South-east Marine Parks Network state of knowledge

Australian Government
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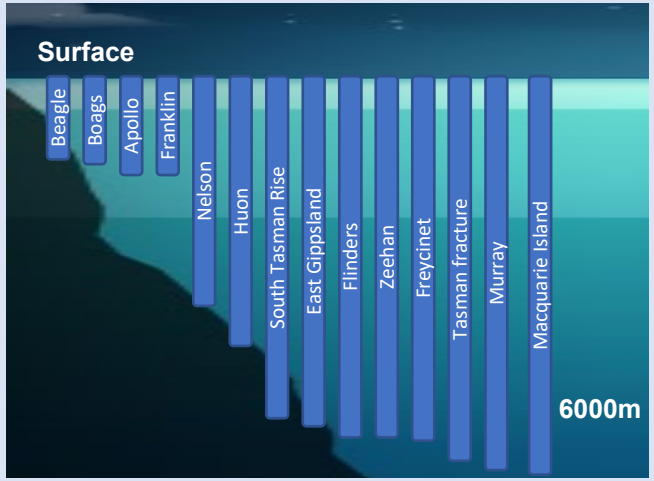
The 14 marine parks in this network contain a wide range of habitats and biological communities including deep rocky reefs, canyons and one of the world's largest cluster of seamounts (underwater mountains). The parks range in depth from 10 metres to over 6000 metres.

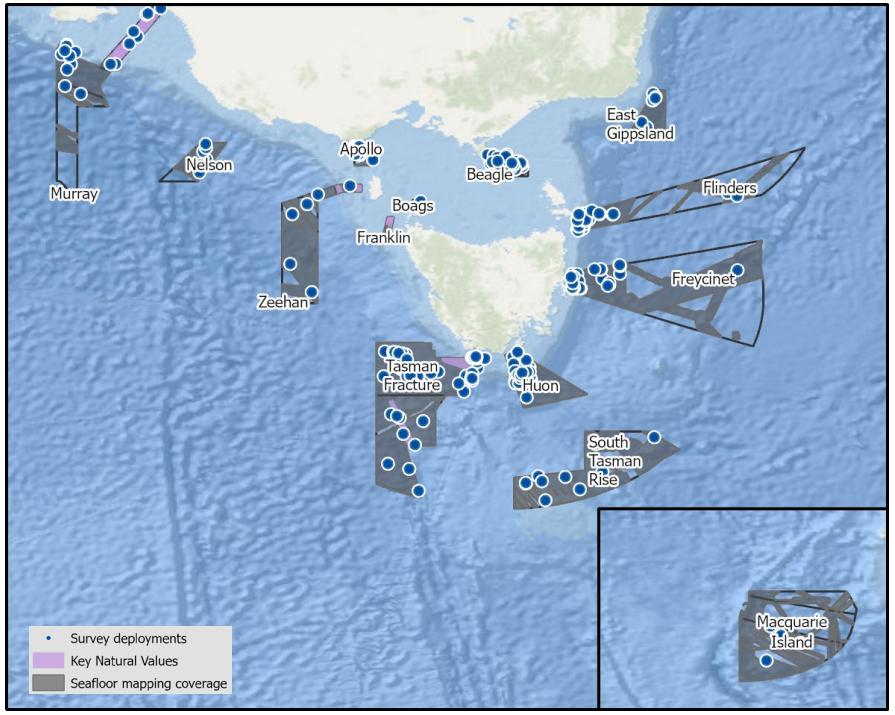
The network has an expanding level of knowledge from the increasing number of dedicated research voyages that have mapped the seafloor and undertaken biological surveys in many high priority areas. We are still learning what is in our parks, so monitoring is limited to deep coral communities on seamounts and a few deep reefs.

Depth ranges



Overall knowledge status

	Apollo	Beagle	Boags	East Gippsland	Flinders	Franklin	Freycinet	Huon	Macquarie Island	Murray	Nelson	South Tasman Rise	Tasman Fracture	Zeehan
Seafloor mapping														
Biological surveys														



Interactive Map and Report.

Low	• No or limited seafloor mapping or biological surveys have occurred
Medium	• Sufficient mapping of only some identified priority park values • Surveys only partially describe habitat and communities of identified priority park values
High	• Sufficient mapping of many to most identified priority park values • Surveys adequately describe habitat and communities in many to most identified priority park values

First Nations knowledge

First Nations people have key knowledge and cultural obligations to care for Sea Country in and around Australian Marine Parks. This state of knowledge will be revised over time with additional information, including working with First Nations to understand priorities identified for Sea Country.

Social, economic and heritage knowledge

A national social and economic benchmark survey was conducted in 2020 that covered awareness and use of the parks[2].

The network is the resting place for four known shipwrecks, as well as several unlocated shipwrecks.

Further information:

1. Hayes et al. (2021). Designing a Targeted Monitoring Program to Support Evidence Based Management of Australian Marine Parks: A Pilot on the South-East Marine Parks Network.
2. Navarro et al (2021) Social and economic benchmarks of the Australian Marine Parks.

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South-east Marine Parks Network state of knowledge

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Informing marine park design

Australian Marine Parks are designed to protect representative areas of Australia's ocean environment. Science was critical to inform the design of the South-east network, including:

- detailed surveys of species and habitat at different depths (available for a very limited area of these waters)
- bathymetry (studying and mapping the sea floor)
- bathomes (areas defined by depth)
- species community and distribution maps
- key ecological features
- biologically important areas.
- provincial and mesoscale bioregions.

Social and economic data was also used to help provide opportunities for sustainable human use and enjoyment of the marine parks.

Understanding bioregions

The information and models were used by scientists to classify large areas of ocean with broadly similar characteristics, such as ecological regions or 'bioregions'. This information was combined and analysed to provide the Integrated Marine and Coastal Regionalisation of Australia (IMCRA). The first version of IMCRA was released in 1998, and has been updated as new information became available. Large provincial bioregions were created in 2004 and inshore mesoscale bioregions were developed in the latest version, IMCRA 4.0, released in 2006.

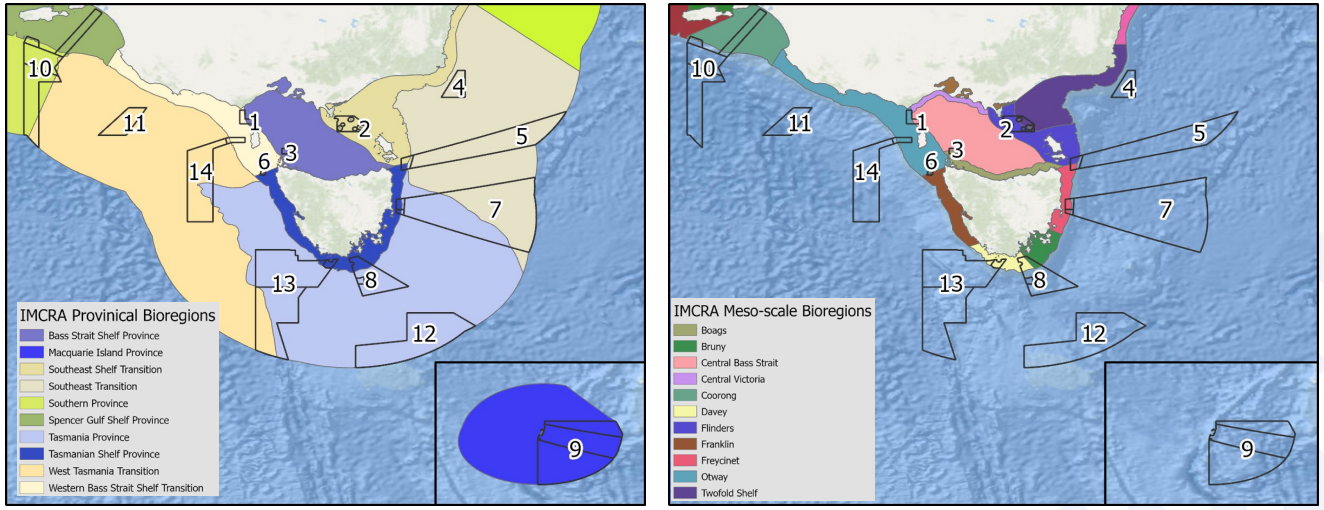
Understanding of bioregions contributed to the design of a comprehensive, adequate and representative marine park system that position Australia as a world leader in marine protection.

Apollo	Beagle	Boags	East Gippsland	Flinders	Franklin	Freycinet	Huon	Macquarie Island	Murray	Nelson	South Tasman Rise	Tasman Fracture	Zeehan
1	2	3	4	5	6	7	8	9	10	11	12	13	14

IMCRA Provincial Bioregions	Percent	Bioregion Area (km^2)
Bass Strait Shelf Province	2%	56,595
Macquarie Island Province	34%	475,466
Southeast Shelf Transition	8%	43,416
Southeast Transition	28%	233,231
Southern Province*	30%	119,462
Spencer Gulf Shelf Province	17%	29,338
Tasmania Province	31%	300,018
Tasmanian Shelf Province	18%	20,205
West Tasmania Transition	12%	289,881
Western Bass Strait Shelf Transition	6%	31,746
Central Eastern Province	0%	33,018
IMCRA Mesoscale Bioregions		
Boags	6%	4,518
Central Bass Strait	1%	49,311
Central Victoria	1%	2,766
Batemans Shelf	0%	596
Flinders	17%	14,799
Twofold Shelf	3%	28,021
Coorong	17%	29,317
Bruny	20%	3,096
Davey	44%	4,426
Franklin	1%	7,868
Freycinet	22%	4,815
Otway	6%	31,746

* Figures include a portion of Western Eyre Marine Park (in the South-west Network)

Proportion of bioregions within Australian Marine Parks in the South-east marine region



Representative areas network

The South-east network includes all 11 Provincial bioregions in the South-east marine region, except the Central Eastern Province (later represented in Temperate East Network). Mesoscale bioregions were not targeted by the original network design (IMCRA 4.0 was finalised later), but are also included to varying degrees within the parks. Mesoscales bioregions focus on ocean environments on the continental shelf, providing additional understanding than provincial bioregions which combined shelf and offshore information.

