

## **HOW A STATEWIDE STREAM SURVEY CAN AID IN UNDERSTANDING FRESHWATER MUSSEL (BIVALVIA: UNIONIDAE) ECOLOGY: EXAMPLES OF UTILITY AND LIMITATIONS FROM MARYLAND**

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### **ABSTRACT**

Gaps in our knowledge of freshwater mussel life history, distribution, and ecology remain even though their study has increased considerably over the past few decades. These studies have traditionally taken place within a population, river, or larger drainage unit, but rarely across a broad landscape, such as a state. Given the imperiled status of a majority of unionid species alternative opportunities to collect valuable data cannot be overlooked. We present results from a statewide biological monitoring program (Maryland Biological Stream Survey) that has incorporated a visual survey for mussels, several example analyses using mussel-bioassessment data, and discuss the utility and limitations of incorporating freshwater mussels into stream assessments. Since 2007, we encountered 11 of the 16 mussel species extant in Maryland during assessments of wadeable streams by using an informal visual survey and recording incidental observations. On several occasions, we have discovered new populations of imperiled mussels or extended a species distribution. The biological and physiochemical data collected at sites coincident with freshwater mussels have allowed us to hypothesize factors potentially limiting species distribution, such as fish-host dynamics, habitat quality, nutrient concentration, and catchment land use. We feel that the addition of a survey effort into a biological monitoring program, invaluable data can be collected that can assist resource managers, malacologists, and researchers answer a variety of questions. Further investigation into the cost-benefits of an appropriate level of sampling effort is needed as this could vary markedly among molluscan faunal regions and by objectives.

**KEY WORDS** Freshwater mussels, Unionidae, biological monitoring, Maryland Biological Stream Survey