

## 3.8 Jawbone Marine Sanctuary

The Jawbone area consists of sandy beach flanked by basalt rock outcrops that are the seaward end of flows of basalt lavae that characterise Melbourne's western plains. The Marine Sanctuary includes one of the few mangrove stands within Port Phillip Bay as well as saltmarsh, seagrass beds, reefs and sandy beaches. The basalt platform is a roosting site for migratory waders.

### 3.8.1 PHYSICAL PARAMETERS

**Table 3.8.1.** Physical parameters of the Jawbone Marine Sanctuary.

Park Name	Jawbone
Conservation status	Marine Sanctuary
Biophysical Region	Victorian embayments
Size of park (ha)	30
Length of coastline (m)	1908
Exposure rating	Low
Wave Energy	Low
Influential currents	None
Tidal variation - springs (m)	0.8
Tidal variation - neaps (m)	0.2
Water temp - summer (°C)	20.4
Water temp - winter (°C)	11.6
Intertidal (ha)	10
Discharges	Rifle Range outfall east drain
Adjacent catchment	Urban

### 3.8.2 MARINE HABITAT CLASSES

The major Marine Habitat Classes in the Jawbone Marine Sanctuary are saltmarsh, mangrove, seagrass and intertidal and subtidal reef and soft sediment (Figure A2.8a).

**Table 3.8.2.** Marine Habitat Classes for the Jawbone Marine Sanctuary.

Marine Habitat Class	Attributes
Shoreline category	Beach
	Platform
	Beach / Platform
Substratum relief	Low profile reef
Substratum texture	Solid reef
Lithology	Basalt

	Granite
	Calcarenite
Subtidal reef biota	Kelp - Phyllospora dominated
	Kelp - Ecklonia dominated
	Kelp - mixed Phyllospora / Ecklonia
Subtidal reef understorey biota	Mixed algae - brown dominated
	Cystophora
	Sessile invertebrates
	Red algae dominated
Subtidal soft sediment biota	Zostera
	Heterozostera
	Mixed seagrass/algae
	Caulerpa
Intertidal soft sediment biota	Mangrove
	Saltmarsh
	Seagrass
Low Profile Reef Area	10.7
Macroalgae on Reef Area (ha)	5.1
Total Reef Area (ha)	15.8
Zostera/Heterozostera Dominant Seagrass (ha)	1.8
Sediment Area (ha)	6.9
Salt Marsh Area (ha)	0.9
Undefined Area (ha)	4.5

### 3.8.3 MARINE ECOLOGICAL COMMUNITIES

For a general outline of some of the animals and plants that may be found in this Marine Sanctuary, refer to Table 3.8.5.

#### Saltmarsh

##### *Flora*

The higher saltmarsh zone is characterised by the glasswort (*Halosarcia pergranulata*). This species is confined to the western shores of Port Phillip Bay, the Bellarine Peninsula and the Barwon River estuary (Urban Land Authority 1987). The mid to lower saltmarsh zone is dominated by the beaded glasswort *Sarcocornia quinqueflora* with *Sclerostegia arbuscula* and *Suaeda australis* also occurring (Urban Land Authority 1987).

***Invertebrate fauna***

No information on the invertebrate fauna of the saltmarsh has been uncovered during the literature search.

***Fish***

No information on the fish fauna of the saltmarsh area of the Jawbone Marine Sanctuary has been uncovered by the literature search.

**Mangrove*****Flora***

The *Avicennia marina* mangrove community at Jawbone Marine Sanctuary is very unusual because it occurs amongst massive basalt boulders rather than on intertidal mudflats which is unique for Victoria and combined with the associated saltmarsh vegetation is considered significant at the state level (O'Byrne 1989; Urban Land Authority 1987).

***Invertebrate fauna***

The literature search uncovered no information on the invertebrate fauna of the mangrove areas.

***Fish***

The literature search uncovered no information on the fish fauna of the mangrove areas.