Ongoing science and adaptive management

The Australian Marine Park science program is providing new information to improve our knowledge and understanding of the natural, cultural, social and economic values of the parks and the pressures on those values is key to managing our parks effectively. Increasing knowledge will help us to review and adapt park management and design to best protect these special places.

Further information:

1. Australian Marine Parks science under the surface
2. Goals and principles for the establishment of the National Representative System of Marine Protected Areas in Australian waters.

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South-east Marine Parks Network state of knowledge

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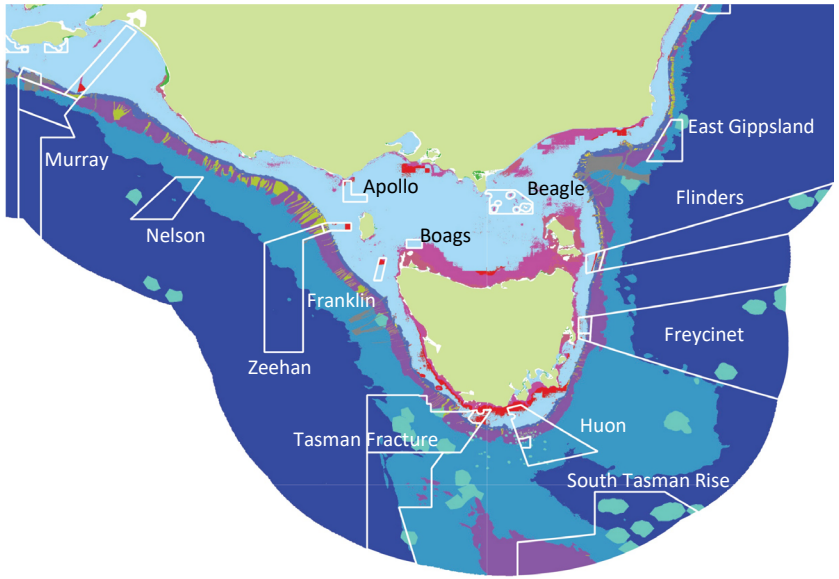
Natural values in more detail

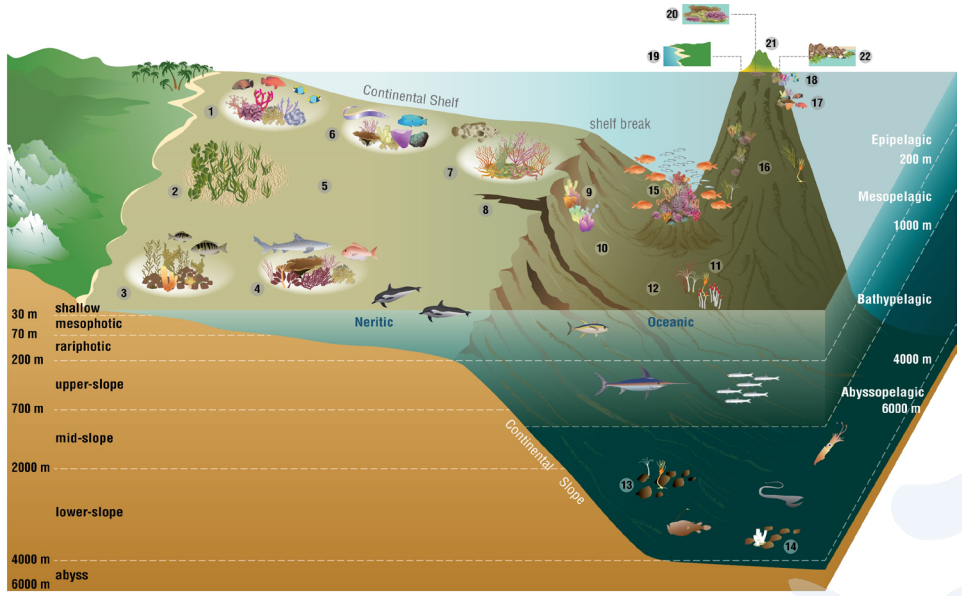
The natural values described in the South-east network management plan in 2013 were by necessity high level and were focused on provincial bioregions, Key Ecological Features and Biologically Important Areas. Understanding of the natural values within the network has improved significantly since the management plan came into effect, enabling better descriptions of the natural values within the Australian Marine Parks.

A natural values common language has been developed to provide a nationally consistent terminology for describing what is in the marine parks. It is based on broad national open water (pelagic) and seafloor (benthic) ecosystems, such as deep (mesophotic and rariphotic) reefs and ecosystem components including immobile (sessile) invertebrates like sponges and coral.

Better definition and understanding of ecosystems and communities associated with them is helping to prioritise science and management to best protect them.



- Shelf unvegetated sediments
- Shelf vegetated sediments
- Shallow rocky reefs*
- Mesophotic rocky reefs
- Rariphototic shelf reefs
- Upper slope sediments
- Upper slope reefs
- Mid slope sediments
- Mid slope reefs
- Lower slope reef and sediments
- Abyssal reef and sediments
- Seamount sediments
- Seamount reefs
- Shelf incising canyons



1. shallow coral reefs
2. shelf vegetated sediments
3. shallow rocky reefs
4. mesophotic rocky reefs
5. shelf unvegetated sediments
6. mesophotic coral reefs
7. rariphotic shelf reefs
8. shelf-incised canyons
9. upper-slope reefs
10. upper-slope sediments
11. mid-slope reefs
12. mid-slope sediments
13. lower-slope reef and sediments
14. abyssal reef and sediments
15. seamount reefs
16. seamount sediments
17. oceanic mesophotic coral reefs
18. oceanic shallow coral reefs
19. beaches
20. intertidal coral reefs
21. islands
22. rocky shores

* Shallow rocky reef ecosystems occur outside of park boundaries.

Note: Macquarie Island Marine Park is not shown on this map. It has limited surveys and further knowledge is needed to accurately identify ecosystems

Ecosystems in the network

There are 22 seafloor (benthic) ecosystems and four open ocean (pelagic) ecosystems present across Australian Marine Parks. Thirteen of the benthic ecosystems exist in the South-east Marine Parks Network, not including shallow coral reefs (1), shallow rocky reefs (3), mesophotic coral reefs (6), oceanic mesophotic coral reefs (17), oceanic shallow coral reefs (18), beaches (19), intertidal coral reefs (20), islands (21) and rocky shores (22).

Further information:

1. Hayes et al. (2021). Designing a Targeted Monitoring Program to Support Evidence Based Management of Australian Marine Parks: A Pilot on the South-East Marine Parks Network.

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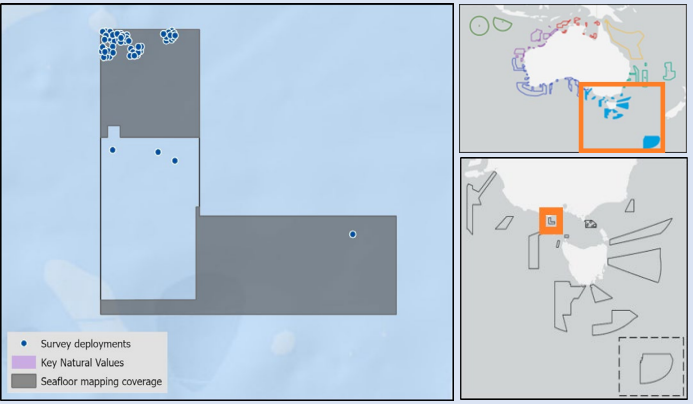
Apollo Marine Park state of knowledge

Australian Government
Parks Australia

Australian Marine Parks



Interactive Map and Report.

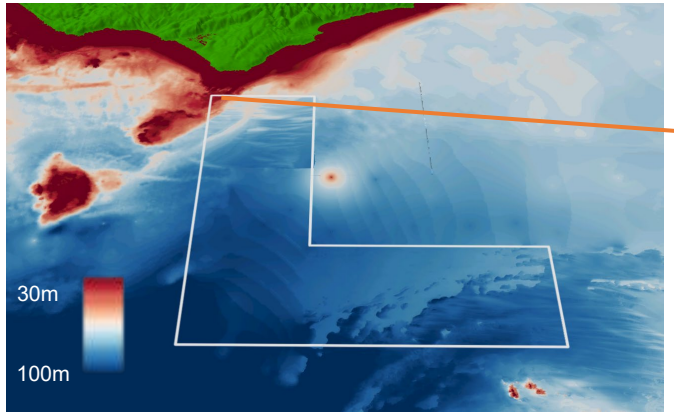
Apollo Marine Park contains sediment ecosystems, deep (mesophotic) reefs and a 5m high raised ridge feature, suspected to be deeper (rariphotic) reef habitat extending from the western park boundary to the northern park boundary[1]. The park covers representative areas of five bioregions.

