management of a species that is expanding its distribution due to climate change

The changing climate is bringing the East Australian Current further into eastern Victorian waters, and is believed to be causing the range expansion of *Centrostephanus rodgersii*. This sea urchin grazes rocky reef, leaving behind bare patches known as 'urchin barrens'. It can reach high densities, which is perceived by some stakeholders to be undesirable in the marine protected areas. Several submitters raised concerns with VEAC about management of this urchin, suggesting its removal from the marine protected areas.

The Friends of Beware Reef have monitored flora and fauna of Beware Reef and were concerned by their observations of increased numbers of *Centrostephanus* and decline of kelp. Parks Victoria has partnered with the group in a project to control sea urchin numbers in Beware Reef Marine Sanctuary and monitor the ecological effects.

> *We now have almost five years of data, which is showing increasing levels of changes beneath the surface of the water. Some indicators being: southern range expansion of northern marine species, the dying out of some species of kelp, and the population explosion of long-spined sea urchins, which are all signs that change is happening and within a very short space of time.*
>
> **Don Love, President,**
> **Friends of Beware Reef, June 2012**

Proposals to remove and/or control particular species in the marine protected areas require careful consideration in the context of the ecological purposes. Climate change is likely to result in more species expanding their ranges into the marine protected areas over time. Policies should be therefore developed, and refined as appropriate over time, to guide consistent and appropriate consideration of such proposals. These policies should be informed by objective consideration of the relevant science and practical long-term management options, and be clearly communicated to stakeholders.

6.1.3 EVALUATION OF EXISTING PLANNING FOR GUIDING ACTION ON CURRENT AND FUTURE THREATS

This investigation coincided with a period of substantial refinement by Parks Victoria of its management planning approach and tools. This refinement includes development of a conservation action planning approach. VEAC understands that the conservation action planning is intended to supplement the existing management plans developed for the no-take areas under section 17D of the *National Parks Act 1975*. Parks Victoria intends that this overall new planning approach will address the relevant 2011 recommendations of the Victorian Auditor-General's Office and reflect current international conservation practices.

If the new tools are finalised and translated to on-ground implementation plans in a timely manner, they should help to address concerns raised by VAGO and submissions to this investigation. This cannot be assessed until the overall approach and tools have been finalised, fully documented and reviewed. It is difficult for VEAC or the community to further comment on this refined approach without complete and publicly available documentation. VEAC therefore focused its evaluation on the challenges and opportunities involved in finalising the refined approach in an appropriate, timely and consultative manner.

To assist stakeholders to interpret this evaluation, VEAC's understanding of Parks Victoria current and proposed planning approaches is summarised below. This summary reflects VEAC's current understanding of these elements. The scope of some elements may change over time.

Overview of Parks Victoria's existing and developing planning approaches

Existing management plans

Management plans are required for all marine national parks and sanctuaries under section 17D of the *National Parks Act 1975*. Plans were finalised for each no-take area during 2005 to 2007 and are intended to have a lifespan of 10 years. The plans include approaches to action on key threats to each no-take area, including advocacy

for action on threats outside the management responsibilities of Parks Victoria.

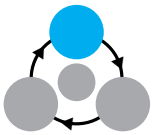
VEAC understands that these management plans will, in future, be incorporated into landscape management plans that cover the multiple parks, reserves and Aboriginal community-owned properties (referred to as Indigenous Protected Areas) within a planning area of the state.

In 2011 VAGO found that 'neither park management plans nor any other documents detail targets, prioritise actions or assign responsibility and time frames for management actions.'[10] VAGO made several recommendations for improving management planning, including developing "supporting plans that specify actions, targets, performance indicators, accountabilities and time frames for delivery." The refined planning approaches and tools that have since been, or are now being, developed by Parks Victoria to respond to these recommendations include the marine protected areas program plan and conservation action planning approach.

Box 11
Case study – Ngootyoong Gunditj Ngootyoong Mara South West Management Plan

The Draft Ngootyoong Gunditj Ngootyoong Mara South West Management Plan, developed by Parks Victoria in partnership with the Gunditjmara Traditional Owners and the Department of Environment and Primary Industries, was released for public comment in May 2013. When finalised, this 15-year plan is intended to guide management of the parks, reserves and Indigenous Protected Areas of south-west Victoria, including Discovery Bay Marine National Park (replacing the single-park management plans). It includes a vision, zoning, goals and strategies to direct management. It also includes measures for monitoring implementation to inform adaptive management. Development of a five-year implementation plan and annual action plans are proposed to specify actions for achieving the vision and goals and implementing the strategies.

The recent Marine Protected Areas Program Plan



In late 2013, Parks Victoria released the *Marine Protected Areas Program Plan 2012-2014* to guide management improvements while VEAC's investigation was in progress.[27] The program plan was also intended to inform review of the statewide strategy discussed in section 6.1.2. The program plan specifies actions, with associated accountabilities and timeframes, across 12 program areas. Many of these actions are relevant to achieving the ecological purposes. The program plan also describes arrangements within Parks Victoria for reporting on delivery of the actions and for external 'State of the Parks' performance reporting.

The program plan sits alongside, rather than replacing, existing management plans for each marine national park and sanctuary. It refers to a number of further proposed plans, such as park implementation plans, regional operation plans, compliance plans and emergency management plans. The program plan does not clearly describe the relationships between these additional planning tools.

The developing conservation action planning approach

Parks Victoria advised VEAC that it had also commenced development of conservation action planning for the no-take areas. Multi-year and annual implementation plans are intended to target specified conservation outcomes, which will describe the desired ecological condition and levels of threat for each no-take area. This planning approach is based on the Conservation Measures Partnership Open Standards developed by non-government organisations including the IUCN, WCPA, WWF and Nature Conservancy (see www.conservationmeasures.org for more information). Parks Victoria provided a preliminary draft of parts of its conservation action plans to VEAC.

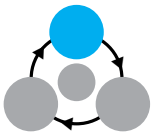
Council notes that the revised planning approach being adopted by Parks Victoria appears to include significant potential improvements, including a focus on identifying key threats to each no-take area, prioritising strategies to act on these threats, and aligning research and monitoring with management. The revised plans are not yet completely or consistently documented. VEAC has identified a number of opportunities for finalising the plans in a way that maximises this potential.

Evaluation of progress with the refined planning approach

Completion and implementation of a planning approach that addresses VAGO's recommendations, is consistent with current international practice and steers management toward the ecological purposes is an important short-term management challenge. The refined planning approach and tools now being developed address VAGO's recommendations from 2011. They should be finalised in a timely manner, after completion of the statewide strategy (see section 6.1.2). This must not occur at the expense of ongoing and timely action on obvious and significant threats.

The draft conservation action plans provided to VEAC were incomplete and could be improved by ensuring that:

- ecological values and threats are identified with scientific rigour. The threat assessment commissioned by this investigation could assist this process but would require extension to consider both the likelihood and consequence of each threat (i.e. method two)[35]
- the plans are informed by a systematic audit of progress with the existing management plans.



The draft conservation action plans could also be improved by more thoroughly considering the threat that poorly managed recreation can pose to the no-take areas. Assessments commissioned by VEAC suggest that this may be an increasingly important threat to some no-take areas as Victoria's population grows. Research, including local studies carried out with Parks Victoria,[37] has demonstrated the capacity for trampling by visitors on Neptune's necklace seaweed beds to damage local biodiversity. While Parks Victoria has authority to directly manage trampling, this evidence does not appear to have informed the draft plans or a substantive management program.

Challenges and opportunities

Key challenge:

Ensuring that planning is timely, regularly updated and effectively guides long-term management of the no-take areas toward the ecological purposes

To guide effective management, planning must be well considered, based on best available science and developed in consultation with stakeholders that can contribute to implementation. This must be balanced with the need for timely completion. The resources applied to planning must also be balanced with those applied to implementation (see **section 6.2.2**). A fit-for-purpose planning approach is required that includes regular review.

Given the developmental nature of the refined planning approach, the opportunities identified by Council for improving planning are broad.

Opportunity:

Complete the refined planning approach and tools in an appropriate manner to effectively guide current and anticipated future management of the no-take areas toward the ecological purposes

There is significant potential to maximise both technical quality and stakeholder acceptance of the refined planning approach and tools during their timely completion.

Stakeholder consultation
A transparent and consultative process would maximise acceptance by agencies that would be involved in implementation and by the wider community.

Use of the best available science
Application of quality assurance processes including expert review would increase the technical rigour and credibility of the plans, further building stakeholder support.

Linkages to the existing management plans
Clarifying relationships between actions in the existing management plans and developing conservation action plans, informed by a systematic audit of management strategies in the existing plans, would reduce confusion and assist quality assurance.

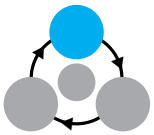
Reporting on progress
Regular public reporting on progress with implementing the marine protected area program plan, draft conservation action plans and any associated plans would assist to build stakeholder confidence in the management of no-take areas.

SEE RECOMMENDATION R3

6.1.4 EVALUATION OF EXISTING PLANNING OF RESEARCH AND MONITORING TO INFORM ADAPTIVE MANAGEMENT

Parks Victoria's management strategy, plans and reports describe its intention to apply adaptive management to Victoria's no-take areas. Adaptive management is well established internationally as a means of 'learning by doing' or using information and experience from past actions (including research) to improve future planning and management. Research and monitoring play an important role in adaptive management, but their targeting, design and communication is critical to their usefulness. The Scientific Advisory Committee assisted VEAC to evaluate these aspects of the planning (i.e. targeting and design) and implementation (i.e. communication) of the research and monitoring conducted for the no-take areas.

Parks Victoria invests significant funds in research and monitoring. This investment, if appropriately targeted, designed and communicated, has significant potential to inform future management. A key example is the use of research to better understand key threats and effective mitigation actions. Such information can provide compelling evidence to encourage action by other managers or stakeholders on threats to no-take areas.



Harnessing this potential is not necessarily straightforward and Council identified a number of significant key challenges. Council also identified some practical opportunities for improvement.

Research to support management towards ecological purposes

Council commends Parks Victoria's sustained and significant commitment to research on the no-take areas. Considerable information about the natural values of the no-take areas has been gathered, but there is significant scope to now more tightly focus this research to provide information that can practically guide adaptive management. This requires improved planning (including priority-setting) and scientific advisory processes.

Parks Victoria has advised VEAC that it has identified priority research themes and issues that guide its research focus in marine and terrestrial environments. These themes do not appear to include a list of specific key research questions, and independent peer review does not appear to be used to specifically guide research investment.

Challenges and opportunities

Key challenge:

Prioritising research to most effectively inform planning and management

Identifying the research questions that would make most difference to future management of the no-take areas in an objective and sufficiently specific manner is a major challenge. A balance is needed between strategic research that helps to better understand marine ecosystems and practical research that helps to identify threats to the no-take areas and actions to best address them.

Opportunity:

Clearly focusing research to maximise its impact on planning and management

Redevelopment of the statewide research strategy provides a major opportunity for Parks Victoria to go beyond the priority broad research themes and issues that it has already developed, and develop a list of specific key research questions to guide management of the no-take areas. The changing climate will bring new possible research avenues, making a list of specific and current priorities increasingly important.

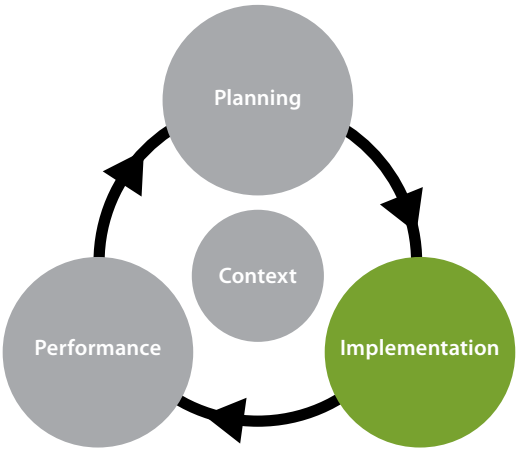
SEE RECOMMENDATION R4

Monitoring to support management towards ecological purposes

Well-targeted monitoring can also play a key role in adaptive management by providing information on biodiversity, threats and the effectiveness of management actions. A long-term monitoring program focusing on reef biodiversity has been in progress in some no-take areas and comparison areas since before the areas were established.[38-40]

Council commends Parks Victoria's sustained and significant commitment to monitoring of the no-take areas. Community volunteers, including Friends groups, also devote substantial enthusiasm and effort to assisting with monitoring activities. Many of these activities are developed and overseen by Parks Victoria. Parks Victoria's recently released Sea Search Manual outlines a variety of monitoring activities that can be implemented by interested volunteers.[41] Some of these have more potential to inform management than others.

Council identified several challenges in the implementation of this monitoring and associated opportunities to maximise it capacity to inform management (see section 6.2.4). Adaptive management is a cyclical process and improvements to current monitoring should, in turn, guide future planning. Parks Victoria has foreshadowed two planning initiatives for its monitoring program that could be informed by these opportunities: development of a new marine research and monitoring plan (included in the marine program plan) and review of monitoring indicators and reporting processes (included in Parks Victoria's conservation action planning approach).[27]



6.2 Implementation of management to achieve the ecological purposes of the no-take marine protected areas

This section describes VEAC's evaluation of the approach used to implement management plans and any other actions needed to achieve the ecological purposes of the no-take areas.

The evaluation focused on the ecological purposes of the no-take areas. Council emphasises that future implementation of management, and communication, about no-take areas should be clearly focused on this purpose.

The evaluation method was described in chapter 4 and the context that shaped VEAC's application of this method to Victoria's no-take areas was described in chapter 5.

The role of implementation in the adaptive management cycle is to allocate resources, implement activities and deliver outputs towards desired outcomes (i.e. the ecological purposes). It includes implementation of research, monitoring, reporting and review to guide adaptive management. The IUCN-WCPA framework recognises separate 'inputs', 'processes' and 'outputs' stages in adaptive management. VEAC integrated these into a consolidated evaluation of 'implementation'.

Implementation of management for the no-take areas is guided by the planning that was evaluated in section 6.1 earlier in this chapter. Due to the connected nature of marine ecosystems, it includes management activities implemented outside as well as within the no-take areas.

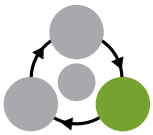
As the manager of Victoria's marine protected areas, Parks Victoria is responsible for leading implementation of management within the no-take areas. Although Parks Victoria does not have responsibility for acting on external threats, it does play an important role in advocating and facilitating action by other agencies and users that contribute to managing or generating threats.

In conducting an integrated evaluation of implementation, VEAC drew on international experience in assessing the 'inputs', 'processes' and 'outputs' elements of the IUCN-WCPA framework.[4] VEAC's aim was not simply to compare the approaches applied in Victoria to those that are commonly applied in other jurisdictions. Instead, the evaluation looked towards the best practices for achieving the long-term ecological purposes of Victoria's no-take areas, taking into account the context in which the areas are situated and managed.

An important aspect of the evaluation was identifying the key challenges for future implementation of management of the no-take areas in the face of a changing climate, a growing population and a range of associated threats. VEAC also identified key opportunities to address the challenges and improve future management. These opportunities formed the basis for Council's recommendations.

This section of the report covers the following areas:

- appropriate implementation of management to achieve the ecological purposes
- evaluation of resource allocation to most effectively address the ecological purposes
- evaluation of processes for reporting, communication and review
- evaluation of implementation of research and monitoring to guide adaptive management
- evaluation of management of threats to address specific provisions of the National Parks Act
- evaluation of the implementation of management to address external threats.



6.2.1 APPROPRIATE MANAGEMENT TO ACHIEVE THE ECOLOGICAL PURPOSES OF THE NO-TAKE AREAS

Addressing long and short-term threats to Victoria's no-take areas will require implementation of management that includes:

- systematic and efficient implementation of management plans, and of any other necessary actions to mitigate treatable threats, comply with legislation and inform adaptive management
- adequate and sustained investment in management, and prioritisation among management activities that takes into account their relative impact on achieving the ecological purposes
- efficient delivery of scientifically sound research and monitoring, informed by planning and supported by effective quality assurance
- use of research, monitoring, reporting and reviews to inform effective adaptive management towards ecological purposes
- advocacy, facilitation and delivery of management of external marine ecosystems and threats as required to achieving the ecological purposes.

VEAC's evaluation of the current implementation of management in this context identified a range of challenges. It also identified opportunities for improvement to address current and future challenges.

6.2.2 EVALUATION OF RESOURCE ALLOCATION TO MOST EFFECTIVELY ADDRESS THE ECOLOGICAL PURPOSES

Management towards the ecological purposes requires sustained and adequate resources. These resources should be focused to maximise their impact on mitigating avoidable environmental threats. VEAC has evaluated the processes used to ensure that resources are directed where they can have the most impact, even while planning approaches are being revised.

VEAC's evaluation focused on two fundamental aspects of resource allocation. The first was the availability of sustained resources for mitigation of avoidable threats. The second was how these resources are allocated amongst management priorities.

In its 2011 audit, the Victorian Auditor-General's Office highlighted that the dedicated funding for management of the marine protected areas by Parks Victoria had not been used as intended, contributing to a lack of marine staffing, expertise and management activities.[10] Council notes that Parks Victoria's overall funding for the marine protected area management increased in response to the VAGO audit and that this increased resourcing has been accompanied by improved tracking of investment.

External threats have major potential to affect progress with achieving the ecological purposes of the no-take areas (see section 5.3). Parks Victoria can advocate action on these threats by the responsible managers or by those that generate the threats. It is critical that adequate resources are available to, and suitably prioritised by, other managers and stakeholders to act on these external threats.

Effective prioritisation of management is similarly critical and there is a risk that detailed planning may be prioritised over delivery of management. The refined planning approach being developed by Parks Victoria aims to address VAGO's recommendations and reflect modern conservation practices. It is likely to guide better targeting of management resources if it is appropriately reviewed, finalised and implemented. This refined approach is also very detailed and its development appears to be absorbing a substantial portion of available management resources. The scale of current investment in planning does not appear to be commensurate with its likely impact on mitigating threats.

Since establishment of the no-take areas, a substantial proportion of investment in their management has been directed towards research and monitoring. This investment also does not appear to be systematically prioritised according to the potential for these projects to guide adaptive management of threats into the future (see section 6.1.4).

Challenges and opportunities

Key challenge:

Ensuring sustained investment of resources that are prioritised to have greatest impact on treatable threats

Funding for management of the no-take areas must be maintained at adequate levels to allow the important, avoidable threats to the biodiversity of the system to be minimised, as far as practicable, in the long term. Management activities such as planning, threat mitigation, reporting, research and monitoring all contribute to addressing threats. However, priorities for allocating resources amongst these activities should be guided by their relative impact on minimising important threats.

Opportunity:

Aligning resources for the greatest impact on mitigating avoidable threats

As threats to the biodiversity of each no-take marine protected area change over time, processes for regular review are needed to ensure resources are targeted to maximise impact on mitigating threats and to achieving the ecological purposes.

Planning currently appears to receive far greater emphasis than implementation of actions to reduce threats and/or advocate action by other managers or stakeholders. Opportunities exist through Parks Victoria's refined planning approach to better align and target available resources.

SEE RECOMMENDATION R5

The need for vigilance and action on threats

While adaptive management can be illustrated as a cyclical process involving sequential stages, simultaneous planning and action is often required to achieve management objectives. Achieving the ecological purposes of Victoria's no-take areas requires continued delivery of management activities, even during planning reviews. An important current challenge for Parks Victoria is to ensure delivery of actions on known threats while it is developing its refined planning approach. While the existing management plans contain relevant management strategies, these actions do not appear to be yet translated into action or implementation plans.

6.2.3 EVALUATION OF PROCESSES FOR REPORTING, COMMUNICATION AND REVIEW

Robust processes for regular public reporting and review are important in ensuring transparency and accountability of management. By its nature, marine management occurs largely out of public view, making regular and transparent reporting particularly important. The Victorian Auditor-General's Office has provided valuable and publicly reported independent checks on aspects of the management of the marine protected areas. These audits have a narrower scope than the IUCN-WCPA evaluation framework for protected area management.

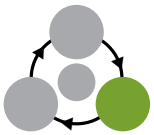
Without systems for regular public reporting, government and the community cannot be assured that actions are being implemented to address key threats.

The 2011 audit of the marine protected area management by VAGO identified a lack of demonstrable management activities within the no-take areas. Several submissions to VEAC echoed these concerns.

This section presents Council's evaluation of processes to:

- demonstrate ongoing funding and management activities to mitigate threats to no-take areas
- support continual improvement and best practice management into the future
- advocate for management of external threats to no-take areas.

Demonstrating implementation of management of no-take areas

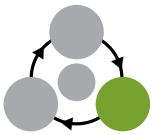


Concerns about delivery of the marine protected area management have arisen from several sources. In its 2011 audit, VAGO noted a lack of demonstrable management activities within the no-take areas. VAGO found that dedicated funding had been used for activities unrelated to the management of the no-take areas, resulting in a lack of staff, expertise and management activities within the marine protected areas. Further, information was not available to assess management efficiency or effectiveness. Several submitters to this investigation also said they believed management of threats to the no-take areas had been inadequate.

Without transparent, systematic and detailed public reporting on allocation of resources and implementation of actions, the community cannot be assured that funding is being sustained and prioritised. It also cannot be assured that on-ground actions are being implemented and/or advocated to address threats to the no-take areas. There are no regular, consolidated and systematic reports of the management actions that have been implemented to address threats to the no-take areas. Many stakeholders also appear to be unaware of the revised management planning that is in progress for the no-take areas.

In reviewing current reporting arrangements, VEAC found that:

- While programs targeting threats to wider marine areas will have benefited biodiversity in the no-take areas, VEAC could identify few publicly reported actions that have been specifically implemented to address threats to the no-take areas. Publicly reported management actions to address key threats to no-take areas include fisheries prosecutions and high-profile responses to marine pest incursions in and near no-take areas.
- In its annual reports, Parks Victoria tends to outline highlights of their marine program rather than systematically reporting on progress in delivering planned management activities.
- VAGO recommended that Parks Victoria develop reporting that enables assessment of performance against park management plans.
- As current management plans do not clearly define actions, there is limited basis for systematically reporting on their delivery.
- Reporting on levels of threats to the no-take areas appears limited. While accurately measuring threats can be technically and logistically challenging, suitable estimates of trends could assist to guide mitigation actions and inform indirect evaluation of progress towards the ecological purposes. Council understands that Parks Victoria is developing a scorecard approach to reporting that may provide a suitable mechanism for such reporting.



Challenges and opportunities

Key challenge:

Assuring sustained investment in management activities

Controlling, and ideally reducing, threats to the biodiversity of the no-take areas is fundamental to achieving the ecological purposes. Acting on the treatable threats to biodiversity that occur within the no-take areas, and advocating action on external threats, should be an ongoing management priority for Parks Victoria. Maintaining confidence among stakeholders and the wider community about the management of the no-take areas is also an important long term priority.

Opportunity:

Use of reporting to demonstrate sustained investment in, and implementation of, management activities

Ongoing reporting provides a means to demonstrate that the funding for management and implementation of management actions is adequate. There is an opportunity to improve the transparency of current management, and thereby stakeholder and community confidence, by establishing regular, systematic and consolidated public reporting on (a) estimated levels of key threats to each no-take area, (b) progress in delivery of achievable actions on threats, (c) progress in finalising and implementing planning, and (d) resourcing.

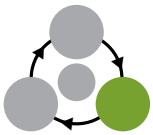
The reporting framework should reflect VAGO's recommendations for performance reporting practices in the environment and sustainability sector (2013).[13]

SEE RECOMMENDATIONS R5 AND R6

Processes to support continual improvement in management practices

Regular review processes to identify opportunities for future improvement are an important part of adaptive management. Quality assurance of implementation, as for planning (see section 6.1.3 and 6.1.4), is important to continual improvement. Appropriate quality assurance processes may, depending on the issue involved, include independent audits or scientific advisory processes.

In 2000 and 2007, Parks Victoria published State of the Parks reports that included a self-review of management effectiveness using the IUCN-WCPA evaluation framework. Parks Victoria has already signalled its intention to broaden its use of the IUCN-WCPA framework for regular reporting on management effectiveness areas in triennial State of the Parks reports.[27] There is scope to improve this reporting, and stakeholder confidence in the reporting, by applying quality assurance processes such as independent audit and/or review, by including tracking of progress in key indicators over time and by ensuring timely delivery of reports.



Parks Victoria has a Science and Management Effectiveness Advisory Committee, which was established to provide independent advice to assist Parks Victoria to develop a strategic and scientifically credible approach to management of parks. However, VEAC's evaluation indicated that the current research and monitoring commissioned and/or guided by Parks Victoria would benefit from further, specific and independent scientific advice in this area.

Challenges and opportunities

Key challenge:

Ensuring adaptive management of the no-take areas is guided by effective review and quality assurance of management, research, monitoring and reporting

Review and quality assurance underpin the continual improvement in management, research, monitoring and reporting that is fundamental to adaptive management. Council has identified regular review of monitoring programs as a specific challenge in its evaluation of the implementation of research and monitoring, but this is also a broader challenge across the implementation of management for the no-take areas.

