French Gulch Restoration – Abandoned Mine to Native Fish Habitat[1]

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Abstract: The restoration on French Gulch and Moose Creek was completed to support the native fisheries reintroduction goals in the Mount Haggin Wildlife Management Area, MT. This area was mined extensively in the 19th century, resulting in large remnant tailings piles and reduced aquatic habitat. These piles resulted in a confined French Gulch without connection to a functioning floodplain and lack of fluvial complexity. Sinuosity of the existing stream was near 1.0 and the average flood prone width was less than 22'. The reaches confined by tailings were also devoid of pool-tail fines spawning areas and complex wood habitat. At the Moose Creek site, remnant mining impacts were less severe but still inhibited floodplain connection. Stream reaches were identified for reference and varying levels of restoration based on the degree of impacts. Over 100 surveyed cross sections were analyzed with 1D modeling to determine channel dimensions. The restoration areas were also modeled to determine shear stress values and approximate particular areas requiring increased stability and roughness to withstand up to the 4% AC flood. The restoration design provided opportunity to accomplish much of the "lighter" restoration with volunteer and AmeriCorps crews. The more extensive restoration was completed by hired contractors with heavy civil and stream restoration capability. Partnership and continued involvement by engineers, contractors, and land managers throughout the project provided ability to overcome obstacles and to expand restoration where possible. Areas of additional remnant tailings removal were identified during construction and completed to increase flood storage and riparian connection to French Gulch. Construction was completed in fall 2016 ahead of schedule and under budget. Monitoring of stream response in 2017, a prolonged runoff year, with pre-existing, design, and post-projects data for comparison. Pre-existing and post project data were used to estimate percent reduction in sediment load in tons/year for TMDL allocations.[3]

Additional Key Words: Restoration, Mines, Tailings, Native Fisheries, Geomorphology, Construction, Habitat, Water.

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3. Work reported here was conducted near 45°57'5.19"N, 113°1'36.70"W