

## **Evaluating Biological and Habitat Index Combinations for Assessment of Idaho Streams**

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States and tribes are encouraged to use multiple biological indices in assessment of waterbodies. Each index provides information on aspects of the aquatic resource that may be unique in terms of stressor sensitivity, stressor type, or ecological scale. However, assessment results relative to impairment thresholds can disagree among indices for an individual waterbody, leading to uncertain overall waterbody assessments. Therefore, we explored options for combining stream indices for macroinvertebrates, fish, and habitat in ways that would yield the most consistent and sensitive results relative to established disturbance categories and precise measurements for repeated replicate measures. The methods varied in the scoring or rating scales used to standardize each index value, the thresholds used to define impairment of aquatic life uses, and the ways of synthesizing multiple indices (taking the average or the minimum). The index compositing method with superior accuracy, sensitivity, and precision includes scoring each index on a continuous scale and averaging the scores after standardizing. In addition, using the 25th quantile of reference sites instead of the 10th quantile resulted in a more balanced error rate among reference and degraded site categories.