Unique, but poorly understood

Victorian marine biodiversity: Unique, but poorly understood

Victorian marine systems are unique. There are seven different communities and groups of particular interest for their ecological and biodiversity values: subtidal rocky reef communities, intertidal rocky reef communities, seagrass communities, soft sediment communities, deep reef communities and marine mammals. In most cases, these systems are not comprehensively monitored, making it difficult to evaluate their condition.

Victorian subtidal rocky reef communities generally appear to be in good condition, except in the far east of the state where some urchin barrens (areas that have been denuded of seaweed) occur. These may have been caused by over-fishing of top predators that eat sea urchins, as well as southward movement of species of urchin that are native to NSW, possibly as a result of climate change.

The Japanese kelp Undaria pinnatifida is an introduced seaweed that has had an impact on subtidal rocky reef communities in northern Port Phillip Bay.

Intertidal rocky reef communities, particularly in Port Phillip Bay and in sites in close proximity to environmental pressures (such as at the Boags Rocks Eastern treatment plant outfall) may be degraded. However, due to high natural diversity between sites and a lack of baseline data it is not possible to determine the extent of this.

Seagrass communities occur in sheltered shallow bays and are important habitat for a number of marine species. Since the late 1950s, Victorian seagrass meadows have shown great variability in area, particularly those in northern Western Port. The reason for this is unknown, but seagrass meadows in other parts of the world are known to be affected by reduced water quality and dredging.

The ecosystem health of species and communities that occur on soft (e.g. sandy) sediments is also largely unknown, particularly on the open Victorian coast. In Port Phillip Bay however, it is known that communities of this type have been subject to over-fishing and are also extensively invaded by exotic species, such as the European Fan Worm. The changes that have resulted from these pressures are irreversible.

Very little is known about deep reef communities, except that it is likely that they are one of the most genetically diverse ecosystems on the planet.

Victoria’s deep reef communities occur in the canyons at the entrance to Port Phillip Bay, on submarine cliffs near Wilsons Promontory and on rocky outcrops along the coast and in Bass Strait. Knowledge about the ecology of these habitats is limited, so assessments of their habitat condition are not possible.

Many deep reef communities are vulnerable to human activities, particularly trawl fishing, which can disturb these habitats, clearing large areas of the reefs of invertebrates.
Marine biodiversity - vital to Victoria

Victoria’s marine biodiversity is unique and plays an important role in our culture and economy. It is estimated that seafood to the value of $180 million is landed in Victoria every year and that over 8000 people are employed by the industry. Marine biodiversity is also important for cultural reasons, with fishing, diving, whale watching and penguin viewing just some of the recreational activities that depend on healthy marine biodiversity.

What the Commissioner says

“Victoria has taken the admirable step of creating several marine parks and reserves, in recognition of the importance of protecting marine biodiversity. Nevertheless, it continues to be threatened by a number of pressures.

“The intensity of human activity in catchments adjacent to Victoria’s main estuaries is of particular concern. Pollution due to highly modified catchments, and marine pest incursion due to increasing shipping trade are two issues of particular significance which will continue to require close management.

“Because most marine fishery species are ‘fully exploited’, their resilience to other pressures remains low. Climate change represents an additional and possibly eclipsing pressure on many species. It is important that fisheries management plans are designed with reference to the precautionary principle that considers the likely impacts of climate change.

“In addition, it is vital that Victoria and Australia take a role of international leadership in tackling climate change, so that it’s affects on marine biodiversity are minimised.”

What you can do

- Choose local, sustainably harvested fish.
- Prevent pollution from your property entering the sea via local stormwater drains.
- Visit a marine park, find out about the local native species there.

For more information


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**Figure 3. The ways that climate change affects the oceans**

There are 81 marine animals species listed under legislation and threatened species lists. Most of these are well known, 'charismatic' animals, such as birds and mammals. In contrast, invertebrates, which make up a greater proportion of all animals, are under-represented. This is likely due to the historic lack of understanding of the vital role that marine invertebrates and other smaller animals play in maintaining healthy ecologies, and the corresponding historically lower research effort.

**Pressures**

There are a number of direct and indirect pressures acting on Victoria’s marine biodiversity.

Fishing can directly remove large numbers of individuals of targeted species from marine environments. All major Victorian fisheries are close to ‘full exploitation’ or are already ‘fully exploited’. Fishing can also impact large numbers of species not specifically targeted (bycatch). Removing biomass from marine habitats can substantially alter numbers of the remaining species.

Introduced marine pests are a particular risk for Victoria’s large estuaries, Port Phillip Bay and Western Port. This is because these estuaries are at a similar latitude to those in the northern hemisphere from which the marine pests originate. The similar climatic conditions mean that marine pests that arrive in Victoria in ballast water or attached to ships’ hulls find local conditions favourable, establish and flourish, out-competing local species.

The design and management of settlements adjacent to the sea is an important contributing factor to the health of marine biodiversity. Heavy rain and storms that wash nutrients and pollution from settlements into the sea can reduce water quality and affect marine biodiversity.

In addition to these pressures, the changing climate is expected to create additional pressures for Victorian marine biodiversity, via several distinct mechanisms.

Ocean acidification is a global phenomenon associated with increasing atmospheric CO₂ concentrations. Even an apparently slight increase in acidity reduces the availability of carbonate (a compound that is essential for building shells and coral) to marine animals.

A decrease in carbonate could have major implications for the health of plankton and other animals upon which larger species feed, thus significantly impacting on food webs.

Climate change is also expected to alter marine currents. For Victoria, an intensification of the East Australian Current has already been observed, and is thought to be already affecting marine biodiversity in the east of the state.