

"Evaluation of An Alternate Benthic Macroinvertebrate Sampling Method for Low Gradient Streams Sampled in the National Rivers and Streams Assessment"

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Benthic macroinvertebrates are one of the primary biological indicators of condition used in the U.S. Environmental Protection Agency's National Rivers and Streams Assessment. Following EPA's Wadeable Streams Assessment, States recommended that a different yet comparable method be evaluated for low gradient streams. Consequently, the 2008-2009 National Rivers and Streams Assessment included a research element to conduct a side-by-side comparison of the standard reachwide macroinvertebrate sampling method with an alternate method specifically designed for low-gradient wadeable streams and rivers that focused more on stream edge habitat. Five of nine aggregate ecoregions (AOEs) sampled in the conterminous United States contained high proportions of low-gradient streams. However, because there was not a defined stream slope cutoff for "low-gradient", crews collected samples using each method across the range of stream gradients at 525 wadeable sites in these AOEs. We compared methods based on estimated numbers of organisms collected, the benthic macroinvertebrate multimetric index (MMI) developed for the 2006 Wadeable Streams Assessment, and its component metrics, using paired nonparametric tests. We used McNemar's test of symmetry to determine whether one method more often provided at least 300 organisms, the minimum sample size desired for the MMI. Relationships between method differences and stream gradient were evaluated using generalized linear models across all sites and for sites with a gradient $\leq 1\%$. Analyses were conducted overall and for each AOE, and some small differences were detected for certain ecoregions and specific metrics. However, statistical analyses did not reveal any biases or trends with stream gradient that would suggest the overall assessment of low-gradient streams on a regional or national scale would change if the alternate method was used rather than the standard sampling method, regardless of the gradient cut-off used to define low-gradient streams. Based on these results, we conclude that incorporating the alternate method into the National Rivers and Streams Survey is unnecessary, and that the survey should continue to use the standard field method for sampling all wadeable streams. This is an abstract and does not necessarily reflect EPA policy. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

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