**Intertidal reef*****Flora***

Macroalgae are generally absent from the intertidal zone although articulated coralline algae are dominant in the very low intertidal zone (Sharpe and Keough 1998).

***Invertebrate fauna***

A survey undertaken by the Marine Research Group in 1987 recorded large numbers of mussels (*Mytilus edulis*), the turbo (*Turbo undulatus*) and the limpet (*Cellana tramoserica*). A total of 65 species were recorded on a single visit (Urban Land Authority 1987). Other studies have found the herbivorous gastropods to be the most conspicuous animals, in particular *Cellana tramoserica*, *Austrocochlea constricta*, *Bembicium nanum*, *Nerita atramentosa*, with scattered *Siphonaria diemenensis*, the scavenger *Cominella eburnea* and the predatory snail *Lepsiella vinosa* (Sharpe and Keough 1998). The tube building polychaete *Galeolaria caespitosa* and *Turbo undulatus* were also found to be common lower

on the shore, with the only other common species being the small omnivorous seastar *Pateriella exigua* (Sharpe and Keough 1998).

A survey of marine molluscs (excluding chitons and cephalopods) washed up on the shoreline of the nearby Altona Coastal Park found common shells in addition to those mentioned including the gastropods *B. melanostomum*, *Austrocochlea odontis*, *Phasianella australis*, *Polinices conicus*, *P. sordidus*, *P. aulacoglossa*, the limpet *Patelloida alticostata* and bivalves *Soletellina biradiata*, *S. donacioides* (Schulz 1991).

### **Fish**

No details about the fish fauna of the intertidal reef was uncovered by the literature search.

### **Subtidal reef**

#### **Flora**

Surveys of the adjacent Gloucester Reef recorded the following species: the green algae *Ulva australis*, *Caulerpa* spp. the brown algae *Sargassum* and the red algal species *Corallina officinalis*, *Gracilaria* spp. and *Polysiphonia* sp. in the very shallow sublittoral zone. The lower sublittoral zone was characterised by a very high cover of *Ecklonia radiata* and *Sargassum bracteolosum* (O'Brien 1975). A later survey of the same reef (Gloucester Reef) described three main algal communities (O'Brien 1981). The first of these was characterised by dominance of *Caulerpa* spp., *Corallina officinalis* and *Acrosorium uncinatum* and was restricted to the shallower areas of the basalt reef. The second community was dominated by *Ecklonia radiata* and *Sargassum bracteolosum* and the understory red algae *Gelidium pusillum*, *Phycodrys australasica* and encrusting corallines. The third community described by O'Brien (1981) occurred in the sandy depressions that occur randomly in the basalt reef and only *Caulerpa remotifolia* was dominant throughout the year on this habitat type. Other species did occur though and they included *Acrosorium uncinatum*, *Broopsis plumosa*, *Caulerpa brownii*, *C. longifolia*, *Enteromorpha compressa*, *Sargassum bracteolosum* and *Ulva lactuca* (O'Brien 1981).

#### **Invertebrate fauna**

No quantitative information on the invertebrate fauna of the subtidal reef at The Jawbone Marine Sanctuary was uncovered by the literature search. However, the following species have been reported as being common in the Marine Sanctuary; the black lipped abalone *Haliotis rubra*, the urchin *Heliocidaris erythrogramma*, the warrener *Turbo undulatus* and the seastar *Uniophora granifera* (P. Marshall pers. comm.). Less common is the elephant snail *Scutus antipodes* (P. Marshall pers. comm.).

### ***Fish***

Surveys of a nearby reef at Altona (Jenkins *et al.* 1996) recorded large numbers of hardy heads (Atherinidae), abundant weed fish (Clinidae, *Heteroclinus adelaide*, *Heteroclinus perpicillatus*) and gobies (Gobiidae). These species are all common to reefs in northern Port Phillip Bay and are likely to be important components of the subtidal reef at the Jawbone Marine Sanctuary as well. Casual observations report that the zebra fish *Girella zebra* is frequently observed within the Marine Sanctuary as are juvenile scaly fins (*Parma* spp.) (P. Marshall pers. comm.).