Opportunity:

Ensuring that State of the Parks reports, or other suitable independent reviews, are regularly implemented to guide effective adaptive management of the no-take areas

Regular, independent reviews and audits of the effectiveness of management of the no-take areas, using the current State of the Parks approach or a suitable alternative, provide an opportunity to both inform adaptive management and provide assurance to stakeholders. These reviews should consider the implementation of relevant recommendations from this investigation, and continue to be based on globally recognised best practice approaches.

This opportunity, and the associated recommendation, applies to management across the no-take and multiple-use areas to achieve their ecological and social purposes.

Opportunity:

Improving independent scientific advisory processes for research and monitoring to guide effective adaptive management of the no-take areas

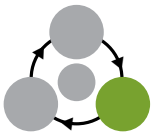
There is an opportunity for independent scientific advisory processes, including processes such as peer review, to be more extensively applied by Parks Victoria. These processes can provide useful specific guidance for research, monitoring, planning and management programs, ensuring scientific robustness and providing assurance to stakeholders. Appropriate application of scientific advisory processes would assist in addressing a number of the challenges and opportunities identified by VEAC in this investigation.

SEE RECOMMENDATION R38

Advocating management of external threats

External threats can significantly affect biodiversity in the no-take areas. Parks Victoria does not directly manage external threats but can provide support, advice and guidance to other managers.

Parks Victoria invests a significant proportion of funds in research, monitoring and planning. Research and monitoring results can provide a compelling tool for influencing the priorities and behaviour of managers and users that can contribute to controlling threats to the no-take areas. These audiences have a variety of information interests and/or needs. Ensuring that communication targets and engages these priority audiences is a further significant challenge. Better prioritisation of research, monitoring and advocacy activities for this purpose was discussed in sections 6.1.4 and 6.2.2.



Challenges and opportunities

Key challenge:

Advocating for management of external threats

Persuading the relevant managers and users to control external threats to the no-take areas is a significant management challenge for Parks Victoria. The no-take areas are just one of many objectives for those that contribute to the management and/or generation of these external threats. The support, advice and guidance provided by Parks Victoria to encourage action on external threats must be carefully targeted to maximise its impact on the relevant audiences.

Opportunity:

Improving communication of research and monitoring to advocate management of external threats

Research and monitoring results are often presented in detailed scientific reports. There is a significant opportunity to better communicate the results of research, and long-term findings of monitoring, to the range of interested stakeholders. Opportunities to engage and communicate with those that manage or generate external threats should be a focus in developing communication products and messages.

Communication of the results of research conducted in the no-take areas to all relevant stakeholders should remain an ongoing priority.

SEE RECOMMENDATION R7

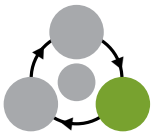
6.2.4 EVALUATION OF IMPLEMENTATION OF RESEARCH AND MONITORING TO GUIDE ADAPTIVE MANAGEMENT

Research and monitoring information informs adaptive management. VEAC's evaluation of planning of research and monitoring for the no-take areas was presented in section 6.1.4. This section considers the way that research and monitoring is implemented, notwithstanding the planning challenges identified previously. The evaluation was informed by advice from the Scientific Advisory Committee (SAC) for the investigation.

Research

Council commends Parks Victoria's sustained investment in research intended to inform management. Parks Victoria has also supported the research interests of various Friends groups.

Maintenance and effective targeting of future research investment will be critical to evidence-based management of future threats in a changing climate.



Parks Victoria implements its research through partnerships with scientists. The benefits of this approach include cost-effective delivery while engaging the scientific community in better understanding the no-take areas. However, its effectiveness depends on ensuring that the research addresses the specific questions that are of practical concern to managers.

Other organisations also conduct research in the no-take areas, separately from Parks Victoria, within permits granted under the *National Parks Act 1975*. This research has potential to inform management and contributes to realising the role of the marine national parks as benchmarks against which other marine areas may be compared.

Challenges and opportunities

Key challenge:

Encouraging appropriate external research

The potential role of the marine national parks in providing benchmarks to inform wider marine management may be increasingly important in Victoria's changing climate. However, not all ecological research needs to be conducted in these areas. Research that could detrimentally affect biodiversity should not be permitted. Encouraging suitable research and preventing inappropriate research is an important challenge in facilitating the responsible use of marine national parks for this purpose.

Opportunity:

Using permitting processes to encourage appropriate external research

There is an opportunity for quality assurance processes to ensure permits are not granted for inappropriate research. Transparent criteria in decision making, and the scientific advisory processes considered previously in this chapter, could be used to assess (i) potential impacts on biodiversity, (ii) whether the research must be conducted in a no-take area and (iii) the likely usefulness of the results for management.

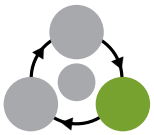
SEE RECOMMENDATION R8

Monitoring

Council commends Parks Victoria's sustained investment in long-term ecological monitoring of the no-take areas and reference sites. Parks Victoria has also encouraged community monitoring. Its recently released Sea Search Manual[41] outlines a variety of monitoring activities that can be implemented by interested volunteers. Some of these have more real potential to inform management than others. Unfortunately, this monitoring information does not appear to have been closely linked to management of the no-take areas, apart from an example involving illegal fishing impacts. To assist adaptive management, the SAC recommended that future monitoring and data analysis focus on:

- better understanding the ecological performance of the no-take areas
- assessing and/or understanding threats, and the effects of management actions where applicable.

The SAC identified some specific challenges involving data analysis and review. It also identified opportunities to improve the capacity of this monitoring to inform management. In addressing these challenges and opportunities, the SAC emphasised the importance of robust ecological assessment approaches. It believed this should involve using information from no-take areas and suitable comparison areas, ideally over a time series extending before and after establishment of the no-take areas. Reef biodiversity has been monitored in this way for several of the no-take areas and reference sites, but not quantitatively analysed across the entire data series. This has limited the capacity of the monitoring to inform this investigation. It also limits the potential for this information to guide future management, research and monitoring of the no-take areas.



As noted in section 6.1.4, several planning initiatives relevant to Parks Victoria's monitoring of the no-take areas are already proposed or in progress. These processes could be informed by implementation of the opportunities described below.

Challenges and opportunities

Key challenge:

Regular analysis of monitoring data to inform management

When monitoring information is available to inform adaptive management, as it is in Victoria, ensuring its regular comprehensive analysis and interpretation is critical to maximising its capacity to inform adaptive management.

Opportunity:

Analysis of existing reef monitoring data to inform management

While the reef monitoring data have been explored qualitatively, the SAC recommended that these data be quantitatively analysed, comparing the no-take areas and comparison areas across the entire monitoring period. This analysis has potential to inform adaptive management of threats, State of the Parks reporting and Parks Victoria's planned monitoring review (see below).

SEE RECOMMENDATION R9

Key challenge:

Regular review of monitoring programs to ensure alignment with management

The importance of regular and independent reviews to ensure ongoing management effectiveness also applies to monitoring. While the value of long-term data series is widely accepted, maintenance of these data series must be balanced and where possible integrated with the need to ensure that monitoring objectives, indicators and design remain suitable to inform practical management.

Opportunity:

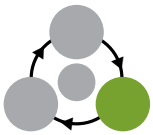
Review of existing monitoring programs to ensure alignment with management

Parks Victoria advised Council that it is reviewing its monitoring indicators for the no-take areas. This is a timely opportunity to ensure that monitoring objectives, approaches and indicators remain appropriate and complete, and take into account the advice from the SAC. The SAC noted the practical impossibility of monitoring all habitats, but was concerned that the reef habitats on which monitoring currently focuses are not necessarily the most sensitive habitats or representative of wider patterns. The scientific advisory processes highlighted earlier in this chapter, and close consultation with managers, will be critical to the success and community acceptance of this review. Its outputs should include specific advice including detailed monitoring program designs.

SEE RECOMMENDATION R10

Community-based monitoring

Interested community members and other stakeholders, sometimes termed 'citizen scientists', devote substantial effort and enthusiasm to collecting information on the no-take areas. This includes participating in monitoring activities largely led by Parks Victoria, but also including the Great Victorian Fish Count and Reef Life surveys. The time and goodwill of these volunteers is a valuable resource that can, if well supported and guided, provide key information for management at time and spatial scales that would not otherwise be possible. Community members and other stakeholders are also often well placed to make natural history observations in the no-take areas. These observations could also be a very useful ecological resource if appropriately and comprehensively documented.



Challenges and opportunities

Key challenge:

Maximising the contribution of monitoring by interested community members and stakeholders to practical management

Scientists, interested community members and other stakeholders can contribute in different ways to collecting information on the no-take areas and their threats. Matching the priority information needs for management with the skills, interests and capacities of these groups can be challenging. There is a range of information about the no-take areas that could be collected by interested community members and other stakeholders, taking into account their diverse skills and time availability. The challenge is to harness these interests and skills to collect the most useful information for management while providing a rewarding experience for participants.

Opportunity:

Guiding and supporting interested community members and stakeholders to conduct monitoring that informs practical management

Notwithstanding the existing Sea Search program, there is an opportunity for Parks Victoria to provide more targeted support and guidance to assist interested community members and other stakeholders to provide observations and data that are most practically useful for management.

The support could include more interaction with, and feedback from, local marine scientists and managers.

The *Sea Search Manual* includes many community monitoring opportunities. The Scientific Advisory Committee (SAC) advised that the significant resource provided by interested community members and other stakeholders could provide most benefit to management if focused on:

- monitoring important threats to the no-take areas at spatial and temporal scales that could not otherwise be measured; systematic large scale surveys of human activities in the no-take areas could be a major focus
- identifying new marine pests (where readily identifiable).

Observations of unusual ecological events or patterns in the no-take areas were considered extremely valuable when comprehensively described, assisted by structured questionnaires. The SAC highlighted the real practical challenges involved for most volunteers in contributing to ecological monitoring. Significant training and quality assurance is required to identify the many and diverse species found in the marine national parks and sanctuaries. In future, this may be assisted by technological advances.

SEE RECOMMENDATION R11

6.2.5 EVALUATION OF MANAGEMENT OF THREATS TO MEET SPECIFIC PROVISIONS OF THE NATIONAL PARKS ACT

This section focuses on management of threats or activities within the no-take areas to address provisions of the *National Parks Act 1975* relevant to management of the no-take areas. These provisions apply to the following threats or activities:

- taking of flora and fauna, including fishing
- petroleum exploration and extraction
- construction of pipelines and cables
- exotic flora and fauna including marine pests.

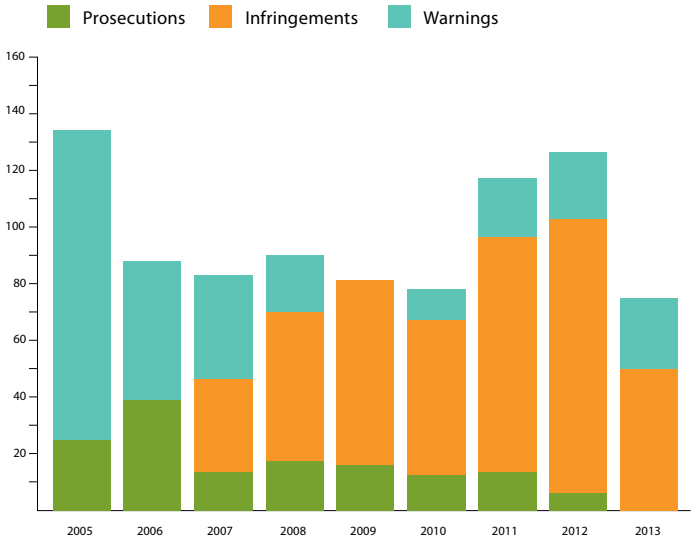
Evaluation of programs for compliance with fishing bans in no-take areas

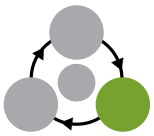
The no-take marine protected areas are fundamentally defined by the absence of fishing and other extractive activities. Non-compliance with these restrictions is a fundamental threat to achieving their primary ecological purpose. A single significant poaching incident could have a major and long-lasting ecological impact.

This section contains the Council's evaluation of the effectiveness of current compliance programs in mitigating the threat of illegal fishing in no-take areas. An effective compliance program requires education and enforcement, a clear focus on no-take areas and integration, where possible, with compliance programs for the broader marine environment. VEAC looked at each of these components in conducting its evaluation.

It is clear that illegal fishing in no-take areas continues to be an ongoing challenge to effective management. Offences in no-take marine protected areas are reported in the *National Parks Act Annual Report* (see figure 8). Submitters to this investigation have also reported observing illegal fishing activities.

Figure 8
Warnings, infringements and prosecutions, 2005–2013





Council has reviewed the available data on enforcement effort and prosecutions, but notes that such information does not necessarily provide a reliable measure of the effectiveness of enforcement.

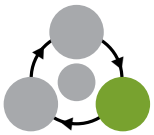
Without knowing the full extent of illegal activities, it is difficult to gauge the proportion of activities that were prevented or apprehended by analysing enforcement data. If there have been no offences detected, it does not necessarily mean no offences have been committed. Conversely, a high offence rate may indicate that many offences are being committed or may reflect increased detection.

Effective compliance programs involve preventative measures, such as education to encourage voluntary compliance, and enforcement measures, such as fines, to penalise non-compliance.

Ensuring compliance with the fishing prohibitions in no-take areas is challenging in Victoria, as it is nationally and internationally. Victoria's approach to compliance, incorporating both enforcement and preventative programs, reflects best practice in tackling illegal fishing activities.

Clear communication of boundaries and of prohibited activities is fundamental for managing no-take areas and is a high priority in Victoria's park management programs. In addition to signage, Parks Victoria contributed to the Victorian Recreational Fishing Guide App, which includes a new feature that allows users to locate the nearest no-take area.

A range of programs encourage enjoyment and appreciation of natural environments in the no-take areas. These contribute to building awareness, understanding and acceptance of fishing prohibitions. The importance of these preventative measures in achieving compliance with fishing bans does not appear to be widely appreciated. These programs and activities are not delivered only by government agencies, but also by volunteers in Marine Care and Friends groups. The wider community also has a presence in Victoria's no-take areas and plays a role in an intelligence and risk-based approach to enforcement by reporting fishing offences.



Challenges and opportunities

Key challenge:

Perception that compliance only involves enforcement

Most submissions on illegal fishing in no-take areas focused on enforcement. Several submitters advised Council that they believed on-ground enforcement of fishing offences in no-take areas to be inadequate. Others reported incidences of illegal fishing in no-take areas. Compliance strategies cannot be based solely on enforcement activities in the widely spread system of no-take areas. Addressing the perception that enforcement is the only legitimate component of compliance strategies may help maintain the confidence of some stakeholders and community members in the management of the no-take areas.

Opportunity:

Recognising the value of preventative strategies in the fishing compliance program

Education, engagement and interpretation activities provide an opportunity to build awareness of, and compliance with, fishing prohibitions in the no-take areas. Communications should also highlight the importance of preventative strategies in an effective compliance program, to complement on-ground enforcement.

Opportunity:

Ensuring an ongoing focus on communicating fishing restrictions

Parks Victoria's ongoing asset maintenance programs include communication of boundaries and fishing prohibitions for each no-take area. There is an opportunity to conduct a systematic audit of the effectiveness of this communication, across all the no-take areas to assist with prioritising ongoing maintenance. This audit should ensure that boundaries of all no-take areas are clearly defined and can be recognised easily and that adequate onshore signage or other effective means of locating boundaries are in place to communicate fishing prohibitions.

Opportunity:

Continued support of the role of community groups in educating the broader community

Community groups play a valuable role in facilitating education, engagement and awareness in the broader community about the ecological values and fishing prohibitions in marine national parks and marine sanctuaries. Parks Victoria should continue to support the efforts of these groups to educate the broader community.

▶ SEE RECOMMENDATIONS R12 AND R13

Victoria's no-take areas were envisaged to be managed in a context of ecologically sustainable management of the wider marine environment. When establishing Victoria's marine national parks and sanctuaries in 2002, the Victorian Government increased funding for fisheries enforcement to boost compliance across the whole marine environment. Fisheries Victoria, now part of the Department of Environment and Primary Industries, is responsible for enforcement of fisheries regulations and focuses its efforts to address the highest risks across Victoria's marine environment, including enforcement of restrictions within the marine protected areas.

Fisheries Victoria's statewide compliance program has flow-on benefits to the no-take areas. The program reduces the risks of illegal fishing to these areas by targeting major poachers who conduct organised criminal activities both within and outside marine national parks and sanctuaries.

The 2011, the Victorian Auditor-General's Office audit found that Fisheries Victoria's fishing compliance activities covered the marine protected areas but were developed in isolation from Parks Victoria.[10] Since then, there has been some increased coordination between Parks Victoria and Fisheries Victoria programs, including combined priority-setting workshops.

Several submissions to VEAC during this investigation expressed concern about a lack of evidence of focused enforcement for Victoria's marine protected areas. Council has confirmed that there is no documented targeted compliance program in place for administering fishing restrictions in marine national parks and marine sanctuaries. While the statewide program contributes to reducing illegal fishing in no-take areas, the marine protected area compliance programs require additional and focused measures.

Parks Victoria and Fisheries Victoria both play key roles in preventing and responding to illegal fishing in no-take areas. Accountability for effective compliance in no-take areas lies with Parks Victoria, as the assigned manager of the no-take areas. Fisheries Victoria, has the primary role in delivering enforcement of the fishing prohibitions. There are many opportunities for collaboration in delivery, such as Parks Victoria using its on-ground presence to gather intelligence and Fisheries Victoria supporting education of licensed fishers. Following several machinery of government changes since the no-take areas were established in 2002, the accountability for compliance has become blurred, compounded by disputes about funding. Overall accountability for enforcement of fishing prohibitions appears to be confused with delivery of enforcement.

Challenges and opportunities

Key challenge:

Illegal fishing in no-take areas remains an ongoing problem that requires targeted compliance activities

While a number of measures are in place to tackle illegal fishing, there is no targeted program that focuses specifically on enforcing the prohibition on fishing in no-take areas. Currently, reducing fishing in these areas relies on the flow-on effects from broader, statewide compliance activities and preventative measures. The longstanding issues around respective roles and responsibilities of Parks Victoria and Fisheries Victoria have impeded development of a targeted program for the no-take areas.

Opportunity:

Demonstrate a clear and focused approach to compliance with fishing prohibitions in no-take areas

Parks Victoria is accountable for ensuring that an effective ongoing program is documented and in place for enforcing fishing prohibitions in no-take areas. The overall compliance strategy, including accountabilities and roles of agencies, should be publicly available.

SEE RECOMMENDATION R14

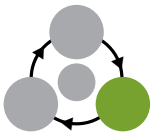
Reducing the threat posed by marine pests within the no-take areas

The National Parks Act contains specific provisions on management of the threat that marine pests pose to the no-take areas. Management of this threat in external marine waters also plays a major, and probably larger, role in reducing the threat to the no-take areas. Accordingly, coordination is required between management of the threat posed by marine pests within and outside the no-take areas. VEAC's evaluation of this coordinated management is set out in section 6.2.6.

Management of earth resources and seabed infrastructure in the no-take areas

Marine national parks extend to 200 metres below the seabed. Beneath this 200 metre limit, the seabed is not subject to the National Parks Act and petroleum extraction is permitted by directional drilling from outside the park to access resources underneath the park. Marine sanctuaries do not have a depth limit.

Submissions to VEAC during the investigation indicate that there is some community concern over the adequacy of protection of Victoria's no-take marine protected areas in regard to petroleum exploration.



The National Parks Act prohibits the granting of an extractive industry work authority in respect of land in marine national parks and marine sanctuaries, and restricts petroleum exploration operations to those done from a vessel or aircraft and carried out in a manner that is not detrimental to the seabed or any flora or fauna of the park, with the consent of the Minister responsible for the National Parks Act and in accordance with any conditions the Minister imposes.

In 2004, the Victorian Government announced that it would not release any further acreage in marine national parks and sanctuaries for oil and gas exploration. Vessels could continue to be able to travel through marine national parks and sanctuaries while conducting exploration in adjacent areas, provided that there is no discharge of seismic sources within the park.

Since 2005, when the most recent consents for petroleum exploration in marine national parks were considered, scientific knowledge has grown about the effects of seismic surveys on marine life.

Challenges and opportunities

Key challenge:

Policy relating to minerals and petroleum exploration in marine national parks and sanctuaries is inconsistent with that in terrestrial national parks, and policy is not reflected in legislation

The advice of the National Parks Advisory Council (NPAC) must be obtained before consent can be given for petroleum exploration in terrestrial national parks and the intertidal area of marine national parks and sanctuaries. NPAC's advice is not required for areas of marine national parks and sanctuaries below low water. For terrestrial national parks, mineral resources licences, consents and other authorities must be tabled in both houses of Parliament and may be disallowed.

The policy that there will be no release of any further acreage in marine national parks and sanctuaries for the purposes of exploration for oil and gas is currently not reflected in legislation.

Opportunity:

Clarifying and improving consistency of provisions for regulation of petroleum exploration

Consistency and transparency will be improved by amendments to the National Parks Act to reflect the current policy that does not allow discharge of seismic sources within marine national parks, and by amendments relating to the advice of the National Parks Advisory Council and tabling and disallowance provisions. There are no implications for current uses.

SEE RECOMMENDATIONS R15 AND R16

6.2.6 EVALUATION OF MANAGEMENT TO ADDRESS EXTERNAL THREATS

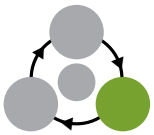
This section considers management outside the marine protected areas that is important to achieving their ecological purposes. This management is relevant to both no-take and multiple-use marine protected areas.

As noted in chapter 5, the biodiversity of the marine protected areas can be influenced by many threats generated outside their boundaries. It can also be affected by the condition of external marine ecosystems, which can be ecologically connected to the marine protected areas. The sections below provide VEAC's broad evaluation of the management approaches used to guide sustainable use of external marine ecosystems and act on key external threats.

This management is conducted by a range of agencies, sometimes in partnership with Parks Victoria, with many other stakeholders influencing threat generation. VEAC's evaluation focused on the policies and tools that guide and coordinate action. Both external marine ecosystems and the activities that generate threats to the no-take areas are managed for a variety of objectives and uses. VEAC's evaluation focused only on achieving the ecological purposes of the marine protected areas.

Evaluation of the management approaches that guide ecologically sustainable use of external marine ecosystems

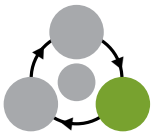
Victoria's external marine environment has important ecological values. Numerous areas that are significant for marine biodiversity and/or ecological processes have been identified.[42] These ecological values underpin marine uses and services, including shipping, fishing and extraction of earth resources, that are valued socially and economically by Victorians. If not carefully managed, some of these marine uses can threaten the ecological processes upon which they, and many other uses, rely. Degradation of these ecological processes can then have flow-on effects to the marine protected areas.



As described by the Council of Australian Governments (COAG), Australia is committed to Ecologically Sustainable Development, which means 'using, conserving and enhancing the community's resources so that the ecological processes, on which life depends, are maintained and the total quality of life, now and in the future, can be increased'.[43] Victoria uses a range of sectoral, spatial, threat and issues-based management approaches to work towards ecologically sustainable management of marine uses. In practice, ecologically sustainable development requires substantial coordination across managers, stakeholders, policies and plans.

In 2011, the Victorian Auditor-General's Office noted that Victoria did not have an overarching policy to 'direct management of the marine environment – one that encompasses all uses, integrates well across catchments and coastal areas, and enables consistent planning across both marine protected areas and other marine areas to achieve agreed outcomes'.[10] A framework to guide integrated marine management was also a key issue in the recent revision of the Victorian Coastal Strategy. Council believes that such an overarching policy is important for achieving the long-term ecological purposes of the marine protected areas. Responsibility for leading development of such a policy currently rests with the Department of Environment and Primary Industries.

Challenges and opportunities



Key challenge:

Preventing degradation of external marine ecosystems and flow-on effects to the marine protected areas

Victoria's marine environment is managed for multiple uses and its sustainable use requires integration across a range of managers, stakeholders, policies and plans. Coordination and advocacy can contribute to ensuring sustainable use but its efficiency and effectiveness cannot be guaranteed. Understanding and responding coherently to the effects of climate change and population requires a more reliable and efficient approach.

Opportunity:

Developing a policy to guide management that prevents future degradation of external marine ecosystems and flow-on effects to the marine protected areas

An overarching statewide policy could direct and structure the integrated, ecologically sustainable management and use of Victoria's marine environment. Such a policy should be based on an ecosystem approach and integrated management of threats across catchments, coasts and sea. It should include (i) a statewide strategic framework and (ii) regional direction and targets to guide ecologically sustainable use, preventing adverse flow-on effects to the marine protected areas. Initial priority should be given to areas under most environmental threat.

