

MICRO-TOPOGRAPHY AND INTERTIDAL ROCK PLATFORM HABITATS OF ROTTNEST ISLAND

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Abstract

Intertidal rock platforms have been recognised as an important marine habitat and a common feature of the Rottnest Island coastline. The associated biota has been investigated over many years but is not in a form usable for management and monitoring purposes. This study surveyed the micro-topography of two intertidal platforms at Parker Point and Radar Reef, digitized the resultant contour maps and created digital elevation models (DEM) for use in a geographical information systems (GIS). Each digital elevation model was interrogated to examine the environmental variables affecting zonation of intertidal biota on rocky shores. These environmental variables included slope, area of elevations, exposure to wave action and exposure to air at different platform elevations as an indicator for the desiccation tolerance of biota. Baseline monitoring transects were established and used to survey the percentage cover of algae and number of invertebrates. The cover and abundance data was related to topography and selected environmental variables using the DEMs, to statistically determine trends in the algal community composition. Using environmental variables, the DEM was reclassified to display species distributions on the intertidal platform in a habitat overlay. This study also involved integrating 12 years of long-term invertebrate population data recorded by the Zoology Department at the University of Western Australia into the GIS. Each long term monitoring transect employed in the UWA survey was examined in terms of its environmental attributes to determine the 'transect area' related to the surveyed population density. Population densities of eight invertebrate species were incorporated into a transect database to represent each species as they would have been found on the intertidal platform for each year surveyed. This has allowed a greater understanding of why population densities vary and provided a clear visual interpretation of trends across the platforms. This research has considerably improved the Rottnest Island GIS with detailed micro-topography of two platforms, high resolution DEMs, and an intertidal habitat overlay. It has also provided a template for Rottnest Island managers to incorporate future monitoring data into the GIS and provided a clear visual representation of

historic invertebrate data to enable a better understanding of natural population trends found on these intertidal platforms.