

Evaluation of aquatic macroinvertebrate indicator metrics to diagnose causes of biological stream impairment in the Hinkson Creek watershed, Boone County, Missouri

Written for:
Hinkson Creek CAM process, Stakeholder and Action Teams

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May 15, 2018

Problem Statement

Biological stream quality in the Hinkson Creek watershed has been evaluated since the late 1990's. The Missouri Stream Condition Index (MSCI), which integrates four screening-level indicators determined from macroinvertebrate data ("metrics"), has shown a depressed biological condition at sites within the Columbia city limits. However, the causes of this stream impairment and decline in aquatic life are currently unknown, even though there is the potential to determine these causes if additional analysis of existing macroinvertebrate data can be conducted. To guide further management actions in this waterway, a more definitive determination of causes for these declines must be determined.

Proposed Actions

We propose to evaluate additional indicators that may provide more diagnostic capabilities in determining causes and sources of stream impairment in Hinkson Creek, by thorough and complete analyses of existing macroinvertebrate data. The following approaches will be included in this effort:

- 1). Examination of additional indicator metrics determined from macroinvertebrate community data previously taken by MDNR from 1999-2017. Categories of indicator metrics will include functional groups, life history traits, dominance, richness, relative abundance, and tolerance.
- 2). Determination of site differences in indicator metrics that have been developed as indicators of specific stressors in wadeable streams, such as those related to a) sedimentation, and b) hydrologic alterations.
- 3). Site comparisons utilizing taxonomic presence/absence and specific indicator macroinvertebrate taxa.
- 4). Examination of museum collections of macroinvertebrates taken prior to the impairment listing of Hinkson Creek, to document any loss or gain of indicator taxa that may have occurred (pre-1999).

Expected Results

Results of this study are expected to aid in the diagnosis of specific causes for decline in the aquatic life of the Hinkson Creek Watershed. Once probable causes are determined, management actions can be proposed to address the causes or mitigate their effects on aquatic life.

Budget

We propose \$75,000 in support of a masters-level graduate student.