SEE RECOMMENDATION R17

Evaluation of the management approaches applied to key external threats

Management of each marine protected area requires acting on key threats generated within the area and advocating action on key external threats. This management must consider both the severity of the threats and likely return for effort, noting that not all threats can be practically addressed with current technology.

The implementation of such management for the no-take areas was evaluated in the preceding sections. This section evaluates the approaches applied by relevant managers to act on the external threats. Examining all management of all external threats was beyond the scope of the investigation. VEAC focused on the following external threats that could have major consequences for biodiversity of a number of the areas:

- marine pests (including marine pests that enter the marine protected areas)
- pollution inputs from catchments (for the marine protected areas in embayments)
- coastal and marine infrastructure
- oil spills.[35]

VEAC's initial analysis clearly indicated that each of these external threats has complex drivers and is affected by many management programs across Victoria and, in some cases, Australia. These programs extend from reducing generation of the threats to mitigating their impacts. Comprehensive evaluation of this management was beyond the scope of the investigation. There is evidence that the marine protected areas are already factored into this management in various ways, including through oil spill response atlases and Regional Catchment Strategies. This requires comprehensive and long-term consideration.

Effective management of all key threats is required to achieve the ecological purposes of the marine protected areas. The marine protected areas must be carefully considered in relevant management approaches, programs or assessments.

VEAC conducted a more detailed evaluation of the management approaches applied to marine pests and pollution inputs from catchments. This management can involve local approaches within or near to the marine protected areas.

As discussed in chapter 5, climate change will also affect biodiversity. Climate change was not included in VEAC's management assessment due to its large-scale drivers. Reducing other threats to the biodiversity of the no-take areas may improve its resilience to climate change effects.

Management to reduce catchment threats

Human activities in catchments can deliver a range of pollutants to marine waters. These pollutants can be delivered directly to the marine protected areas via waterways and drains; they more often enter indirectly from external marine waters. Catchment-based pollutants do not threaten all the marine protected areas.[36] They are a more significant threat to the marine protected areas in embayments. This threat may grow as Victoria's population increases. The changing climate is also predicted to affect the dynamics of catchment runoff to marine waters.[30]

Objectives for water quality and targets for loads guide action on catchment-based pollution to Victoria's marine waters. Marine ecosystems require specific targets as they can be vulnerable to different pollutants than those in waterways. Objectives and targets are generally set in State Environment Protection Policies and inform Regional Catchment Strategies. Separate, non-statutory water quality improvement plans have updated targets for pollutant loads to Port Phillip Bay and Western Port over 2009-2014 (Better Bays and Waterways 2009)[44] and to Corner Inlet over 2014 – 2033.[45]

Council notes that most water quality targets, objectives and policy for Victoria's bays and inlets have not been updated for many years. The current targets for input loads to Port Phillip Bay and Western Port will soon become out of date. The Department of Environment and Primary Industries has advised Council that it plans to review State Environment Protection Policy for Victoria's surface waters during 2014. The Victorian Government's 2012 *Plan of Action for A Cleaner Yarra River and Port Phillip Bay* also commits to the development of a new Environmental Management Plan for Port Phillip Bay.[46]

Challenges and opportunities

Key challenge:

Regularly review objectives and targets to protect marine water quality

Catchment pollutant loads pose a key threat to Port Phillip Bay and Western Port and their marine protected areas, and are predicted to be affected by the growing population and changing climate. Regular and timely review of the objectives and targets that guide on-ground action on this threat is critical.

Opportunity:

Updating current objectives and targets to protect marine water quality

The planned review of water quality policy presents an opportunity to update targets and objectives, guided by the best available science. These targets should then guide effective and adequately resourced action on input loads to marine waters including the marine protected areas. The policies and plans should be supported by coordinated administrative arrangements, transparent reporting and well-targeted monitoring and review processes.

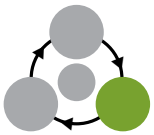
SEE RECOMMENDATION R18

Management to reduce marine pest threats

There are many species of exotic flora and fauna in Victoria's marine waters. Only a few of these have major ecological effects and are considered marine pests. Native species that extend their distributional range naturally, for example under climate change, are not included in the marine pest management system. Marine pests pose a significant threat to the biodiversity of the no-take areas. Once introduced, they are generally difficult if not impossible to eradicate. The *National Parks Act 1975* requires:

- prevention of the introduction of marine pests into the no-take areas to be promoted
- eradication or control of marine pests found in the no-take areas to be provided for.

Marine pests can be introduced by biofouling of surfaces or by discharge of ballast water or bilge systems. Once introduced, they can naturally disperse between marine areas. This means that marine pests that are established in external marine waters can often colonise in the marine protected areas. Management of marine pests within the marine protected areas can be important, but may not always have much effect on reducing the ongoing threat that these pests pose to biodiversity. This section considers the approaches used to manage marine pests within and outside the marine protected areas, from the perspective of achieving the ecological purposes. There is established hierarchy of approaches for marine pest management (see box 12).



Box 12
Hierarchy of approaches to managing marine pests

The hierarchy of approaches to managing the ecological threat posed by marine pests is well established. It is described in Victoria's Biosecurity Strategy[47] as:

1. prevent the entry of new high-risk species
2. eradicate, where possible, species that are at an early stage of establishment
3. contain, where possible, species that are beyond eradication
4. manage, where possible, widespread species using an asset-based approach.

Ecologically significant marine pests are already established in the no-take areas, just as weeds are established in terrestrial national parks. It is not feasible to remove these existing pests using current technology, nor can the threat of new introductions from established external populations be eliminated.

While some established marine pests clearly have detrimental ecological impacts, Council does not consider that these impacts overwhelm the value of the marine protected areas in maintaining examples of Victoria's biodiversity for future generations.

Minimising the introduction of new pests, and the spread of existing pests, as far as practically feasible must continue to receive very high priority.

Challenges and opportunities

Key challenge:

Reducing introductions of new marine pests to Victoria that may colonise the marine protected areas

High priority should be given to preventing introduction and translocation of new marine pests to the no-take areas. This depends significantly on minimising introductions to external marine waters. Improved management of ballast water and biofouling ideally involves large scale, national approaches, but national arrangements for these marine pest vectors are still developing. Victoria has been a national leader in developing a domestic system for reducing introductions of marine pests from the ballast water of vessels over 400 tonnes.

Opportunity:

Reducing introductions of marine pests to Victoria via hull fouling that may colonise the marine protected areas

Biofouling remains a vector for introducing new pests and translocating existing pests in Victoria. Victoria could provide national leadership, as it did for ballast water management, in developing domestic management approaches for this threat.

SEE RECOMMENDATIONS R19 AND R20

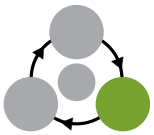
Where practically possible, early eradication and/or minimising the spread of established marine pests can also help reduce the risk that the pests will establish in the no-take areas. Eradication of newly introduced marine pests to an area can be technically and logistically challenging. It may be possible for some pests and locations if action is taken quickly but this requires early identification of new introductions.

The 'trigger list' of marine pest species of concern that guides response planning in Australia is currently being updated. Systematic surveillance for these species across Victoria's marine waters poses major practical and financial challenges. However, the principle that those who generate environmental risks should contribute to the cost of containment, avoidance and abatement is well established in Victoria's environmental policy. Surveillance to identify newly introduced pests to the no-take areas currently includes reef monitoring programs, community-based monitoring and opportunistic observations. There is scope to improve the comprehensiveness of these surveillance methods across habitats and pest species.

When new pests are identified, investment of resources in eradication requires careful consideration. Important factors include the likelihood of success, relative threat posed by the pest species, risk of further spread and ecological impacts of eradication. Despite the significant impacts of some marine pests, eradication efforts may not be worthwhile if the pest will be quickly reintroduced. Reintroduction may occur via translocation or natural dispersal from other established populations. However, it may be possible to regularly remove some types of marine pests from parts of some no-take areas. The risk of an eradication method leading to further spread requires close attention. Any eradication programs implemented must involve adequate permits, operating procedures and other safeguards to ensure that pests are not inadvertently spread and that ecological impacts do not outweigh benefits.

The establishment of marine pests depends on environmental conditions and is likely to be affected by the changing climate in ways that are difficult to predict with confidence. Scientific understanding, trigger lists and any other relevant management arrangements will require regular updating over time to take account of the changing climate.

Challenges and opportunities



Key challenge:

Identifying realistic options for rapid eradication of marine pests within and outside the marine protected areas

High priority should be given to quickly eradicating new pests where it is practical, but finding new marine pest populations across Victoria's vast marine waters is difficult. When introductions are identified, identifying eradication approaches and assessing the chance of success also involve many challenges. Marine pest surveillance methods and eradication decisions need to be informed by best available and current science, which requires long-term investment.

Opportunity:

Improve existing approaches for early identification of marine pests within and outside the marine protected areas

A systematic but practical surveillance approach for priority marine pests should be established, guided by best available science, outside the marine protected areas.

There may be opportunities to involve community, industry and other stakeholders. There are also opportunities to improve surveillance within the no-take areas. Some national guidance is available and developing technology may increase survey effectiveness and cost-effectiveness over time.

Opportunity:

Use research and cost-benefit analysis to make informed decisions on eradication options that do not further spread marine pests

Transparent cost-benefit analysis has potential to assist decisions on marine pest eradication and assist communication with stakeholders. Providing the underpinning science is a research priority for Parks Victoria and other relevant agencies.

SEE RECOMMENDATION R19

If a decision to eradicate is made, rapid and coordinated action is likely to be required across agencies and stakeholders. Collaborative, cross-agency eradication responses have been implemented for several marine pests identified in or near the marine protected areas. Informal collaboration is not necessarily a reliable long-term approach and clear administrative arrangements are critical. The Victorian Auditor-General's Office considered marine pests in its 2011 audit,[10] recommending that the cross-agency Biosecurity Standing Committee assign responsibility for developing a marine pest biosecurity plan. Development of this plan commenced, but now requires consideration of marine biosecurity arrangements in the new Department of Environment and Primary Industries.

Challenges and opportunities

Key challenge:

Ensuring capacity to respond to marine pest emergencies efficiently and effectively

Efficiently and effectively responding to the introduction of marine pests that may threaten the marine protected areas, or surrounding marine environment, will require sustained ongoing preparedness. Well planned and coordinated administrative arrangements, including access to appropriate resources, will be critical to ensuring capacity for rapid response.

Opportunity:

Establish appropriate administrative arrangements and resourcing to ensure capacity to respond to marine pest emergencies efficiently and effectively

Victoria is currently reforming its emergency response arrangements and there is an opportunity to use and/or build on this process to ensure that appropriate administrative arrangements and resourcing are in place for responding to any major marine pest emergencies.[48] Integration with Victoria's wider biosecurity arrangements is likely to assist efficiency and cost-effectiveness

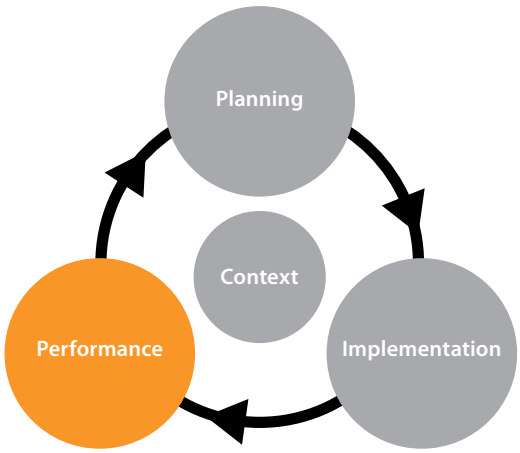
SEE RECOMMENDATION R21

7. Performance of the no-take marine protected areas in achieving their ecological purposes

This chapter provides VEAC's evaluation of the performance of Victoria's existing no-take marine protected areas in meeting their ecological purposes. This evaluation is equivalent to the outcomes element in the IUCN-WCPA framework for evaluating management effectiveness. This framework also provided the structure for VEAC's evaluation of management planning (section 6.1) and implementation (section 6.2). The performance evaluation forms a separate chapter due to its emphasis in the terms of reference and its interest for stakeholders.

> Management results in impacts or outcomes, hopefully achieving defined goals and objectives. [2]

IUCN-WCPA envisaged the outcomes (or performance) element of management effectiveness assessments to, broadly, 'measure the real effects of management actions: whether management is maintaining the core values for which the protected area was established'.[2] It also noted that outcomes are often both the most important and most difficult management elements to evaluate.



VEAC's evaluation of the ecological outcomes of Victoria's no-take areas was guided by the advice of the Scientific Advisory Committee and based on the best possible approaches that could be applied to the available information. The evaluation provides useful insights for future management, although detailed information on all aspects of the biodiversity of Victoria's no-take areas is not currently available. The recommendations that Council has made for improving research, monitoring, reporting and management reviews for the no-take areas will support improved future performance evaluations, which will, in turn, guide improved future management of the areas to achieve their long-term ecological purposes.

Before providing VEAC's evaluation of the ecological performance of the no-take areas, this chapter describes the approaches that VEAC applied to the assessment. These approaches were carefully targeted to the purposes, ecological characteristics and available information on Victoria's no-take areas. They also aimed to maximise the robustness and objectivity of the evaluation.

This chapter:

- overviews VEAC's approaches for evaluating performance towards the major ecological purpose of maintaining examples of Victoria's marine biodiversity
- describes the key factors that influenced these approaches
- provides VEAC's application of each approach and its conclusions
- describes VEAC's evaluation of the performance of the marine national parks in achieving their further ecological purpose of providing a benchmark for research and monitoring
- provides VEAC's overall evaluation of the performance of the no-take areas in achieving their ecological purposes.

7.1 VEAC's approaches for evaluating ecological performance of the no-take areas

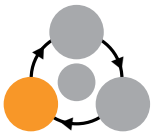
The primary ecological purpose of the no-take areas is to maintain examples of Victoria's biodiversity (including ecological processes) in a relatively natural condition. VEAC's evaluation of performance in achieving this purpose was based on three assessment approaches or lines of evidence. Drawing on guidance from both the IUCN-WCPA framework and the investigation's Scientific Advisory Committee, VEAC considered the available, objective and robust evidence to answer the following questions:

1. What type of biodiversity would be expected in the no-take areas since establishment if they were achieving their ecological purposes?
2. Is the expected biodiversity present?
3. Have the key threats to biodiversity of the areas have been acted on and contained (as far as practically feasible) or, ideally, reduced?

Selection of these evaluation approaches, and the analysis methods that VEAC applied to them, was affected by a number of factors. These factors are summarised in section 7.2. Further technical details are available in separate cited reports. The extent of scientific understanding about marine ecosystems, and of information on Victoria's no-take areas, was a significant factor in applying the approaches and interpreting the results.

Sections 7.3 to 7.5 set out VEAC's application of each evaluation approach. They describe the information that was available for applying the approach, how VEAC applied the approach and the conclusions reached. Section 7.6 focuses on VEAC's evaluation of the performance of the marine national parks as benchmarks. The conclusions from the application of each approach informed VEAC's overall evaluation of the performance of the no-take areas in achieving their ecological purposes, provided in section 7.7.

7.2 Factors that affected VEAC's performance evaluation approaches



A number of factors influenced VEAC's approaches for evaluating the ecological performance of the no-take areas. Some of the same factors influenced VEAC's evaluation of management and were considered in chapter 6. This section recaps on these common factors and also considers factors that specifically influenced the ecological performance evaluation.

7.2.1 FOCUS ON ACHIEVING THE ECOLOGICAL PURPOSES

IUCN-WCPA emphasised the need for evaluations of protected area outcomes to focus on what the establishment and management of the areas are specifically aiming to achieve. Marine protected areas have been established around the world for two types of ecological purposes:

- rehabilitating biodiversity, sometimes including ecosystem services such as fisheries
- preserving biodiversity that is already in relatively good condition.[15]

Scientific predictions can be made of biodiversity changes in areas established for these two purposes.

VEAC's evaluation focused on the primary ecological purpose of maintaining examples of Victoria's biodiversity, including its variation in space and time, in a relatively natural condition. This variation in space and time was an important consideration for VEAC in identifying methods and information for its evaluation and in interpreting the results.

The marine national parks had a further, related ecological purpose of providing a benchmark against which other marine areas could be compared. VEAC separately considered the performance of the marine national parks in achieving this purpose.

7.2.2 GUIDANCE FROM THE IUCN-WCPA

The IUCN-WCPA framework recognises two broad approaches for evaluating protected area outcomes:

- evaluation of the status of, and change in, the areas' natural values
- evaluation of the extent to which a threat to the area has been reduced or to which other objectives of management have been achieved.

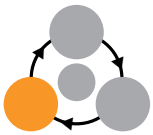
These approaches must be adapted to the purpose of the protected area; changes in ecological values are not expected in areas that were established to maintain rather than rehabilitate biodiversity. The first approach assesses ecological performance directly, while the second uses indirect evidence. Direct assessment using sound science is recognised by IUCN-WCPA as being desirable but practically difficult. Availability of suitable information is very often limiting.

The IUCN-WCPA guidebook 'How is your MPA doing?' provides a generic guide for assessing performance within the IUCN-WCPA framework.[7] It stresses the need to match assessment approaches and indicators to the protected area's purpose. The guidebook lists potential biophysical indicators for applying each of the two broad evaluation approaches, as a starting point for adapting the approach to specific cases.

7.2.3 SPECIFIC ADVICE ON A SUITABLE APPROACH

VEAC sought advice from the investigation's Scientific Advisory Committee (SAC) and Community Reference Group (CRG) to guide its specific performance evaluation approach. This advice was focused carefully on the purposes of the no-take areas and the role of the investigation. An expert consultancy also provided specific information inputs.

CRG members highlighted the information and opinions held by their communities and stakeholder groups on the biodiversity and performance of the no-take areas. The CRG advised that its stakeholder groups wanted VEAC to conduct an authoritative assessment that is accepted by the scientific community. They felt that the wider community would be interested in the outcomes and validity of the assessment, but not the full technical details. The CRG recommended that VEAC apply a transparent approach to the evaluation and present a clear framework explaining how the range of available information about the biodiversity of the no-take areas had been interpreted.



The SAC provided advice to VEAC on interpreting the ecological purposes, identifying expectations for biodiversity and developing scientifically valid evaluation approaches, methods and indicators. It assisted VEAC to develop the framework recommended by the CRG for interpreting information on the biodiversity of the no-take areas for the evaluation.

7.2.4 INCOMPLETE KNOWLEDGE OF BIODIVERSITY

Achieving the ecological purpose of the no-take areas means maintaining their biodiversity in a relatively natural condition, in the long term and to the extent realistically possible. Biodiversity includes the variation that occurs within species, between species and of ecosystems.

> The definition of biodiversity used in the International Convention on Biodiversity is: 'Biological diversity' means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Scientific understanding of biodiversity is central to identifying possible methods and indicators for evaluating performance. The species or other components of biodiversity that underpin the resilience of the no-take areas, or their ability to resist damage and quickly recover from human-related disturbances, are only beginning to be understood scientifically. Some species, including some seaweeds and seagrasses, are known to provide habitat for many other species. There are almost certainly other important values whose key roles are yet to be discovered.

7.2.5 EXPERIENCE FROM OTHER MARINE PROTECTED AREAS

Experience from marine protected areas elsewhere has the potential to help identify expectations for biodiversity in achieving the ecological purposes of Victoria's no-take areas. Not all such evaluations can be translated directly and the implications of differences in ecology, initial condition and ecological purposes require careful consideration. The objectivity and scientific quality of the evaluations also requires examination. VEAC commissioned a critical review of the biodiversity outcomes that have been identified in the marine protected areas with similar ecological purposes and ecology to those of Victoria's no-take areas. The review built on initial discussions with the SAC and informed its overall advice to VEAC.[26]

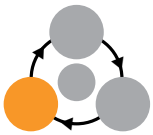
7.2.6 INFLUENCES ON PERFORMANCE REQUIRING CONSIDERATION

VEAC's evaluation approach needed to consider the factors that may affect the ecological performance of the no-take areas from within and beyond their boundaries. The condition and management of marine biodiversity within and outside the no-take areas were important considerations. Performance may also be affected by characteristics of the protected areas themselves, including their size, biodiversity and the time that has elapsed since their establishment. The terms of reference for the investigation did not include evaluation of the design of the no-take areas, but such characteristics may have influenced performance to date.

It was also important to factor the natural variation of marine biodiversity over space and time into the evaluation, to minimise the risk of apparent changes or differences in the biodiversity being misinterpreted. This is a common issue in ecological assessments and the SAC advised VEAC of appropriate methods to address it. The methods are described later in this chapter.

7.2.7 PERFORMANCE IN CONTROLLING KEY THREATS

Management of key threats is central to achieving the ecological purpose, noting that not every threat can be reduced in practice. Assessments commissioned by VEAC indicated that the threats with short-term potential to significantly affect the biodiversity of no-take areas in all bioregions are related to the possibility of major oil spills and the introduction of new marine diseases or pests. Despite their severe consequences, these events are relatively rare.



A wider range of threats has potential to affect no-take areas in the embayments, including pollution inputs from catchments, fishing, coastal infrastructure and port development. The challenges involved in managing these threats were considered in VEAC's management assessment.

7.2.8 CLIMATE CHANGE EFFECTS

Some changes to biodiversity of the no-take areas have already been attributed to Victoria's changing climate and much larger future changes are anticipated. VEAC noted that the future biodiversity of the no-take areas will reflect to some extent the larger-scale changes across the marine environment. It is possible that the no-take areas may be more resilient to some threats (see section 5.2.4). Council does not consider that these changes to the biodiversity of the no-take areas will undermine their value with respect to their ecological purposes.

While climate change was a consideration for VEAC's evaluation, it will be increasingly important for future reviews that aim to guide adaptive management of the no-take areas towards their long-term ecological purpose.

7.3 Evaluation of the biodiversity that would be expected in achieving the ecological purposes

VEAC's evaluation of the biodiversity, or any changes to biodiversity, that may be expected in achieving the ecological purposes of the no-take areas was based on:

- existing understanding of marine ecosystems
- results of performance evaluations for other comparable marine protected areas.

Effects of characteristics of the areas were important considerations.

7.3.1 INFORMATION AVAILABLE FOR THE EVALUATION

Most case studies identified in the expert review focused on tropical areas and on how the marine protected areas have affected large or edible fish and shellfish.[26] The following indicators of biodiversity increased, to very varied degrees, in many of the tropical and temperate marine protected areas evaluated:

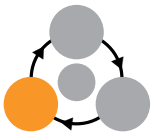
- abundance, as density
- biomass
- organism size
- species richness.

Decreases in the same indicators occurred in other marine protected areas and these differences did not appear to be explained by the initial condition of the areas.[26] These results, therefore, have limited value for identifying the type of biodiversity, or changes to biodiversity, expected in Victoria's no-take areas. Fish are part of the biodiversity of Victoria's no-take areas, but there is no evidence that they indicate the condition of wider biodiversity.

Not all species would be expected to increase in the marine protected areas. The declines in fish species diversity that have been observed in some marine protected areas are believed to be the result of natural ecological processes, such as larger fish feeding on other species.

The current challenges in predicting how the marine protected areas may affect overall diversity were emphasised in an evaluation of reef biodiversity for 11 marine protected areas and reference sites in southern Australia.[49] This evaluation found that numbers of large fish predators were generally higher and numbers of many invertebrates and small fish generally lower in the marine protected areas, which was considered a possible sign of more natural biodiversity. The authors also noted that including marine protected areas of a range of ages in this evaluation could have confounded some of its conclusions.

Analysis and comparisons of studies can provide some indication of how the size and age of marine protected areas may influence their effects on aspects of biodiversity. Consistent surveys of shallow reef fish have now been conducted in 87 marine protected areas worldwide. A recent analysis of these survey results assessed the combined effects of five design and management features on the outcomes of these areas: size, age, isolation from other reefs, degree of permitted fishing and level of enforcement.[50] Many of these case studies and surveys cannot be directly extrapolated to Victoria's no-take areas, which were established to maintain overall biodiversity rather than just fish. Some key results are summarised in box 13, but must be applied cautiously to VEAC's evaluation.



7.3.2 METHODS AND ANALYSIS APPLIED TO THE EVALUATION

The SAC used the expert review, and the wider expertise and experience of its members, to advise VEAC on what type of biodiversity, or changes to biodiversity, may be expected in achieving the ecological purposes of Victoria's no-take areas. The SAC also advised on whether, and how, VEAC could confidently evaluate if any such biodiversity or changes have occurred since the areas were established. The SAC noted that performance evaluations for other marine protected areas have not always used a robust approach to identifying indicators or analysis methods that take account of the ecological purposes.

The SAC developed its advice for Victoria's no-take areas over two full-day roundtable discussions. This advice was documented by VEAC and circulated to SAC members for further consideration and confirmation. VEAC obtained more detailed information to build on this advice from the review, its bibliography and other sources recommended by SAC members.

7.3.3 CONCLUSIONS FROM THE EVALUATION

The SAC emphasised that achieving the primary ecological purpose of the no-take areas involves maintaining the biodiversity of the areas in relatively natural condition. It does not require rehabilitation of biodiversity that was in relatively good condition when the areas were established. Case studies from elsewhere suggest that the biodiversity of Victoria's no-take areas may change over time, as their condition becomes more natural. This is desirable, but not required, to achieve the ecological purpose.