Depth - 47m -101m

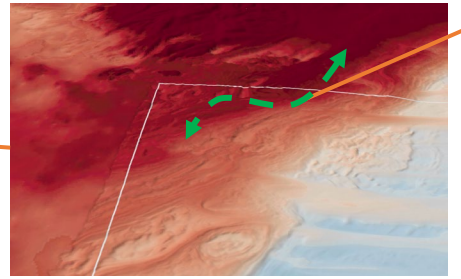
60% of seafloor mapped, most at medium to high resolution to support habitat mapping and biodiversity surveys.

Overall knowledge status

Apollo Marine Park has a **low to medium level of knowledge**. Fine-scale mapping includes high biodiversity areas of deep (mesophotic) reef ecosystems in the north west corner. This area has been a focus for fish community surveys, with data from 50 Baited Remote Underwater Video systems yet to be analysed. The south east section of the park has also been mapped with interpretation of seabed features yet to be undertaken.



Source; Geoscience Australia



Source; Geoscience Australia

Southern Rock Lobster (Credit: Antonia Cooper)

Key knowledge gaps

- Deep (mesophotic and rariphotic) shelf reef benthic communities and demersal fish communities.
- Soft sediment benthic communities (epifauna and infauna) and contaminant levels (e.g. hydrocarbons, heavy metals).

Key activities

Commercial fishing
Recreational fishing
Shipping

Key pressures

Resource extraction
Climate change
Underwater noise

Known underwater cultural heritage[2]

The MV City of Rayville, an American motor ship, is located on the western side of the park in 82m of water. It was the first American vessel sunk during World War II, on the 8th of November 1940, after hitting a mine. The wreck was first surveyed in 2009 and resurveyed in 2019[1].

Feature of interest

Prized Southern Rock Lobsters (*Jasus edwardsii*) are thought to migrate throughout the year between the highly productive state waters and Apollo Marine Park reef systems.

Other knowledge

A rich diversity of oceanic seabirds forage in these waters, including the endangered Shy Albatross (*Thalassarche cauta*).

MV City of Rayville. Credit: Dave Hurst

Further information:

1. Ierodiaconou et al. (2020) *Hydrographic Survey of Apollo Marine Park*. Final report to Parks Australia, Warrnambool,).
2. Protected under the Underwater Cultural Heritage Act 2018 (UCH) and included on the National and Commonwealth Heritage Lists under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

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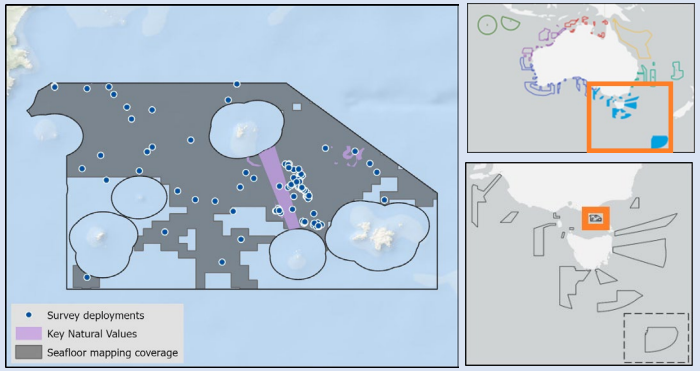
Beagle Marine Park state of knowledge

Australian Government
Parks Australia

Australian Marine Parks



Interactive Map and Report.

Beagle Marine Park contains an extensive area of soft sediment with some areas of rocky reef, which are likely to be a relict sand dune field prior to sea level rise. The park covers representative areas of three bioregions.

The small area (~5km^2) of reef between the Kent and Hogan Islands group has been a focus of research and support a sessile invertebrate assemblage comprised of bryozoans, hydroids and a high diversity of temperate sponges[1].

Depth - 46m - 77m

62% of seafloor mapped, much of it at medium to high resolution to support habitat mapping and biodiversity surveys.

Overall knowledge status

Beagle Marine Park has a **medium level of knowledge**. Representative areas of the park and some identified priority park values have been mapped. Biological surveys have focused on the deep rocky reefs.

Source: IMAS/IMOS

Deep rocky reefs

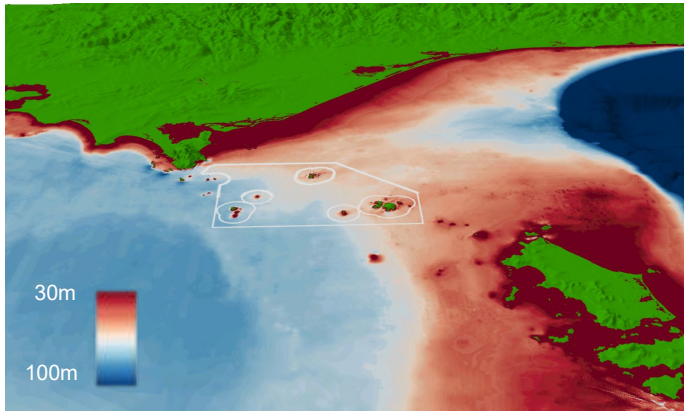
KNV

Deep (mesophotic) reef is a rare ecosystem in the bioregions within Bass Strait. This reef is exposed to large currents leading to high biological productivity and provides habitat for a diverse range of species. An incredible density and diversity of sponges provide food for other species by concentrating the nutrients swept past in the currents. The marine park was once dry land which made up part of a land bridge to Tasmania.

Monitoring priorities

Is the condition of demersal fish communities associated with deep (mesophotic) rocky reefs and shelf sediment ecosystems maintained through ecologically sustainable use?

To what extent is climate change affecting our ability to protect and conserve natural values?



Source; Geoscience Australia

Key knowledge gaps

- Validate features inferred from seafloor mapping
- Mapping of comparable habitat outside park boundaries
- School and gummy shark population
- Impact of invasive New Zealand screw shell (*Maoricolpus roseus*) on native scallop beds
- Soft sediment benthic communities

Key activities

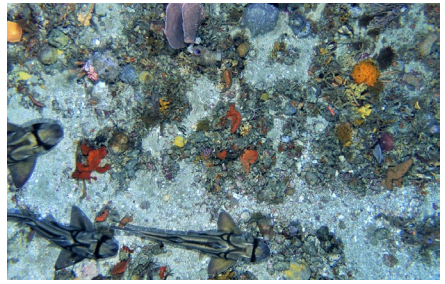
Commercial fishing
Recreational fishing
Shipping

Key pressures

Resource extraction
Climate change
Underwater noise

KNV

KNV= Key Natural Values
Habitat or species that are particularly important to management



Source: IMAS/IMOS

Feature of interest

An aggregation of hundreds of Port Jackson Sharks (*Heterodontus portusjacksoni*) was observed along the central reef ridges between Hogan Island group and Kent Island group during July 2018. It is thought these reef features may be an important shelter location for this species during winter foraging migrations to Bass Strait. Yet to be determined if these aggregations are an annual occurrence[1].

Known underwater cultural heritage

Beagle Marine Park contains two shipwrecks within its Multiple Use Zone, the SS Cambridge (1940) and the SS Queensland (1876)[2].

Further information:

1. Barrett et al (2020). *Beagle Marine Park: Post Survey Report. Report to the National Environmental Science Program*

2. Protected under the Underwater Cultural Heritage Act 2018 (UCH) and included on the National and Commonwealth Heritage Lists under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

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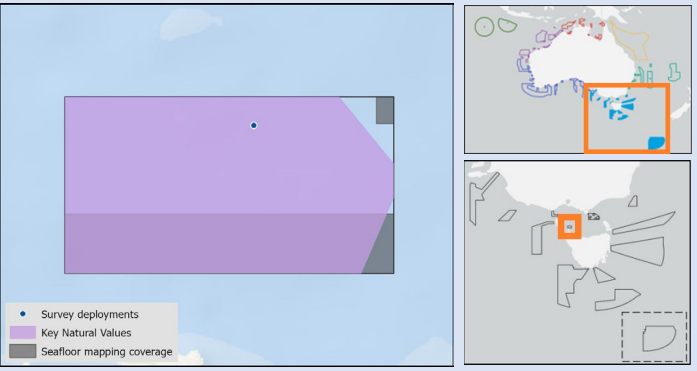
Boags Marine Park state of knowledge



Interactive Map and Report.

Boags Marine Park contains extensive mobile dune fields, likely dominated by crustaceans, polychaete worms and molluscs that live in and on sediments[1]. It covers representative areas of three bioregions. The southern third of the park has been mapped using fine scale multibeam[2].

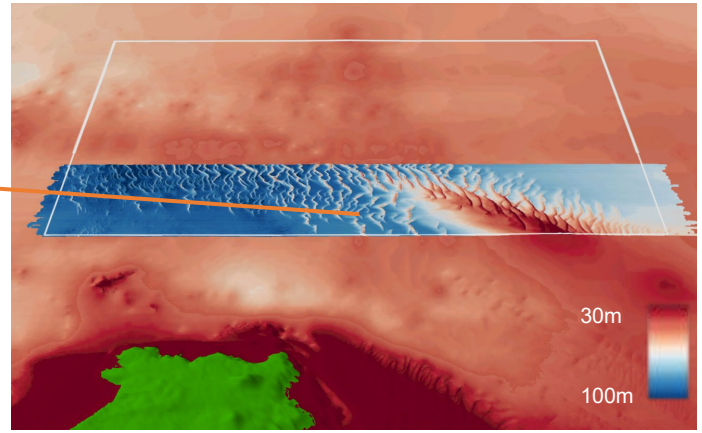
Depth - 10m - 62m

30.9% of seafloor mapped, almost all at high resolution to support habitat mapping and biodiversity surveys.

Overall knowledge status

Boags Marine Park has a **low to medium level of knowledge**. Fine-scale mapping of the southern end of the park has revealed seafloor features expected to occur throughout the park. No known biological surveys have been undertaken.

