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Regional Hydraulic Geometry Curve for the Upper Menominee River

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Abstract.–Regional hydraulic geometry curves provide a better understanding of river morphology and help in the design of stream restoration projects by providing information to estimate bank-full discharge, mean depth, width, and cross-sectional area at ungaged sites within given drainage areas. Although regional curves have been developed for various United States drainage areas, a statewide effort to develop regional curves is only recently underway in Michigan. In July and August 2006, data were collected to develop regional curves for the Upper Menominee River drainage area based on bank-full characteristics of the Sturgeon River, Iron River, Brule River, Pine Creek, and Peshekee River. Data collected on each water body included surveys of longitudinal and cross-sectional profiles and measurement of channel materials. Analysis of the data determined bank-full channel dimensions and allowed for reaches to be classified according to Rosgen valley and stream types. Using the surveyed data, regional curves were developed from regression analyses of the relationship between bank-full channel dimensions and drainage area. Bank-full cross-sectional area and mean depth had the strongest relation to drainage area as evidenced by r^2 values of 0.78 and 0.74, respectively. Although the number of surveyed sites was small, these curves may be used as general guidelines to help ensure proper design and stability of future stream channel modifications and restoration efforts in the Upper Menominee River drainage area.