INTRODUCTION

A variety of estuarine-dependent fish species inhabiting Albemarle Sound and its tributaries support important commercial and recreational fisheries in coastal North Carolina. Of those species, the anadromous striped bass (*Morone saxatilis*) has been one of the most important. A major portion of fishery research efforts in Albemarle Sound waters since 1955 has focused on striped bass, which constitutes a multi-million dollar fishery in the region (Rulifson et al. 1982). The major spawning area for Albemarle Sound striped bass is located in the Roanoke River, a swiftly-flowing coastal stream that empties into the extreme western end of the Sound (Figure 1). Spawning occurs upstream between Halifax at River Mile (RM) 120 and Weldon (RM 130), North Carolina, from mid-April through June (Rulifson et al. 1993). The historical spawning grounds further upstream were blocked by construction of the Roanoke Rapids Dam at RM 137 (McCoy 1959). Eggs develop to the hatching stage as they are transported downstream by currents (Hassler reports, Rulifson reports). After hatching, the larvae continue downstream through the Roanoke River delta and into western Albemarle Sound to the historical nursery areas (Rulifson et al. 1988, 1992a, 1992b).

Other finfish species utilizing Albemarle Sound and the Roanoke River represent a diverse collection of life history strategies. Anadromous species besides striped bass include the American shad (*Alosa sapidissima*), blueback herring (*A. aestivalis*), alewife (*A. pseudoharengus*), hickory shad (*A. mediocris*), and Atlantic sturgeon (*Acipenser oxyrhynchus*). The shortnose sturgeon (*A. brevirostrum*) is believed to be present though uncommon (Laney et al. 1989). The semi-anadromous white perch (*Morone americana*) is abundant and a close relative of striped bass. The only catadromous species is the American eel (*Anguilla rostrata*). Several of the anadromous species (e.g., striped bass, white perch, American shad) require freshwater discharge from rivers and streams at a rate adequate to suspend eggs and larvae within the water column, and to transport the young to nursery grounds. Others (e.g., sturgeons and blueback herring) require flowing waters to bathe the adhesive eggs until hatching; larvae are then transported downstream to the nursery grounds. Coastal estuarine species include the Atlantic menhaden (*Brevoortia tyrannus*) and gizzard shad (*Dorosoma cepedianum*), both of which utilize the oligohaline and brackish nursery areas of Albemarle Sound. Several catfish species (*Ictaluridae*) also utilize these habitats. The remaining species are resident freshwater fishes, the young of which are found in shallow vegetated areas of the rivers and streams. Most of these species are in one of the following groups: minnows (Cyprinidae), suckers (Catostomidae), catfishes (Ictaluridae), sunfishes (Centrarchidae), and darters (Percidae) (Table 1).

From the mid-1970s through the 1980s, the striped bass fishery in Albemarle Sound suffered from declines in harvest. A number of environmental factors and overharvest have been hypothesized as contributing to the decline. Until the late 1980s, a strong year class of Roanoke striped bass had not been observed since 1970, and no significant year classes were produced since 1976 (Hassler et al. 1981; USDOI and USDOC 1985). Only recently have environmental restoration and regulatory efforts been successful in producing relatively strong year classes of striped bass in 1988 and 1989 (Rulifson and Manooch 1990a, 1993; Nelson 1993; Henry and