

# Marine Natural Values Study Summary

## Jawbone Marine Sanctuary



Australia's southern waters are unique. Ninety per cent of our marine plants and animals are found nowhere else on earth.

The system of Marine National Parks and Sanctuaries has been established to represent the diversity of Victoria's marine environment, its habitats and associated flora and fauna.

Victoria's marine environment has been classified into five bioregions according to a nationally agreed scheme based on physical and biological attributes.

Jawbone Marine Sanctuary is the one of three marine sanctuaries and one marine national park in Port Phillip Bay, which is part of the Victorian Embayments bioregion.

Image left:  
Intertidal basalt reef in Jawbone Marine Sanctuary.  
Photo by Australian Marine Ecology.

Image right:  
The hard coral *Plesiastraea versipora* on subtidal reef.  
Photo by Australian Marine Ecology.

### Description

The sanctuary covers 30.5 hectares in the north-west of the bay, offshore from Williamstown. It extends along 1.9 kilometres of coast from the high water mark to a maximum of 300 metres offshore, from the fishing clubs in Bayview Street west to Wader Beach.

The sanctuary abuts the Jawbone Flora and Fauna reserve.

Access is on designated walking tracks via Jawbone Reserve and Jawbone Flora and Fauna Reserve.

Parks Victoria acknowledges the Aboriginal Traditional Owners of Victoria – including its parks and reserves. Indigenous tradition indicates that the sanctuary is part of Country of Boonwurrung.

### Physical Parameters and Processes

Jawbone Marine Sanctuary shoreline geology is basalt, the seaward end of lava flows that characterize Melbourne's western plains. The sanctuary is shallow and mostly < 4 metres deep. It is not subject to large waves, strong currents or swell but in strong westerly conditions waves can reach heights of 2 metres.

Natural hydrodynamic events such as storm surges displace seaweed and kelp, erode beaches and deposit sand

over the reefs. The sanctuary has an unequal semidiurnal daily tidal pattern. Spring tides are 0.8 metres and neap tides 0.2 metres, with the water in the sanctuary exchanged every 28 – 50 tidal cycles.

Surface water temperatures average 20.4°C in the summer and 11.6°C in the winter.

Kororoit Creek and stormwater drains create episodes of lower salinities in the sanctuary. This freshwater runoff, phytoplankton blooms and disturbance of nearby fine sediments frequently create turbid conditions.

The former Merrett Rifle Range, now a Special Protection Area, with its limited access for over 110 years has protected this shoreline. Merrett Rifle Range shore platform, with its Quaternary volcanics, intertidal reef, shell deposits and mangroves is of regional geological significance.

### Marine Habitat Distribution and Ecological Communities

The main habitats protected by the sanctuary include intertidal and subtidal basalt reef, intertidal and subtidal soft sediment, seagrass and the water column. Its basalt reefs, shallow inshore waters, mudflats and seagrass beds provide foraging and roosting areas for local and migratory seabirds and shorebirds.



The mangrove *Avicennia marina* grows on the soft sediment between the massive intertidal basalt boulders. Associated with the mangroves is an extensive Wet Saltmarsh herbland dominated by the beaded glasswort *Sarcocornia quinqueflora* and backed by coastal hypersaline shrubland.

Macroalgae and sessile invertebrate cover on the intertidal reef is very low and the cover of sea lettuce *Ulva* spp. is ephemeral. Turfing and coralline algae, seagrass *Zostera muelleri* and the calcareous tube-worm *Galeolaria caespitosa* are present low in the intertidal zone.

The mobile invertebrate fauna on the intertidal reef is dominated by molluscs including the top shell *Austrocochlea porcata*, conniwink *Bembicium* spp., black nerite *Nerita atramentosa* and variegated limpet *Cellana tramoserica*. Also found, in low abundance, are whelk *Lepsiella vinosa*, top shell *Austrocochlea odontis*, warrener *Turbo undulatus*, limpets *Notoacmea mayi*, *Patelloida alticostata*, *Siphonaria* spp. and the seastar *Parvulastra exigua*.

The introduced green shore crab *Carcinus maenas* is found on the intertidal reefs.

The biscuit seastar *Tosia australis* is an abundant invertebrate on the subtidal reefs.  
Photo by Australian Marine Ecology.

Much of the subtidal soft sediment is bare of vegetation, but in the north west of the sanctuary there is a large *Zostera/ Heterozostera* seagrass bed.