### **Seagrass**

#### ***Flora***

There are some areas of *Heterozostera tasmanica* seagrass beds in the Jawbone Marine Sanctuary (Park Notes).

#### ***Invertebrate fauna***

No information was uncovered regarding the invertebrate fauna of the seagrass beds at the Jawbone Marine Sanctuary

#### ***Fish***

There was no information available describing the fish assemblages associated with the Jawbone Marine Sanctuary seagrass beds.

### **Unvegetated soft sediment**

#### ***Invertebrate fauna***

Infaunal samples were taken as part of an environmental effects statement in the nearby Altona Bay in 1986 (Urban Land Authority 1987). The macroinvertebrate fauna was numerically dominated by the polychaete worm *Ceratonereis pseudoerythraeensis*, the bivalves *Mysella donaciformis* and Galeommatidae and the amphipod *Corophium* spp. (Urban Land Authority 1987).

#### ***Fish***

The Marine and Freshwater Resources Institute has undertaken repeated trawl surveys in Port Phillip Bay on soft sediments, which include a station at 7 m depth off Williamstown. This is the nearest relevant information that was available on the fish fauna of soft sediments

for the Jawbone Marine Sanctuary. This site was characterised by abundant stingarees, globefish, yank flathead, long snouted and greenback flounder (Parry *et al.* 1995).

### 3.8.4 BIOLOGICAL PROCESSES

Biological processes occurring within the Marine Sanctuary are unknown.

### 3.8.5 SPECIES DISTRIBUTION INFORMATION

A list of crustacean, fish, algae and seagrass species which have their distributional limits at or near the Jawbone Marine Sanctuary is presented in Table 3.8.3. The distributional limits of the biota listed here may reflect collection effort in this area rather than actual Victorian distributions. Many areas of the Victorian coast have never been sampled and therefore biota ranges may be much greater than those suggested.

**Table 3.8.3.** Biota with distributional limits located at or near the Jawbone Marine Sanctuary. (PW – presumed to be at or near western limit in Sanctuary, PE – presumed to be at or near eastern limit in Sanctuary).

Phylum	Family	Species	Common name	Category
Chordata	Syngnathidae	<i>Leptoichthys fistularius</i>	Brushtail pipefish	PE
Crustacea	Penaeidae	<i>Penaeus plebejus</i>	Prawn	PW
Magnoliophyta	Zannichelliaceae	<i>Lepilaena cylindracarpa</i>	Seagrass	PE
Rhodophyta	Ceramiaceae	<i>Bornetia tenuis</i>	Red algae	PE
Rhodophyta	Ceramiaceae	<i>Rhipidothamnion secundum</i>	Red algae	PW

### 3.8.6 SHOREBIRDS

The Jawbone Marine Sanctuary encompasses the eastern end of an area extending from Altona to Williamstown that is a nationally significant shorebird feeding area. The marine and intertidal areas are diverse, including habitats such as salt marsh, rocky reef, seagrass beds, intertidal flats, sandy beaches and mangroves. The region is primarily a feeding area for birds although some roosting occurs. The threatened species list is shown in Table 3.8.4 and includes the Orange-bellied Parrot. Other threatened species to have been recorded in the Marine Sanctuary include the Little Tern, Fairy Tern and Eastern Curlew (Schulz 1991).

Small numbers of waterbirds roost on the shore platforms of the Marine Sanctuary but it is the shallow offshore waters that provide important feeding areas for species such as cormorants, grebes and terns.

### 3.8.7 MARINE MAMMALS

No recorded sightings of threatened marine mammals were found for the Jawbone Marine Sanctuary.