Source; Geoscience Australia



Source; Geoscience Australia

Mobile dune fields

A prominent and striking feature of the park are the extensive, mobile dune fields caused by the combination of shallow depths (40-60m) and strong-tidal currents in the area. Several of the dunes are over 10m high. These mobile dunes are unlikely to support complex sessile invertebrate communities like those observed in Beagle Marine Park, and are instead likely to be dominated by organisms that live in and on the sediments, such as polychaete worms[1].

Key knowledge gaps

- Further understanding of foraging in the park by Shy Albatross

Key activities

Commercial fishing

Key pressures

Resource extraction
Climate change
Underwater noise

Shy Albatross. Credit: Wild Ocean Tasmania

Feature of interest KNV

The endangered Shy Albatross (*Thalassarche cauta*) is an endemic Australian seabird, which breeds exclusively on three offshore Tasmanian islands. The park contains core foraging areas for early incubating and post-fledgling Shy Albatross from nearby Albatross Island[3].

KNV

KNV= Key Natural Values
Habitat or species that are particularly important to management

Further information:
1 (pers. comm Dr N Barrett 2018).
2. CSIRO (2018). *Hydrographic Survey of the Boags Commonwealth Marine Reserve in Southwestern Bass Strait.*
3. Mason et al. 2018. Telemetry reveals existing marine protected areas are worse than random for protecting the foraging habitat of threatened shy albatross (Thalassarche cauta)
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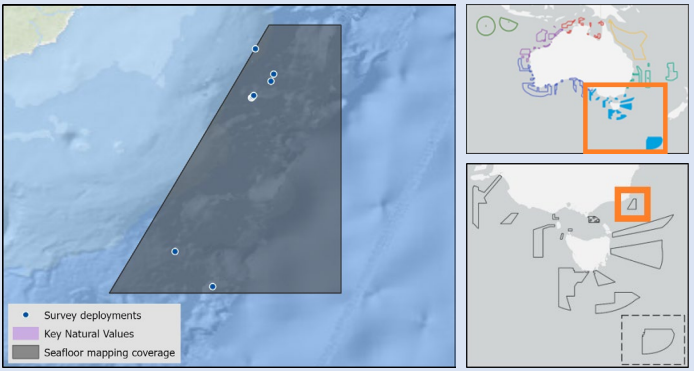
East Gippsland Marine Park state of knowledge

Australian Government
Parks Australia

Australian Marine Parks



Interactive Map and Report.

East Gippsland Marine Park contains deep water habitats featuring large box canyons, ridges, margin slumps, and plateaus bordered by steep escarpments. It covers representative areas of the south-east transition bioregion.

Depth - 604m - 5276m

100% of seafloor mapped, almost all at medium to high resolution to support habitat mapping and biodiversity surveys.

Further information:
1. O'Hara, Tim. (2019). *The Eastern Australian Marine Parks: Biodiversity, assemblage structure, diversity and origin.*
2. Henschke, et al. (2013). Salp-falls in the Tasman Sea: A major food input to deep-sea benthos.

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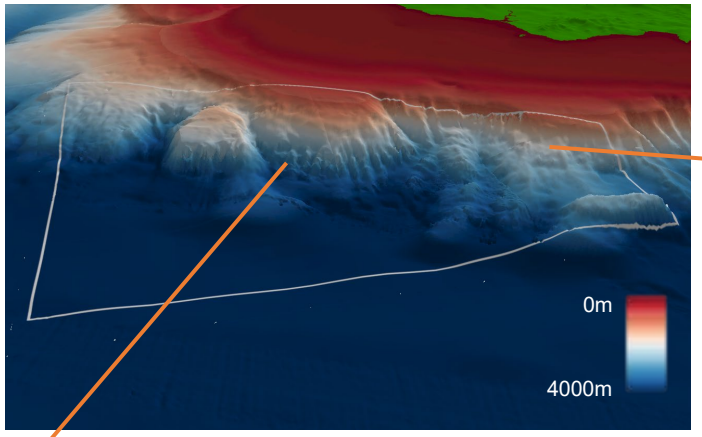
Overall knowledge status

East Gippsland Marine Park has a **medium level of knowledge**. The significant geomorphology provides habitat for a diverse array of mobile and sessile (immobile) fauna and are the focus of research efforts aiming to characterise the unique structure of these valuable high biodiversity habitats.

Mid-bathyal seafloor community (O'Hara. 2019)



Source; Geoscience Australia

Box canyon

A prominent feature of the park is a large box canyon that borders the southern edge of a significant plateau feature. The canyon is distinguished by a steep incline at the head before cutting in at the lower slope and then progressing to the abyssal plain[1].

Key knowledge gaps

- Understanding impacts of emerging pressures on park values.

Key activities

Commercial fishing
Shipping

Key pressures

Resource extraction
Climate change
Underwater noise

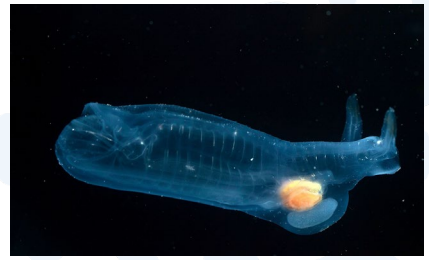
Rocky escarpments (O'Hara, 2019)

Habitat

Rocky escarpments provide valuable habitat for benthic communities[1].

Feature of interest

Mid bathyal seafloor habitats support a diverse array of mobile and sessile fauna.



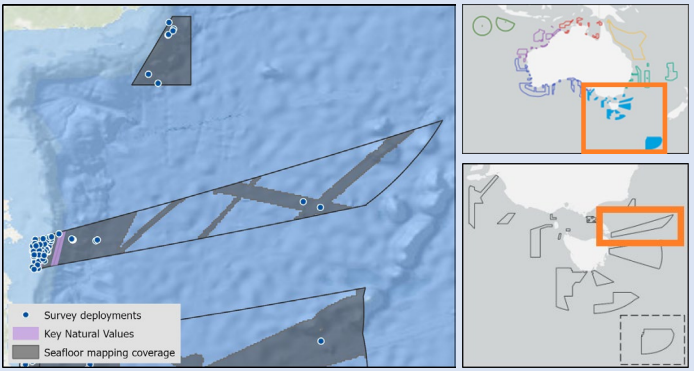
Credit: Michael Stukel

Twin sailed Salps (*Thetys vagina*) contribute valuable biomass to the seafloor.[2]

Flinders Marine Park state of knowledge

Australian Government
Parks Australia

Australian Marine Parks



Interactive Map and Report.

Flinders Marine Park contains soft sediment and hard substrate shelf areas, canyons, deep (mesophotic) reefs, and seamounts. It covers representative areas of four bioregions.

Targeted biological surveys have revealed diverse benthic communities of hydrozoans, bryozoans, ascidians and sponges. Monitoring of these communities has been undertaken using Automated Underwater Vehicles (AUVs).

Depth - 34m - 5041m

33% of seafloor mapped, with much at medium to high resolution to support habitat mapping and biodiversity surveys.

Further information:

1. Perkins *et al.* (2019). Analysis of a time-series of benthic imagery from the South-east Marine Parks Network. Institute of Marine and Antarctic Studies.
2. Monk J, *et al* (2016a) *Outcropping reef ledges drive patterns of epibenthic assemblage diversity on cross-shelf habitats.*.
3. Althaus *et al* (2016) *Analysis of approaches for monitoring biodiversity in Commonwealth waters*: Field work report.

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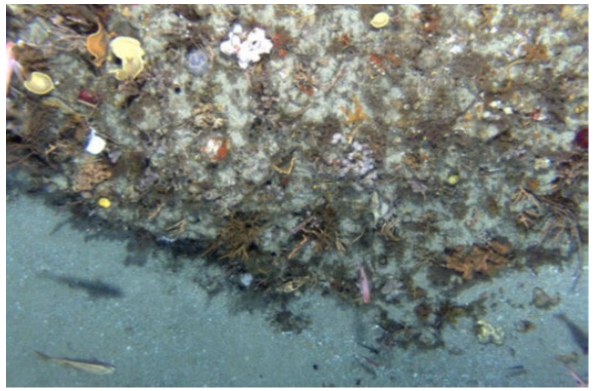
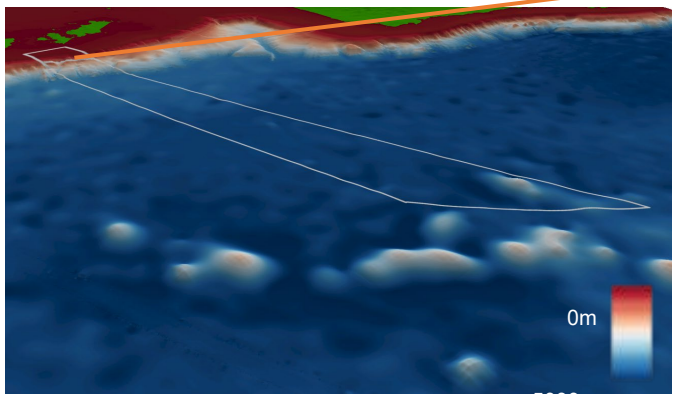
Overall knowledge status

Flinders Marine Park has a **medium level of knowledge**. Fine-scale mapping exists for the shelf break, all of the upper and mid continental slope and much of the lower slope. Targeted biological surveys and monitoring has focused on deep reefs.



