ABSTRACT

PREDATION BY RESIDENT SALMONIDS ON ATLANTIC SALMON (SALMO SALAR) FRY STOCKED IN SOUTHERN NEW ENGLAND STREAMS

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To elucidate various mechanisms that influence survival of stocked Atlantic salmon (Salmo salar) fry in the Connecticut River it is important to understand the relative impact predators have on fry survival. I studied predator-prey interactions between juvenile Atlantic salmon and trout in three Massachusetts streams and in artificial streams. Brook trout (Salvelinus fontinalis), brown trout (Salmo trutta), rainbow trout (Oncorhynchus mykiss), and salmon parr are known to consume stocked fry, but studies quantifying the rate of predation are unavailable. I sampled stomach contents of PYOY salmon and trout following fry stocking in the spring of 1997 and 1998. Between 4.3 and 48.6 % of the stocked salmon fry were consumed within the first two days after stocking and total mortality due to predation varied from 4.3 to 60.7%. In one stream fry consumption had a significant positive relationship with predator fork length ($F = 5.83$; $p = 0.009$), and the percentage of riffle habitat ($F = 4.29$; $p = 0.004$), whereas total drift ($F = 6.63$; $p = .0112$) was negatively related. In two streams a positive relationship in the average fork length of all predators was identified as a significant predictor of fry consumption. No significant differences were found between the stomach weights of predators (without fry weight) that consumed fry and those that did not. Consequently predators do not appear to be consuming fry as a result of hunger, rather as result of opportunity. Experiments in artificial stream sections tested how habitat complexity and predator species composition affect predation rate. Fry consumption rates were not different between brook trout and brown trout ($p = 0.59$). Predation rate tended to decrease as the percentage of riffle habitat increased but the decrease was not significant ($p = 0.22$). This information should help partition mortality sources of young salmon in the Connecticut River basin and may prove useful in other restoration programs.