

used by Dueser and Shugart (1979), two are noteworthy here. Dueser and Shugart interpreted unequal species abundances (i.e., sample sizes) as conveying meaningful information about habitat exploitation by the subject populations. Carnes and Slade, on the other hand, are interested only in species comparisons that are independent of abundance. This contrast reflects fundamentally different concepts of the niche, being focused on the environment in the first case and on the organism in the second. Also, Dueser and Shugart computed their niche metrics relative to the weighted origin (grand centroid) of the discriminant space. Carnes and Slade (1982) recommend computing an unweighted estimate of the average of all sampling sites, whether or not these sites were represented in any species sample. It is clear that these two procedures will produce different estimates of the niche pattern statistics if the unweighted origin differs significantly from the weighted origin. Only experience will reveal whether the collection and inclusion of "species absence" data will prove worthwhile and cost effective.

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MOBILE PREDATORS AND THE STRUCTURE OF MARINE INTERTIDAL COMMUNITIES¹

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Field experiments and quantitative sampling have been very productive in demonstrating the relative importance of physical factors, competition, and predation in structuring various intertidal communities (Connell 1961, 1972, 1975, Paine 1974, Menge 1976, Menge and Sutherland 1976, Peterson 1979a, b, Wiltse 1980). Even the best methods, however, have their concomitant limitations and affect to some extent the phenomena under study. We address a small, but general, methodological problem that may have large consequences for interpretations of how predators alter intertidal communities. Specifically, the effects on community structure of such highly mobile intermittent predators as crabs, fishes, and birds are hard to

demonstrate and easy to overlook or misinterpret, but assuming them to be unimportant may perpetuate oversimplified models of community interactions. We illustrate, using evidence of our own and from the literature, how this problem may apply in a particular well-studied situation, and question the assumption that *Thais lapillus* is the only significant predator of mid-intertidal rocky shores in New England (Menge 1976, 1978b). We also indicate approaches for resolving the problem and implications of such work.

The General Problem

Faunal elements. The advantages of intertidal habitats for quantitative and experimental studies, viz., their direct accessibility at low tide and the predominance of sedentary species, are both offset by (1) their comparative inaccessibility at other times, and (2) the many mobile consumer species that interact with and prey upon their resident biotas on tidally, diurnally, and annually rhythmic schedules. At high tide, for example, various fishes, especially by day, and crustaceans, often by night (Ropes 1969), prey upon the intertidal biota; and fishes (Stephenson and Searles 1960), crabs (Virnstein 1977, Peterson 1979a), and shrimp (Bell and Coull 1978) have been shown in experiments to alter significantly the composition of