The subtidal reef is not diverse, with low to moderate abundances of the common kelp *Ecklonia radiata*, large browns *Sargassum* spp, filamentous brown algae *Ectocarpales* and often abundant encrusting coralline algae. The algal communities are indicative of high nutrients and low salinities which suggests a large estuarine influence from Kororoit Creek.

The invasive marine pest Japanese kelp *Undaria pinnatifida* and broccoli weed *Codium fragile* subspecies *fragile* have been observed in the sanctuary since 2009.

Sessile invertebrates include the coral *Plesiastrea versipora* and sponges.

The mobile invertebrate assemblage of the subtidal reef is dominated by the sea urchin *Heliocidaris erythrogramma*, seastars *Meridiastra gunnii*, *M. calcar* and *Coscinasterias muricata* and blacklip abalone *Haliotis rubra* and to a lesser extent the biscuit star *Tosia australis*.

The introduced northern Pacific seastar *Asterias amurensis* and European fanworm *Sabella spallanzanii* have been observed sporadically in low numbers in the sanctuary.

More than seventeen species of fish have been observed on the subtidal reefs with the southern hulafish *Trachinops caudimaculatus* the most abundant. Present in very low abundance are zebrafish *Girella zebra*, dusky morwong *Dactylophora nigricans* and little rock whiting *Neoodax balteatus*.

The water column is home to a variety of planktonic and pelagic organisms. Those that make their permanent home in the water column include sea jellies, salps, fish, and phytoplankton and zooplankton. Some seabirds also use the waters of the sanctuary.

### Species and Communities of Conservation Significance

The sanctuary provides important feeding and roosting habitat for thirty-six threatened bird species such as the critically endangered orange-bellied parrot *Neophema chrysogaster*, grey-tailed tattler *Heteroscelus brevipes* and the intermediate egret *Ardea intermedia*.

It protects feeding areas for twenty-four internationally important migrant bird species, including the black-tailed godwit *Limosa limosa* and great knot *Calidris tenuirostris*. Five species of marine flora and fauna are believed to be at their distributional limits including the brushtail pipefish *Leptoichthys fistularius*.



## Major Threats

Measures to address or minimise threats identified for Jawbone Marine Sanctuary form part of the park management plan. Parks Victoria also uses an adaptive management approach which includes periodic reviews of priority natural values and threats through processes such as the State of the Parks evaluation and setting of desired conservation outcomes. Through these processes Parks Victoria has identified emerging threats and developed appropriate management responses and actions.

Serious threats include trampling, illegal fishing, increased sedimentation, disturbance of birds, nutrients from stormwater, pollutants from Kororoit Creek and invasive marine pests.

Several introduced species have been found in the sanctuary including the Japanese kelp *Undaria pinnatifida*, green algae *Codium fragile* subspecies *fragile*, Northern Pacific Seastar *Asterias amurensis*, green shore crab *Carcinus maenas* and European Fan Worm *Sabella spallanzanii*.

Encrusting ruffled orange sponge and the hard coral *Plesiastrea versipora* on subtidal reef.  
Photo by Australian Marine Ecology.

There have also been reports of the purple urchin *Heliocidaris erythrogramma* increasing in abundance and forming barrens (areas devoid of macroalgae) in the northern part of the bay, including the sanctuary. It is unclear whether the recent increases in abundance are part of a natural cycle or a persistent increase in this native species.

Climate change poses a serious medium to long term threat to natural values. Parks Victoria will use an adaptive management approach to develop responses and actions that focus on priority climate change issues such as extreme weather events and existing risks that are likely to be exacerbated by climate change.

## Research and Monitoring

Parks Victoria has established extensive marine research and monitoring programs that address important management challenges for the marine national parks and sanctuaries. These focus on improving baseline knowledge, as well as applied management questions.

Since the establishment of the parks in 2002 our knowledge and understanding of natural values and

threats for the system have improved significantly through the marine science program. Much of the research has been undertaken as part of the Research Partners Program involving collaboration with various research institutions.

There are five ongoing research projects and one habitat mapping project that are relevant to Jawbone Marine Sanctuary, while nine research projects and one habitat mapping project have already been completed.

The sanctuary has ongoing intertidal and shallow subtidal reef monitoring programs. Community based monitoring of seagrass habitat through Sea Search, and fish through Reef Watch, is also conducted.

While recognising there are still knowledge gaps Parks Victoria will continue to focus on addressing the information needs that will assist management.

**For more information, including marine habitat mapping products, please see the full versions of the Marine Natural Values reports on [www.parks.vic.gov.au](http://www.parks.vic.gov.au).**