A detailed and definite evaluation of whether the condition of all of the biodiversity in Victoria's no-take areas has been maintained would require scientifically based measures of this condition.

Box 13
Biodiversity and the size and age of a marine protected area

Size

Several evaluations have considered how size affected aspects of biodiversity in marine protected areas, but its influence has not yet been definitively reviewed. Some significant effects of even small reserves have been identified, but the larger reserves tended to have bigger effects on various aspects of biodiversity. The expert review compared the sizes of Victoria's no-take areas to the size range of other marine protected areas that have significantly affected aspects of biodiversity

Age

The effects of a marine protected area's age on its biodiversity outcomes appear to be complex. A recent evaluation, which included case studies in southern Australia, found that some changes to biodiversity typically occurred quickly (within three years). These included changes to heavily fished species, some mobile fish species and smaller species that reproduce quickly. Other species that grow slowly, grow large and/or have few offspring (e.g. some sharks and rays) can take many years to decades to respond.
An evaluation of some other case studies suggested that the direct effects of marine protected areas (e.g. increased abundance of fished species) occurred after a mean of just over five years, whereas indirect effects on no-fished species became significant after an average of about 13 years. This does not necessarily mean that further changes to the biodiversity of these marine protected areas may not occur over longer periods. Waiting for at least 15 years to rigorously assess the performance of the marine protected areas has been suggested, as both the biodiversity and public acceptance of the areas are complex processes that can evolve and change over decades.[28]

Combined effects of key design and management features (including size and age)

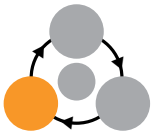
The outcomes of 87 marine protected areas worldwide for reef fish increased exponentially with five key features: no-take regulations, efficient enforcement, old age (>10 years), large size (>100 km^2) and isolation from other reefs (by deep water or sand). No-take, enforcement, large area and old age all made similar contributions to increases in overall fish biomass. Isolation contributed more to increased fish biomass but a similar amount to the biomass of some types of fish. When only well enforced no-take areas were assessed, the biomass of some types of reef fish was greatly affected by size, age and isolation.[50]

An evaluation of whether the condition of biodiversity has become more natural would require clear predictions of how those measures would be expected to change. The SAC concluded that current scientific understanding does not allow these measures or predictions to be confidently identified. This is due to the complex interactions that occur within marine ecosystems and the few robust evaluations of comparable areas with similar ecological purposes. Cautious application of the available case studies suggests that if the condition of Victoria's no-take areas becomes more natural, changes may include:

- some large fish might increase somewhat in size, abundance, biomass and diversity in some areas, but could decrease in others
- some small reef fish and reef invertebrates might decline
- overall species diversity might decline, but predictions cannot realistically be made about changes to other aspects of the biodiversity, ecological processes or resilience.

The sizes of Victoria's no-take areas (in area and length of coastline) fall within the range of sizes of other marine protected areas in which some aspect of biodiversity has changed after protection.[26] Victoria's no-take areas are older than some other marine protected areas in which changes to biodiversity have been observed, but further indirect changes may be yet to emerge. The biodiversity of the no-take areas will also affected by management of external ecosystems due to the effects of large-scale ecological processes.[29]

In the absence of definitive measures or predictions for the evaluation, the SAC recommended alternative methods for exploring whether the condition of biodiversity in Victoria's no-take areas has been maintained or has become more natural. These methods are described in section 7.4. Their results must be cautiously interpreted. While they provide the best evaluation that is currently possible, they are not conclusive. These methods consider aspects of biodiversity, but the SAC noted that it might not be possible to evaluate ecological resilience until the areas are challenged by a significant disturbance.

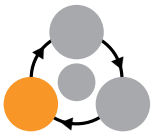


7.4 Evaluation of whether the biodiversity of the no-take areas is consistent with achieving the ecological purposes

As noted above, achieving the primary ecological purpose of the no-take areas requires maintaining, rather than necessarily improving, the condition of their biodiversity. VEAC applied the available scientific understanding and information to provide the best possible indication of whether the condition of biodiversity in the no-take areas has been maintained. It is not currently possible to evaluate every aspect of the performance of the areas in achieving this purpose due to insufficient scientific understanding. This evaluation was guided by the SAC and the expert review.

7.4.1 INFORMATION AVAILABLE FOR THE EVALUATION

VEAC identified a range of documented quantitative and qualitative information about the biodiversity of the no-take areas. Most were not designed for use in an objective and robust evaluation of the performance of the no-take areas in achieving their ecological purposes. Some may be more relevant to performance in achieving their social purposes.



Parks Victoria's natural values reports were a key resource and submissions to the investigation also provided a range of information and observations. [20] – [25] Because the performance evaluation focused across all the no-take areas, information covering more than one no-take area was given priority in compiling possible information for use in the assessment.

The available information on biodiversity of the no-take areas fell into three broad categories, shown in table 3.

While Indigenous knowledge of marine biodiversity and ecological processes was also a potentially relevant information source, VEAC could not find any substantial documented records of this kind for Victoria's marine ecosystems. It was not feasible for VEAC to gather such information during the investigation. If documented in future, this information has potential to provide a useful resource for marine management.

Table 3
Categories of information on biodiversity

Category of biodiversity information	Description
1. Detailed comparative information about the performance of the no-take areas	• Comparisons of the biodiversity of the no-take areas to reference sites, ideally both before and after establishment • Included quantitative and semi-quantitative information • The only large-scale information identified was Parks Victoria's reef monitoring program, which is being supplemented by the developing Reef Life Survey monitoring. Other studies and bird monitoring exist for individual no-take areas.
2. Broad statements or opinions about the performance of the no-take areas	• Generally stated opinions that do not include the detailed basis for these opinions • Largely from submissions.
3. Descriptions of biodiversity of one or many no-take areas	• Included specific quantitative, semi-quantitative or qualitative information for one or more no-take area/s • Included studies with various purposes, such as marine mapping • Consolidated in Parks Victoria's natural values reports.

7.4.2 METHODS AND ANALYSIS APPLIED TO THE EVALUATION

The SAC advised on methods to objectively assess the suitability of available biodiversity information for use in the evaluation, with an emphasis on applying robust and objective methods that factored out natural variation.

Preferred methods

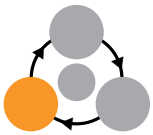
Methods for factoring out natural variation in biodiversity indicators are well established. They ideally involve monitoring each no-take area and multiple reference or comparison sites before and after establishment (comparative assessment). The relevance, reliability and objectivity of the biodiversity measurements are critical. Nonetheless, even the most robust comparative assessments cannot provide definite conclusions as they are based on circumstantial evidence. Methods developed in epidemiology (i.e. studies of the causes of disease) to increase confidence by combining multiple lines of comparative evidence have been adapted for ecological assessments.[51] Ideally, VEAC's evaluation would apply such methods to appropriate biodiversity information for Victoria's no-take areas and reference sites, using scientifically-based measures of condition. This was not possible for the current evaluation due to the absence of appropriate data.

Practical methods

As the measures, predictions and information required to apply the preferred methods were not available, VEAC applied a pragmatic approach to the available information and provided guidance for improving future monitoring and evaluations, informed by advice from the SAC.

In the absence of definitive indicators and predictions, the SAC recommended exploring the information available on biodiversity of the no-take areas. Detailed descriptions of biodiversity for individual areas were available, but did not always include comparison sites. Available comparative information ranged from detailed monitoring to opinion. The SAC identified two methods for analysing this information:

1. A checklist of key environmental values that were initially present in each no-take area and are relevant to the condition of its overall biodiversity. The analysis would involve identifying whether those values are currently present.
2. A comparative evaluation (using suitable data) of any differences in key ecological values between no-take areas and suitable reference or comparison sites, ideally both before and after establishment.



The checklist of values was readily developed by:

- refining the key ecological values identified for each no-take area (i) when establishment of the areas was recommended by the Environment Conservation Council (taking into account the differences between recommended and established boundaries for some of the areas) and (ii) in Parks Victoria's developing conservation action plans*
- collating existing information on the presence of each value at the time of establishment and as close as possible to 2012. The year 2012 was chosen because Parks Victoria had already screened and compiled much of the relevant information in its 2012 natural values studies for the no-take areas. Recent, documented information was not available for some no-take areas, particularly those in very deep or exposed locations.

The ecological values used in VEAC's checklist focused on the presence of key habitats, which were an important factor in the design of the no-take areas (see section 5.2). They also included the presence of canopy-forming brown algae, which are widely understood to provide habitat for many other marine species on some reefs.

While other species are known, or predicted, to play ecologically important roles in some other habitats of the no-take areas, there was insufficient confidence and/or information to include these among the ecological values across the no-take areas. These values and checklists could be updated over time with growing information and understanding.

The comparative evaluation method was more complex to apply, requiring more detailed information. It had the potential to support more robust and detailed conclusions, allowing a fuller evaluation of whether the condition of biodiversity has been maintained in the no-take areas than the simple presence or absence of key values. VEAC worked with the SAC to develop a transparent framework to screen the available biodiversity information for application to these methods.

*These developing plans are based on The Nature Conservancy's Conservation Action Planning Methodology, which is recommended by the IUCN-WCPA for defining protected area values.

Checklist of values analysis

As far as VEAC could assess from the available information, all the key ecological values that were included in the checklist (see table 4) were present in the most recent documented surveys of each no-take area. In interpreting this checklist, it is important to note that the most recent information on some values in some no-take areas dates from before 2012, in some cases back to 2004. While these ecological values describe the biodiversity of the no-take areas at a very coarse level, they reflect some of the key ecological factors that guided design of the no-take system.

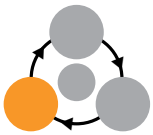


Table 4
Checklist of key ecological values in each no-take area

	Habitat	Rocky reef		Habitat forming algae		Soft sediment		Seagrass	Mangroves	Saltmarsh
	No-take area	Inter	Sub	Inter	Sub	Inter	Sub			
Otway	Discovery Bay MNP	Y	Y	•	Y	Y	Y	•	•	•
	Merri MS	Y	Y	•	Y	Y	Y	•	•	•
	The Arches MS	•	Y	•	Y	•	•	•	•	•
	Twelve Apostles MNP	Y	Y	•	Y	Y	Y	•	•	•
Central Victorian	Marengo Reefs MS	Y	Y	•	Y	•	•	•	•	•
	Point Danger MS	Y	Y	Y	Y 2004	•	•	•	•	•
	Point Addis MNP	Y	Y	Y	Y	Y	Y	•	•	•
	Eagle Rock MS	Y	Y	Y	Y	•	•	•	•	•
	Barwon Bluff MS	Y	Y	Y	Y	•	•	•	•	•
	Mushroom Reef MS	Y	Y	Y	Y 2004	•	•	•	•	•
	Bunurong MNP	Y	Y	Y	Y	Y	Y	•	•	•
Victorian Embayments	Port Phillip Heads MNP	Y	Y	Y	Y 2009	Y	Y	Y	•	•
	Point Cooke MS	•	Y	•	Y	Y	•	•	•	•
	Jawbone MS	Y	Y	•	Y	Y	•	Y	Y	Y
	Ricketts Point MS	Y	Y	Y	Y	Y	Y	•	•	•
	Yaringa MNP	•	•	•	•	Y	Y	Y	Y	Y
	French Island MNP	•	•	•	•	Y	Y	Y	Y	Y
	Churchill Island MNP	Y	•	•	•	Y	Y	Y 2009	Y 2006	•
	Corner Inlet MNP	•	•	•	•	Y	Y	Y 2007	Y	•
Flinders	Wilsons Promontory MNP	Y	Y	•	Y	Y	Y	Y	•	•
Twofold Shelf	Ninety Mile Beach MNP	•	?	•	•	Y	Y	•	•	•
	Beware Reef MS	Y	Y	•	Y	•	•	•	•	•
	Point Hicks MNP	Y	Y	•	Y 2010	Y	Y	•	•	•
	Cape Howe MNP	Y	Y	?	Y 2010	Y	Y	•	•	•

Key:

Y	present in 2011 or 2012
•	not a key ecological value for this area (the habitat may, or may not, be present but it is not a key ecological value)
year date:	year of most recent observation if earlier than 2011
?	unknown

- **For Ninety Mile Beach Marine National Park** subtidal rocky reefs were listed by ECC as one of the represented habitats. Parks Victoria has been unable to locate these rocky reefs and anecdotal information suggests that this may be a transitory habitat that is affected by sand burial.
- **For Cape Howe Marine National Park** intertidal reefs and their habitat-forming algae: this habitat is a very small part of the park with extremely limited access. The intertidal reefs have been mapped using imagery collected in 2004. The current status of habitat-forming algae on these reefs is unknown.

Comparative evaluation analysis

The available comparative information was first allocated into five categories based on its potential for use in this analysis. The SAC recommended that VEAC use only information from the comparative ecological assessments category (i.e. category 3) for its performance evaluation, to maximise robustness and objectivity. The information in this category was further screened for demonstrable relevance, reliability and objectivity.

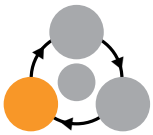


Table 5
Categories of comparative information

Screening category and definition	Suitability for use in objective and robust performance evaluation
1. **Testimonials:** statements, recommendations, or other expressions of admiration or appreciation of the no-take area as worthy or desirable, or the converse	Not suitable as objectivity and reliability difficult to assess. May be useful for evaluating performance in achieving social purposes.
2. **Propositions:** suggestions about the ecological performance of the no-take area, including aspects of its ecology, that require further consideration or acceptance	Not suitable but provide a basis for objective research to inform future evaluations. May in some cases contribute equivocal evidence to an evaluation, noting uncertainty.*
3. **Comparative ecological assessments:** observations of suitable ecological indicators over time (i.e. before and after establishment of the no-take areas) and/or in space (i.e. in no-take and reference or comparison areas)	Potentially suitable but reliability and objectivity requires case-by-case examination. Information may be qualitative or quantitative and may be collected by professional scientists or stakeholders.
4. **Indigenous ecological knowledge**	Potentially suitable but not currently documented. Included for completeness.
5. **Red flags or warnings:** signals of possible major, or impending major, changes or threats to the no-take areas relevant to their ecological performance	Not suitable but useful to inform management (e.g. sightings of new invasive species, diseases, or species range extensions related to climate change).

* The SAC noted that developing and testing propositions is the foundation of scientific research and that, when tested, the propositions often prove untrue. This does not diminish their value in the process of improving understanding, but does mean that untested propositions cannot in themselves provide robust evidence of ecological performance of the no-take areas. Propositions are a valuable resource for guiding research to better understand the ecology of the protected areas.

Only two available comparative ecological assessments were potentially suitable for VEAC's comparative evaluation: Parks Victoria's long-term monitoring of the biodiversity of subtidal and intertidal reefs.[52] The biodiversity information provided by stakeholders was not comparative. It also generally did not include sufficient context for objectivity to be assessed. The SAC noted the potential for stakeholder observations to provide useful information for future performance evaluations if supported by comparative information and more detailed context.

VEAC further considered the design, reviews and available analyses of the reef monitoring data in consultation with the SAC (see section 6.1.4) The reef-monitoring programs included the appropriate measurements for a comparative evaluation focussing on the condition of reef biodiversity. Some apparent patterns in the data have been described and graphed, but the data have not been analysed across much of the monitoring period using objective quantitative statistics. The longest analysis extends to 2006/07. This was a major barrier to use of these

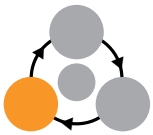
data in VEAC's evaluation. It was not feasible for VEAC to analyse this large data series within the investigation and therefore to apply the comparative evaluation method.

The SAC recommended that VEAC commission a case study to illustrate the use of objective quantitative analysis of the subtidal reef monitoring data to contribute to performance evaluation. This case study explored whether the no-take areas appeared to have higher resilience than surrounding marine areas to the sea urchin *Centrostephanus rodgersii*.[53] The distribution of this sea urchin has extended from New South Wales into Victoria's coastal waters, including four of the no-take areas. The case study found no evidence that the no-take areas have had greater resilience to the effects of this sea urchin than external comparison areas. It noted that the monitoring program was not designed to address this specific question. The case study did show that the monitoring data could be used for objective comparative evaluations of some species and some no-take areas. It also identified differences in abalone abundance between Cape Howe Marine National Park and comparison areas, and differences in abalone size between Point Hicks Marine National Park and comparison areas. These differences may have already been present when these no-take areas were established or may have developed following protection. The case study analyses also showed an overall slightly increased abundance of lobster within the Wilsons Promontory Marine National Park, and slightly decreased abundance outside the areas after establishment of this park. The case study recommended some future improvements to the monitoring program.

VEAC's management evaluation identified opportunities for review of the reef monitoring program to improve future performance evaluations and guide future management. The case study and its recommendations for improvements to the monitoring program will be a valuable input.

7.4.3 VEAC'S CONCLUSIONS

As noted above, achieving the primary ecological purpose of the no-take areas requires maintaining the condition of their biodiversity. It does not necessarily require the condition of this biodiversity to become more natural. It is not currently possible to definitively evaluate whether these purposes have been achieved. Guided by the SAC, VEAC applied the scientific understanding and information that is available to provide the best possible indication of whether the condition of biodiversity in the no-take areas has been maintained.



VEAC found that the key, broad environmental values that were initially present in each no-take area, and that are relevant to the condition of biodiversity, were still present in the most recent surveys. Repeating this checklist analysis at regular intervals may provide a useful tool for broadly tracking performance. Its rigour could be improved by including additional ecological values relevant to the condition of biodiversity as scientific understanding grows, including more recent survey information and including comparison sites. Friends groups may be interested in leading regular censuses and checklists.

The checklist analysis focused on whether key aspects of native biodiversity have been retained. It did not consider additions to biodiversity that affect the condition of the no-take areas, such as the establishment of marine pests. This is considered in section 7.5.

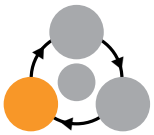
The checklist analysis focused on very broad environmental values. The comparative evaluation method had the potential to support more robust and detailed conclusions, allowing a fuller evaluation of whether the condition of biodiversity has been maintained in the no-take areas than the simple presence or absence of broad key values. VEAC could not apply the comparative evaluation method to this investigation as suitable, and appropriately analysed information was not available. The existing monitoring information on reef biodiversity could be used for this purpose in future, and Council has recommended that it is analysed using quantitative statistical methods.

As the climate changes, more species are expected to extend their range into the no-take areas. The occurrence of the sea urchin *Centrostephanus rodgersii* in several eastern no-take areas explored in VEAC's case study analysis is considered an early example. While climate change will clearly further affect the biodiversity of these areas, Council does not consider that it will undermine their value with respect to their ecological purposes. Consideration of such species in the future performance evaluations that inform adaptive management will be a complex issue.

7.5 Evaluation of whether key threats to biodiversity of the no-take areas have been acted on and contained

Managing the existing no-take areas towards the ecological purposes involves controlling, or ideally reducing, threats to their biodiversity. Evaluation of available information about how these threats have been managed, and how their levels may have changed, can indicate progress in achieving the ecological purposes. The biodiversity of the no-take areas can also be affected by external marine ecosystems. Information on the management of these ecosystems is also relevant to such an evaluation.

Information on threats must be cautiously interpreted for this purpose. It is feasible that the characteristics of the no-take areas, such as their size or age, may also have affected their progress in maintaining biodiversity in relatively natural condition.



7.5.1 INFORMATION AVAILABLE FOR THE EVALUATION

VEAC's assessment of the important threats to the no-take areas (see section 5.3), and of how these threats are managed (see sections 6.1 and 6.2) was a key input to this part of the performance evaluation. The threat assessment took account of previous threat assessments, including those conducted by Parks Victoria, and considered threats to the no-take areas from within and beyond their boundaries.[36] The management assessment considered the key threats identified in this threat assessment and other threats covered by specific provisions in the *National Parks Act 1975*. The threats considered in this management evaluation were:

- compliance with fisheries prohibition
- marine pests
- pipelines and petroleum exploration
- catchment pollution sources (for embayments)
- oil spills
- coastal development (for embayments).

VEAC identified little information specific to the no-take areas relating to changes in levels or impacts of these threats. The exceptions were for the threats and measures set out in the table below.

Table 6
Important threats and available measures and information specific to the no-take areas

Threat	Available measure and information
Compliance with fisheries prohibition	• Number of infringement notices and/or warnings for offences against the Fisheries Act or National Parks Act and regulations
Marine pests and disease	• Pest species observed either incidentally or during reef monitoring • Pest species observed near the no-take areas • Qualitative statewide evaluation in State of the Environment Report 2013
Pipelines and petroleum exploration	• Number of consents issued under the National Parks Act

This information requires careful interpretation, as not all measures are directly related to the level of threat or impact. Trends in the number of observed measures for fisheries offences, for example, do not necessarily provide an accurate indication of trends in actual offences or the resulting impact on biodiversity.

Larger-scale information on catchment-based pollution (for embayments) and oil spills may provide an indication of these threats to the no-take areas. The uncertainties involved in this extrapolation must be borne in mind. The information sources and measures that VEAC used for these threats, focusing on existing authoritative assessments, are provided in table 7.

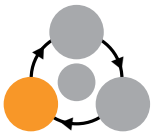


Table 7
Important threats and available measures and information relating to the wider marine environment

Threat	Available measure and information
Catchment pollution sources to embayments	Information from monitoring or assessment of relevant water quality indicators and/or input loads: • Port Phillip Bay: evaluated in Better Bays and Waterways (2009) and Closeout of Environmental Approvals report for the Channel Deepening Project (2012) • Western Port: evaluated in Better Bays and Waterways (2009) and Understanding the Western Port Environment (2011) • Corner Inlet: evaluated in the Corner Inlet Water Quality Improvement Plan (2013) • Qualitative statewide evaluation in State of the Environment Report 2013
Oil spills	• Records of pollution incidents, including listing of major historical incidents [54] • Qualitative statewide evaluation in State of the Environment Report 2013

VEAC did not identify any suitable information for evaluating trends in the threat or impact of coastal and marine development on the no-take areas. The draft revised Victorian Coastal Strategy highlighted the continued population growth, but fluctuating population growth rates, over the past decade on the Victorian coast.[55] This growth is relevant to the threat that development poses to the no-take areas, but is not the only source of this threat. The threat assessment commissioned by VEAC (see 5.3) did not rate coastal and marine development among the most significant threats to the no-take areas. It was not further considered in VEAC's performance evaluation.

Information on the condition and management of external marine ecosystems was also relevant to VEAC's performance evaluation, as it may have affected the biodiversity of the no-take areas. It is not possible to fully map the complex and extensive physical and ecological connections within marine environments. VEAC's evaluation therefore assumed that Victoria's entire marine environment could feasibly affect the no-take areas. While connectivity is probably not this extensive, some very large-scale linkages have been observed. Limited documented information was available to assess trends in the condition of Victoria's marine ecosystems. The recent State of Environment Report 2013 qualitatively assessed the condition of Victoria's marine and coastal ecosystems, drawing on available information on ecosystem health, conservation, biodiversity (focusing on listed species and threats) and water quality.

7.5.2 METHODS AND ANALYSIS APPLIED TO THE EVALUATION

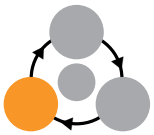
VEAC's assessment of the available information on management of threats to the no-take areas drew largely on the analyses it had already conducted. Available information on changes to levels of relevant threats to the no-take areas was evaluated qualitatively, drawing where possible on existing assessments and reviews. Any existing quantitative analyses of trends in threat levels were incorporated.

7.5.3 VEAC'S EVALUATION

Illegal fishing

Fishing necessarily affects biodiversity by removing individuals of some species. Any flow-on effects to other species will depend on factors including the species, size and numbers of individuals removed. Prohibitions on fishing in the no-take areas will therefore have made their biodiversity more natural, but it was not possible from the available data for Council to accurately assess the size of this effect. Council was also unable to accurately assess trends in illegal fishing or in its impact since the areas were established. This is not confined to Victoria. The practical difficulties in measuring the effectiveness of compliance programs are well recognised. Trends in enforcement effort and infringement notices may not accurately reflect trends in actual compliance for a range of reasons. VEAC did not identify any obvious and major trends in offence statistics over 2005-2013. Successful prosecutions have included substantial illegal removal of abalone from Point Hicks Marine National Park and from the Jawbone Marine Sanctuary. Council's management assessment identified several opportunities to reduce the threat that non-compliance poses to biodiversity in the no-take areas.

Marine pests and diseases



Unfortunately, several species of marine pests are well established in a number of the no-take areas (see table 8). These include species that are known to affect biodiversity, including the Northern Pacific Seastar, Japanese kelp and the screw shell. This is similar to the establishment of weeds across the terrestrial national parks estate.

