



Benewah Creek Stream Channel Restoration Project

Benewah Creek, Idaho



The Coeur d'Alene Tribe contracted with R2 to develop channel and floodplain restoration

designs for approximately 1.7-miles of Benewah Creek as part of Phase II of the Benewah Creek Restoration Project. The longitudinal stream gradient is around 0.4% and the channel is entrenched. Historic logging, land clearing and grazing resulted in a loss of floodplain forest and riparian zone vegetation, leading to stream bank erosion and loss of habitat complexity.

R2 worked closely with Tribe field and GIS staff. Strategically located test pits were dug across the floodplain to evaluate floodplain stratigraphy and an existing channel incision hypothesis. R2 developed a topographic map of the valley from LIDAR data, then verified and supplemented the map with field survey data collected using RTK GPS technology. The test pit and topographic analysis results indicated that the entrenched nature of the stream channel was similar to historic conditions, and that the primary control on floodplain inundation was more likely due to the loss of beaver and not to channel incision as originally hypothesized. Relict channel swales visible on the valley floor as defined by the topographic map and historic

aerial photographs appear for the most part to be relict channels that have slowly filled in through aeolian deposition (loess), as opposed to fluvial deposition.

The analysis and field data results were crucial for guiding designs. Design elements included (1) constructing a new channel in a relict channel



identified on the topographic map and converting the existing channel into a vegetated high flow swale, (2)

constructing a second high flow floodplain swale and a side channel in other relict channel locations, and (3) constructing various wood structures that mimic beaver dams to either raise the upstream water surface during flooding or



provide a framework that beavers can use to build bigger dams in the future. Log structures were

designed to protect junctions at new channel locations from avulsing and re-excavating the former channel. Riparian revegetation plans were developed accordingly, including development of a nursery area for onsite use.

R2 produced detailed design drawings to be used to guide fit-in-the-field directed work, assisted with permitting including plan presentation to permitting staff, and provided construction management support services in the summer of 2009.

Project Elements:

- Hydraulic Engineering and Modeling
- Geomorphology, Sediment Transport
- Stream Restoration Design, Plans and Specs
- Fish Habitat Project Planning and Permitting
- Construction Management