FRESHWATER MUSSELS OF THE POWELL RIVER, VIRGINIA AND TENNESSEE: ABUNDANCE AND DISTRIBUTION IN A BIODIVERSITY HOTSPOT

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ABSTRACT

The Powell River, located in southwestern Virginia and northeastern Tennessee, is a tributary of the Clinch River in the headwaters of the Tennessee River system. Historically, the Powell River had a diverse freshwater mussel fauna of 46 species. Various surveys conducted over the past century have recorded a decline in mussel densities and diversity throughout much of the river, due to historical and on-going anthropogenic impacts. In 2008 and 2009, random timed-search, systematic search, and guadrat sampling of 21 sites were completed to document species richness, relative abundance, density, and size-class structure of resident mussel populations. During the random timed search (10 sites) and systematic search (10 additional sites) portions of the survey (n=1,399 person-h), surveyors collected 15,084 mussels of 29 species. Catch-per-unit-effort ranged from 0.33 to 22.12 mussels/person-h. We observed living individuals (n = 412) of 9 of the 17 federally endangered species previously reported in the river (Dromus dromas, Epioblasma brevidens, E. triguetra, Fusconaia cor, Lemiox rimosus, Plethobasus cyphyus, Quadrula cylindrica strigillata, Q. intermedia, and Q. sparsa) and two candidate species for federal protection (Pleuronaia dolabelloides and Ptychobranchus subtentum). We recorded 19 species from 18 sites, including 5 endangered species during quadrat sampling efforts. Mean densities ranged from 0.00 to 2.25 mussels/m² among sites sampled. Relatively recent recruitment was also evident for 16 of 29 species; including 4 endangered species (D. dromas, E. brevidens, Q. intermedia, and Q. sparsa). The mussel fauna of the lower Powell River continues to represent one of the most diverse in the United States. Outside of the Powell River, only 2 or 3 populations remain for most of the listed species extant in the river. Given these qualities, the Powell River deserves recognition as a location for focused conservation efforts to protect its diverse mussel assemblage.

KEY WORDS Freshwater mussels, Powell River, Survey, Endangered Species, Biodiversity