

AN ABSTRACT OF A THESIS

CURRENT DISTRIBUTION AND SEASONAL HABITAT USE OF THE THREATENED SPOTFIN CHUB IN THE EMORY RIVER WATERSHED

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The spotfin chub, *Erimonax monachus*, is a small, uncommon minnow, restricted to the Tennessee River drainage. This species is recognized as threatened by the US Fish and Wildlife Service and endangered by the Tennessee Wildlife Resources Agency. Relatively few studies pertaining to the spotfin chub have been conducted on the Emory River Watershed. The overall goals of the project were to: (1) determine current distribution and model presence/absence of spotfin chubs throughout the Emory River Watershed, (2) characterize Emory River Watershed fish communities, and (3) describe spotfin chub seasonal habitat use within the known distribution.

Spotfin chub distribution and fish communities of the Emory River Watershed were sampled by electrofishing predetermined 200-m sites. In addition, snorkeling drifts were performed between sample sites to obtain precise spotfin chub distribution. Logistic regression analysis was used to predict variables significant to spotfin chub presence. Fish communities were characterized by percent composition, species richness, and the Index of Biotic Integrity (IBI). Multiple regression analysis was used to determine degree of association between fish communities and environmental variables. Seasonal spotfin chub habitat preferences were determined by quarterly snorkeling eight 200-m sites, within the historic range, and measuring habitat when fish were located. Descriptive statistics and Chi-Square analysis were used to determine if differences existed in spotfin chub seasonal habitat use.

Current spotfin chub distribution differed from the historical distribution. In Daddys Creek and Clear Creek sub-watersheds, distribution decreased a total of 8.7 km; Obed River distribution remained the same, and upper Emory River distribution increased 5.5 km (3.2 km net loss). Drainage area (km²) significantly predicted and was positively correlated to spotfin chub presence ($P=0.0057$). Emory River Watershed fish communities demonstrated stable conditions despite varying environmental factors. Drainage area was positively correlated ($P < 0.001$) and turbidity was negatively correlated ($P = 0.0173$) to species richness. Drainage area was positively correlated ($P = 0.0013$) and conductivity was negatively correlated ($P < 0.001$) to IBI scores. In spring, summer, and fall, spotfin chubs occupied run habitats, over bedrock or boulder substrates, while in winter they shifted to pool habitats, over sand substrates.