

IMPACT

University of Idaho
Extension

Water Quality Extension Program
208.292.1287, Fax: 208.292.2535
Coeur d'Alene, Idaho 83814

Determining the impact of forested roads on the Beaver Creek watershed

The Situation

Beaver Creek, a tributary to the North Fork Coeur d'Alene River, contains rural areas of forests, recreational lots, rangeland, and habitat for fish and wildlife. The 44-square-mile watershed has a long history of timber harvest, mining and road construction on public and private lands. Water quality in Beaver Creek does not fully support beneficial uses as outlined in the Clean Water Act and is subject to Total Maximum Daily Load (TMDL) requirements for sediment. TMDLs are in development for temperature, cadmium, lead and zinc.

Until water quality conditions improve, water quality impairments continue to make it difficult to proceed with natural resource development projects such as mining exploration or timber harvest. In addition, water quality in the watershed prevents Beaver Creek from fully supporting its fisheries potential. At the same time, landowners are concerned about erosion, flooding, and deposition of sediments along their streamside properties. The transportation network is one land-use that produces ongoing water quality challenges in this watershed.

Our Response

In 2010, University of Idaho Extension (UI Extension), Idaho Department of Environmental Quality (DEQ) and the US Forest Service (USFS) undertook a multi-part watershed assessment in the Beaver Creek Watershed to determine what actions were necessary to return the watershed to a functioning condition. This work was requested by the North Fork Coeur d'Alene River Watershed Advisory Group and was funded through the USFS Resource Advisory Committee. Water quality, fisheries habitat, stream channels, flood risks, stream crossings and the transporta-



Road survey along Potosi Gulch shows potential for mass failure and sediment contribution to the stream (photo courtesy of USFS).

tion network were all assessed to develop a comprehensive inventory of current watershed condition.

One assessment methodology, the Geomorphic Road Analysis and Inventory Package (GRAIP) was developed by the USFS Rocky Mountain Research Station in order to categorically evaluate drainage conditions of roads and to assess their interaction with the stream network. This is done through an in-depth field survey and a sophisticated geographic information system (GIS) model which determines whether or not roads and their associated drainage features (culverts, waterbars, etc.) contribute sediment to the stream. Drainage features' risk of failure is also assessed in this model.

Sediment and the heavy metals they carry, continues to create water quality impairments in the Beaver Creek Watershed. To determine the amount of sediment coming from forested roads, 146 miles of road were inventoried utilizing the GRAIP model within

the watershed (63% of the road network) along with nearly 3,000 associated drainage features.

Program Outcomes

The GRAIP model proved to be an effective way of identifying roads and drainage features in the watershed, that through maintenance or replacement, could drastically reduce the amount of sediment that is contributed to the Beaver Creek stream network. This kind of information is crucial to land managers that are trying to get the most 'bang for their buck'. In terms of water quality improvement, strategic transportation management has the potential for reducing measurable quantities of impairments, namely sediment.

- An estimated 220 tons of sediment is delivered each year to the stream network by the inventoried roads
- Nearly 99% of inventoried roads show signs of erosion, although only 10% of those roads deliver sediment to streams
- Two miles of road were found to deliver over half the total sediment load to streams
- Only 3% of the drainage features inventoried were found to deliver 90% of the sediment
- Twenty-one of the 85 culverts inventoried were projected to contribute 4,200 tons of sediment if they were to fail
- Nineteen culverts presented migratory barriers to nearly 24 miles of habitat for fisheries

Looking forward

The research team (UI Extension, USFS and DEQ) is sharing their findings with other stakeholders, including private landowners, to begin tackling some of the issues highlighted in the assessment. Recommendations made in the report can be used to guide future land use decisions so that threatened resources are protected.

Finally, the team also hopes to make improvements to the GRAIP model by localizing some of the variables that formulate the outputs. The model was originally developed based on criterion from a nearby geographic region.

Cooperators and Co-Sponsors

Kajsa Stromberg – Watershed Specialist – Idaho Department of Environmental Quality, Coeur d'Alene

Aaron Prussian – Hydrologist and Fisheries Biologist – US Forest Service, Fernan

North Fork Coeur d'Alene River Watershed Advisory Group – localized expertise

USFS Resource Advisory Committee – fiscal sponsor

FOR MORE INFORMATION

Ashley McFarland, Area Extension Educator
Water Quality Extension Program
University of Idaho Extension
1031 North Academic Way #242
Coeur d'Alene, Idaho 83814
Phone: 208.292.1287
Fax: 208.292.2535
E-mail: amcfarland@uidaho.edu

27-12amcfarland-forested.pub
10/12