

Briefing to Environment Victoria on threats to the marine environment with development of Barry Beach, Corner Inlet.

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The Victorian Government may be planning to develop a coal port at Barry Beach in Corner Inlet. Corner Inlet is essentially a shallow submerged plain. In Australia's set of bioregions it is grouped with Western Port Bay and Port Phillip Bay as Victorian Embayments. Extensive mud and sandflats are broken by a dendritic system of deep channels converging east ward to the entrance. Many of these channels originate from the tidal mudflats near the coast but the Franklin River drains into one. There is little evidence of rapid siltation but rivers carried sediment into Corner Inlet during the 1934 and 1952 floods. In the southern part of Corner Inlet there is some evidence of erosion on the sandy shore at Townsend Point.

East of Corner Inlet there is a series of barrier islands fringed on the landward side by estuarine channels with large areas of seagrass. This is Nooramunga. Spring tide range is generally about 1.5 metres along the East Gippsland coast but it increases to nearly 3 metres at Port Albert and the channels between the barrier islands are maintained by tidal scour.

The extensive mudflats are feeding areas for many wading birds including migrants from Asia. These mudflats may have seagrass on them or be bare. The bare mudflats contain underground invertebrates feeding on the microalgae that live on the surface. Filter feeders live by ingesting seawater containing phytoplankton, zooplankton or other organic particles.

Seagrasses grow in large areas in Corner Inlet and Nooramunga. These beds are the nursery areas for commercial and recreationally important fish and prawns. Seagrass beds reduce erosion and act as filters to water flowing over them. They are a nutrient and carbon dioxide sink.

Seagrasses in Corner Inlet and Nooramunga are *Zostera muelleri* and *Halophila australis* in the intertidal and *Heterozostera nigricaulis*, *Halophila australis* and *Posidonia australis* in the subtidal. *Posidonia australis* is often seen exposed at low tide but it will have water that it has trapped surrounding the shoots. Leaves may be bright brown when they are sun burnt as distinct from those with a pale brown to dark brown that are senescent or dead. *P. australis* is nominally a subtidal seagrass and can grow to at least 20 m if the water is clear enough.

The areas of *P. australis* in Corner Inlet and Nooramunga are the only large patches of *P. australis* in Victoria, the nearest being at Beachport in South Australia or the Kent Group of Islands in Bass Strait and Twofold Bay in NSW. *Posidonia* covers unvegetated substratum very slowly, i.e. decades to return to damaged areas. It should also be kept in mind that any

deposition of sediment onto the beds of *Posidonia* now appearing at low tide will put *Posidonia* in a very vulnerable position. The leaves of this seagrass have a life of about 70 days compared to the life of a *Zostera* leaf which lives about 30 days. This is important because epiphytes on seagrass can smother the leaves and kill plants and epiphytes are opportunistic users of nutrients from the water column. The older the leaf the greater the volume of epiphytes it will have on it. Unlike the *Zosteraceae* that grows in these inlets, *Posidonia* recovers from damage or decline very slowly.

Mangroves grow in the northern part of Corner Inlet and prevent erosion, and are efficient nutrient sinks from the runoff of rivers and drains. Mangroves act as habitat for juvenile fish and have a diverse population of invertebrates associated with them.

Threats

Seagrass in Corner Inlet and Nooramunga has declined in area since 1978. What has occurred at an individual species level and whether there has been a return by some is not well reported. It is not clear as to what may have reduced the seagrass extent in Corner Inlet and Nooramunga but there is a number of possible suspects. Excessive growth of epiphytes caused by excess nutrients may have reduced leaf growth or even completely covered leaves so they could not photosynthesise. Epiphytic algae are seasonal and seagrass, in a normal pristine condition, has growths of algae, diatoms and epifauna on its leaves. An infestation of the bivalve mollusc *Electroma georgiana* was found on *Posidonia* last year (2012) that had reduced the leaf length to three or four cm but the *Posidonia* bed is expected to recover.

Sediment and phytoplankton in the water column may have so reduced light in the growing season that plants died when their stored reserves were used up. The extra sediment may have come from boat wakes, erosion and terrestrial runoff. The process of reduced depth due to sediment build up may expose *P. australis* and *Z. muelleri* to such an extent that they die. Scouring and human disturbance, such as propeller scours and mooring anchors, may damage seagrass beds and then storms enlarge the damaged areas. It is unlikely that disease has played a part in loss of seagrass in Corner Inlet and changes in hydrology are unlikely because there is not a lot of development going on within the inlets.

Corner Inlet is quite shallow and considerable dredging would need to occur for a port at Barry Beach for coal ships. Dredging would add turbidity and in extreme conditions cause smothering of seagrass and mangrove pneumatophores and seedlings.

Apart from the threats of development of a port in Corner Inlet there is the risk of oil spills, groundings, erosion from ships' wakes and other accidents if more and larger ships are to enter this inlet.