

### South Willow Creek

#### Stream Relocation & Restoration, Wetland Restoration & Enhancement



**Location:** Harrison, Montana

**Client:** Private Client and NRCS

**Key Project Elements:**

- ❖ Geomorphic Assessment
- ❖ Hydrologic Assessment & Hydraulic Analysis
- ❖ Sediment Transport
- ❖ Natural Channel Design
- ❖ Wetland Enhancement
- ❖ Wetland & Riparian Revegetation



**Project Description:**

South Fork Willow Creek is a freestone tributary to the Jefferson River in Southwest Montana. The project reach was historically channelized to supply water to a mill, resulting in a steep channel gradient, over-widened cross sections, and a high degree of entrenchment leading to floodplain abandonment. The existing channel was a nearly uniform 30 to 40-foot-wide corridor with very low habitat complexity. Deep rooted woody riparian vegetation had also been significantly reduced from historic conditions.



RE team members led the development of restoration design to restore a 3,800 foot reach of the creek and diversify and enhance adjacent wetlands. The restoration design included developing a dynamically stable planform, profile and cross-section for a complete channel relocation, creation of aquatic habitat, restoration and development of the floodplain, and a comprehensive revegetation plan. Specific tasks included geomorphic analysis, instream flow and habitat assessments, reference reach characterization, flood frequency analysis, bedload characterization and hydraulic modeling of the designed channel. A 2,500 foot reach of the channel was relocated onto an adjacent floodplain surface to abandon the most entrenched portions and to bypass a substantial headcut at the lower end of the project.



Upon completion, this project resulted in a fully functional channel and floodplain corridor, significantly enhanced complex aquatic habitat, and the establishment of diverse wetland habitats. The restored channel has a stable plan form more consistent with historic channel patterns, a longitudinal profile with appropriate bed feature slopes, and channel cross-section geometry with an appropriate width / depth ratio.