

# Mine Land Restoration in Denali National Park and Preserve – A Fifteen Year Retrospective

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Following nearly 80 years of mining in the Kantishna Hills of Denali National Park and Preserve, active restoration efforts, begun in 1991, have been conducted on 20 abandoned and newly acquired mining claims to date. Historic mining activities have resulted in the disruption of the entire system of physical, hydrologic, and biologic relationships in several watersheds. Placer-mined streams in the area are characterized by unstable or excessively confined streambeds, with little or no riparian vegetation. Increased sediment loading from such unstable streams results in additional problems downstream, such as cementing of substrates and clogging of benthic invertebrate habitat. Evidence indicates that the value of riparian habitat for wildlife in mined drainages of the Kantishna Hills is severely reduced where a large amount of riparian vegetation and soils are absent.

Initial restoration efforts began on lower Glen Creek where \*\*\* tons of equipment and debris were removed. Two reaches of stream channel were then reconstructed to the 1.5 year discharge, and the surrounding floodplain capacity was rebuilt to contain a 100 year flood. Various research projects were established on the Glen Creek site to include studies of natural plant succession, the role of mycorrhizae and other soil microflora (Treu et. al,1996), revegetation methods (Densmore, 1994), and benthic invertebrate populations (Major, 1996) for facilitation of riparian zone recovery. Research and monitoring of Lower Glen Creek continues, making this property the flagship for land restoration in Denali.

From 1989 to 2002, \*\*\*acres of abandoned and disturbed mine lands were the site of additional clean-up and restoration efforts. At lower Eureka Creek, two trailer houses were removed along with two dozers, washplant equipment, 17 hazardous waste barrels, and three 30-yard dumpsters of misc. trash. Additionally, 500 feet of channel and floodplain were rebuilt. At Slate Creek, concerns were focused on treating the acid mine drainage (pH 2.2), by building an anoxic limestone drain (ALD) and an underground geotextile curtain was installed to capture and direct subsurface drainage to the ALD. At the Red Top lode mine, reclamation action included an adit closure, treatment for mine drainage, and slope stabilization. In 2002, a restoration project on Caribou Creek was completed, and involved moving 37,000 cys of material in a 1 mile long section of stream valley.

In 2004, efforts were concentrated on Glen Creek where a restoration design was implemented to include 4.5 acres of tailings and floodplain re-distribution, 1500 feet of stream channel was re-established, and 15 tons of scrap steel and trash were hauled out of the park. In 2005, an NPS contractor removed over 200 haz mat containers, excavated 2 contaminated soil sites, and removed about 60,000 lbs of trash & junk. However, funding was not available to remove large equipment and structures, or to scarify the remaining footprints or other disturbed areas.

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