

## Ecology of burrowing crabs in temperate saltmarsh of south-east Australia

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### Introduction

Saltmarshes are considered to be important coastal habitats because of their role in filtering surface water prior to its entering the sea, their contribution to coastal productivity (Morrisey 1995), and because they are a source of organic material and nutrients for a wide range of marine communities (Boorman 1999). One important visual feature of a saltmarsh is the presence of a large number of crab burrows, and this indicates an abundance of crabs within the saltmarsh environment. Crabs inhabiting saltmarshes excavate burrows over extensive areas, profoundly modifying the physical structure of the environment (Jones *et al.* 1994, 1997). The excavation activities of crabs and the resulting burrows may have important ecological significance on ecosystem functioning. Results from a mangrove habitat study found that burial of plant detritus by the excavation activities of sesarmid crabs, or litter directly pulled into their burrows, enhance the heterogeneity and thereby the efficiency of microbial decomposition in subsurface mangrove sediments (Kristensen 2008).

Crabs living in the mangrove habitat are relatively well studied compared to those occupying the saltmarsh, and recognised for their role in contributing to the structure and function of mangrove habitats through burrowing and feeding activities (Warren and Underwood, 1986; Smith 1987). Mangrove crabs are also recognised for their role as food for higher-order predators (Robertson 1988) and their contribution to the foodweb through processing of leaf litter into more palatable forms, thereby contributing to nutrient cycling and energy flow (Lee 1995, 1997; Skov and Hartnoll 2002). By contrast very little is known about the ecology of crab species in temperate Australian saltmarsh, and in particular the degree to which saltmarsh crabs support the adjacent estuarine foodwebs.

### Sampling of crabs in saltmarsh

The most widely employed survey methods used to estimate the diversity and distribution of crabs living in saltmarsh in Australia, include visual census (Nobbs and McGuinness 1999; Golley *et al.* 1962; Nakasone 1982; Warren 1990; Hagen 1993) and burrow counts (MacFarlane 2002; Kerwin 1971; Aspey 1978; Krebs and Valiela 1978; Breitfuss 2003).

Visual census involves an observer counting crabs on the sediment surface. This method is relatively simple and non-destructive, but it has disadvantages because the census is dependent on the emergence of crabs from burrows and their activity on the surface. Factors influencing