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A Landscape-Based Ecological Classification System for River Valley Segments in Michigan's Upper Peninsula

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Abstract.–I developed a classification system for streams in Michigan's Upper Peninsula (UP) using a landscape-based approach that was originally developed for Lower Peninsula (LP) Michigan streams. Multiple linear regression, cluster analysis, and graphical techniques were used to examine stream attribute data (stream size, temperature, hydrology, gradient, water chemistry, valley type, fish community, and connectivity to one of the Great Lakes) and watershed attributes (surficial geology, land use, elevation, expected groundwater flow) to develop classification categories. Stream segments were classified based on examination of watershed characteristics and known relationships between these characteristics and stream attributes. I classified a total of 81 UP river systems into 596 discrete segments. Classified stream segments ranged from 0.4 to 187 km long and represented a broad range of stream types. Classifications used for UP rivers were modified from those developed for LP streams for water temperature, stream hydrology, stream gradient, and fish community because of substantial differences between UP and LP rivers. The UP VSEC system should be helpful to resource managers as a communication and learning tool as they manage UP stream resources. Efforts should now be directed to combining the UP and LP classifications into a single statewide stream classification system. This would provide resource managers statewide with a valuable tool for understanding and managing Michigan's stream resources.