V. Index of Biotic Integrity *IBI* (Karr 1981, Plafkin et al. 1989)

IBI Metrics Descriptions

An IBI gives a comparative analysis of species to identify levels of biological conditions. Using metrics the IBI categorizes organisms into separate groups that can be used to identify habitat type and quality. Each metric outputs a number which corresponds with habitat conditions. Metric 1, Total number of fish species. Metric 1 will decrease as pollution levels within the habitat increase and shows the total number of native fish species. Metric 2, Number and identity of darter species. Metric 2 species are sensitive to siltation and benthic oxygen levels. Scores for this metric will decrease when amounts of silt increase and oxygen levels decrease. Metric 3, Number and identity of sunfish species. Metric 3 is the pool dwelling species and will have low numbers when pool degradation is occurring. Metric 4, Number and identity of sucker species. Metric 4 will usually be the largest biomass of the stream and is comprised of mainly the suckers. The scores will decrease when physical and habitat degradation occurs. Metric 5, Number and identity of intolerant species. Metric 5 will indicate high and moderate quality sites by using intolerant species availability. Metric 6, Proportion of individuals as green sunfish. Metric 6 determines low from moderate quality streams by counting tolerant species populations. Metric 7, Proportion of individuals as omnivores. Metric 7 decreases as the physical and chemical habitat deteriorate. Metric 8, Proportions of individuals as insectivorous cyprinids. Metric 8 decreases in amount and variety when the habitat's condition becomes poor. Metric 9, Proportion of individuals as top carnivores. Metric 9 will be a reflection of the lower trophic species; if these species are absent then top carnivores will not be present. Metrics 10-13 (Metric 10, Number of individuals in sample. Metric 11, Proportion of individuals as hybrids. Metric 12, Proportion of individuals with disease, tumors, fin damage, and skeletal anomalies. Metric 13, Total fish biomass *optional*) deal with the abundance of fish species in the stream. These metrics decrease with stream pollutions, with the exception of metric12. Metric 12 will increase as a result from a poor environmental health conditions.

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Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment

Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. US Environmental Protection Agency; Office of Water; Washington DC http://www.epa.gov/OWOW/monitoring/techmon.html

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