

BROWN MARSH EFFECTS ON HABITAT FUNCTIONS AND FISHERY SPECIES

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Coastal Louisiana supports one of the most productive fisheries in the United States, and most fishery species use estuarine nursery areas during their early lives. The young of these species, including brown shrimp, white shrimp, blue crab, spotted seatrout, southern flounder, and red drum, depend on the flooded marsh surface, and more specifically, the marsh edge for food and protection from predators. Food and refuge functions provided at the marsh edge influence population size by enhancing the growth and survival of these young animals during their estuarine-dependent stages. Population sizes of brown shrimp, white shrimp, and blue crab in a marsh are positively related to the amount of marsh edge per unit area. Thus at the landscape scale, populations of these species in a marsh system are dependent on the pattern of marsh:water interspersion (i.e., how patches of vegetation are distributed within water). The brown marsh phenomenon has the potential to affect fishery resources because it threatens not only the amount of marsh available for exploitation by fishery species but also is likely to alter spatial patterns of marsh and water in the coastal zone. We can examine the effects of this phenomenon by measuring the distribution of nekton densities in healthy and affected areas. Functional attributes of the marsh may be affected by the brown marsh phenomenon in a number of ways. Meiofauna, important prey of young fishery species (especially juvenile shrimp), are closely associated with marsh plants, and their populations may decline as emergent vegetation is lost in die-off areas. We can assess the effect of the die-back on this food resource by monitoring meiofaunal populations and examining the diets of selected fishery species in affected and healthy marshes. The refuge function also will likely diminish in die-back areas as vegetated marsh is converted to bare substrate, and this should be reflected by differences in nekton densities between healthy and affected marshes. How the brown marsh phenomenon affects fishery populations likely will depend on the size of the affected area, how long denuded areas remain unvegetated, and marsh:water interspersion patterns that develop as a result of this phenomenon.