**Table 3.8.4.** Threatened shorebird records from Jawbone Marine Sanctuary and surrounds (AVW).

Common Name	Scientific Name	FFG	National (EPBC)	State (TWV)	Treaties	Year TWV
Australasian Gannet	<i>Morus serrator</i>			Vul		1991
Caspian Tern	<i>Sterna caspia</i>	L		Vul	CJ	1997
Crested Tern	<i>Sterna bergii</i>			LR		1991
Fairy Prion	<i>Pachyptila turtur</i>		Vul	LR		2000
Glossy Ibis	<i>Plegadis falcinellus</i>			Vul	C	1987
Great Egret	<i>Ardea alba</i>	L		End	CJ	2001
Intermediate Egret	<i>Ardea intermedia</i>	L		CEn		2001
Little Egret	<i>Egretta garzetta</i>	L		CEn		1988
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	L	End	CEn		1988
Pacific Gull	<i>Larus pacificus</i>			LR		1991
Pied Cormorant	<i>Phalacrocorax varius</i>			LR		1991
Whiskered Tern	<i>Chlidonias hybridus</i>			LR		2000

**Table 3.8.5.** Selection of some animals and plants that may be found in the Jawbone Marine Sanctuary.

The table below is not an exhaustive species list, nor does it identify only common organisms, but is provided as an outline of some of the biota that may be seen in this park.

	Common name	Scientific name
<b>Flora</b>	brown algae	<i>Sargassum bracteolosum</i> , <i>Ecklonia radiata</i>
	green algae	<i>Ulva</i> spp., <i>Ulva australis</i> , <i>Ulva lactuca</i> , <i>Caulerpa</i> spp.,
	red algae	<i>Corallina officinalis</i> , <i>Gracilaria</i> spp. and <i>Polysiphonia</i> sp.
	saltmarsh	<i>Halosarcia pergranulata</i> , <i>Sarcocornia quinqueflora</i> Suaeda
	mangrove	<i>Avicennia marina</i>
	seagrass	<i>Heterozostera tasmanica</i>
<b>Invertebrates</b>	polychaete	<i>Ceratonereis pseudoerythraeensis</i> , <i>Galeolaria caespitosa</i>
	bivalves	<i>Mysella donaciformis</i> , <i>Mytilus edulis</i> and <i>Galeommatidae</i>
	amphipod	<i>Corophium</i> spp.
	gastropods	<i>Turbo undulatus</i> , <i>Cellana tramoserica</i> , <i>Austrocochlea</i>
	seastar	<i>Pateriella exigua</i> , <i>Uniophora granifera</i>
	black lipped abalone	<i>Haliotis rubra</i>
	urchin	<i>Heliocidaris erythrogramma</i>
<b>Fish</b>	hardy heads	Atherinidae
	weed fish	<i>Heteroclinus adelaide</i> , <i>Heteroclinus perpucillatus</i>
	gobies	Gobiidae
	zebra fish	<i>Girella zebra</i>
	juvenile scaly fin	<i>Parma</i> spp.

### 3.8.8 SITES OF GEOLOGICAL AND GEOMORPHOLOGICAL SIGNIFICANCE

Sites of geological and/or geomorphological significance within or adjacent to Jawbone Marine Sanctuary are listed below (MPV database and Buckley 1993):

Merrett Rifle Range Shore Platform, (Regional/Local Significance): Four features, intertidal area, shore platform of Quaternary Volcanics, white mangrove, shell deposits. Shore platform and shell deposits with mangrove.

Altona East Sand Bars, (Regional/Local Significance): The site includes the intertidal and submarine topography of part of northern Port Phillip Bay. Major sand bars/spit/ridge system.

### 3.8.9 KNOWLEDGE GAPS

Despite the proximity of the Jawbone Marine Sanctuary to Melbourne there was surprisingly little information uncovered by the literature search. Descriptions of the intertidal reef invertebrates are available as site descriptions for experimental research at this site. Detailed information is available relating to the flora of an adjacent subtidal reef but no surveys, to our knowledge, have been undertaken on the subtidal reef within the Marine Sanctuary. No information was available for intertidal reef fish and all other Marine Ecological Communities in the Jawbone Marine Sanctuary are unstudied.