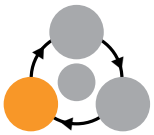
Marine pests have almost certainly had detrimental impacts on the condition of biodiversity in a number of no-take areas. These pests will be difficult, if not impossible, to eradicate with current technology. Council does not consider that this overwhelms the value of the areas in maintaining examples of Victoria's biodiversity in as natural condition as practically feasible. Council's management assessment highlighted the importance of minimising new introductions of marine pests within and beyond the no-take areas.

One major marine disease has occurred in Victoria since the no-take areas were established: the outbreak of the herpes-like abalone viral ganglioneuritis.* This disease was confirmed in 2006 to be spreading among wild abalone along Victoria's southwest coast and has since been found from Discovery Bay to Cape Otway. This virus has affected many reefs in southwest Victoria and is likely to have adversely affected some no-take areas. This again underlines the importance of preventing pest and disease outbreaks across Victoria's marine environment due to the real practical constraints involved in containment and eradication.

*Further information on abalone viral ganglioneuritis in Victoria is available at http://www.depi.vic.gov.au/fishing-and-hunting/fisheries/marine-pests-and-diseases/abalone-disease

Table 8

Pest species present in no-take areas as recorded in marine natural values reports, references cited within these reports and/or information provided by Parks Victoria



KEY:

- • known
- - suspected
- • observation reported but not confirmed through follow-up study

Bioregion	No-take area	Introduced sp: Abalone ganglioneuritis	*Carcinus maenus* (green shore crab)	*Codium fragile* (broccoli weed)	*Asterias amurensis* (northern pacific sea star)	*Sabella spallanzanii* (European fan worm)	*Undaria pinnatifida* (Japanese kelp)	*Grateloupia turuturu* (red algae sp)	*Musculista senhousia* (bivalve mollusc)	*Crassostrea gigas* (Pacific Oyster)	*Astrosole scabra* (NZ seastar)	*Maoricolpus roseus* (screw shell)	Terrestrial pest plant sp on Mud Islands (not identified specifically)	*Spartina anglica* (Common cordgrass)
Otway	Discovery Bay MNP	•												
	Merri MS													
	The Arches MS	•												
	Twelve Apostles MNP	•												
Central Victorian	Marengo Reefs MS													
	Point Danger MS		-											
	Point Addis MNP		-											
	Eagle Rock MS		-											
	Barwon Bluff MS		-											
	Mushroom Reef MS		•											
	Bunurong MNP													
Victorian Embayments	Port Phillip Heads MNP*		•	•	•	•							•	
	Point Cooke MS		•		•	•	•	•						
	Jawbone MS		•	•	•	•	•							
	Ricketts Point MS		•	•	•	•	•							
	Yaringa MNP								•	•				
	French Island MNP													
	Churchill Island MNP		•	-										
	Corner Inlet MNP		•	•										•
Flinders	Wilsons Promontory MNP		-		•						•	-		
Twofold Shelf	Ninety Mile Beach MNP													
	Beware Reef MS		-								•			
	Point Hicks MNP		-								•	•		
	Cape Howe MNP		-								•	•		

*note: some pest species were found in different sections of the park

Pipelines and petroleum exploration

The construction or operation of pipelines and seabed cables and petroleum exploration are unlikely to have significantly affected biodiversity of the no-take areas. To date, only one relevant consent has been granted. This 2005/06 consent was for transit of a seismic survey vessel through the Twelve Apostles Marine National Park with no discharge of airguns. It is unlikely to have had major effects on biodiversity.

Oil spills

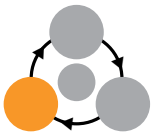
Major oil spills are a potentially significant threat to the no-take areas because they can have major consequences for biodiversity. The likelihood of major spills occurring is very low.[36] There have been a variety of small pollution incidents in Victoria's marine waters from time to time but no major oil spills in Victoria since the no-take areas were established.[54]

Catchment pollution sources to embayments

Pollutant loads from catchments to Victoria's embayments are difficult to accurately estimate. Nutrients and sediment inputs are considered to pose the most threat to these ecosystems. These threats are best known for Port Phillip Bay and least known for Corner Inlet.

Victoria's population has grown since the no-take areas were established. This may have increased the threat of catchment pollution to the no-take areas in embayments. Council identified few actions that have specifically aimed to reduce this threat to no-take areas. However, some no-take areas will have benefited from actions to reduce this threat to wider marine ecosystems. Despite population growth, the nutrient load entering Port Phillip Bay is considered to have decreased since the 1992-96 Port Phillip Bay Environmental Study.[44] Drought conditions over much of the past decade are likely to also have reduced pollution inputs to Port Phillip Bay and Western Port. Since the drought broke, elevated levels of some water quality indicators may have affected no-take areas in Port Phillip Bay. Western Port receives lower catchment inputs, but may have experienced similar conditions. VEAC is unaware of any current and relevant trend analyses. Much less is known about water quality and inputs for Corner Inlet. Nutrient and sediment inputs to Corner Inlet have been of community concern. The recent Corner Inlet Water Quality Improvement Plan targets these inputs.

Condition and management of external marine ecosystems



It was difficult for Council to assess the extent to which the condition and management of external marine ecosystems may have affected the biodiversity of the no-take areas. Approaches for assessing the condition of temperate marine ecosystems are not well established internationally. This is partly due to the logistic, financial and taxonomic challenges that can be involved in monitoring. Natural temporal variation can also make it difficult to interpret apparent trends. The recent State of the Environment Report for Victoria concluded that trends in marine and coastal health and biodiversity are unclear. Water quality was considered stable and in fair condition. The rating of trends in marine and coastal conservation in the State of the Environment Report was based largely on the number of marine protected areas and development of coastal land, and is therefore not strictly relevant to this evaluation.

Victoria's marine environment, coasts and catchments are widely used. These uses can, if not carefully managed, pose a variety of threats to marine ecosystems. Ecosystems along Victoria's open coast are exposed to fewer threats than those in the embayments,[36] and are likely to be in better condition. VEAC's management evaluation noted the range of sectoral, spatial, threat and issues-based policy applied to managing Victoria's marine environment. Council has recommended development of an overarching policy to guide and coordinate ecologically sustainable use and management. This policy could provide a basis for systematic reporting on progress, thereby assisting future management and evaluations of the no-take areas.

7.6 VEAC's evaluation of the performance of the marine national parks as benchmarks

In achieving their primary ecological purpose (i.e. maintaining examples of Victoria's marine biodiversity in relatively natural condition), the marine national parks were also intended to provide benchmarks for research and monitoring.

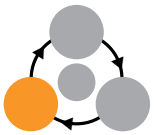
While the marine national parks do not need to be used for research or monitoring to serve their purpose as benchmarks, their capacity to do so depends on:

- maintenance of their biodiversity in relatively natural condition
- appropriate permitting and management processes for research and monitoring
- awareness of their availability as benchmarks
- ideally, maintenance of a suitable core monitoring program for the marine national parks that can be built upon for specific additional purposes.

These criteria appear to have been achieved. VEAC's performance evaluation indicated that the biodiversity of the no-take areas has broadly been maintained, notwithstanding the established marine pests. There is some awareness of the availability of the marine national parks as benchmarks, as research and monitoring has been conducted there.* Permits administered by the Department of Environment and Primary Industries oversee this research. Marine national parks have been used as reference sites to inform abalone harvest management, although this was not integrated with the ongoing marine protected area monitoring.

VEAC is not aware of evidence that research or monitoring has significantly damaged biodiversity in any marine national park. To ensure that such damage does not occur in future or go on undetected, Council has recommended that research with potential to adversely affect biodiversity not be permitted in any no-take area, unless the research is critical for achieving the ecological purposes and there is no feasible alternative.

There is an opportunity for Parks Victoria, supported by scientific experts, to further promote and otherwise facilitate the responsible use of the marine national parks for this benchmark purpose. Parks Victoria could act as a broker to encourage integration among projects, including monitoring programs, to assist the development of consolidated understanding and maximise cost effectiveness.



7.7 VEAC's overall evaluation of the performance of the no-take marine protected areas in achieving their ecological purposes

Victoria's no-take areas were established with the long-term intention of maintaining examples of Victoria's marine ecosystems, as understood at the time and including natural dynamics. Achieving this ecological purpose means maintaining all of the biodiversity of these areas in relatively natural condition. This largely involves mitigation of the key and treatable threats. The no-take areas were not intended to rehabilitate marine areas. It is, of course, desirable to improve the condition of biodiversity where feasible in the no-take areas, but this is not required to achieve their purpose.

Council's evaluation indicated that the biodiversity of the no-take areas has been broadly maintained, based on the aspects of ecological performance that could be evaluated.

The evaluation also indicated that the marine national parks appear to be achieving their additional ecological purpose as benchmarks.

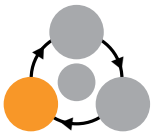
Council found that the major marine habitats of the no-take areas, including habitat-forming seaweeds and seagrasses, were still present in the most recent surveys of each of the no-take areas. These marine habitats have a substantial influence on biodiversity and were important in the design of the no-take areas. Council also found no evidence of major increases in the impact of threats to the no-take areas since establishment, apart from establishment of marine pests and the abalone virus in several locations. It is also possible that the impacts of catchment-based pollution

*Research and monitoring programs conducted in each on the no-take areas through Parks Victoria's research partners program and similar mechanisms are listed in the series of updated marine natural values reports. For example: Barton, J. Pope, A. and Howe, S. 2012, *Marine Natural Values Study Vol 2, Marine Protected Areas of the Central Victoria Bioregion*. Parks Victoria Technical Series Number 76. See www.parkweb.vic.gov.au.

on no-take areas in the embayments may have increased following the breaking of the drought. Marine pests and disease will have detrimentally affected the condition of biodiversity in some no-take areas at some scales. Council is of the view that these impacts do not fundamentally diminish the value of the no-take areas in maintaining examples of Victoria's biodiversity in as natural condition as is practically feasible. Preventing future marine pests and diseases to the extent possible is a priority for management.

Council's evaluation of the ecological performance of the no-take areas was based on the best possible analysis of the available information and understanding. The analysis was not definitive and could not cover all aspects of biodiversity. Monitoring data are available, but not yet analysed, that would allow a more detailed future evaluation of whether reef biodiversity has been maintained. Exploration of these data may also indicate whether there have been improvements to the condition of reef biodiversity. They are a substantial resource for future performance evaluations. Council has recommended analysis of these data using methods that compare the no-take areas and reference sites. Council has also recommended that a review be conducted that considers the extension of this monitoring program to other marine habitats and threats.

VEAC's evaluation was conducted just over a decade after Victoria's no-take areas were established. A key question for Council was: what type of biodiversity would be expected in the no-take areas after this period if they were achieving their purposes? Scientific understanding and experience from marine protected areas elsewhere did not provide a comprehensive answer, but did provide useful indications. Many of the available, detailed evaluations focus on performance of marine protected areas in rehabilitating edible fish and shellfish. Victoria's no-take areas focus on maintaining, rather than rehabilitating, overall biodiversity. The prohibition of fishing is expected to improve the condition of this biodiversity over time (i.e. make it more natural). This does not mean that all species in the no-take areas, or the diversity of species, are scientifically predicted to increase. Natural ecological processes involve interactions between species. Some species can increase at the expense of others, for example by feeding on them. Clear communication of this understanding, and of the ecological purposes, by park managers may help to minimise future misunderstandings about the performance of the no-take areas.



Apart from management of threats to the no-take areas, factors such as the design of the no-take areas and management of external ecosystems may also have affected the performance of the no-take areas in achieving their purposes. Evaluation of the design of the no-take areas was beyond the scope of the investigation. Council has recommended development of a state-wide policy to guide future, ecologically sustainable management and use of Victoria's marine environment.

Climate change is expected to have large-scale effects on Victoria's marine environment, including on the no-take areas. The extension of the distributional range of the sea urchin *Centrostephanus rodgersii* is widely considered an early example of these effects. Council does not believe that these changes reduce the value of the no-take areas with respect to their purposes, but this requires clear and consistent communication. The no-take areas may be less affected by climate change due to their more natural biodiversity, supporting their value as benchmarks.

Regular performance evaluations are a key component of the adaptive management cycle recognised in the global framework for assessing protected area management. Future performance evaluations for the no-take areas should be based on the best available approaches, advice and information.

8. Victoria's multiple-use marine protected areas: evaluation of management and performance in achieving their ecological purposes

As for the assessment of the no-take marine protected areas (see chapters 5 to 7) VEAC's evaluation of management and performance of Victoria's six multiple-use marine protected areas was structured by the IUCN-WCPA framework but focused on the management arrangements, ecological conditions and threats relevant to achieving their ecological purposes.

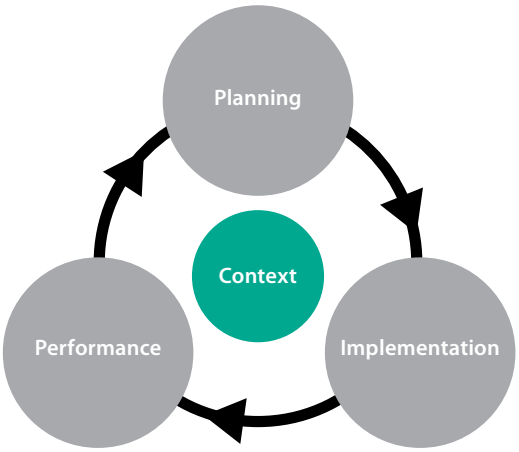
8.1 Management context

The context was broadly described in the discussion paper for the investigation, but was considered in further detail for the assessment.

Chapter 5 of this report provides an analysis of the context of Victoria's no-take marine protected areas. Several specialist consultancies were drawn on for that analysis, and are also relevant to the multiple-use areas. The full consultancy reports are available on VEAC's website.

VEAC analysed the following aspects of the management context of the multiple-use areas to guide the scope of its assessment:

- how the areas were established
- key legislation that prescribes their management
- governance and administrative arrangements
- relevant management arrangements for marine ecosystems and threats outside the areas
- relevant management arrangements for terrestrial ecosystems and threats outside the areas
- relevant audits of the management of the marine protected areas.



8.1.1 ESTABLISHMENT OF THE MULTIPLE-USE AREAS

Victoria's six existing multiple-use marine protected areas were established prior to the creation of the marine national parks and marine sanctuaries in 2002, and now include the areas of the pre-existing parks that were not subsumed wholly or partially into the no-take system. The history of Victoria's first marine protected areas is described in the discussion paper for the investigation.

All six of Victoria's remaining multiple-use marine protected areas are in the South Gippsland and West Gippsland regions (see figure 2):

- five areas around Wilsons Promontory established in 1986:
  - Shallow Inlet, Corner Inlet and Nooramunga marine and coastal parks
  - Wilsons Promontory Marine Park
  - Wilsons Promontory Marine Reserve
- Bunurong Marine Park established in 1991 and situated on the east and west sides of the Bunurong Marine National Park.

Three marine and coastal parks are situated in inlets or embayments and include terrestrial land, and three other marine protected areas are located on the open coast.

The Environment Conservation Council (ECC) in its final report on the Marine Coastal and Estuarine Investigation in 2000 noted that 'without exception the existing marine parks have very significant environmental values, and make a substantial contribution to the representative and comprehensive nature of the marine protected areas system'.[17] The ECC did not recommend any new multiple-use parks but recommended the existing areas (except for those incorporated in no-take marine national parks or sanctuaries) be retained to be managed for a variety of uses which do not impact on the values and objectives of the park.

Marine and coastal parks

In 1982, the Land Conservation Council recommended the establishment of Shallow Inlet, Corner Inlet and Nooramunga marine and coastal parks (originally termed marine and wildlife reserves) to protect the significant ecological values of these areas, particularly internationally significant migratory wading bird habitats. The 1982 declaration of the Corner Inlet – Nooramunga area as a Ramsar Wetland of International Significance coincided with this recommendation. The Ramsar listing recognises the ecological importance of this area through a complementary international management framework.

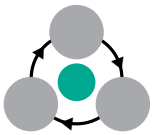
The marine and coastal parks include coastal land which accounts for approximately 10 per cent, 20 per cent and 40 per cent of the total area of Corner Inlet, Shallow Inlet and Nooramunga marine and coastal parks respectively.

Marine parks and marine reserve – open coast

The areas known as the South Gippsland Marine and Coastal Parks established in 1986 include the three marine and coastal parks discussed above, and two marine protected areas on the open coast – i.e. outside bays, inlets and estuaries – the Wilsons Promontory Marine Reserve and Wilsons Promontory Marine Park. Most of the original marine reserve was included in the Wilsons Promontory Marine National Park in 2002.

The third multiple-use marine protected area on the open coast is the Bunurong Marine Park to the east and west of the Bunurong Marine National Park near Inverloch. The Bunurong Marine Park was established in 1991 after extensive community consultation. The central no-take sanctuary zone of the marine park was entirely subsumed within the Bunurong Marine National Park in 2002.

The assessment conducted by VEAC focuses on management and performance of the existing multiple-use areas and does not include an assessment of their design or the processes by which they were established.



8.1.2 LEGISLATION UNDERPINNING ESTABLISHMENT AND MANAGEMENT

Marine and coastal parks, unlike Victoria's other marine protected areas, contain areas of coastal land and, in the case of Nooramunga Marine and Coastal Park, substantial island areas. The inclusion of these terrestrial areas was intended to protect highly significant natural values in their own right as well as their connections to the marine environment, with a particular focus on protecting roosting areas of wading birds. Most terrestrial land within the marine and coastal parks was already reserved under the *Land Act 1958* or *Crown Land (Reserves) Act 1978*.

The Victorian Government established the South Gippsland marine and coastal parks in 1986 through a gazettal process which involved reserving any previously unreserved public land within the boundary under the Crown Land (Reserves) Act and listing it on Schedule Four of the National Parks Act. Pre-existing reserves within the boundaries of the marine and coastal parks retained their existing reservations, and land subject to leases and licences was also excluded. This was originally intended to be a temporary arrangement, to be resolved through a later parliamentary process that was deferred for a number of reasons, including the LCC and ECC marine, coastal and estuarine investigations and subsequent responses by Government that together ran from 1991 to 2002. The intended extent of the marine and coastal parks is depicted on the plan accompanying the reservation and lodged in the Central Plan Office, and in other maps and publications at the time the Government announced their establishment. Reserves that were in place at the time of establishment in 1986 – almost all the coastal land, including islands, and some of the seabed – have not yet been re-reserved and included in the parks as intended.

Schedule Four of the National Parks Act was established as a means to provide protection under the Act to areas 'as though they were a park' through gazettal rather than through Parliament as for other parks. Current Schedule Four marine protected areas are intended to be managed as though they were Schedule Three parks ('other parks'), although the provisions of the Act specified to apply are somewhat ambiguous or contradictory in this respect and require clarification.

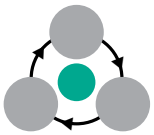
The 'unfinished business' of formal definition of boundaries and reservation of the marine and coastal parks impedes effective management of threats to the values for which the areas were established. For example, rangers do not have any regulatory tools to manage dogs in highly sensitive shorebird roosting sites because the coastal land has not yet been formally incorporated in the park and the park regulations therefore do not yet apply.

The boundaries of the three multiple-use areas on the open coast are not beset with the same problems as the three marine and coastal parks in the bays and inlets. However, the Wilsons Promontory Marine Park and Wilsons Promontory Marine Reserve are contiguous and managed in an identical way, and therefore the separate reservations and different nomenclature is confusing. Part of the Bunurong Marine Park retains an underlying permanent reservation for protection of the coastline, a narrower purpose than for the remainder of the marine park, which is also potentially confusing and difficult to communicate.

Council has made several recommendations relating to formal definition of boundaries and provision of a sound legislative base for management.

SEE RECOMMENDATIONS R22 TO R28

8.1.3 GOVERNANCE AND ADMINISTRATIVE ARRANGEMENTS



As described in section 5.1.3, a management services agreement between the Secretary to the Department of Environment and Primary Industries (DEPI), Parks Victoria and the Minister for Environment and Climate Change sets out principles for the delivery of park management services, lists the land to be managed and sets out the key functions of Parks Victoria and DEPI.

Parks Victoria is the land manager for all areas under the National Parks Act unless there are specific provisions under the Act e.g. for appointed land of a Traditional Owner Land Management Board that is in a park. Parks Victoria is therefore the designated manager of multiple-use marine protected areas. The Act does not provide for management of parks to be delegated to committees of management. The incomplete reservation of the marine and coastal parks means that several committees of management are still in place for parts of the coast intended to be in the parks, further confusing the governance and the public understanding of the purpose and management frameworks of the areas.

Management arrangements for multiple-use areas are more complex than are those for no-take marine protected areas. By definition, multiple-use marine protected areas provide for a wider range of activities than are permitted in no-take areas, and a suite of interrelated management frameworks apply. This means that a number of other land managers are active in the multiple-use protected areas including, in particular, DEPI for fishing and hunting management, the West Gippsland Catchment Management Authority as waterway and catchment manager, and Gippsland Ports. VEAC's evaluation of management included an assessment of the activities of other resource managers and systems and programs in place to integrate management across the sectors towards the ecological purposes of the multiple-use areas and the activities.

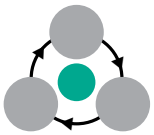
8.1.4 MANAGEMENT FOR EXTRACTIVE USE OF RESOURCES

Apart from the *Environment Protection Act 1970*, legislation and management frameworks that apply to the range of uses in the marine parts of multiple-use marine protected areas are generally sectorally based, and include the *Fisheries Act 1995, Marine Safety Act 2010, Petroleum Act 1998* and *Pipelines Act 2005*. The principal extractive use in the multiple-use parks is the harvesting of living marine resources through commercial and recreational fishing.

The Fisheries Act 1995 and Fisheries Regulations 2009 regulate commercial and recreational fishing. Fisheries management plans for certain commercially harvested species are established within this framework. The Corner Inlet commercial fishery, which covers both the Corner Inlet and Nooramunga marine and coastal parks, is specifically regulated under a Corner Inlet Fishery Access Licence. A voluntary licence buy-back scheme in 2000 for Victorian bay and inlet commercial fisheries resulted in the cessation of commercial fishing in the Shallow Inlet Marine and Coastal Park. Commercial wild catch fisheries in the three multiple-use areas on the open coast are regulated under a number of fishery access licences including but not limited to Abalone Fishery (Central Zone), Rock Lobster Fishery (Eastern Zone) Ocean Fishery, and Wrasse (Ocean) Fishery. Under the Offshore Constitutional Settlement between the Commonwealth and Victoria the Commonwealth also manages some fisheries in Victorian waters, e.g. the trawl fishery, but the Victorian open coast multiple-use parks are excluded from these arrangements.[56]

Except for those in exempt categories (e.g. under 18s, over 70s), a Recreational Fishing Licence is required for recreational fishing in all Victoria's marine, estuarine and fresh waters by any method including line fishing, bait collection, gathering shellfish, spear fishing and diving for abalone and rock lobster.

8.1.5 MANAGEMENT ARRANGEMENTS FOR TERRESTRIAL ECOSYSTEMS



As marine and coastal parks include both marine and terrestrial (coastal) environments, legislative and management frameworks for both environments apply. Management frameworks applying in different parts of the parks include those established under the *National Parks Act 1975, Flora and Fauna Guarantee Act 1988, Wildlife Act 1975, Coastal Management Act 1995*, and *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth).

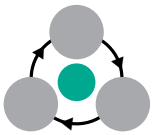
As outlined above, management arrangements for the coastal land in the marine and coastal parks is currently complex as various parts of the parks (or areas intended to be in the parks) were reserved at different times using different mechanisms. The reservations of coastal Crown land have not yet been re-made to reflect the intended boundaries of the marine and coastal parks. As a consequence, there are many old or obsolete reservations and an absence of appropriate regulations.

8.1.6 AUDITS ON THE MANAGEMENT OF THE MARINE PROTECTED AREAS

As described in earlier chapters, the Victorian Auditor-General's Office (VAGO) has undertaken several recent audits of relevance to the investigation. Most relevant was the 2011 performance audit, *Environmental management of marine protected areas*.[10] VEAC's assessment considered the management processes implemented in response to VAGO's recommendations from this audit. The recommendations are set out in box 3 earlier in this report. The findings relevant to this investigation are summarised in section 5.1.5. This audit pointed to systemic weaknesses with park planning, program management and resource allocation that should be addressed.

VAGO highlighted several issues relating specifically to the multiple-use areas. These are discussed in the relevant evaluations in the sections that follow. VAGO noted that these parks make up 53 per cent of Victoria's marine protected areas and have significant environmental values.

8.2 Ecological context



8.2.1 THE ECOLOGICAL PURPOSES OF THE MULTIPLE-USE AREAS

Clear understanding of the purposes of a marine protected area is fundamental to its management, and also to assessment of performance. There are some differences in the documented purposes for which each of the multiple-use areas were established, largely relating to the individual biophysical characteristics of the areas or reflecting the terminology used at the time they were set aside. Further details on specific purposes can be found in the discussion paper for the investigation.[3] For this investigation, the establishment purposes for multiple-use marine protected areas have been consolidated as follows:

- to protect areas containing significant natural ecosystems for their ecological significance (including the habitat of international migratory waders for the three marine and coastal parks), natural interest or beauty, scientific history and/or archaeological interest
- to manage these significant ecological values in a way that accommodates sustainable use of resources including, but not limited to, commercial and recreational fishing
- to provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments.