Source; Nicholas Perkins, IMAS



Source; Geoscience Australia

Deep reefs

KNV

Long linear reef features that extend over kilometres are often undercut forming small caves and ledges. A diverse sessile invertebrate community of hydrozoans, bryozoans, ascidians and sponges occur on these features.

The central western boundary of the park has mesophotic reefs habitat with red cup sponges, a dominant feature of this site.

Unique fish communities associated with rare outcroppings of shelf break reefs are a feature of the park. Rock lobsters are also present within the park.

Key knowledge gaps

- Additional seafloor mapping of the shelf.
- Benthic communities of canyons and upper slope reefs and sediments.
- Changes in reef and sediment communities due to climate change and other pressures.
- Recreational fishing effort and catch in the Multiple Use Zone.

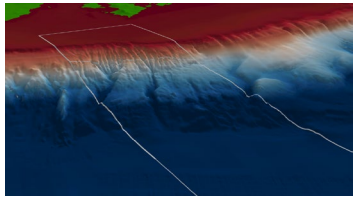
Key activities

Commercial fishing, Recreational fishing, Shipping

Key pressures

Resource extraction, Climate change, Underwater noise

KNV **KNV**= Key Natural Values
Habitat or species that are particularly important to management



Source; Geoscience Australia

Two major canyons occur within the park featuring large benthic fauna such as bamboo octocorals on the rocky outcrops, where topography is steeper. The Flinders canyons and upper slope reef supports a high abundance of rare corals.

KNV

Source; Nicholas Perkins, IMAS

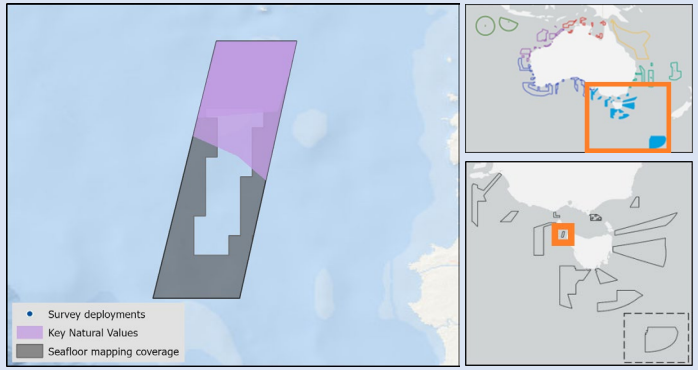
Feature of interest

Biologically diverse survey sites with a variety of sponges, cnidarians, and hydroids, including large gorgonian fans and soft coral species unique within the South-east network.

Franklin Marine Park state of knowledge

Australian Government
Parks Australia

Australian Marine Parks



Interactive Map and Report.

Franklin Marine Park is dominated by shelf unvegetated sediment habitat with high-profile deep reef features in the northern section. It covers representative areas of four bioregions.

Depth - 49m – 116m

55% of seafloor mapped, almost all at medium to high resolution to support habitat mapping and biodiversity surveys.

KNV

KNV= Key Natural Values
Habitat or species that are particularly important to management

Overall knowledge status

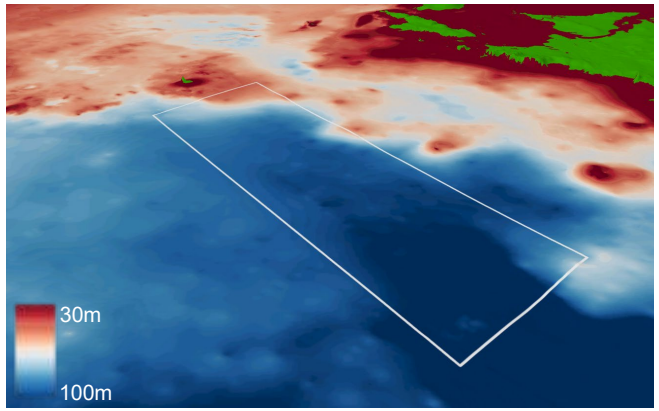
Franklin Marine Park has a **medium level of knowledge**. The reef habitats have been a focus of fine-scale mapping efforts in the park. The northern and southern ends of the park have been continuously mapped[1]. Limited biological surveys have been undertaken.

Source: Wild Ocean Tasmania

Feature of interest

KNV

The northern half of the Franklin Marine Park is a core foraging area for the endangered Shy Albatross (*Thalassarche cauta*) which breeds exclusively on three offshore Tasmanian islands – one of which is Albatross Island to the north-east of the park[3].



Source; Geoscience Australia

Key knowledge gaps

- Fine scale mapping, and validation of features of the north and north-east section of the park
- Characterise the deep (mesophotic and rariphotic) shelf reefs benthic communities and demersal fish communities.

Key activities

Commercial fishing
Shipping

Key pressures

Resource extraction
Climate change
Underwater noise

Source: Atlas of living Australia; Richard Ling

Kelp forests

The northern section of the park contains complex reef likely formed by volcanic lava flows, which at its shallowest depths of 35m support kelp forests (*Ecklonia radiata*) - a rare habitat type in Australian Marine Parks[2].

Source: IMAS

Reef habitats

The southern end of the park contains limestone pavement outcrops, and is sponge dominated in areas of higher relief[2].

Further information

1. Davey et al. 2022, Hydrographic Survey of Zeehan and Franklin Marine Parks, West Coast Tasmania.
2. Pers. comm. Neville Barrett, 2022.
3. Mason et al. 2018. Telemetry reveals existing marine protected areas are worse than random for protecting the foraging habitat of threatened shy albatross (Thalassarche cauta)

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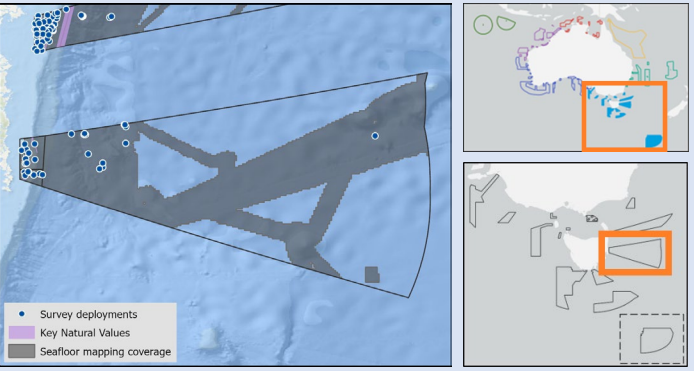
Freycinet Marine Park state of knowledge

Australian Government
Parks Australia

Australian Marine Parks



Interactive Map and Report.

Freycinet Marine Park features sediment dominated shelf areas, a high-profile granite reef, and low profile reef ridges along the mid-shelf. All these habitats support a diverse array of invertebrate communities and fish assemblages[1]. It covers representative areas of four bioregions.

Depth - 43m – 5231m

47.8% of seafloor mapped, much at medium resolution to support biodiversity surveys.

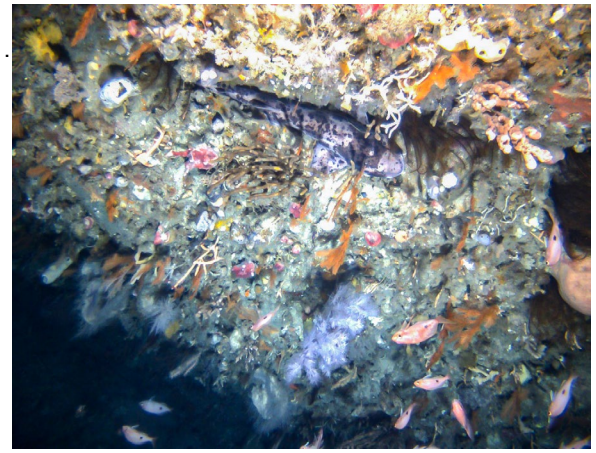
KNV

KNV= Key Natural Values
Habitat or species that are particularly important to management

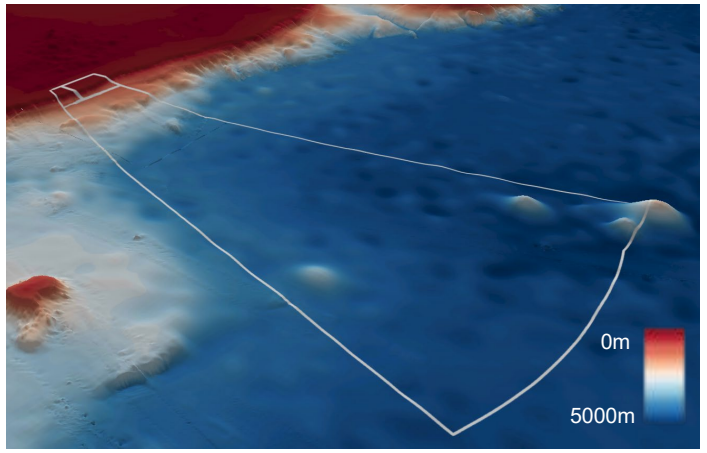
Further information:
1. Perkins et al. 2019. Analysis of a time-series of benthic imagery from the South-east marine parks networks.
| State of Knowledge published Feb 2023 |

Overall knowledge status

Freycinet Marine Park has a **medium level of knowledge** despite the small number of dedicated research voyages. Mapping and biological surveys have occurred in all identified priority areas.



Source: Nicholas Perkins.



Source; Geoscience Australia

Deep reef

KNV

An isolated high-profile granite reef rising 20m above the surrounding seabed is covered in a diverse invertebrate fauna of sponges, gorgonian fans, mushroom corals and rare but distinctive tree-forming black corals. Unique fish communities associated with rare outcroppings of shelf break reefs are a feature of the park[1].