### 3.8.10 RESEARCH

Author	Project	Notes
(Lindsay )	Reef fish recruitment inside and outside of marine parks	Upcoming Honours project
(Sharpe and Keough 1998)	An investigation of the indirect effects of intertidal shellfish collection	
(Keough <i>et al.</i> 1997)	Geographic variation in interactions between size classes of the limpet <i>Cellana tramoserica</i>	
(Marshall and Keough 1994)	Asymmetry in intraspecific competition in the limpet <i>Cellana tramoserica</i> (Sowerby).	
(Keough <i>et al.</i> 1993)	Correlations between human collecting and intertidal mollusc populations on rocky shores	
(O'Brien 1981)	The subtidal algal ecology of the Gloucester reserve reef, northern Port Phillip Bay	
(O'Brien 1975)	Standing crop, community composition and seasonal variations in two contrasting benthic algal communities of the Hobsons Bay area	

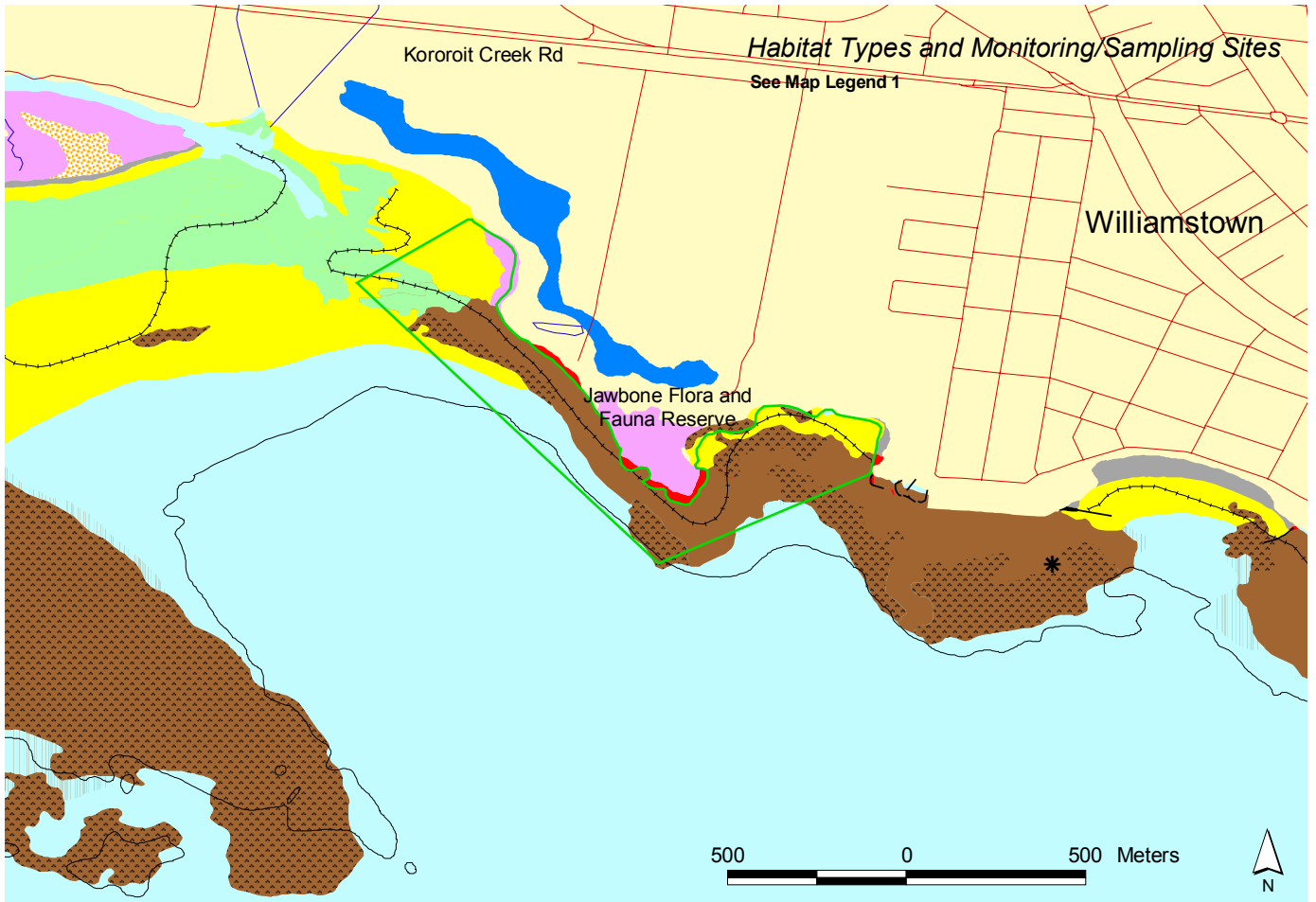


Figure A2.8a: Jawbone MS marine habitats and monitoring/sampling sites.

