

ABSTRACT

AGE, SIZE, HATCH-DATE, AND GROWTH RATE DISTRIBUTION OF YOUNG-OF-YEAR AMERICAN SHAD IN THE CONNECTICUT RIVER

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Age- and size-based habitat use and movement patterns of young-of-year American shad in rivers are not well understood. Adult females reach their natal rivers at different times and ascend the river at different rates, which may lead to variation of hatch dates at a single location. Also, shad are serial spawners so eggs may be released in varied habitats at varied distances from the river mouth. If survival is a function of growth rate and location, understanding how hatch date, spawning location, movement and growth interact may lead to a clearer understanding of the mechanisms that regulate survival. In the present study, three sites were seined biweekly to collect resident shad during river residence time, spring to fall. During outmigration, samples were also collected at two hydroelectric facilities, weekly. From the fish collected, otoliths were removed from about 20% to obtain age and growth rate information. Distributions of length, weight, relative condition, age, hatch date, and growth rates were examined. A conceptual model was developed to examine the possibility of a single source of juvenile shad or multiple sources of shad moving about the Connecticut River. There were increases in length and age over time until late in the season when the increases became mostly insignificant. According to the conceptual model this meant that there were multiple sources of fish contributing to the juvenile population in the Connecticut River. These sources move through the study area based on their age and ultimately their hatch dates. Cohorts collected early in the year as premigrants were never sampled as migrants later in the year at the hydroelectric projects. Cohorts collected late in the year as migrants were never collected earlier in the year as premigrants. Only a narrow "window" of fish were collected as both premigrants and migrants. Growth rates of individuals varied over time, starting low at the time of hatch, peaking at about 50-days old, and then decreasing until outmigration. Fish that were hatched later in the season had higher growth rates than fish that were hatched earlier in the season. Despite an increase in weight over time all fish exhibited a decrease in relative condition until outmigration.

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