Monitoring priority

Are the condition of fish communities and rock lobsters on deep (mesophotic and rariphotic) rocky reefs improving or maintained through ecologically sustainable use of the park?

Key knowledge gaps

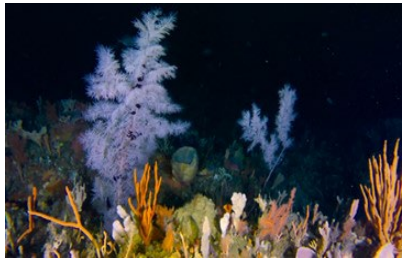
- Additional mapping of inner shelf reefs in the parks and reference sites north of park
- Benthic communities in upper slope reefs and sediments
- Recreational fishing effort and catch in the park

Key activities

Commercial and recreational fishing

Key pressures

Resource extraction
Climate change
Underwater noise



Source: James Parkinson.

Feature of interest

Diverse mesophotic (deep) benthic communities and rare tree-forming black corals associated with granite reef features.

Source: Nicholas Perkins

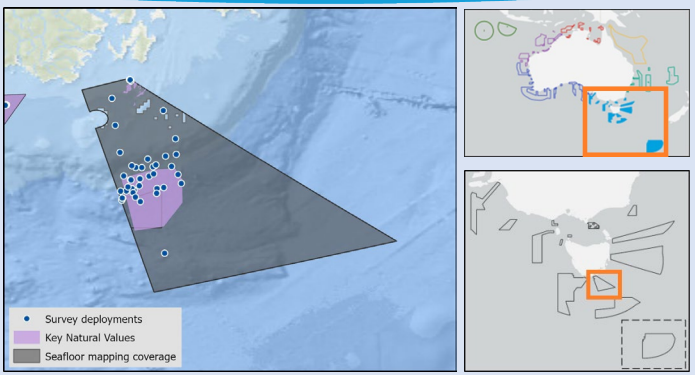
Sponges and corals

Mesophotic (deep reef) featuring encrusting sponges and corals[1].

Huon Marine Park state of knowledge

Australian Government
Parks Australia

Australian Marine Parks



Interactive Map and Report.

Huon Marine Park displays multiple levels of seabed habitats from the large cluster of seamounts on the continental slope to low profile reefs and sediment plains on the continental shelf[1]. It covers representative areas of four bioregions.

Depth - 40m – 4040m

96% of seafloor mapped, almost all at medium to high resolution to support habitat mapping and biodiversity surveys.

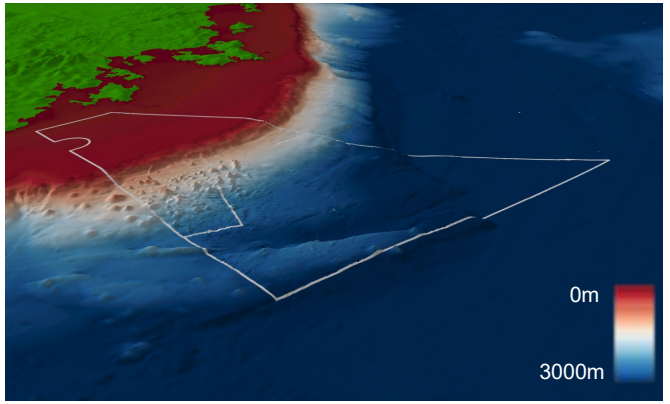
KNV

KNV= Key Natural Values
Habitat or species that are particularly important to management

Overall knowledge status

Huon Marine Park has a **medium to high level of knowledge**. Much of the shelf break and continental slope has been mapped, including reef and seamount ecosystems. The shelf reefs and seamount habitats have been the focus of biological surveys owing to their unique structure and high level of biodiversity and species endemism they provide.

Source; CSIRO



Source; Geoscience Australia

Feature of interest

KNV

Patience Seamount supports a spawning aggregation of basketwork eels (*Diastobranchus capensis*) - the only reported spawning aggregation of oceanic eels globally[1].

The park contains one of the world's largest cluster of seamounts (underwater mountains).

Monitoring priority

Is the condition of deep-sea coral communities on seamount reefs improving after the removal of historic pressures?

Key knowledge gaps

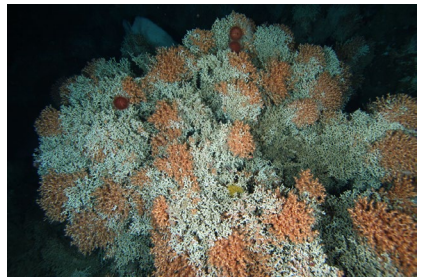
- Seafloor mapping of NW and NE sections of the park
- Distribution of deep-sea coral communities on Seamounts and slope areas
- Basketwork eel aggregation extent, timing and duration

Key activities

Commercial fishing

Key pressures

Resource extraction
Climate change



Solenosmilia variabilis. Source: CSIRO

Deep coral reefs

The Huon seamounts are inhabited by diverse deep-sea coral communities including stony reef building corals and habitat forming octocorals[2].

KNV

Source: Emma Flukes

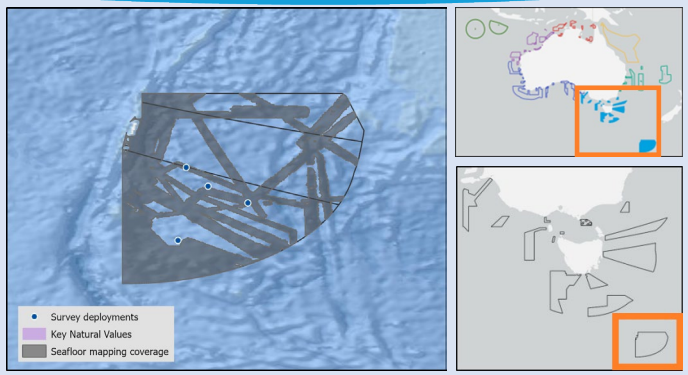
KNV

Benthic fauna

Southern Rock Lobsters are an apex predator important for ecosystem functioning on rocky reefs[2].

Further information
1. Luceer et al. 2018. An eco narrative of Huon marine park.
2. Monk et al. 2016. Biological and habitat feature descriptions for the continental shelves of Australia's temperate water marine parks…
| State of Knowledge published Feb 2023 |

Macquarie Island Marine Park state of knowledge



Interactive Map and Report.

Macquarie Island Marine Park features both sanctuary and habitat protection zones offering the highest levels of protection to this unique sub-polar park. It covers representative areas of the Macquarie Island Province bioregion.

Depth - 86m – 6000m

49.7% of seafloor mapped, most at medium resolution to support biodiversity surveys.

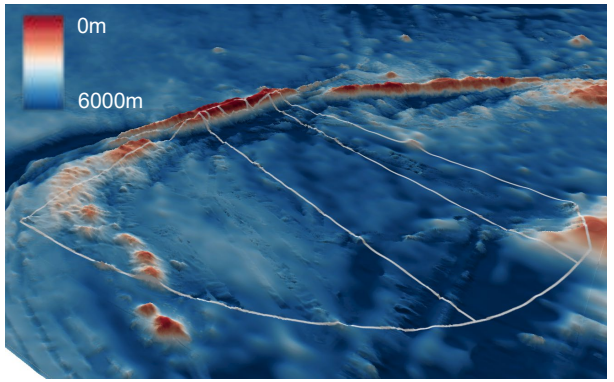
Overall knowledge status

Macquarie Island Marine Park has a **low knowledge level**. This is due to its remote location and seasonal constraints. High resolution mapping of Macquarie ridge and a significant number of studies have been conducted on the marine mammal and bird populations inhabiting the area.

Source; Eric Woehler

Feature of interest

The Macquarie Island Marine Park encompasses important foraging habitat for Royal Penguins (*Eudyptes schlegeli*) the only endemic penguin species on Macquarie Island[2].



Source; Geoscience Australia

Key knowledge gaps

- Information on high priority shelf, upper slope, reefs, canyons, and sediments identified from fine scale resolution multibeam mapping is required.
- Further research to identify species of conservation interest and their spatial distributions and key habitats.

Key activities

Commercial fishing

Key pressures

Resource extraction
Climate change

Source; Eric Woehler

King penguins

King Penguins (*Aptenodytes patagonicus*) breed on Macquarie Island and forage within the park[1].

Patagonian toothfish

Patagonian Toothfish (*Dissostichus Eleginoides*) are a large demersal fish found around Macquarie Island.

Source; Narelle Campbell

Home range

Southern Elephant Seals (*Mirounga leonine*) breed on Macquarie Island[3].

Further information:
1. Wienecke & Robertson. 2002. Foraging Areas of King Penguins from Macquarie Island in Relation to a Marine Protected Area
2. Hull et al.1997. Foraging zones of royal penguins during the breeding season, and their association with oceanographic features.
3. Van den Hoff. 2001. Dispersal of southern elephant seals (Mirounga leonine) marked at Macquarie Is. | State of Knowledge published Feb 2023 |

Murray and Nelson Marine Parks state of knowledge

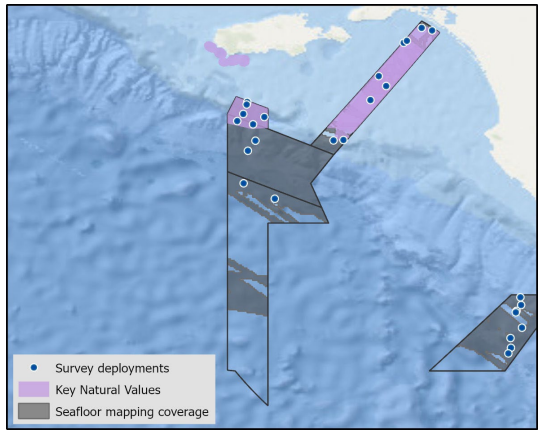
Australian Government
Parks Australia

Australian Marine Parks

Murray Marine Park contains highly varied geomorphology throughout the park, potentially encompassing many shelf reef habitats. The northern edge consists predominately of Lacepede shelf, a large shelf area intersected by ancient channels of the Murray River that converge at the head of Sprigg canyon on the continental shelf[2]. It covers representative areas of four bioregions.