These areas are also considered to supplement Victoria's contribution to the national representative system of marine protected areas.

The consolidated purposes adopted by VEAC are for practical assessment purposes and do not affect the formal purposes defined in relevant policy and statute.

The Scientific Advisory Committee for the investigation advised Council that biodiversity in more natural condition is predicted to have higher ecological resilience, or capacity to resist damage and recover quickly, to some of the disturbances it may face in the future (see section 5.2.1 and chapter 6).

The requirement to accommodate extractive uses – primarily fishing - in the multiple-use marine protected areas fundamentally affects the degree to which biodiversity values can be protected and natural condition achieved.

As the terms of reference for VEAC's investigation placed an emphasis on biodiversity and ecological values, the ecological aspects of these purposes have received priority in the assessment of performance and management. Assessment against the purposes that refer to providing for enjoyment and understanding of the natural environment is discussed in chapter 9.

8.2.2 THE BIODIVERSITY OF THE MULTIPLE-USE AREAS

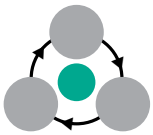
While the significant natural values of the multiple-use areas are well known and were well documented at the time the areas were established in the 1980s and 1990s, updated information on these areas is generally not available in comprehensive and accessible reports except for the Corner Inlet Ramsar site and bird data. Since the no-take areas were established in 2002, new habitat mapping and inventory has generally been focused on these areas rather than on multiple-use areas. For example, the ecological values of the three multiple-use areas on the open coast at Wilsons Promontory and Bunurong were as well known as the adjacent marine national parks until 10 to 15 years ago, but little additional information has been collected since then.

Two of the three marine and coastal parks (Corner Inlet and Nooramunga) are included in the Corner Inlet Ramsar site as an area of international significance for migratory wading birds. The Shallow Inlet Marine and Coastal Park is not included in the Ramsar site, but is designated as an Important Bird Area (IBA) by Birdlife Australia.[57] Designation as an IBA takes into account the importance of areas for both non-migratory and migratory birds. Corner Inlet and Nooramunga are also designated IBAs. The Ecological Character Description for the Corner Inlet Ramsar site, updated in 2011, describes the major features of the site that form its ecological character as its large geographical area, the wetland types present (particularly the extensive subtidal seagrass beds), diversity of aquatic and semi-aquatic habitats and abundant flora and fauna (including significant proportions of the total global population of a number of waterbird species).[58]

In addition to the biodiversity values, the coastal environments of marine and coastal parks also have geological and geomorphological sites of regional, state and national significance. VEAC commissioned a review to summarise the information currently available on 132 geoheritage sites or sub-sites near Victorian marine protected areas. For each marine area or group of areas, the context (in terms of geology and geomorphic processes) is described, and there is a brief discussion of management implications.[59]

Section 5.2.3 describes the scales of ecological processes affecting the biodiversity of marine protected areas. VEAC commissioned an expert review to illustrate and better understand the important ecological connections for Victoria's marine biodiversity.[29] This review provided case studies demonstrating the scales of some important processes, which are applicable to both no-take and multiple-use areas (see boxes 7 and 8).

8.2.3 THE IMPLICATIONS OF CLIMATE CHANGE FOR THE ECOLOGICAL VALUES OF THE MULTIPLE-USE AREAS



Climate change is predicted to significantly affect Victoria's marine environment. The potential changes to biodiversity are discussed in section 5.2.4 including the implications for the biodiversity in the no-take marine protected areas. Much of this discussion is equally applicable to the multiple-use areas, with an important qualification: that the more natural diversity of the no-take areas could increase its resilience to some effects of climate change.

In the future, an additional challenge to managing the sheltered environments of the three marine and coastal parks will be sea level rise with its accompanying changes to storm wave and tidal processes. The Nooramunga barrier islands and sandy dune systems are highly susceptible to erosion and impacts associated with climate change related increases to sea level and increased wave energy.[36] There are currently no data describing sediment movements and long-term shoreline changes to identify climate change impacts. Box 14 is a case study of the potential impacts of sea level rise on the sheltered environments of the Nooramunga Marine and Coastal Park.

Box 14

Case study – impacts of sea level rise on natural values in marine and coastal parks

The Gippsland coast (including 90 Mile Beach) is a long stretch of stable landforms: a complex of tidal inlets, sandy barrier islands or spits, back barrier lagoons, and the remains of barriers and lagoons from previous geological ages. The present-day barriers are virtually at sea level, and are the integrated result of combined along-shore and onshore-offshore sand transport.

The barrier island and mainland fringe, east of Corner Inlet, is a complex of barrier islands, including the outer barrier and the mainland coastal fringe, a complex tidal embayment with associated ebb and flood deltas. These features are of national significance.

With sea level rise, there is increased likelihood of inundation and erosion in the sandy barriers, and changes to the shorelines, bars and channels of the tidal inlets. The changes will affect the shoreline and the land above sea level, and also landforms below the water. A tidal inlet's channels and bars are shaped by the currents whose paths are partially determined by water depth. Changes to the tidal currents will change sediment distribution, therefore altering bars, channels, and other features.

These areas are likely to undergo change during the process of sea level rise. Change will include shifting of bars and channels, possible coastal erosion, and possibly the loss of some islands or barriers. If the area's natural processes are in good condition, and the sea level rise is not more rapid than the rate of landform evolution, then the change to a new equilibrium may be relatively straightforward. If the resilience of the system is compromised by interruptions to the sediment transport mechanisms or destruction of the plant communities, change may be more difficult.

Source: Wakelin-King, G A and White, S Q (2013)[59]

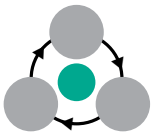
8.2.4 THREATS TO THE ECOLOGICAL VALUES OF VICTORIA'S MULTIPLE-USE AREAS

Managing Victoria's marine protected areas towards their ecological purposes involves mitigating the important and treatable threats to ecological values. Section 5.3.1 describes in detail VEAC's approach to threat assessment.

Victoria's marine protected areas are vulnerable to a variety of threats. General patterns were described in section 5.3.2. Threats with current potential to substantially affect marine protected areas across all bioregions include introduction of new marine pests and diseases, possibility of major oil spills, climate change, pollution inputs from catchments, coastal and marine infrastructure, and tourism and recreation within the marine protected areas. Marine protected areas in the embayments generally had a wider range of threats. VEAC commissioned additional work to provide an assessment of anthropogenic threats to the biodiversity of the existing marine protected areas, including the multiple-use areas.[35] [36] The consultancy report is available on VEAC's website. Agriculture is an important contributor to the threat from catchment pollution to the Gippsland marine and coastal parks.[36] Natural resource utilisation maybe a further threat in multiple-use parks where extractive uses are permitted.

Additional threats to terrestrial environments in the marine and coastal parks include habitat damage from urban and infrastructure development on the coasts, impacts of terrestrial weeds and pest animals such as foxes, cats and dogs, over-abundant native fauna on islands e.g. koalas, and cattle grazing of vegetation including saltmarshes.

While Parks Victoria assessed the threats to no-take marine protected areas over 2004-06,[33] no such assessment has been undertaken for the multiple-use areas. VAGO, in its 2011 audit, noted the absence of risk assessments for the multiple-use parks. However, threats have been systematically identified for two of the multiple-use areas – the Corner Inlet and Nooramunga marine and coastal parks – as part of Australia's obligations under the Ramsar Convention. In addition, the threat assessments undertaken by Parks Victoria for the Wilsons Promontory and Bunurong marine national parks can be cautiously extrapolated to the adjacent multiple-use marine parks and marine reserve.



As part of its role as a Contracting Party to the Ramsar Convention on Wetlands, Australia is expected to manage its Ramsar sites so as to maintain the ecological character of each site and notify the Ramsar Secretariat of any change. Ecological character is defined by the Ramsar Convention as the combination of the ecosystem components, processes and benefits/services that characterise the wetland at a given point in time. An Ecological Character Description for the Corner Inlet Ramsar site (which includes both the Corner Inlet and Nooramunga marine and coastal parks), prepared in accordance with a national framework for such descriptions, was published in 2011. A range of threats to the ecological character of Corner Inlet were identified. Given the size and diversity of wetland habitats present, the threats to the values of the Ramsar site vary greatly across multiple spatial and temporal scales and in terms of their potential severity.[58]

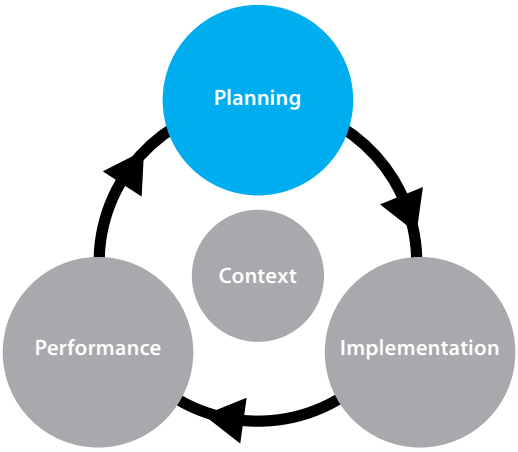
A range of recreational boating-related threats, especially to seagrass beds, are apparent for Corner Inlet. Recreational angling and commercial net fishing were also considered likely to represent key ongoing threats to fish stocks, although there are no available data to determine impacts. The main threats to the Corner Inlet Ramsar wetlands in terms of water quality are increased inputs of sediments and nutrients. Seawalls represent a key agent leading to fragmentation and isolation of tidal habitats from adjacent marine waters.

8.3 Planning to achieve the ecological purposes of the multiple-use areas

The role of planning in the adaptive management cycle is to guide implementation and delivery of management activities towards desired outcomes (e.g. the ecological purposes). Section 6.1 describes VEAC's evaluation of the planning approach that guides management towards achieving the ecological purposes of the no-take areas. While some of the discussion is also relevant to the multiple-use areas, the significant differences in the purposes, legislation and governance, and management arrangements, limit the application of the analysis.

Management plans are required for the six multiple-use areas under the *National Parks Act 1975* through the application of section 18(2)(d) to the areas listed in Schedule Four.

In its audit, VAGO identified that there were no finalised management plans for the marine and coastal parks, although draft plans were prepared in 1990 and 1996. As described in the discussion paper for VEAC's investigation, finalisation of these plans was initially deferred to await the outcome of the Land Conservation Council's, then Environment Conservation Council's Marine, Coastal and Estuarine Investigation. The complexities associated with the marine and coastal parks were not resolved in, or following, this investigation as attention and resources turned to establishment of the no-take system of marine national parks and sanctuaries in 2002. The open coast multiple-use areas at Wilsons Promontory and the Bunurong coast were included in the relevant management plans for the adjacent marine national parks in 2006.



Section 6.1.3 provided an overview of Parks Victoria's current and proposed planning approaches, noting that the investigation coincided with a period of substantial refinement of these approaches and tools. The statewide strategy developed in 2002 guided planning for the management of the no-take areas from 2003 to 2010 but did not cover the multiple-use areas.[16] The Marine Protected Areas Program Plan 2012-2014 covered both the multiple-use areas and the no-take areas, and specified actions, with associated accountabilities and timeframes, across 12 program areas.[27] As discussed in section 6.1.3 the program plan refers to a number of further proposed plans, such as park implementation plans, regional operation plans, compliance plans and emergency management plans. Implementation plans for the multiple-use South Gippsland marine and coastal parks were to be prepared as a priority.

8.3.1 EVALUATION OF POLICY AND PLANNING TO GUIDE LONG-TERM MANAGEMENT OF THE MULTIPLE-USE AREAS

Evaluation of policy and planning must focus on the primary ecological purposes of the multiple-use areas, as outlined in section 8.2.1 for no-take areas.

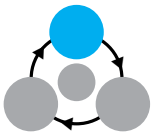
Council noted in the draft proposals paper that there is no common understanding of specific goals and actions that would maximise protection of ecological values while also providing for extractive uses, primarily fishing. In the absence of such an understanding, fisheries are managed independently and decisions on other potentially damaging or disturbing activities in the multiple-use areas are made on a case-by-case basis, usually in response to specific proposals, rather than as a result of applying clear and documented policy. Examples include aquaculture, commercial hovercraft tours, water sports events and spearfishing competitions.

A broadly-based process across agencies and stakeholders is required to translate the ecological purposes of the multiple-use parks into specific biodiversity goals, before detailed policies can be developed. Biodiversity goals must acknowledge that the requirement to accommodate extractive uses – primarily fishing – in the multiple-use areas fundamentally affects the degree to which biodiversity values can be protected. As noted in section 8.2.2 updated information on the biodiversity values of the multiple-use areas is generally not available in comprehensive and accessible reports, such as the marine natural values reports for the no-take areas. This information should be collated and publicly available prior to commencing the process of establishing biodiversity goals.

SEE RECOMMENDATIONS R29 AND R30

The approaches for updating existing policy to guide planning for no-take areas outlined in section 6.1.2 also broadly apply to the multiple-use areas.

The Council noted earlier in this report that the revised planning approach being adopted by Parks Victoria, including conservation action planning for the no-take areas, appears to include significant potential improvements, including a focus on identifying key threats to each no-take area, prioritising strategies to act on these threats, and aligning research and monitoring with management. This improved approach cannot be extended to the multiple-use areas until specific biodiversity goals are established as outlined above and, after that, planning is likely to involve several agencies. However, as the park manager Parks Victoria has a role in leading the conservation action planning for the multiple-use areas.



SEE RECOMMENDATION R31

8.3.2 PLANNING OF RESEARCH AND MONITORING

As outlined in section 6.1.4, Parks Victoria's management strategy, plans and reports describe its intention to apply adaptive management to Victoria's no-take areas. Adaptive management is similarly applicable to the muliple-use areas. Research and monitoring play an important role in adaptive management, but their targeting, design and communication is critical to their usefulness. Parks Victoria's investment in research and monitoring has significant potential to inform future management of all the marine protected areas, for example to better understand key threats and effective mitigation actions.

Although in general terms Parks Victoria's research strategies, approaches and statewide plans apply to the multiple-use areas, there are no specific actions identified in the *Marine Protected Areas Program Plan 2012-2014* for them. However Council acknowledges that knowledge gaps cannot be determined or critical research questions meaningfully developed until specific biodiversity goals are established for the multiple-use areas.

SEE RECOMMENDATION R32

8.4 Implementation of management to achieve the ecological purposes of the multiple-use areas

This section describes VEAC's evaluation of the implementation of management plans and other actions needed to achieve the ecological purposes of the multiple-use areas.

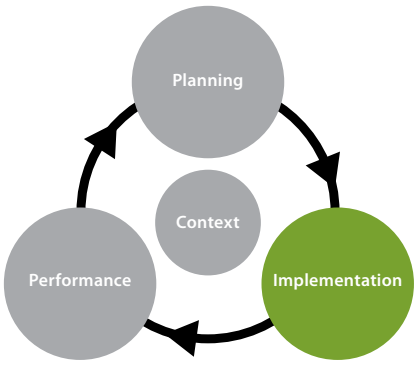
The role of implementation in the adaptive management cycle is to allocate resources, implement activities and deliver outputs towards desired outcomes (i.e. the ecological purposes). It includes implementation of research, monitoring, reporting and review to guide adaptive management. The IUCN-WCPA framework recognises separate 'inputs', 'processes' and 'outputs' stages in adaptive management. VEAC integrated these into a consolidated evaluation of 'implementation'.

Implementation of management for the multiple-use areas is guided by the planning that was discussed in section 8.3 earlier in this chapter. Due to the connected nature of marine ecosystems, it includes management activities implemented outside as well as within the multiple-use areas.

As the manager of Victoria's marine protected areas, Parks Victoria is responsible for leading implementation of management within the multiple-use areas. However Parks Victoria does not have responsibility for several significant activities in the multiple-use areas which are managed directly by other agencies such as Fisheries Victoria. It does have an important role in advocating and facilitating action by other agencies and users that contribute to managing or generating threats.

Because of the absence of a clear governance framework for the multiple-use areas, VEAC's evaluation of management of the multiple-use areas was more limited than that carried out for the no-take areas. The evaluation focuses on integrated management to achieve the ecological purposes of the multiple-use areas and management of key threats.

The evaluations for the no-take areas covering resource allocation, reporting, research and monitoring, and management to address internal and external threats also broadly apply to multiple-use areas (see section 6.2).



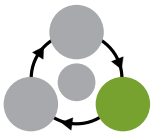
8.4.1 INTEGRATED MANAGEMENT TO ACHIEVE THE ECOLOGICAL PURPOSES OF THE MULTIPLE-USE AREAS

A variety of uses are accommodated in the multiple-use areas, and responsibility for managing the different uses is spread across several agencies and a range of legislation. This means the park manager cannot be wholly responsible for ensuring that the conservation outcomes of these areas are delivered, although they play an important coordinating role. Integration across the relevant agencies is essential to ensure that the cumulative impacts of all uses on the ecological values are demonstrably considered.

While there is evidence that some individual uses of these areas are being managed and some broad environmental threats are being mitigated, VEAC did not find evidence of any structured framework for integrating management of the multiple-use areas across uses, and insufficient evidence to determine that systems directed to managing individual uses or threats are achieving integrated outcomes, focused on the establishment purpose of the areas. In particular, fisheries management is not integrated with management of other uses in the multiple-use areas and operates independently of park management.

An exception to the general absence of integrated management is found in the Corner Inlet and Nooramunga marine and coastal parks – the two largest of the six areas – where there is evidence that threats have been systematically identified and are being actively managed. In these parks collaborative management is driven by the Ramsar listing of the site, which has generated Australian Government funding (see case study in box 15), and is led by the catchment management authority rather than the park manager. A Strategic Directions Statement was prepared in 2008 and endorsed by relevant agencies and community organisations.[60] Again, as noted above, fisheries management is not integrated into the planning and management frameworks.

Box 15
Collaboratively addressing threats to biodiversity values in the Corner Inlet and Nooramunga marine and coastal parks



Corner Inlet Connections is a partnership between government agencies, landowners and the community. The partnership is committed to maintaining and improving the environmental, agricultural and economic sustainability of the inlet and its surrounds.

The Australian Government has funded Corner Inlet Connections for a further five years, from 2013 to mid-2018. This project will continue to protect the Corner Inlet Ramsar site by addressing critical threats including reducing sediment and nutrient loads from the catchment, as well as threats within the site.

In particular, the project will:

- Implement the Corner Inlet Water Quality Improvement Plan to reduce the sediment and nutrient inputs to the Ramsar site from the Corner Inlet catchment, thereby maintaining seagrass condition. Key activities include working with landholders in the catchment to fence waterways and restore eroded areas like landslips and gullies.
- Protect bird populations and vegetation communities through containing infestations of weeds (including spartina) and pest animals (including foxes)
- Protect saltmarsh and mangrove communities through fencing, revegetation and weed control programs.
- Increase participation of Traditional Owner groups delivering on-ground NRM activities.

The project will be delivered by the West Gippsland Catchment Management Authority and use an established partnership of agencies (including Parks Victoria, DEPI, Landcare and the Gunaikurnai Land and Waters Aboriginal Corporation), community groups and industry bodies to continue improving community participation skills and knowledge to protect Corner Inlet.

8.4.2 MANAGEMENT TO ADDRESS KEY THREATS

Section 6.2.6 evaluated management outside the marine protected areas that is important to achieve their ecological purposes. That evaluation is relevant to both no-take and multiple-use marine protected areas, and covered management to reduce catchment threats and management to reduce threats from marine pests.

Section 8.2.4 described potential threats to the ecological values of the multiple-use areas from within the areas. In its review of management to address key threats, VEAC found that:

- there is little evidence of management activities to mitigate threats within the open coast multiple-use parks at Wilsons Promontory and Bunurong
- there is evidence of targeted actions being delivered and documented to address some threats to the values of the terrestrial components of two of the three marine and coastal parks e.g. fox eradication on islands important for resident shorebird breeding and migratory wader roosting
- there is no cross-sectoral approach to management of recreational fishing, boating and water sports in the multiple-use areas that would allow cumulative impacts of recreational use to be identified and addressed, and to translate this into management actions directed to protection of ecological values
- fisheries are mostly managed at the state or regional zone level rather than at the level of an individual protected area, and information on commercial catch within the multiple-use areas appears to be unavailable to park managers or is difficult to utilise
- understanding of recreational fishing catch in the multiple-use areas is poor or non-existent
- the goal of ecosystem-based fisheries management in Victoria has not yet been translated into practical management measures that could form the basis for targeted actions to reduce threats in the multiple-use areas
- some anecdotal evidence is available of bay and inlet fisheries licence holders adopting protocols to reduce by-catch and habitat damage from their fishing activities
- staff turnover and recent changes in fisheries agencies may impact on management and research capacity.

8.5 Performance of Victoria's multiple-use marine protected areas in achieving their ecological purposes

This section provides VEAC's evaluation of the performance of Victoria's existing multiple-use marine protected areas in meeting their ecological purposes. This evaluation is equivalent to the outcomes element in the IUCN-WCPA framework for evaluating management effectiveness.

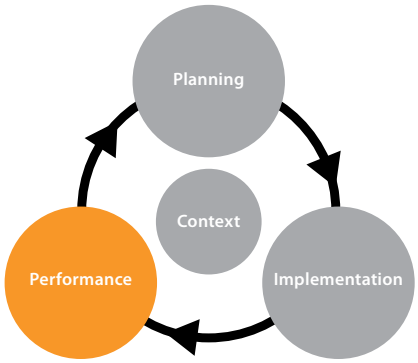
IUCN-WCPA envisaged the outcomes (or performance) element of management effectiveness assessments to, broadly, 'measure the real effects of management actions: whether management is maintaining the core values for which the protected area was established'.[2]

In the earlier sections of this chapter, Council noted the absence of clear biodiversity goals and governance frameworks for the multiple-use areas. Management plans have not been finalised for three of the six areas. For these reasons VEAC's evaluation of the ecological performance of the multiple-use areas was limited to a broad assessment of whether the key values have been maintained and key threats managed. The recommendations that Council has made for improving legal and governance frameworks and for a process to establish specific biodiversity goals will assist in guiding improved planning and management of the areas to achieve their long-term ecological purposes.

8.5.1 INFORMATION AVAILABLE FOR THE EVALUATION

As described for the no-take areas in section 7.2.2, the IUCN-WCPA framework recognises two broad approaches for evaluating protected area outcomes (or performance):

- evaluation of the status of, and change in, the area's natural values
- evaluation of the extent to which a threat to the area has been reduced or to which other objectives of management have been achieved.



These approaches must be adapted to the purpose of the protected area. As stated earlier in this chapter, the need to accommodate extractive uses such as commercial and recreational fishing in Victoria's multiple-use areas fundamentally affects the degree to which natural values can be protected.

The first approach assesses ecological performance directly, while the second uses indirect evidence. Direct assessment using sound science is recognised by IUCN-WCPA as being desirable but practically difficult. Availability of suitable information is very often limiting.

The Scientific Advisory Committee (SAC) for the investigation provided advice on a best practice approach to assessing ecological performance of Victoria's no-take marine national parks and sanctuaries in the absence of detailed information. This two-pronged approach looks at whether key ecological values present at the time of establishment have been retained, and whether key threats to these ecological values are being managed.

Information limitations were pertinent in considering whether Council could assess performance of the multiple-use areas in achieving their intended ecological outcomes. The SAC agreed that in principle, an assessment similar to that undertaken for the no-take areas could provide, at a coarse level, an indication of the ecological performance of these areas. This assessment would involve an analysis of whether establishment values have been retained, and whether management of threats to the ecological values could reasonably be expected to contribute to retention of these values.

For the marine components of the multiple-use areas, a comprehensive assessment would be more complex. It would need to be underpinned

by understanding of the ecological values that need to be maintained to support both the uses and conservation of the areas in the long term, and consider whether the existing uses have been managed in a way that does not cause detrimental cumulative impacts on these values. Generally, there is insufficient knowledge of these areas available to support such an assessment.

However there is a range of documented quantitative and qualitative information about the biodiversity of the multiple-use areas, although most were not designed for use in an objective and robust evaluation of the performance of the areas in achieving their ecological purpose. As stated earlier the purpose is to protect areas containing significant natural ecosystems for their ecological significance.

Marine natural values reports are not available for the multiple-use areas as they are for the no-take areas, and few submissions addressed the multiple-use areas or provided information. Council has recommended that marine natural values reports be prepared and published to support planning and management.

The available information on biodiversity of the multiple-use areas includes comprehensive long-term monitoring data on birds including resident and migratory shorebirds for the Corner Inlet, Nooramunga and Shallow Inlet marine and coastal parks; and qualitative and quantitative data on coastal vegetation communities, terrestrial flora and fauna, endangered flora and fauna, seagrasses, and marine habitats. The information on marine biodiversity in the open coast multiple-use areas at Wilsons Promontory and Bunurong, however, has not been updated for some time.

