



Aquatic Invertebrate Community Monitoring at Hot Springs National Park

Importance: *The canary in the mine and the bugs in the creek*

Scientists commonly monitor aquatic invertebrates, insect larvae and nymphs and other invertebrates living in stream beds, to assess stream conditions. Many invertebrates reside in the stream bed for a year or more, exposing them to water quality conditions throughout that time. Some species tolerate poor water quality, while other species require pristine conditions. Therefore, the aquatic invertebrate community composition is the “canary in the coal mine” for overall stream integrity.

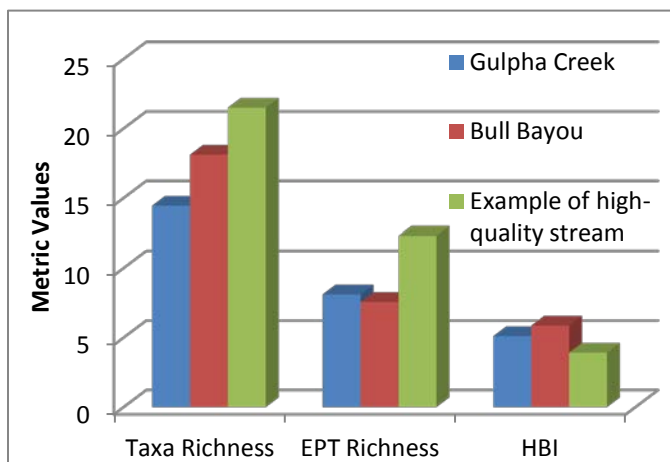


Long Term Monitoring: *Indices of change*¹

The Heartland Inventory and Monitoring Network scientists sampled invertebrate communities in Gulpha Creek and Bull Bayou for the first time in June 2009. The Network collected physical habitat information in conjunction with sampling. These data establish a baseline for assessing changes in invertebrate community composition and habitat quality as indicators of overall stream integrity. The Hilsenhoff Biotic Index (HBI) and Ephemeroptera, Plecoptera, Trichoptera (EPT) richness assess the environment using calculated values associated with a gradient of stream conditions. Various measures and indices provide status and trends in stream integrity when changes are examined over multiple years.

Status and Trends: *Establishing a Baseline*

Headwater sources of both streams are located outside the park boundary, where land use may result in upstream disturbances that impact Bull Bayou and Gulpha Creek within the park. Continued assessment of long term water quality conditions and aquatic invertebrates will provide park managers with information on these potential impacts. Presently, there are insufficient data to fully characterize the integrity of Bull Bayou and Gulpha Creek. Establishing status and trends in stream integrity will require several years of data. Additionally, scientists suggested that:



Summary statistics for invertebrate samples at each stream and a hypothetical, high quality stream. High richness values indicate good stream conditions, but a low HBI indicates good stream conditions.

1. Maintaining wide riparian buffers with native plants along the streams will help protect aquatic life and in-stream habitat from runoff chemicals and sedimentation, while reducing erosion of the stream channel.
2. Storm water management that reduces flow directly to the streams would reduce erosion, chemical pollution and sedimentation, improving stream conditions.

Heartland Inventory and Monitoring Network of the National Park Service. Visit

www.nps.gov/im/units/htln/index.htm
... protecting the habitat of our heritage



¹ Luraas, J. A., and D. E. Bowles. 2012. Aquatic invertebrate Monitoring at Hot Springs National Park, 2009. Natural Resource Data Series NPS/HTLN/NRDS—2012/241. National Park Service, Fort Collins, Colorado.