Although cost-effective cumulative sampling methods such as using bags of sediment have been demonstrated as potentially more informative than grab sampling (Nix et. al, 1994), only limited research exists on methods for cumulative sampling of fecal indicator bacteria, correlations and profiling capabilities between these methods and grab sampling, or comparisons against periodic-sampling methods used to assess legal surface-water contact standards. This study reports the furthest advancement to-date in cost-effective cumulative sampling methodology using bagged particulate-matter, by development and use of a cumulative-sampler device containing diatomaceous earth (Celite 545; DE Sampler). DE Samplers were deployed to collect *E.coli* with practical use as a more limited-contact and cost-effective tool for future success-monitoring of an urban stream planned for restoration. To evaluate the DE Sampler a BACI study model was implemented with reference sites in non-adjacent watersheds for comparison to the study area, along with comparison at all sites to grab-sample methods used to assess contact standards. A novel indication of strong correlation is observed between cumulative sampling with DE Samplers and very frequent grab-sampling with membrane filtration of the water column, and with the low-cost compartment bag test (CBT, Aquagenex) across multiple watersheds and time-intervals. The DE sampler allowed for a cost-effective fecal profiling strategy that yielded a more-informed diagnoses of fecal contaminant presence than standard grab-sampling alone, and when combined with general water quality monitoring suggested a likelihood for the drivers of eutrophication during summer months to also lead to fecal growth and persistence in the primary stream study area.