

Evaluating the Effects of Roads on Watershed Processes and Fisheries in a
North Fork Coeur d'Alene River Tributary Using the GRAIP Model:
Potential Uses and Implications

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The North Fork Coeur d'Alene River and many of its tributaries have been affected by extensive timber harvest, road construction, mining, and other development over the last century and many streams now exceed state water quality standards for sedimentation, metals, and temperature. We used the GRAIP model in a watershed assessment for a third order tributary with EPA-approved sediment TMDLs to quantify sediment produced from roads, evaluate sediment delivery to streams, and identify structures with a high likelihood of failure or that may be barriers to fisheries. Over 60% of the known roads were surveyed, most of which are managed by the US Forest Service. Nearly every road generated some sediment; however, only 8% of it was delivered directly to streams and originated from only 10% of the roads. The condition and delivery potential of nearly 3,000 drainage features were also evaluated and approximately 90% of the sediment was delivered to streams through only 3% of those drainage features. Of the 85 stream crossing culverts, 21 were found to be both too small and showed signs of damage, and 4,500 tons of road fill material was at risk of erosion and failure into streams. Nineteen culverts were also found to block fisheries upstream migration. The benefits of using GRAIP will be discussed, including its potential to prioritize road reconstruction projects, inform travel management analyses, develop and implement TMDLs, and guide fisheries distribution or habitat quality studies. In addition, the results of concurrent water quality and stream channel surveys will be discussed as they pertain to a larger watershed assessment designed to guide natural resource management decisions by US Forest Service and others to restore watershed conditions to full support of cold water aquatic life.