

Juvenile Winter Flounder Distribution by Habitat Type

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ABSTRACT: Shallow embayments in Connecticut were sampled with a 1-m beam trawl for young-of-year winter flounder from 1990–1993 to determine if there are habitat types within nursery areas which consistently yield higher abundances. Initial examination of catch frequencies and all physical measurements indicated that only sediment type correlated with abundance. There was no consistent pattern in winter flounder catch in relation to salinity, water temperature, water column turbidity, depth interval, channel/non-channel, or the presence of sea lettuce (*Ulva lactuca*). Catch data were then classified into five habitat types defined by a combination of sediment and overlying litter. Analysis of variance in catch among habitat types showed that mean catch was significantly different among four of the five habitat types. Highest densities within a site most often occurred in mud/shell-litter habitat, followed by mud/wood-litter and mud/no litter habitat; sandy sites with or without litter yielded the lowest densities. Independent sampling of new sites corroborated the distributional pattern seen at the original sites, and importance of mud/shell-litter habitat. The distributional pattern seen here can provide a means of assessing which sites would be expected to support a higher abundance of young-of-year winter flounder, and which sites might provide less, if no other factors intervene.

Introduction

Winter flounder (*Pseudopleuronectes americanus*) is one of many species dependent on inshore embayments for spawning and nursery grounds. Throughout its range this species forms localized spawning groups with a high degree of fidelity to a specific geographic location (Saila 1961a; Howe and Coates 1975). Juveniles remain in or near their natal embayment for up to two years (Saucerman and Deegan 1991). Fidelity to specific spawning areas makes winter flounder particularly vulnerable to localized depletion due to often extensive alteration of inshore embayments by human activities such as dredging and filling. Because winter flounder are also heavily harvested, both commercially and for sport, factors affecting recruitment dynamics are important to the conservation of this species. Although earlier studies have shown that winter flounder seek protected embayments (Percy 1962; Percy and Richards 1962; McCracken 1963) and coastal salt ponds (Saila 1961b; Poole 1966) to spawn, a clearer understanding of which physical

characteristics promote survival of young will aid efforts to preserve and enhance local spawning groups. This study was designed to address that need by determining if there are habitat types within nursery areas which consistently yield higher abundances of winter flounder. Because our ultimate goal is to identify and protect nursery habitat from degradation in a quick, inexpensive, and unambiguous manner, only straightforward physical parameters easily measured in the field were considered.

Methods

STUDY AREA

Initially five sites along the Connecticut coast (Fig. 1) were sampled for juvenile fish as part of a larger Connecticut Department of Environmental Protection (CTDEP) inshore finfish survey. Fish were sampled seasonally in June (spring), late July–August (summer) and October (fall) in 1990–1993 in the Thames River, Connecticut River, Clinton Harbor, New Haven Harbor, and Housatonic River (1990–1992 only). Sites were sampled over a 2-wk period each season, rotating among sites which

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