Observations on the Sediment Dynamics of Selected Tributaries of the Kootenai River, Montana, Spring 2008

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Suspended-sediment and bedload-discharge measurements were made by the U.S. Geological Survey on five tributaries of the Kootenai River in northwest Montana during the spring 2008 runoff season. The measurements were made to provide spawning-habitat data for white sturgeon recovery studies being conducted on the Kootenai River in Idaho. The five tributaries investigated were Ruby Creek, Libby Creek, Parmenter Creek, Yaak River, and Fisher River, which are high-gradient coarse-bed streams with drainage areas ranging from about 12 to 838 square miles. Collectively, these tributaries compose about two-thirds of the Kootenai River drainage basin between Libby Dam in Montana downstream to the Montana-Idaho border. Large variations in sediment transport observed between sites and between flow conditions provide preliminary indications of the sediment dynamics in that portion of the basin. Above-average snowpack in water year 2008 produced peak streamflow of at least a 2-year recurrence-interval at the measurement sites, enabling collection of sediment data over a range of streamflow that included bankfull discharge. Detailed bedload-discharge data indicate substantial lateral variation in particle size and mass transport. Bedload ranged from sand to cobble-size material. Sediment-transport curves relating water discharge to suspended-sediment and bedload discharge indicate substantial variability in transport capacity among the sites investigated. Comparison of channel cross sections where repeated streamflow measurements were made during the 2008 runoff season show that channel-geometry changes ranged from minimal to substantial. Sediment-transport characteristics were compared among the five Montana sites and with other selected coarse bed streams in the Northern Rocky Mountains and western United States to gain some perspective on the sediment-transport characteristics of these streams relative to those for other high-gradient, coarse-bed streams. Sediment transport was normalized for comparison by dividing the suspended and bedload discharge components at bankfull stream discharge by the drainage area of each stream.

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