Murray seafloor mapping

49.9% of seafloor mapped, most at medium resolution to support biodiversity surveys.



Interactive Map and Report.

Depth - 24m - 5729m

Feature of interest

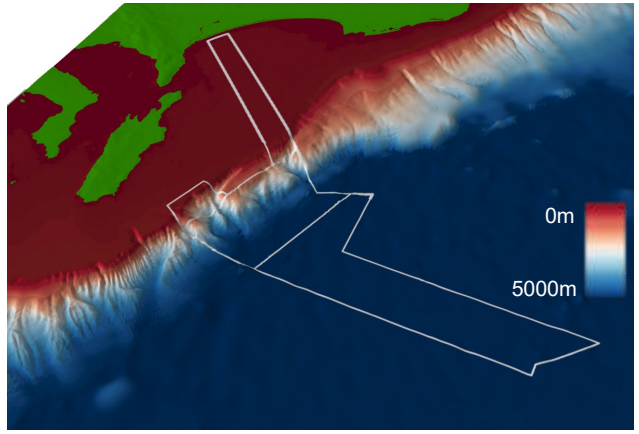
KNV

Murray Marine Park incorporates core foraging areas and home range for the endangered Shy Albatross (*Thalassarche cauta*)[1].

Source: Wild Ocean Tasmania

Overall knowledge status

Murray Marine Park has a **low level of knowledge**. Limited fine-scale mapping and no known biological surveys have occurred.



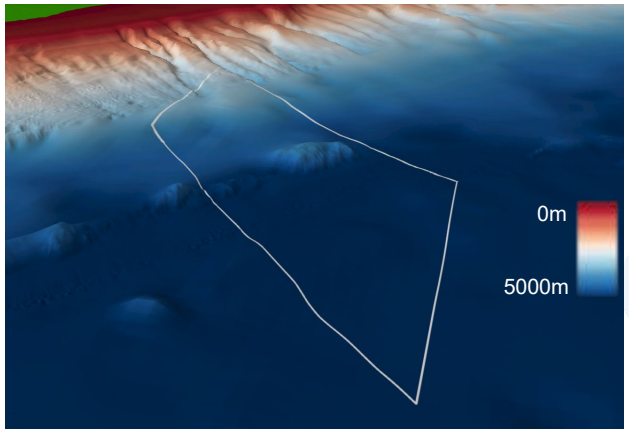
Source; Geoscience Australia

Key activities

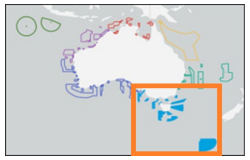
Recreational fishing
Shipping

Overall knowledge status

Nelson Marine Park has a **low level of knowledge**. No targeted fine-scale seafloor mapping or biological surveys have occurred.



Source; Geoscience Australia

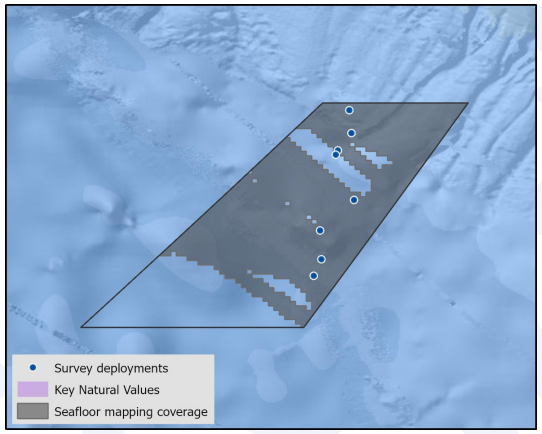


Key pressures

Resource extraction
Climate change
Underwater noise

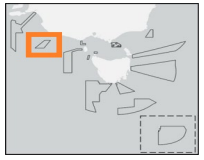
Nelson seafloor mapping

63% of seafloor mapped, most at a medium resolution to support biodiversity surveys.



Interactive Map and Report.

Depth - 2557m - 5612m



Key activities

Commercial fishing
Shipping

Further information

1. Mason et al. 2018. Telemetry reveals existing marine protected areas are worse than random for protecting the foraging habitat of threatened shy albatross (Thalassarche cauta)
2. Hill et al. 2009. Ancestral Murray River on the Lacepede Shelf, southern Australia: Late Quaternary migrations of a major river outlet and strandline development.

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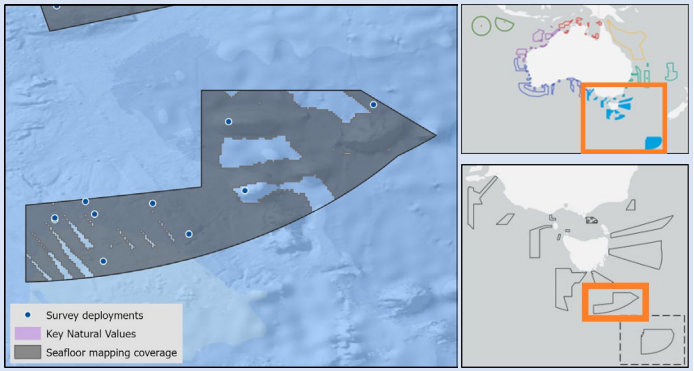
KNV

KNV= Key Natural Values
Habitat or species that are particularly important to management

South Tasman Rise Marine Park state of knowledge

Australian Government
Parks Australia

Australian Marine Parks



Interactive Map and Report.

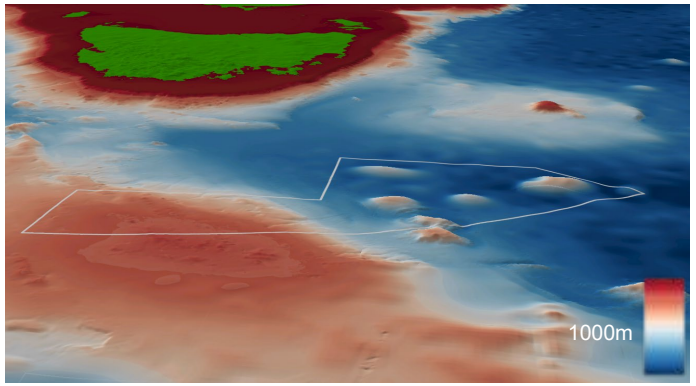
South Tasman Rise Park contains a cluster of distinctive seamounts characterised by flat tops that potentially encompass many shelf reef habitats. The seamount areas are highly productive with diverse coral assemblages, which have been the target of historical commercial fishing efforts for decades owing to their ability to support vast fish assemblages[1]. The park covers representative areas of the Tasmania Province bioregion.

Depth - 804m – 5022m

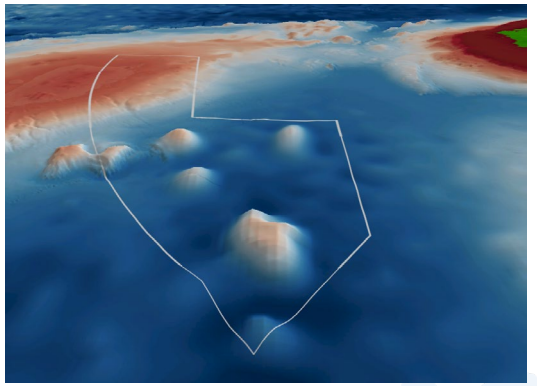
77.7% of seafloor mapped, most at a medium resolution to support biodiversity surveys.

Overall knowledge status

South Tasman Rise Marine Park has a **low level of knowledge**.
Medium resolution mapping covers much of the park. No targeted biological surveys have been undertaken in the park.



Source; Geoscience Australia



Source; Geoscience Australia

Seamounts

A cluster of seamounts situated within South Tasman Rise are inhabited by deep-sea coral communities, forming vast habitats that provide refuge and foraging grounds for crustaceans, squid and large fish assemblages[1,2].

Key knowledge gaps

- Fine scale multibeam mapping of identified key priority areas
- Characterise benthic communities and demersal fish communities on priority areas

Key activities

Commercial fishing (historic)

Key pressures

Resource extraction
Climate change

Fish communities

No targeted research sampling of any reef associated fishes within the park, however commercial fishing target Orange Roughy (*Hoplostethus atlanticus*) and bycatch from these fisheries has shown a number of Oreid species occur in high abundance. Antarctic Flying Squid (*Todarodes filippovae*) have also been caught as part of research within the park[1,2].

Coral communities

South Tasman Rise Marine Park seamount coral communities include scleractinians, golden corals, bamboo corals, black corals and soft corals[1].

