

## The Importance of Rare Taxa to Multimetric Indices

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### Biographical Sketches of Authors

Kristen Pavlik is an aquatic biologist for Tetra Tech, Inc., in Baltimore, MD. She is currently assisting the US EPA with the implementation of the national Wadeable Streams Assessment project. She is also the technical lead for a countywide biological monitoring program (Howard County), and monthly stormwater sampling (Anne Arundel County), both in Maryland. She has also been involved in field sampling, laboratory sample processing and taxonomy, data management, QA/QC, and report writing.

Erik Leppo is a biologist in Tetra Tech's Baltimore Office. He has 10 years of experience collecting and analyzing biological data for use within the biological indicators framework.

### Abstract

The usefulness of including rare taxa in bioassessment scores has been widely contested. The variable definition of a rare taxon complicates the issue, varying from "very seldomly occurring", to "a species known to exist in a community that is absent from a sample series from that community". These frequency of occurrence definitions are functional, but too broad or conceptual to serve as a definition of taxa encountered in any routine and practical biological sampling activity. Two operational definitions of rare taxa that we have used are: 1) those taxa that occur at only a single site in a geographic area, or 2) those taxa occurring at many sites, but only in relatively low numbers (e.g., less than 5). The importance of rare taxa to biological assessments potentially has serious effects on the level of effort required for both field and laboratory activities.

Prince George's and Howard Counties (Maryland) currently operate independent biological monitoring programs that sample sites on 1<sup>st</sup> – 4<sup>th</sup> order streams on a rotating basin schedule. Prince George's County is located in the Coastal Plain, and therefore uses the Maryland benthic index of biological integrity (B-IBI) calibrated for streams of that physiographic region; Howard County is located in the lower Piedmont physiographic region, and uses the B-IBI calibrated for non-Coastal Plain streams. Defining rare taxa as above, we address the question of effects on multimetric indices by directly comparing those calculated with, to those calculated without rare taxa. Other factors are kept constant, allowing for an effective comparison between the degree of index correspondence using taxa of these different rarity classes.