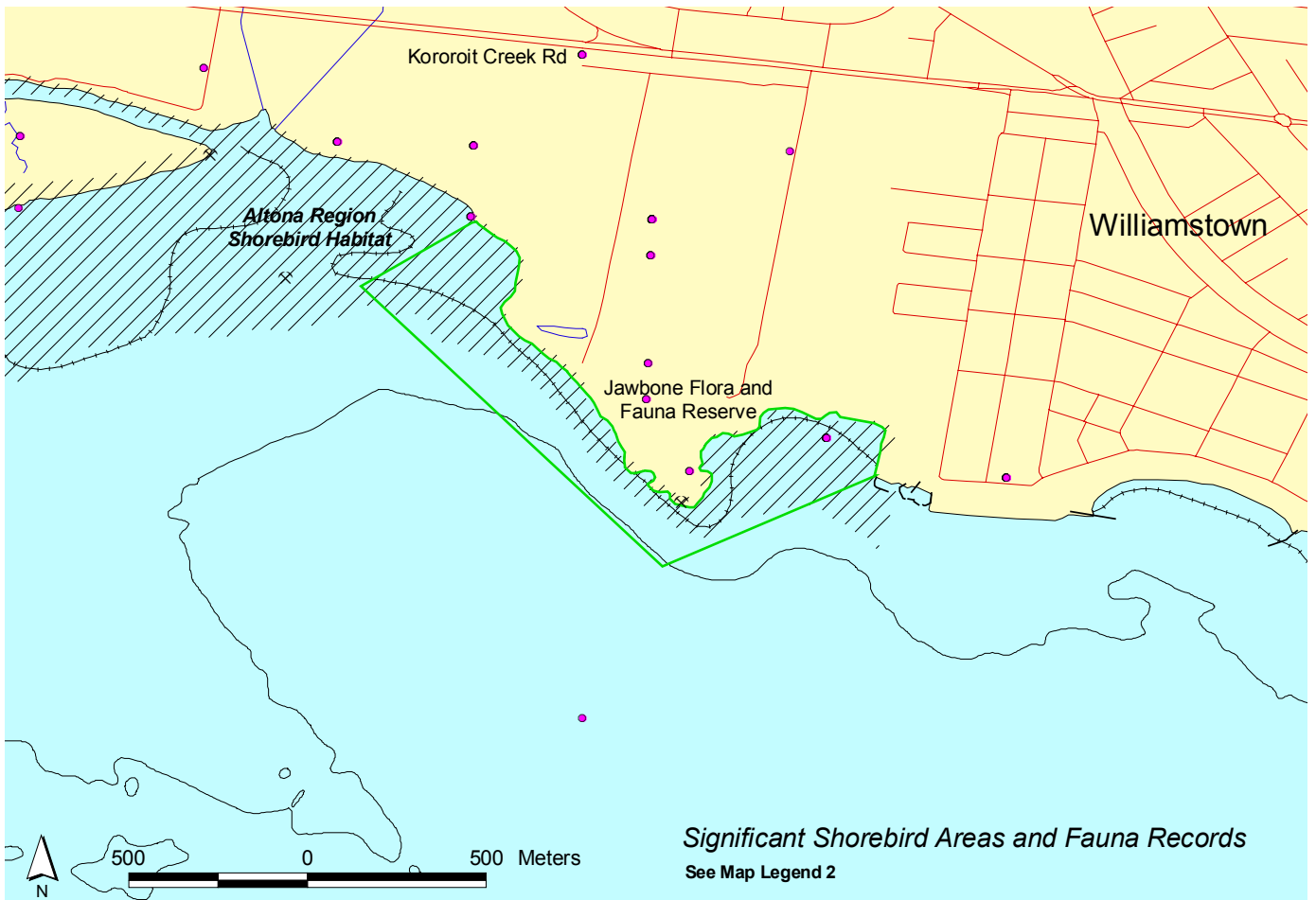








































Figure A2.8b: Jawbone MS shorebird and fauna values (see Table 3.8.4 for threatened species list).









## LEGEND 1: Marine and Coastal Habitats and Monitoring Sites

- ★ DNRE/Parks Victoria Marine Monitoring Sites
- ⊕ AME Sampling Sites (data not available for this study)
- ⊕ DNRE Stage 3 Study Sampling Sites
- ⌞ DNRE Stage 3 Sediment Sampling Sites
- \* MAFRI Abalone Reef Assessment Sites
- ▲ EPA Fixed Site Monitoring Points
- EPA Beach E. Coli Monitoring Sites
-  Piers
-  Roads
- Marine Protected Areas
  -  Marine National Parks
  -  Marine Sanctuaries
  -  Special Management Areas
- Marine Habitats
  -  Amphibolis Dominant Seagrass
  -  Amphibolis Dominant Seagrass & Macroalgae
  -  Halophila Dominant Seagrass & Macroalgae
  -  Rocky Reef
  -  Macroalgae
  -  Macroalgae on Reef
  -  Posidonia Dominant Seagrass
  -  Pyura & Macroalgae
  -  Sediment
  -  Zostera/Heterozostera & Halophila Dominant Seagrass & Macroalgae
