



## Benthic algae and seagrass of the Walpole and Nornalup Inlets Marine Park

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### Background

The Walpole and Nornalup Inlets Marine Park located on WA's south coast is a discrete estuarine system comprising two connected inlets and the tidal reaches of three rivers. This estuary is relatively unusual in this region because its mouth is permanently open to the sea instead of being periodically closed by a wave-generated sand-bar. This means that marine-like conditions prevail within the inlets for most of the year, except during periods of high rainfall when freshwater flows from the rivers into the inlet basins.

This inlet system has not experienced the significant environmental degradation present in many other estuaries in south-western WA, and its remarkable scenery and surrounding forests has made the inlets a focus for recreational activities for many decades. These very high ecological and social values led to the Walpole and Nornalup inlets being made a marine park in 2009.

Since formation of the marine park, scientists from DEC's Marine Science Program and the WA Herbarium have been working with the local management staff to undertake research that will improve our capacity to manage this remarkable area and preserve its ecological and social values. During 2010, this included making the first dedicated survey of benthic algae and seagrasses in the marine park, which turned up some surprising results.

### Findings

The survey recorded 49 species of benthic algae and seagrasses, including 15 green algae, 11 brown algae, 18 red algae, 4 seagrasses, and one cyanobacterium. Given that only 14 species of marine plants were previously recorded, this represents a substantial increase in our knowledge of the flora of the Walpole and Nornalup Inlets. As might be expected, most of the species recorded were relatively common elements of the south-western Australian marine flora, but a few were of taxonomic or biogeographic and ecological interest. Included in this group was a new, as yet un-named species of the green algal genus *Codium*, which was actually one of the more common algae encountered during the study. This species will be described and named in the scientific literature.

Also found during the survey were the first known reproductive specimens of the red alga *Mazoyerella australis*, a species first described over 150 years ago, but whose taxonomy was never



Coastal scenery near the mouth of the Walpole and Nornalup Inlets Marine Park (Photo: Michael Rule).



A new species of *Codium* discovered during the survey (Photo: John Huisman).

fully understood. By examining the intricate details of these specimen's reproductive structures, DEC scientists will be able to accurately assess the taxonomic relationships of this species and place the species into a phylogenetic framework.

The survey also revealed significant differences in the marine plant diversity of the Walpole and Nornalup inlets, with the number of species decreasing markedly with increasing distance from the ocean, reflecting a reducing marine and increasing estuarine influence.



Clear oceanic water near the mouth of the estuary (Photo: John Huisman).



Relatively turbid water in the Walpole Inlet (Photo: John Huisman).

## Management Implications

This study has markedly increased our knowledge of benthic algae and seagrasses of the Walpole and Nornalup Inlets Marine Park. All records made during the survey are now represented as voucher specimens in DEC's Western Australian Herbarium. This means that the specimens collected during 2010 can be re-examined at any time, and will form an important baseline that can be compared with the outcomes of future monitoring.

Long-term monitoring is a critical aspect of managing WA's marine parks and reserves. Periodic monitoring will enable DEC to understand how marine biodiversity conservation values respond to both natural events and a range of human activities. Baseline surveys like this one are an integral part of that process.

Further information on the results of this survey can be found in Huisman, J.M., Kendrick, A.J. and Rule, M.J. 2011. Benthic algae and seagrasses of the Walpole and Nornalup Inlets Marine Park, Western Australia. *Journal of the Royal Society of Western Australia* 94: 29-44.