Further information:

1. Anderson & Clark. 2003. Analysis of bycatch in the fishery for orange roughy, Hoplostethus atlanticus, on the South Tasman Rise
2. Pethybridge et al. 2013. The foraging ecology of an oceanic squid, Todarodes filippovae: The use of signature lipid profiling to monitor ecosystem change

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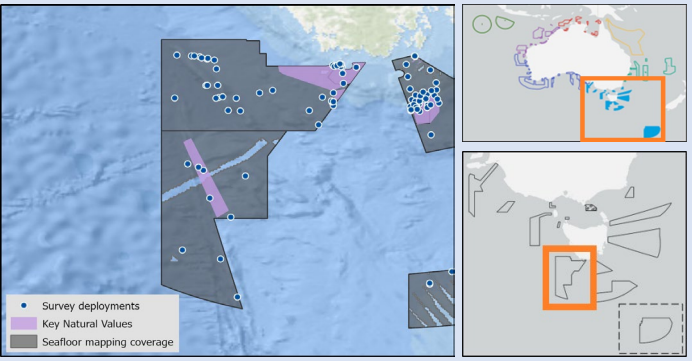
Tasman Fracture Marine Park state of knowledge

Australian Government
Parks Australia

Australian Marine Parks



Interactive Map and Report.

Tasman Fracture Marine Park contains deep reefs, seamounts and a fracture zone unique to the network. Small high-profile deep (rariphotic) reefs occur in the north-western and eastern sections along with an isolated high-profile reef in the north-eastern sector, south-east of the Mewstone[2]. The park covers representative areas of four bioregions.

Depth - 60m – 5559m

99.7% of seafloor mapped, almost all at medium resolution to support biodiversity surveys.

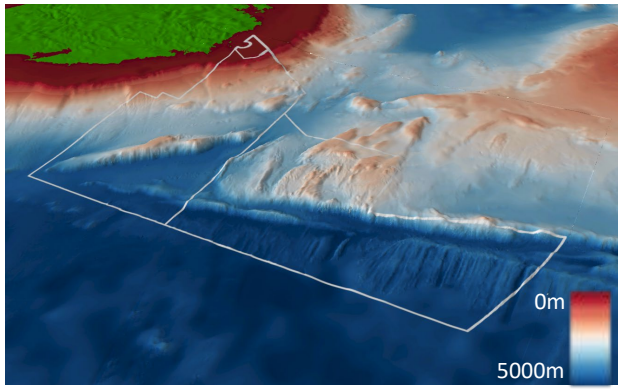
KNV

KNV= Key Natural Values
Habitat or species that are particularly important to management

Overall knowledge status

Tasman Fracture Marine Park has a **medium level of knowledge**. Fine-scale mapping of some identified priority natural values includes deep rocky reefs and seamounts. The abundance of deep (rariphotic) reef and boulder habitat support a highly diverse benthic community[1].

Source; NESP/IMAS



Source; Geoscience Australia

Feature of interest

High resolution mapping of the reef systems has highlighted the distinct geomorphology, benthic communities and diverse fish assemblages associated with the large reef features found within the park. Reef systems support widely distributed southern Rock Lobster (*Jasus edwardsii*) along with isolated sightings of the endangered Pink Handfish (*Brachiopsilus dianthus*) and the vulnerable Ziebell's Handfish (*Brachiopsilus ziebelli*)[1].

KNV

Monitoring priority

Is the condition of deep (rariphotic) shelf reef mobile invertebrate communities improving or maintained via ecological sustainable use and removal of historic pressures?

Key knowledge gaps

- Fine scale mapping of likely shelf break reef
- Distribution of deep-sea coral communities on seamounts and continental slope
- Use of the park by priority species including orange roughy, handfish and shy albatross

Key activities

Commercial fishing

Key pressures

Resource extraction
Climate change

Pink Handfish (credit: Karen Gowlett-Holmes)

The fracture

KNV

The fracture is a uniquely deep (2000-4000m) geomorphic feature for the region. It provides habitat for a range of fauna not found elsewhere in the network, including habitat forming species such as anemones and barnacles.

Main Matt seamount

KNV

The large aggregation of Orange Roughy (*Hoplostethus atlanticus*), oreo dories and a diverse range of deep-sea sharks at Main Matt seamount is unique to the network.

Source; Wild Ocean Tasmania

Shy Albatross

KNV

Shy Albatross (*Thalassarche cauta)* is Australia's only endemic albatross and one whose breeding range is limited to three rocky islands adjacent to the Huon and Tasman Fracture marine parks.

Further information:
1. Perkins et al. 2023. Changes in rock lobster, demersal fish, and sessile benthic organisms in the Tasman Fracture Marine Park: comparisons between 2015 and 2021.(Final paper yet to be released).
2. Monk et al. 2017. Biological and habitat feature descriptions for the continental shelves of Australia's temperate-water marine parks- including collation of existing mapping in all AMPs.
3. Mason et al. 2018. https://onlinelibrary.wiley.com/doi/epdf/10.1111/ddi.12830
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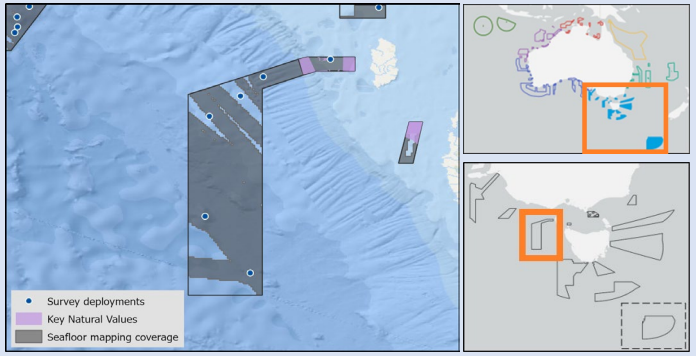
Zeehan Marine Park state of knowledge



Interactive Map and Report.

Zeehan Marine Park displays low-profile platform reef across much of the shelf area. The eastern edge of the park is smooth and undulating before changing in the mid shelf to a more corrugated pavement characterised by 3-5m high ledges with flat faces. The park covers representative areas of four bioregions.

Depth - 91m – 5174m

75.5% of seafloor mapped, most at medium resolution to support biodiversity surveys.

KNV

KNV= Key Natural Values
Habitat or species that are particularly important to management

Further information:
1. Monk, et al. (2017). Biological and habitat feature descriptions for the continental shelves of Australia's temperate-water marine parks- including collation of existing mapping in all AMPs.
2. Williams, et al. (2007) Using data from the proposed Zeehan MPA to provide an inventory of benthic habitats and biodiversity, and evaluate prospective indicators for monitoring and performance assessment:
3. Mason, et al. 2018. Telemetry reveals existing marine protected areas are worse than random for protecting the foraging habitat of threatened shy albatross (Thalassarche cauta).
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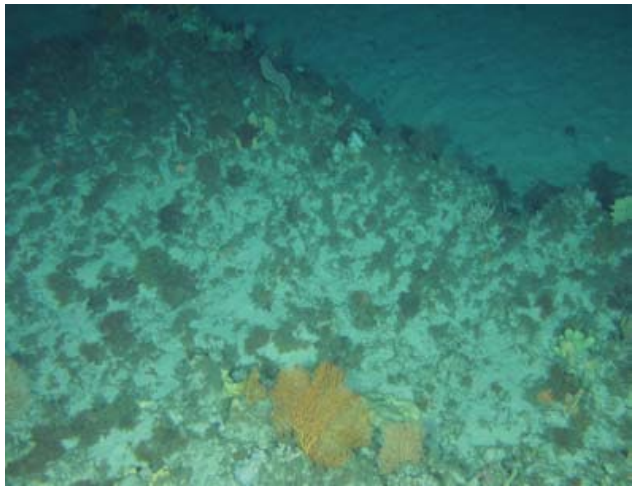
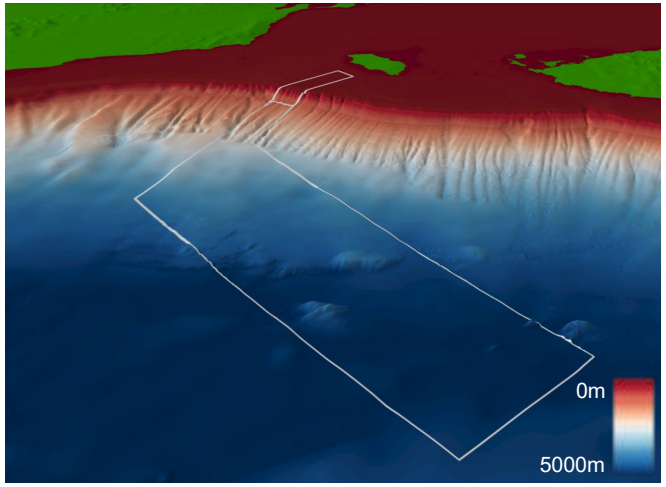
Overall knowledge status

Zeehan Marine Park has a **medium level of knowledge**. The shelf reefs areas have been the focus of research efforts owing to their unique structure and potential as valuable high biodiversity habitats[1].



Source: A. Williams et la. 2007



Source; Geoscience Australia

Deep reef habitats

Rocky limestone reefs of varying size which support large sponges, sea whips and large soft and hard bryozoans[2].

Key knowledge gaps

- Fine scale mapping of inner shelf areas
- benthic communities and demersal fish communities on deep (mesophotic and rariphotic) shelf reefs
- soft sediment communities and potential contamination levels

Five relatively small canyons occur within the park featuring rocky outcrops that support a diverse community of associated fauna.

KNV

Key activities

Commercial fishing

Key pressures

Resource extraction
Climate change
Underwater noise

Shy Albatross. Credit: Wild Ocean Tasmania

Feature of interest

KNV

Shy Albatross (*Thalassarche cauta*) is Australia's only endemic albatross, with Zeehan a core foraging area for early incubating albatross from Albatross Island[3].

Source: A. Williams et la. 2007.

Benthic fauna

Coarse sediments provide valuable foraging grounds for crustaceans[2].