  -  Zostera/Heterozostera Dominant Seagrass
  -  Zostera/Heterozostera Dominant Seagrass & Macroalgae
  -  Undefined
- Shore Types
  -  Cobble/Shingle Beach
  -  Intertidal Mud-Sand Flat
  -  Intertidal Shore Platform
  -  Mangroves
  -  Salt Marsh
  -  Sand Beach
  -  Sand Dunes
  -  Steep Shoreline (rocky cliffs/embankments)
  -  Land

See Legend 2 for Depth Contour Values

### LEGEND 2: Shorebirds and Other Fauna Values

-  Shorebird Roosts
  -  Threatened Shorebird Sightings (AVW)
  -  Hooded Plover Nesting Sites
  -  Little Penguin Colonies
  -  Seal Colonies
  -  Threatened Marine Mammal Sightings (AVW)
  -  Sites of Geological Significance
  -  Boat Ramps
  -  Ramsar Sites
  -  Significant Shorebird Habitats
  - Marine Protected Areas
    -  Marine National Parks
    -  Marine Sanctuaries
    -  Special Management Areas
  -  Piers and Jetties
  -  Roads
  - Land
    - 
- #### Depth Contours

  -  Low Water Mark
  -  5 m
  -  10 m
  -  20 m
  -  30 m
  -  50 m
  -  70 m
  -  100 m