OCCUPANCY AND ALLOCHTHONY THRESHOLD RESPONSES OF PLETHODONTID STREAM SALAMANDERS TO STREAM CONDUCTIVITY

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**Abstract**

Mountaintop removal mining with valley fills (MTR/VF) often leads to elevated specific conductance within Central Appalachian streams and rivers. Elevated specific conductance is one mechanism hypothesized to be responsible for the decline in stream salamanders in MTR/VF streams, where previous studies have shown reduced abundances and species richness compared to reference streams. Aquatic macro-invertebrates, an important subsidy to stream salamander diet, are also known to decline in streams affected by MTR/VF, potentially limiting the ability of certain salamanders and life stages to persist. In this study, we conducted repeat count surveys of salamanders, examined diets, and collected detail information to water chemistry at 30 sites to answer the following questions: 1) Does stream salamander abundance exhibit threshold values across a specific conductance gradient? 2) What are the effects of specific conductance on salamander diet? We estimated a 56% drop in larval abundance after a specific conductance of 253 μS and a 58% drop in adult abundance after 384 μS. In larval salamanders, the ratio of aquatic to terrestrial prey decreased from 4:1 to 1:1 after 148 μS, the total volume of prey items per stomach decreased by 77% after 113 μS, and the importance values of aquatic prey decreased by 50% after 120 μS. Our results suggest that the reduction in aquatic prey availability is a major driver influencing larval stream salamander occupancy and overall population persistence. Mitigation practices and policies that increase riparian vegetation and canopy cover could provide additional prey subsidies that could restore salamander populations in streams affected by MTR/VF.