

ASSESSMENT OF FORESTRY BEST MANAGEMENT PRACTICES, II: PATTERNS IN STREAM BIOLOGICAL ENDPOINTS IN TERMS OF NATURAL VARIABILITY AND FERTILIZATION

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Watersheds dominated by forest cover typically have high quality water. In managed forests, fertilizers may be periodically applied during the growing period. The Florida Forest Service has developed Best Management Practices (BMPs) for managed forests to minimize the potential impacts of forestry operations, including fertilization, to forest streams and maintain water quality. However, a comprehensive study evaluating stream condition (i.e. water quality and biota) prior to, during, and following fertilization in the context of BMPs and natural variability has not been conducted. In 2012 we undertook a 5 year study to characterize stream condition prior to, during, and following fertilizer application in two managed forests in central Florida. In conjunction with extensive hydrological and water quality monitoring, we evaluated physical and biological benchmarks associated with Florida's Department of Environmental Protection (FDEP) numeric nutrient criteria. Three sites on two managed forest streams in north Florida were evaluated for phytoplankton chlorophyll a (chl a), aquatic vegetation and periphyton biomass (Linear Vegetation and Rapid Periphyton Surveys), habitat condition, and benthic invertebrate assemblages (Stream Condition Index, SCI). Macroinvertebrate assemblages on Hester-Dendy multiplate samplers were also collected to evaluate temporal variability. Samples are collected at least twice per year for some endpoints (SCI) and up to 8 times per year for others (artificial substrates). To date and in both streams, phytoplankton chl a, aquatic vegetation, and periphyton biomass values are attaining FDEP's nutrient thresholds. Macroinvertebrate SCI scores classified both stream as "healthy" and/or "exceptional" in the first year of the study. Macroinvertebrate data from artificial substrates showed distinct assemblages for each site even within a stream, with some site-specific seasonal variation. Detailed study findings to date will be discussed in the context of forest BMPs and temporal variability.

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