PRE-HARVEST WATER QUALITY OF EPHEMERAL STREAMS IN MISSOURI OZARK FORESTS

Abraham Smith

Dr. John Bowders, Thesis Supervisor

ABSTRACT

The Missouri Department of Conservation (MDC) developed a best management practice that leaves a riparian buffer next to streams to reduce the possibility of water quality degradation. The purpose of this study is to quantify water quality in upland forested watersheds before harvesting commences in order to provide a baseline for comparison with post-harvest water quality analyses. Water monitoring occurred on 15 sites in and around Current River and Angeline Conservation Areas in Missouri, USA. Water samples were collected from in-stream water samplers located in the ephemeral drainage way and hillslope samplers located on slopes adjoining the ephemeral drainage way. The water samples were tested for total phosphorous, soluble reactive phosphorous, total nitrogen, nitrate, ammonia, calcium, magnesium, potassium, total suspended solids, total volatile suspended solids, pH, and electrical conductivity. The time period of sample collection began in October 2004 and lasted to January 2006. This time period yielded nearly 384 samples. The baseline levels for all constituents have been quantitatively determined by utilizing the "three sigma method" which incorporates data from 99.87% of all values recorded for the species of interest. The following baseline values were established: pH was 8.3, electrical conductivity was 200 us/cm, TSS was 0.5 g/L and TVSS was 0.2 g/L, Ca was 13 mg/L and Mg was 10 mg/L, K was 10 mg/L, TP was 1.3 mg/L and SRP was 1.1 mg/L, total nitrogen was 5.8 mg/L and nitrate and ammonia concentrations were 1.3 and 1.6 mg/L respectively. All parameter concentrations were found to have strong seasonal trends, and varied greatly from site to site.