**High Gradient Benthic Index (HGMI)1**

Study area: northern New Jersey, above the geologic fall-line including the following ecoregions: North Central Appalachians, Central Appalachian Ridges and Valleys, Northeastern Highlands, Northeastern Coastal Zone, and Northern Piedmont.

Index Metrics

1. Number of EPT families = X/12 \*100
2. % non-insect families = (70-X)/63 \*100
3. % EPT (no Hydropsychidae) adj = {35.15 + X – [45.59 – 11.59\*log10(areasqkm)]}/67 \*100
4. Number of scraper families = X/6 \*100
5. Family Biotic Index adj = {7- [4.19 + X – (3.636 + 0.615\*log10(areasqkm))]}/4 \*100

X = observed metric

ADJ (Adjusted metric value) = Mean reference + Metric observed – Metric predicted, where predictions are based on linear regression analysis of reference metric values on catchment size.

Calculate the average of the 5 scores above to obtain an overall assessment score.

Assessment Rating Score

Excellent ≥ 63

Good < 63 - 42

Fair < 42 - 21

Poor < 21

**Attributes**

**Excellent: Minimal changes in structure of biological community and minimal changes in ecosystem function.** Virtually all native taxa are maintained with some changes to biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

**Good: Some evident changes in structure of the biotic community and minimal changes in ecosystem function.** Some changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa but sensitive-ubiquitous taxa are common and abundant; ecosystem functions are fully maintained.

**Fair**: **Moderate to major changes in structure of biological community and moderate changes in ecosystem function.** Sensitive taxa are markedly diminished; conspicuously unbalanced distribution of major groups from that expected; organism condition shows signs of physiological stress; system function shows reduced complexity.

**Poor: Extreme changes in structure of biological community and major loss of ecosystem function.** Extreme changes in structure; wholesale changes in taxonomic composition; extreme alterations from normal densities and distributions; organism condition is often poor; ecosystem functions are severely altered.

1 Based on 100 organism subsample, family level taxonomy