



**Thompson and Fourmile Creeks
Baseline Macroinvertebrate Community Description and Metals
Analysis for Macroinvertebrates and Sediment**

**Prepared For:
Thompson Divide Coalition**

And

**Roaring Fork Conservancy
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Executive Summary

The objective of this study was to document baseline conditions for macroinvertebrate communities and baseline metal burden in macroinvertebrate tissues and stream sediment. The sampling was conducted at Fourmile Creek, North Thompson Creek, Middle Thompson Creek and South Middle Thompson Creek.

Sampling was conducted on September 29, 2009. At each site, three benthic macroinvertebrate samples were taken in riffle habitat with a modified Hess sampler. Benthic macroinvertebrates were preserved in ethanol and transported to the lab where they were sorted, enumerated, and identified to the lowest practical taxonomic level.

One composite sediment sample and one composite macroinvertebrate tissue sample were collected from each study site for metals analyses. ACZ Laboratories, Inc. (Steamboat Springs, CO) analyzed both sediment and macroinvertebrate tissue for arsenic, copper, lead, selenium, and zinc.

According to diversity, evenness, and HBI scores, all four sites have good water quality. Samples from Middle Thompson, North Thompson, and Fourmile creeks indicate pristine conditions since diversity scores were greater than 3.0. Evenness scores were similar to diversity in that Middle Thompson, North Thompson, and Fourmile creeks had comparable scores while South Middle Thompson had a lower score. High evenness scores and low HBI scores signify a lack of organic pollution.

EPT values ranged from 12 to 21 and taxa richness varied from 25 to 34 (Figure 5, Figure 6); at all four sites approximately fifty percent of the taxa collected were from the orders Ephemeroptera, Plecoptera, and Trichoptera. Since the EPT index is a direct measure of taxa richness among species that are generally considered to be sensitive to disturbances and a large proportion of taxa were EPT taxa, none of the sites show indications of disturbance. South Middle Thompson Creek had the highest EPT values and taxa richness, while Fourmile Creek had the lowest values. The range of values for both EPT and Taxa Richness are typical of lower order streams in Colorado.

Arsenic concentrations in the sediment and macroinvertebrate tissue samples were low and are unlikely to pose a concern to aquatic biota. Copper was present in low concentrations in all sediment samples. Lead concentrations were low in both sediment and macroinvertebrate tissue samples. Selenium concentrations in both sediment and macroinvertebrate tissue samples for all sites were considered to have no hazard. Finally, sediment zinc concentrations were sufficiently low such that no adverse effects to aquatic life seem likely.

Overall, results from the macroinvertebrate samples and metals analyses indicate good water quality conditions on Fourmile, Middle Thompson, North Thompson, and South Middle Thompson creeks.