The Corner Inlet Ramsar site Ecological Character Description (ECD)[58] describes the ecological character of the site, which includes both the Corner Inlet and Nooramunga marine and coastal parks, current and future threats to ecological character and changes that have been observed or documented since its Ramsar listing in 1982. Comprehensive bird data are also available for the Shallow Inlet Marine and Coastal Park, including threats, which is designated as an Important Bird Area (IBA) by Birdlife Australia.

Commercial fishing catch data are available for major fisheries including an extensive data set of abundances of abalone and other key ecological and habitat features at key fishing areas since 1991 (including at Wilsons Promontory) acquired through annual fishery-independent surveys.

VEAC has reviewed the available information, and considers that the recent Corner Inlet Ramsar site ECD provides a suitable basis for a broad evaluation of performance of the Corner Inlet and Nooramunga marine and coastal parks in achieving their ecological purposes, to the extent that it covers some of the key ecological values and current and future threats. The Shallow Inlet IBA covers the important bird values and threats, and is suitable as a basis for assessment for those values.

While a checklist of key marine environmental values is available for the three open coast multiple-use areas, it has not been recently reviewed or updated and is not a suitable basis for assessment.

Fisheries data are suitable for fisheries assessment, but are generally not suitable for assessing performance in achieving the purpose of protecting significant natural ecosystems.

8.5.2 VEAC'S OVERALL EVALUATION

Victoria's multiple-use areas were established for the purpose of protecting areas containing significant natural ecosystems for their ecological significance (including the habitat of international migratory waders for the three marine and coastal parks) while accommodating resource uses such as fishing.

Achieving this ecological purpose means maintaining the biodiversity of these areas, while accommodating extractive uses. As for the no-take areas this largely involves mitigation of the key and treatable threats. Council has noted earlier in this chapter that the requirement to accommodate extractive uses – primarily fishing – in the multiple-use marine protected areas fundamentally affects the degree to which biodiversity values can be protected.

With the above qualification, Council's evaluation indicated that certain components of the biodiversity of the three marine and coastal parks have been broadly maintained, based on those aspects of ecological performance that could be assessed. There are good data to conclude

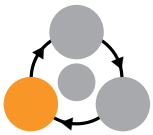
that a key ecological value of the three marine and coastal parks - the habitat of international migratory waders - has been maintained. The Corner Inlet Ramsar site ECD cites an analysis which indicates that both migratory species richness and species abundance have remained stable since 1982, with the exception of the curlew sandpiper and sharp-tailed sandpiper. However it is important to note that any changes in bird abundance are likely to be the result of multiple stressors both off and on-site.

There is insufficient information upon which to base an assessment of the three open coast multiple-use areas, although there are no reports to suggest that there has been any change to the presence of the major marine habitats in these areas.

Marine pests are likely to have detrimentally affected the condition of biodiversity in multiple-use areas at some scales. While some threats such as catchment-based pollution are being managed there is insufficient information about fishing – particularly recreational fishing – to determine whether there is an impact on ecological values. Climate change is expected to have large-scale effects on Victoria's marine environment, including on the multiple-use areas. As stated earlier for the no-take areas, while climate change will clearly further affect the biodiversity and natural values of these areas, Council does not consider that it will undermine their value with respect to their ecological purposes.

Available information on changes to levels of relevant threats to the multiple-use areas was evaluated qualitatively, drawing where possible on existing assessments and reviews. Information in the Corner Inlet Ramsar site ECD provided VEAC with a basis to evaluate whether key threats to the biodiversity of the Corner Inlet and Nooramunga marine and coastal parks have been acted on and contained. Significant threats to the globally significant bird populations in the Shallow Inlet Marine and Coastal Park have been identified through the IBA program, but there is insufficient information to evaluate whether the key threats have been acted on and contained .

The Council notes that the ECD concluded that there have no overarching changes to the ecological character of the site since listing, although some habitats, such as Posidonia seagrass meadows, appear to have suffered ongoing losses due to water quality degradation. It is recognised that a number of long-term threats are having an incremental and cumulative effect on ecological character.



The main threats to the Corner Inlet Ramsar wetlands in terms of water quality are increased inputs of sediments and nutrients. The recent Corner Inlet Water Quality Improvement Plan targets these inputs.[61] Some areas within north and western Corner Inlet appear to be under water quality stress.

Based on the available information, introduced animals, weeds and introduced marine pests are significant threats to the ecological values of the marine and coastal parks. While some targeted actions are carried out to address these threats in the Corner Inlet marine and coastal parks, mostly with Australian government funding (see box 15), there is less evidence of management actions to address similar threats in the Shallow Inlet Marine and Coastal Park. The impact of grazing on significant vegetation communities in the three marine and coastal parks, such as saltmarsh, is acknowledged but not actively targeted by specific management actions.

Based on the available information, Council found no evidence of major increases in the impact of threats to the multiple-use areas since establishment, apart from establishment of marine pests. However there is insufficient information to determine the impacts of several acknowledged threats.

Given the variable information available to Council to evaluate the performance of the multiple-use areas, as more information becomes available, it is important to update this evaluation. Regular performance evaluations are a key component of the adaptive management cycle recognised in the global framework for assessing protected area management.

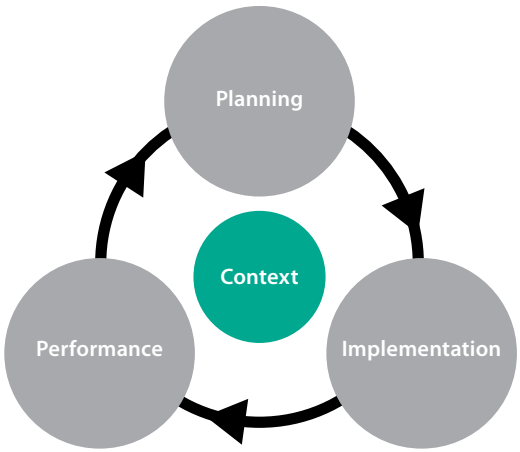
SEE RECOMMENDATION R38

9. Victoria's marine protected areas: management and performance to achieve their social purposes

VEAC's assessment of management and performance of Victoria's existing marine protected areas focused on the management arrangements, ecological conditions and threats relevant to achieving the ecological purposes of the areas (see chapters 5 to 8 of this report) as the terms of reference for the investigation placed an emphasis on ecological values. However, the marine protected areas were also established for recreation and education associated with enjoyment, appreciation and understanding of natural environments.

The discussion paper outlined the approach VEAC proposed to take to the assessment against this group of 'social' purposes. VEAC tailored the IUCN-WCPA framework for assessing management effectiveness to broadly structure its assessment.

VEAC used an initial analysis of the management context within which the areas were established, and the social and cultural context within which they are situated, to identify the priority issues that it should consider. This chapter covers both the no-take and the multiple-use areas. Traditional Owner interests in the marine protected areas are discussed in chapter 10.



9.1 Context

The management context of the marine protected areas was described and analysed in sections 5.1 (no-take areas) and 8.1 (multiple-use areas), including how the areas were established, key legislation that prescribes their management, governance and administrative arrangements, and relevant audits of the management of the marine protected areas.

The Environment Conservation Council's final report for its Marine, Coastal and Estuarine Investigation (2000) included an analysis of potential social and economic impacts on coastal communities adjacent to areas recommended as marine national parks and sanctuaries.[17] The report drew on a number of sources to compile a demographic /socio-economic profile and an industry profile of selected towns. This report provides a snapshot of the social context of coastal communities adjacent to the marine protected areas.

The social context of the marine protected areas is wider than communities living adjacent to the marine protected areas, and also includes 'the public' who use the parks for recreation and education associated with enjoyment, appreciation and understanding of natural environments. Three categories of 'the public' are recognised for the purposes of VEAC's assessment: on-site visitors, virtual (or off-site) visitors and non-visitors.

Marine protected areas affect and are affected by people. Understanding the socio-economic context of stakeholders involved with and/or influenced by the marine protected area is essential for assessing, predicting and managing the marine protected area. [7]

9.1.1 THE SOCIAL PURPOSES OF THE MARINE PROTECTED AREAS

The social purposes of Victoria's marine protected areas are drawn from several sources and have been consolidated for the purposes of the investigation as follows: to provide opportunities for recreation and education associated with enjoyment and understanding of natural environments. For no-take areas this purpose is secondary to the primary purpose of protecting biodiversity. For multiple-use areas, recreation and education can include the extractive use of resources.

9.1.2 THE KEY SOCIAL VALUES OF THE MARINE PROTECTED AREAS

The discussion paper for the investigation describes the major uses of each marine protected area related to enjoyment and appreciation, drawn largely from management plans which document recreational and educational uses of the areas.

Enjoyment, appreciation and understanding of natural environments can be understood from a range of theoretical perspectives within the field of social science. To provide advice to VEAC for this investigation and a resource for future management of Victoria's marine protected areas, an expert review of the contemporary literature was commissioned. The full report is available on VEAC's website, and contains a supplementary report which collates and reviews the existing data on visitor use related to Victorian marine protected areas. The review provided a current understanding of the many dimensions of the concepts of enjoyment, appreciation and understanding as relevant to Victorian marine protected areas. [62] The review revealed that many factors can affect an individual's experience of Victoria's marine protected areas including:

- their knowledge, attitudes, feelings and beliefs
- the activity they are undertaking, how engaged they are with it and the extent to which it fulfils their needs and desires
- the marine protected area they are engaging with – or environment within the area
- their past experience with respect to the area/s and its declaration of protection.

The spectrum of recreational and educational users of marine protected areas comprises on-site visitors (recreational users, students, volunteers), virtual or off-site visitors (through internet, media, aquaria, museums, zoos) and non-visitors (who may value a site simply because it exists).

Table 9 summarises the visitor and non-visitor categories, and gives examples of activities or interests for each category.

Table 9

Visitor and non-visitor utilisation of marine protected areas for enjoyment, appreciation and understanding of natural environments

Visitor category	Activities or interests *
On-site visitor – recreation	• snorkelling and scuba diving • rockpool walks/exploration • bird watching • beach recreation (swimming, walking, sunbathing) • surfing • boating and water sports • photography and filming • fishing (in multiple-use areas only) • viewing from adjacent land, scenic flights • tourism e.g. dolphin swims, whale watching
On-site visitor – education	• primary and secondary schools programs • universities and TAFEs • visitor information centres • ranger-led walks e.g. rock pool rambles • Coastcare Summer by the Sea program
On-site visitor – volunteer	• community-based monitoring (e.g. Sea Search, habitat mapping) • Coastcare/Landcare/FishCare Victoria • I sea, I care ambassador program • Friends/Marine Care groups • local environment groups e.g. SANE - Surfers Appreciating the Natural Environment and Swan Bay Environment Association • Estuary Watch • primary and secondary schools • Reef Watch Victoria (e.g. Great Victorian Fish Count) • field naturalists clubs • fossil digs • bird clubs e.g. Birdlife Australia and Victorian Wader Study Group • Dolphin Research Institute
On-site visitor – aesthetic or incidental	• boat transits • views of park landscape from beach or road
Virtual or off-site visitor	• viewing television documentaries • reading magazine and newspaper articles • accessing Youtube and other online images and information • Marine and Freshwater Discovery Centre - Queenscliff • visiting marine aquaria • visiting marine displays in zoos and museums • in-school or off-site education
Non-visitor	• option value • existence value

* the listed activities and interests focus on the marine environment and do not include activities in the terrestrial environment of the marine and coastal parks

9.2 Planning for marine protected areas to achieve their social purposes

Parks Victoria is responsible for leading management planning for Victoria's marine protected areas, although it may not have responsibility for all the relevant activities.

This section of the report discusses the existing policy and planning to guide management to achieve the social purposes, i.e. to provide opportunities for recreation and education associated with enjoyment and understanding of natural environments, including planning to guide on-ground action and planning to guide research and monitoring.

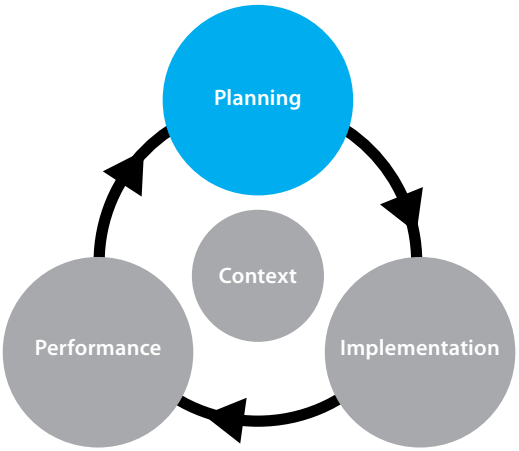
The responsibility for non-extractive recreation is spread across a number of agencies. Integration of planning is challenging in these circumstances. For example, as well as Parks Victoria, agencies with responsibility for some aspects of recreational boating and watersports, maritime safety and the provision of boating facilities include port authorities, Transport Safety Victoria, Water Police, VicRoads, local councils, the Victorian Coastal Council, regional coastal boards and DEPI.

In the multiple-use areas, Fisheries Victoria manages recreational fishing although there may be additional requirements under the *National Parks Act 1975* in some areas e.g. permits for organised events such as competitions. Any additional requirements are managed by Parks Victoria.

The 2002 *Policy for sustainable recreation and tourism on Victoria's public land* provided the statewide policy setting for recreation and tourism on public land. This policy is currently under review.

A number of tourism frameworks and strategies were released in 2013 and provide whole-of-government direction for the tourism industry e.g. *Victoria's 2020 tourism strategy, Victoria's regional tourism strategy 2013-2016* and *Victoria's Aboriginal Tourism Development Strategy 2013–2023.*

A person or business who conducts a guided tour or recreational activity for profit on public land is required to hold a tour operator licence. Legislative amendments in 2011 established a consistent framework for licensing commercial tourism and commercial recreation activity on



public land in Victoria. The tour operator licensing system also applies to State waters i.e. waterways, bays and coastal waters, marine protected areas. Activities such as wildlife tours or dolphin viewing require a tour operator licence. Council notes that management of fishing is again operating independently of other land and resource management, and fishing tour operators are not currently required to obtain a tour operator licence. The majority of licensed commercial tours and activities on public land are managed by Parks Victoria under its Tour Operator Management System.

Parks Victoria's planning approach

Section 6.1.3 described VEAC's understanding of Parks Victoria's management planning approach and planning tools. Existing management plans were finalised for each no-take area and three of the six multiple-use areas during the period 2005 to 2007. The plans systematically address information, interpretation and education; access; recreational activities; tourism; public safety; community awareness and community participation.

As discussed in chapter 6, in 2011 VAGO found that 'neither park management plans nor any other documents detail targets, prioritise actions or assign responsibility and time frames for management actions.'[10] VAGO made several recommendations for improving management planning, including developing 'supporting plans that specify actions, targets, performance indicators, accountabilities and time frames for delivery.' The refined planning approaches and tools that have since been, or are now being, developed by Parks Victoria to respond to these recommendations include the marine protected areas program plan and landscape management plans covering multiple parks and reserves.

The program plan specifies actions, with associated accountabilities and timeframes, across 12 program areas, including three relating specifically to the social purposes for which the marine protected areas were established: community and visitor engagement, recreation and tourism, and partnerships – community.

Actions in the program plan sit alongside, rather than replacing, strategies in existing management plans. The program plan refers to a number of further proposed plans, such as park implementation plans, regional operation plans, compliance plans and emergency management plans. For the three program areas listed above, the following additional existing or proposed plans and planning tools are mentioned: 2012-2014 MPA visitor communications plan, Visitor experience framework, Levels of service for MPAs, MPA tourism plan, Tour Operator Management System, Volunteer codes of practice for activities in MPAs, and Volunteer strategic action plan. The visitor communications plan is itself aligned to Parks Victoria's Communications and marketing framework 2009, Education and interpretation strategic framework 2010, Framework for managing compliance 2011 and also the tour operator reforms process.

The program plan does not clearly describe the relationships between these additional plans and planning tools, and the current status of the interlocking plans and frameworks is not readily available.

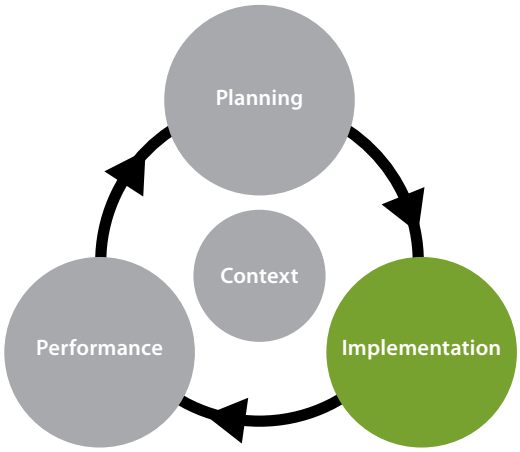
More broadly, Parks Victoria has developed a number of tools and services to assist with planning for visitor experiences, including Levels of Service (LoS) which is a tool to guide the strategic management of visitor services across the park and reserve network. It provides a statewide context for the establishment and delivery of services and infrastructure to meet the needs of visitors. The LoS Framework has been developed using data from Parks Victoria's visitor research program, asset management system, financial system and field inspections. It produces two ratings to assist park managers: park rating and visitor site rating.

LoS assessments and ratings do not appear to be clearly linked to the strategies for visitors outlined in management plans.

Planning for visitor research

Parks Victoria's *Visitor research strategy 2011-2016* was prepared in response to a visitor and social research audit conducted by Deakin University (2008), which found that the ability of Parks Victoria's visitor research program to fulfil its objectives was constrained by limited budgets, changing priorities, staff movements, reactive and unfocused research responses, and the absence of a written strategy to guide and articulate visitor research priorities.

The degree to which the research strategy is succeeding in guiding visitor research could not be determined.



9.3 Implementation of management to achieve the social purposes of the marine protected areas

This section briefly describes VEAC's evaluation of the approach used to implement management plans and any other actions needed to achieve the social purposes of the no-take areas.

The evaluation considered resource allocation to address the social purposes, processes for reporting, communication and review, and implementation of research and monitoring to guide management.

The role of implementation in the adaptive management cycle is to allocate resources, implement activities and deliver outputs towards desired outcomes (i.e. the social purposes). It includes implementation of research, monitoring, reporting and review to guide adaptive management. The IUCN-WCPA framework recognises separate 'inputs', 'processes' and 'outputs' stages in adaptive management. VEAC integrated these into a consolidated evaluation of 'implementation'.

Implementation of management is guided by the planning that was evaluated in section 9.2 earlier in this chapter.

In its 2011 audit, the Victorian Auditor-General's Office (VAGO) highlighted that the dedicated funding for management of marine protected areas by Parks Victoria had not been used as intended, contributing to a lack of marine staffing, expertise and management activities.[10]

Although VAGO's audit was of environmental management, its conclusions can be extended to management of recreation and education. Council notes that Parks Victoria's overall funding for marine protected area management increased in response to the VAGO audit and that this increased resourcing has been accompanied by improved tracking of investment.

Resources applied to management of recreation and education appear to be focused on specific high use locations such as Wilsons Promontory Marine National Park at Tidal River, Bunurong Marine National Park near Inverloch and marine sanctuaries along the Surf Coast (e.g. Barwon Bluff Marine Sanctuary) and in urban locations such as Port Phillip Heads Marine National Park, Jawbone and Ricketts Point marine sanctuaries in Melbourne; and Merri Marine Sanctuary at Warrnambool.

As discussed in section 6.2.3, robust processes for regular public reporting and review are important in ensuring transparency and accountability of management. In reviewing current reporting, VEAC found that several sources of information are available that demonstrate that actions are being implemented to provide for recreation and education associated with enjoyment and understanding of natural environments. These include but are not limited to:

- assets such as signage and visitor displays (e.g. bird hides, snorkel and dive trails)
- information materials produced such as Parknotes
- activities and locations of licensed tour operators
- educational resources for schools
- records of marine activities delivered each year through Parks Victoria's Learning and Discovery (education and interpretation) program, and the total number of participants
- education programs delivered through external providers
- videos on Parks Victoria's Youtube channel
- Museum Victoria's underwater images and footage
- marine life field guide apps
- submissions to and participation in management plan consultations

- Friends groups and their activities
- media articles on biodiversity of marine protected areas (see box 16)
- visitor data
- community attitudes and behaviour data
- nature and level of volunteer participation.

While there are many excellent examples of education and information products and community involvement in management, these are often not linked to the strategies for visitors or community involvement found in individual management plans. They are more likely to relate to community-initiated projects and activities.

Council considers that there is an opportunity to look strategically across all the marine protected areas to determine priorities for management actions and programs that enhance enjoyment, appreciation and understanding, while continuing to support proposals and activities of community groups and volunteers. For example, some marine national parks are more suited than others to promoting the role and function of no-take marine protected areas. In addition, many of the marine sanctuaries were established for their suitability as accessible sites for recreation and education in a natural environment, as well as for their biodiversity values, but this potential is not always taken into account in implementation of management. However, Council notes that the recent trend to regional delivery models for park management may diminish the capacity to reach agreement on statewide priorities for education, engagement and interpretation.

SEE RECOMMENDATION R33

Council found that there is strong evidence of co-ordination and collaboration in community engagement and education particularly between Coastcare and summer parks programs, with Reefwatch and Friends groups, and between Parks Victoria and Museum Victoria in promoting awareness of marine biodiversity.

Co-ordination between management agencies on recreation more generally is not evident. Recreational fishing in multiple-use areas is managed independently of Parks Victoria and, except in the areas where Parks Victoria is the local port manager and the waterway manager, recreational boating is also managed independently.

Friends groups and other community organisations and volunteers play a valuable role in promoting the ecological values of the marine national parks and sanctuaries. Some groups are particularly active in developing education and information materials about their park or sanctuary, while others provide on-ground guidance to visitors. Traditional Owner organisations have advised VEAC that information about Aboriginal cultural heritage in marine protected areas should be provided by Traditional Owners.

SEE RECOMMENDATION R34

Box 16

Case study – Scientists have revealed previously unseen marine life through a comprehensive biological survey undertaken in the Twelve Apostles Marine National Park

The underwater Bioscan conducted by Museum Victoria, Deakin University and Parks Victoria surveyed 20 kilometres of coastline, extending from the Twelve Apostles Marine National Park to The Arches Marine Sanctuary; revealing rare sightings of hundreds of species including rich fish life, crayfish, slumbering Port Jackson sharks and colourful coral gardens. Scientists documented this diverse underwater world with thousands of images and hundreds of hours of spectacular video footage.

"Bioscans such as this one allow us to study the large number of species present as well as investigating recent pest and climate change arrivals," said Dr Mark Norman, Museum Victoria's Head of Science.

In areas too deep to dive, Deakin University scientists dropped more than 100 baited video cameras to attract and film deeper-water species. This revealed a rich fish life of snapper, leatherjackets, squid and an impressive range of sharks and giant sting rays.

The Twelve Apostles Bioscan is one of a series conducted by Museum Victoria and Parks Victoria, including a survey of the Grampians National Park, the Bunurong Marine National Park, Wilsons Promontory National Park and the Alpine National Park.

Research and monitoring

There are three broad areas of visitor research at Parks Victoria.

- The visitor and community monitoring program is an ongoing data collection program used to produce corporate performance measures and comprising the Visitor Number Monitor, the Visitor Satisfaction Monitor and the Community Perception Monitor.
- The applied visitor research program targets individual aspects of visitors to parks or the local community in response to specific research questions, historically contracted to specialist market research agencies or involving collaborative research with universities or other institutions.
- Modelling business functions and technical support involves staff using research and existing data to assist in managing key issues within Parks Victoria.

The expert review of enjoyment, appreciation and understanding commissioned by VEAC includes a review of existing research data related to these concepts.[62] The review tabulates the 'grey' literature (consultancies and reports) related to enjoyment, appreciation and understanding and provides an assessment of existing data. The table identifies the constructs (attitude, perception, activity level etc) that have been measured in each study, the indicators that are used, whether no-take and multiple-use areas are differentiated and the overall relevance of the measure to the establishment purposes of education, appreciation and understanding. The report is available on VEAC's website.

Recent studies employ commonly used surrogates or preferred constructs for evaluating the quality of the visitor experience in the form of benefits derived from the visit, including: levels of satisfaction – rating of the dissatisfiers, satisfaction of the overall experience and adequacy of visitor opportunities. In addition, there are data available on visitor numbers and visitor frequency to the no-take areas. There are no data available for visitation to multiple–use areas. This reflects the absence of targeted management of recreation in the multiple-use areas.

Considerable information has been collected regarding the levels of appreciation and understanding of visitors and the community for no-take areas, but not for the multiple-use areas.

Visitor research can assist managers in achieving objectives related to the social purposes of the marine protected areas, and should be extended to the multiple-use areas.

