

EUSTACHE CREEK MINE SITE AND STREAM CHANNEL RECLAMATION- PLANNING, MONITORING, AND IMPLEMENTATION

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Mining for gold in middle and headwater tributary streams of the Ninemile Creek watershed, a middle Clark Fork River tributary, has left numerous physical and biological legacies slow to heal. These legacies include unstable channel and floodplain habitats, an inhibited riparian community, increased water temperatures, reduced stream channel complexity, disconnected surface flow and altered fish assemblages. Large-scale fire and landscape scale evaluations in Ninemile watershed provided the planning backdrop for prioritization, partnership, and implementation of the Eustache Creek project, a 1-mi reclamation project in the headwaters of Ninemile Creek. Reclamation objectives include: provide bedload transport through the reach by facilitating deposition and scour without excessive aggradation or degradation, increase channel complexity (wood, pools, substrate), re-watering dewatered channel segments, and improving the ability of floodplain surfaces to support primary and secondary succession of native vegetation. We used a geomorphic design approach to establish stream channel and floodplain configurations in an attempt to achieve these objectives. Restoration techniques included collection and propagation of native riparian seed for transplant back to reclaimed surfaces, use of shallow groundwater retention sills, rootwad composites and wood vane structures to assist with initial channel stability and complexity, and organic amendments to mine spoils. No large rock was imported to fix the channel in place. Pre- and post-project monitoring includes longitudinal and cross-section profiles, fish abundance and movement estimates, aquatic invertebrate metrics, water temperature monitoring, instream habitat metrics, and photo points in both the reconstructed and a reference tributary similar to Eustache Creek. Preliminary findings were discussed.