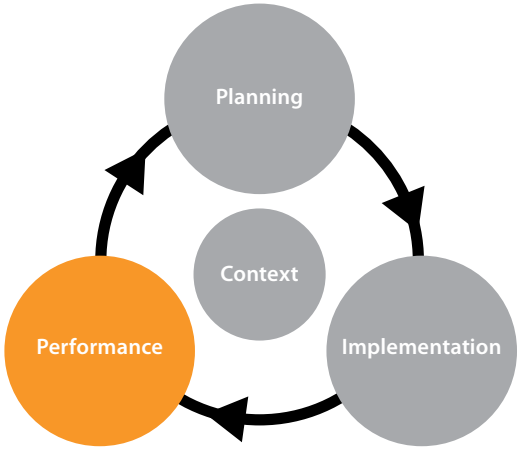
SEE RECOMMENDATION R35

Threats and challenges to management

The terms of reference required VEAC to examine and provide an assessment of any ongoing threats and challenges to the effective management of existing marine protected areas. The major focus of this assessment was in relation to the biodiversity and ecological outcomes.
A brief assessment has also been undertaken of the threats and challenges to the effective management of the provision of opportunities for recreation and education associated with the enjoyment and appreciation of natural environments i.e. the social outcomes.

Threats and challenges include:

- disenfranchised recreational users
- user conflict
- crowding
- inadequate physical access (road access, boat access, walking access, equipment) or related to the marine environment (e.g. areas with high wave energy, cold water, and requirement for specialised equipment)
- social access (information, cost, skill, confidence, companionship)
- access issues for the virtual visitor: lack of access to a computer or other means of engaging with virtual media; difficulty accessing the off-site centres such as aquaria
- safety – actual and perceived.



9.4 Performance of marine protected areas in achieving their social purposes

IUCN-WCPA outlines several socio-economic goals and objectives commonly associated with marine protected area use, and offers a variety of socio-economic indicators to assist in determining the effectiveness of management actions in attaining goals and objectives specific to marine protected areas.[7]

The most relevant objectives to the social purposes of Victoria's marine protected areas are:

- recreational opportunities maintained or enhanced
- educational opportunities maintained or enhanced
- understanding of environmental values
- appreciation enhanced
- participation in marine protected area management.

In the discussion paper for this investigation, the Council proposed using three categories to help structure its assessment of performance in relation to use, enjoyment and appreciation of natural environments: visitation, community awareness, and scientific understanding. Potential attributes and examples of potential indicators for each of these categories were described. The Council subsequently determined to focus its assessment on the categories listed in table 10 to reflect the objectives in management strategies and plans. Scientific research and monitoring is discussed in chapters 5 and 6.

Table 10
Attributes and available information for assessing performance

Categories of objectives related to enjoyment, appreciation and understanding	Attributes and available information
Provide high quality opportunities for a range of user groups (including virtual visitors)	• visitor data • market research • licensed tour operator data • culturally and linguistically diverse programs • disability program
Provide for educational use by schools and community groups	• visitor statistics • licensed tour operator data
Maintain appropriate visitor signage and interpretive and educational material	• assets and products
Provide specialised educational resources and materials	• products
Promote marine protected areas to ensure Victorians understand their purpose and significance	• licensed tour operators • zoos and aquaria • Marine and Freshwater Discovery Centre, Queenscliff • media
Community awareness	• attitudinal surveys • reporting
Community engagement and partnerships	• consultation and involvement in decision making • active Friends groups • volunteer projects in parks • support for community initiatives via grant programs

9.4.1 VEAC'S OVERALL EVALUATION

It is clear that many high quality information and education materials are available. A range of recreation opportunities and opportunities for community involvement are also provided. This is particularly the case for the no-take areas. The multiple-use parks appear to be heavily used for recreation but management is dispersed across many agencies and organisations and there is little evidence of targeted management of recreation and education in these areas or coordination by the park manager.

Based on the available information it appears that stakeholders and the local community are engaged in planning and management in the no-take areas, including research and monitoring. There is less evidence for the multiple-use areas except for Corner Inlet and Nooramunga marine and coastal parks where there is some involvement through the Corner Inlet Connections partnership (see section 8.4.1).

Given the variable information available to Council to evaluate performance to achieve the social purposes, as more information becomes available, it is important to update this evaluation. Regular performance evaluations are a key component of the adaptive management cycle recognised in the global framework for assessing protected area management.

SEE RECOMMENDATION R38

10. Traditional Owner interests in Victoria's marine protected areas

The interests of Aboriginal Traditional Owners and other Aboriginal people in marine protected areas is relevant to the scope of VEAC's Marine Investigation for a number of reasons. The most significant of these is the requirement within the *Victorian Environmental Assessment Council Act 2001* (section 18) that VEAC, in carrying out an investigation, should consider the need to conserve and protect any areas which have ecological, natural, landscape or cultural interest or significance, recreational value or geological or geomorphological significance. For the Marine Investigation, the scope of 'cultural interest or significance' includes Aboriginal cultural interests in the environments, resources, areas and sites within the existing marine protected areas.

VEAC commissioned a background paper describing recognition and engagement of Aboriginal Traditional Owners, and other Aboriginal peoples, in the use and management of Victoria's existing marine protected areas.[63] The paper is available on VEAC's website.

The following discussion draws on the background paper and on submissions to the investigation from Traditional Owner organisations.

10.1 Aboriginal relationship with coastal and marine environments

As in other coastal and island regions around Australia, Aboriginal groups in coastal Victoria have a complex cultural, social and economic relationship with the marine environment that pre-dates British colonisation and also pre-dates the stabilisation of current sea levels about 6,000 years ago.

This relationship did not cease at colonisation. On the contrary, much of the basis of Indigenous interests in coastal and ocean management today are based on continuing cultural traditions, rights and responsibilities. Numerous government enquiries, reports and research projects over the last several decades have documented the strong connections between coastal Indigenous peoples and their marine environments. A fundamental point is that Indigenous people in many parts of the coast view the coastal waters as an inseparable extension of coastal land. Traditional Owners of coastal land have rights and duties to the adjacent sea as well as the land.

Archaeological evidence from Victoria indicates that occupation of coastal areas is as old as the present coastline – about 6,000 years. Most coastal occupation sites in Victoria, however, are 4,000 years old or younger. Populations and resource use have increased throughout the last couple of thousand years, with the oldest occupation sites located on Wilson's Promontory.

The diversity of Aboriginal coastal archaeological sites in Victoria is described in the Land Conservation Council's Marine and Coastal Special Investigation descriptive report (1993). The report points out that nearly one fifth of all of Victoria's archaeological sites occur within one kilometre of the coast. By far the most common sites are the shell middens, which are often well preserved and easily recognised. Surface artefact scatters

and isolated artefacts are the next most common site types, while rock shelters, scarred trees and quarries are relatively rare.

Contemporary relationships between Aboriginal people and Victoria's marine environments are the product of customary maritime cultures described above and the impact of British colonisation, settlement and subsequent coastal developments.

10.2 Native title and traditional owner agreements

Native title is the recognition in Australian law that some Indigenous peoples continue to hold rights to their lands and waters, which come from their traditional laws and customs. Aboriginal groups can apply to have these rights recognised by the Federal Court, under Commonwealth *Native Title Act 1993*.

However, the difficulty of achieving the test for native title led in Victoria to the development of an alternative system for recognising rights of Aboriginal Traditional Owners. The Victorian *Traditional Owner Settlement Act 2010* (TOS Act) is designed to offer an expedited approach to settling native title. It offers a state-based system for the out-of-court resolution of native title claims. Under the TOS Act Traditional Owners have unique rights and responsibilities over their Country, including sea country.

The first claim to be settled under the TOS Act was between the Gunaikurnai and the State of Victoria in 2010 for land in Gippsland. The settlement agreement involved the granting of parks and reserves as Aboriginal Title to be jointly managed with the State, subject to entering into a traditional owner land management agreement.

10.3 Aboriginal cultural heritage

The *Aboriginal Heritage Act 2006* is the primary legislation in Victoria for protecting Aboriginal cultural heritage. A major objective of the legislation is to accord appropriate status to Traditional Owners in relation to decision making about their cultural heritage. This objective is also consistent with the Victorian *Charter of Human Rights and Responsibilities Act 2006* and the United Nations Declaration on the Rights of Indigenous Peoples.

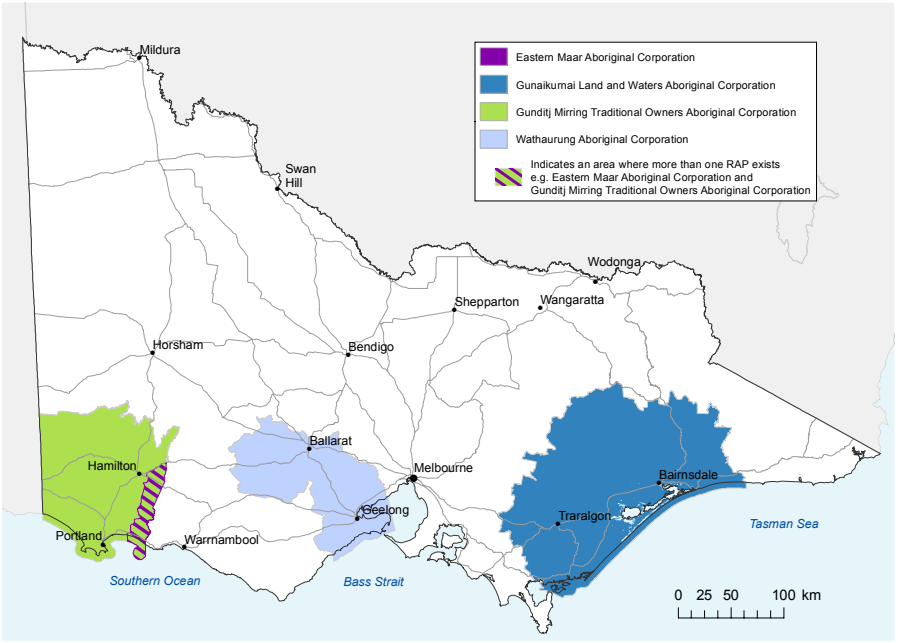
The Act established the Victorian Aboriginal Heritage Council (VAHC) one of whose primary functions is to appoint Registered Aboriginal Parties (RAPs). The RAPs are incorporated bodies appointed by the VAHC to manage Aboriginal heritage for a specific area. Where native title exists, native title holders must be appointed as RAPs, so that there is alignment between recognition of Traditional Owners' rights under native title and the Victorian cultural heritage management system.

Registered Aboriginal Parties are designed to provide for Traditional Owners to be involved in the management and protection of their heritage on a local level. One of the key functions of RAPs is their involvement in the development and assessment of cultural heritage management plans.

There are four RAPs in coastal Victoria (see figure 9) These are:

- Eastern Marr Aboriginal Corporation whose appointed country includes Port Campbell National Park
- Gunaikurnai Land and Waters Aboriginal Corporation whose appointed country includes Gippsland Lakes Coastal Park and The Lakes National Park
- Gunditj Mirring Traditional Owners Aboriginal Corporation whose appointed country includes Discovery Bay Coastal Park
- Wathaurung Aboriginal Corporation trading as Wadawurrung whose appointed country includes land along the Surf Coast and Geelong.

Figure 9
Registered Aboriginal Parties in coastal Victoria as at 9 December 2013
Source Aboriginal Affairs Victoria



There are also a number of other organisations who are current RAP applicants or have been former applicants, and have interests in coastal areas. These are:

- Bidwell-Maap Aboriginal Corporation
- Boon Wurrung Foundation Ltd
- Bunurong Land Council Aboriginal Corporation
- Nindi-Ngujarn Ngarigo Monero Aboriginal Corporation.

10.4 Aboriginal joint management and co-management models

The *Traditional Owner Settlement Act 2010* recognises the ongoing connection of Traditional Owners to the land through joint management agreements. These agreements recognise Traditional Owner rights and the special relationship of Aboriginal peoples to their land. As part of the Gunaikurnai Recognition and Settlement Agreement, the Gunaikurnai Traditional Owner Land Management Board (TOLMB) was established to jointly manage ten national parks and reserves in the agreement area, including Mitchell River, The Lakes and part of Snowy River national parks and the Gippsland Lakes Coastal Park. Four Indigenous cultural rangers were appointed to work on jointly managed land.

As further applications for recognition and settlement agreements are determined, Council envisages these agreements as increasingly forming the framework for involvement of Traditional Owners in management of the marine protected areas.

SEE RECOMMENDATION R36

Co-management is another form of partnership with Traditional Owners operating in Victoria. Co-management is an outcome of the recognition of native title which provides for Traditional Owner membership of park councils to guide park management, but title to parks and reserves is not transferred to the Traditional Owners.

An example of co-management is the partnership between the Victorian government and the Gunditjmara peoples in the form of the Budj Bim Council. The Budj Bim Council forms part of the 2007 Native Title Settlement Agreement, a partnership between the Gunditjmara Traditional Owners and the Victorian government. The Council includes six representatives of the Gunditjmara peoples, two from Parks Victoria, one from the Department of Environment and Primary Industries and one from the Glenelg Hopkins Catchment Management Authority. The Budj Bim Council creates a working partnership model to

manage the area's Aboriginal cultural heritage and natural values. The Council manages Mount Eccles National Park (Budj Bim), Victoria's first national park to be co-managed by Parks Victoria and Traditional Owners under the National Parks Act, and gives the Traditional Owners a formal body to represent them on issues of land management and future planning.

To date no joint management or co-management arrangements in Victoria include marine protected areas. However, section 17D of the *National Parks Act 1975* does provide for the possibility of management of a marine national park or a marine sanctuary by a TOLMB.

10.5 Involvement of Traditional Owners in land and resource management

Traditional Owners have advised the Council that there is a need to embed and profile Aboriginal governance in relation to sea country in Victoria. In relation to the existing marine protected areas, this is suggested to involve the recognition of the Federation of Victorian Traditional Owner Corporations, Victorian Aboriginal Heritage Council and the individual coastal Native Title Corporations and Registered Aboriginal Parties as key stakeholders in the drafting and implementation of conservation action plans for marine national parks and sanctuaries.

In relation to the multiple-use areas where fishing is permitted, Council notes that DEPI's Victorian Aboriginal Fishing Strategy commits to work 'in partnership with Victorian Traditional Owner Groups as the first custodians of our saltwater and freshwater environments', and recognises the need to develop and draw upon structures of representation across Victorian Aboriginal communities to better inform the management of fisheries.

Parks Victoria recognises the connection of Traditional Owners with sea country in its planning and management. Parks Victoria has developed an Indigenous Partnerships Strategy and Action Plan which provided a framework for Aboriginal cultural heritage management. However this is now out of date and currently under review. The former Department of Sustainability and Environment's (now DEPI) Indigenous Partnership Framework 2007-2010 is also out of date and has been under review for some time.

In March 2011 all Victorian government departments were committed to developing Aboriginal Inclusion Action Plans. The action plans address improving accessibility to services, improving employment opportunities for Aboriginal people, and providing opportunities for Aboriginal people and departments to form partnerships. While these plans can help support the policy makers, Traditional Owners see a 'pressing need for a contemporary and coordinated state policy on Aboriginal partnerships that goes beyond the high level principles of the Victorian Government Aboriginal Inclusion Framework'.[64]

Parks Victoria is working with Aboriginal groups in other areas through memorandums of understanding. At Wilsons Promontory National Park, a memorandum of understanding has been developed between Parks Victoria and the three Traditional Owner groups with a connection to Prom Country – Gunaikurnai, Bunurong and Boon Wurrung. Memorandums of understanding, like the one at Wilsons Promontory, enable a sharing of knowledge about managing cultural heritage and benefit both Parks Victoria and the Traditional Owners.

Parks Victoria has also collaborated with Traditional Owners in the preparation of a sea country plan. The Kooyang Sea Country Plan was prepared by Framlingham Aboriginal Trust and Winda Mara Aboriginal Corporation for coastal and marine areas in Maar sea country in south-west Victoria.[65] A sea country plan is a maritime example of what could more broadly be called a country-based plan, which is simply a non-statutory strategic plan for the traditional country of a particular Indigenous group as defined and selected by that group. Country-based plans provide an opportunity to tell the story of a Traditional Owner group and its country, and to be a catalyst for supporting culture, addressing concerns and achieving aspirations.

An Indigenous Protected Area (IPA) is an area of Indigenous-owned land or sea where Traditional Owners have entered into an agreement with the Australian government to promote biodiversity and cultural resource conservation. There is no legislative basis to the declaration or management of an Indigenous Protected Area. It is a voluntary arrangement. There are four IPAs in south western Victoria, including Deen Maar on coastal land

owned by the Framlingham Aboriginal Trust, declared in 1999.

The Australian government also envisages sea country IPAs which would involve Indigenous people managing Indigenous activities within the marine environment. A sea country IPA would also provide a framework for Indigenous communities to work with other groups who have interests in and actively use the marine environment and to allow all stakeholders to work together towards the effective conservation and management in these areas.

In addition to the formal avenues for joint management and co-management, Council notes the range of models for non-statutory involvement of Traditional Owners in land and resource management.

SEE RECOMMENDATION R37

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Appendix 1
Submissions received

● Period 1 ● Period 2 ● Period 3

Abalone Industry Committee	●		
Adams, Mae			●
Adriaanse, Robert			●
Allan, Theodora			●
Allan, Troy			●
Allardice, Russell	●		●
Andrews, Emma			●
Anglesea, Aireys Inlet Society for the Protection of Flora and Fauna			●
Annells, Shirley			●
Auchettl, Kerrie			●
Auchettl, Lynette			●
Auchettl, Peter			●
Australian Coastal Society Ltd - Victorian Chapter			●
Australian Fishing Trade Association	●		
Australian Marine Ecology	●		
Australian Marine Sciences Association		●	●
Bacon, Joel			●
Baker, Luke			●
Barwon Coast Committee of Management Inc.	●		
Baxter, Lou	●		
Bayre, Sue			●
Bennett, Jeff			●
Bilborough, Natalie			●
BirdLife Victoria Conservation Committee	●		●
Birjak, Anna			●
Black Rock Underwater Dive Group		●	
Blackham, Graeme			●
Blum-Caon, Sharon	●		
Bowden, Marg			●
Boyle, William	●		
Bruton, Ian			●
Buck Diving Enterprises Pty Ltd.		●	
Bulling, Kate			●
Burger, Nicolaas & Lorna			●
Burton, Matisse			●
Burton, Michele & Bruce			●
Caneva, Lina			●
Carey, Alison			●
Carey, Hayley			●
Carey, Rod			●

Carruthers, Dale			●
Catt, Allan			●
Challinor-Rogers, Joanne			●
Chan, Ho Sum			●
Christie, Andrew		●	●
Clappison, Kristina			●
Clarke, Joan			●
Corangamite Catchment Management Authority			●
Costanzo, Melanie	●		
Costanzo, Tracey	●		
Costello, Russell			●
Courtney, Maralyn & Phil			●
Coutin, Patrick	●		●
Crowcroft, Peter	●		
Curtis, Doreen			●
Curtis, Shaun			●
Daniel, Chris	●	●	
Davies, Wendy			●
Dempsie, Jennifer			●
Department of Primary Industries	●		
Di Lallo, Guerino			●
Di Lallo, Maria			●
Djumas, Despina			●
Djumas, Harry			●
Dolphin Research Institute		●	
Donovan, Louisa & Castellas, Jeffrey			●
Dunn, Maxwell Ian			●
East Gippsland Shire Council	●		
Eastern Zone Abalone Industry Association Inc.	●	●	
Environment Defenders Office (Victoria) Ltd.	●		
Evers, Judy			●
Falls, Anthony			●
Falls, Laurissa			●
Federation of Victorian Traditional Owners Corporations			●
Feller, Michael			●
Ferrari, Elspeth			●
Fishermen Direct Pty Ltd	●		
Forbes, Chris			●
Ford, Michelle			●
Foster, Dale & Karen			●

● Period 1 ● Period 2 ● Period 3

Framlingham Aboriginal Trust		●	
Fraser, Susan			●
Frawley, Jenelle			●
Friends of Beware Reef	●		●
Friends of Eagle Rock Marine Sanctuary (FERMS)	●		
Friends of Point Addis			●
Friends of the Bluff	●		
Gaeggeler, Vivienne			●
Gardner, Joan & Jim			●
Gibbons, Matthew			●
Gippsland Ports	●		
Glasson, Nick			●
Gleeson, Regina	●		
Glenelg Hopkins Catchment Management Authority			●
Glenelg Shire Council	●		
Gower, Carolyn			●
Gower, John			●
Green, Matt			●
Gunson, John & Shirley			●
Hall, Anthony			●
Harris, Virginia			●
Hartigan, Cecilia	●		
Hawkins, Jasmine			●
Hayes, Don		●	
Heal, Sara			●
Henderson, Sue			●
Heyblok, Simon			●
Hilt, Kathryn			●
Hilt, Roberta & Mike			●
Hilt, Tessa			●
Hirschfeld, Thomas			●
Holden, Dominique			●
Hosking, Rebecca	●		
Hosking, Rod & Woodward, Pat			●
Hosking, Simson & Small, Rebecca, Mark & Sophie	●		
Hudgell, Suzanne			●
Hughes, Doug			●
Hunnam, Ray			●
Hurley, Shannon	●		
Ingram, Kylie			●
Iversen, Chris			●
Jan Juc Coast Action Group	●		
Jawbone Marine Sanctuary Care Group	●		●
Jensen, Elizabeth			●
Johansen, Anne			●
Kaye, Robyn			●
Kenny, Shane & Siggins, Merri			●
Kerin, Jim	●		
Kirkman, Hugh	●		
Kleeberger, Cornelia			●
Knowles, Kirstie			●
Lane, Desmond			●
Langmead, David			●
Lansdown, Lorraine & Malcolm			●
Law Institute of Victoria		●	
Laycock, June			●
Leeworthy, Grant			●
Leslie, Loretta			●
Leunig, Les			●
Lewis, Ray			●
Lombardi, Christine			●
Lombardo, Maria			●
Lorne-Aireys Inlet P-12 College - Grade 3/4*	●		
Manhal, Robert & Jennifer			●
Marine Care Point Cooke	●		●
Marine Care Ricketts Point Inc.	●	●	●
Mariotti, Robert			●
Marriott, Jane			●
McCallum, Campbell			●
McDonald, Sheridan			●
McDougall, John	●		●
McIntyre, Jean			●
McPherson, Steve			●
Millman, Ray	●		
Mollison, Brad			●
Monash Area Scuba Club		●	
Monash University Underwater Club		●	
Moon, Andrena			●
Moon, Melanie			●
Moon, Paul			●
Moon, Sarah			●
Mordialloc Beaumaris Conservation League Inc.	●		●
Mortensen, Greta			●
Murphy, Julian			●
Museum Victoria			●
Musilli, Chris			●

* Multiple submissions

● Period 1 ● Period 2 ● Period 3

Myers, Rob			●
Negus, Judith			●
Newman, Russell			●
Newman, Russell & Alice			●
Norden, Lorraine & Will			●
Norris, Michael			●
O'Gorman, Debra and Stephen			●
O'Neill, John		●	
O'Toole, Marg		●	
Parker, Bobby		●	
Parks Victoria		●	●
Petros, Vasy			●
Pfeifer, Horst		●	
Port of Melbourne Corporation	●		
Portland Professional Fishermen's Association		●	
Postill, Kim			●
Prysten, Peter			●
Read, Claire & Mark			●
RMIT Underwater Club	●	●	●
Rogers, Jane, Wally, Hayden, Allison & Annalise			●
Sawyer, Ray & Bronwen			●
Schell, Gudrun			●
Schinkel, Maurice	●	●	●
Scuba Divers Federation of Victoria		●	●
Scullin, Ben	●		
Seafood Delicacies Limited		●	
Seafood Industry Victoria	●	●	●
Shields, Brian	●		●
Shillinglaw, Gaye			●
Smith, Sarah			●
South Gippsland Conservation Society		●	
Stanilovic, Daniel	●	●	
Steiert, Joan			●
Stephan, Janet			●
Stephens, Larry			●
Stevenson, Jonathon	●		
Street, Charles			●
Surfers Appreciating the Natural Environment	●	●	●
Tarrant, Iain			●
Tasmanian Seafoods Pty Ltd.	●	●	
Taylor, Julie-Ann			●
Thomas, Clyde		●	
Tung, Mabel			●
Tyers, Bessie			●

van Rooyen, Abigail			●
Vernon, Glendon			●
Victorian Abalone Council	●	●	
Victorian Abalone Divers Association Inc.		●	
Victorian Abalone Processors Association		●	●
Victorian Aboriginal Heritage Council			●
Victorian National Parks Association	●	●	●
VRFish	●	●	●
Walker, Dale			●
Walthers, Paul & Rose			●
Weaver, Patrick			●
Welland, Mark			●
Wescott, Geoff		●	●
West Gippsland Catchment Management Authority			●
Western Abalone Pty Ltd.		●	
Western Coastal Board	●		●
West-Moore, Jo			●
Whitten, Derek			●
Williams, G & Kerry			●
Wilson, Geoff	●	●	
World Conservation Trust		●	
Wrest, Malcolm			●
Young, John & Gene			●