The Tepee Creek/IXL Meadows Restoration Project was implemented to address channel incision on an 1880' stream reach. Unlike traditional treatment approaches for incised reaches that involve excavation of new floodplain or the use of channel-spanning structures, the approach at Tepee Creek involved importing gravels to raise the bed elevation to restore overbank flow frequency to the pre-disturbance floodplain, and renew beneficial meadow functions such as water storage, flow moderation, extended late season flow, and establishment of wetland and riparian vegetation.

Tepee Creek is a Klickitat River tributary occurring 22 miles due east of Mt. Adams within the Yakama Nation Reservation in the Cascade Mountains of south-central Washington State. The project site is located at 2965' elevation with a contributing drainage area of 8.4 square-miles and mean annual precipitation of approximately 25". Forestry is the principal land-use.

HEC-RAS was used to characterize the level of impairment to the existing stream and to develop design dimensions to restore overbank flooding during 1.5-year (approximately 80 cfs) and greater floods. Modeling of pre-project conditions indicated floodplain access through the majority of the 1880' long reach occurred at the 10-year flood. Design dimensions were cross-checked with nearby analogues and regional geometry equations.

The design was implemented using a fit-in-the-field approach. Gravel was imported to raise the bed elevation an average of 3'. Ninety-five feet of new channel was constructed to reconnect 135' of historic channel and lengthen the overall reach to 1990'. Pool/riffle sequences were reconstructed along 1950' of the reach at 0.95% average slope and bankfull width of 18.4'. A 140' long 3.0% coarsened riffle was constructed to provide persistent grade control at the downstream end of the project to transition from the elevated restored channel to untreated channel downstream. Twenty-eight complex LWD jams were constructed along channel margins to maintain pool depths, provide cover, and restrict bank erosion. Numerous LWD placements were constructed for floodplain roughness, and logs were buried within the channel to provide extra stability where hydraulic modeling indicated excess stream power. Extensive salvage of existing vegetation (sod mats and shrubs) was employed for bank protection and to hasten the recovery rate. Salvage of alluvial gravels was conducted where they were present. Two crushed culverts and road fill were removed from an abandoned cross-valley road alignment that was blocking surface flow into a side channel.

Early results are promising. Peakflows during the winter of 2006-2007 were less than bankfull though surface flow still occurred in three out of four side channels and overbank flow occurred in one relatively small area. Data from three shallow monitoring wells have shown a rise in the average annual groundwater surface between 1.3 and 2.4' with the summer water table 3-4' higher. Roughly 3100 ft^2 of perennial wetland created/enhanced. Vegetative recovery was rapid, particularly in areas where salvaged plant materials were used. Two steelhead redds were observed within the reach and juvenile *O. mykiss* abundance was greater.

The project was presented at the 2008 River Restoration Northwest Design Symposium.

The project will be monitored in 2008 and maintenance will be performed as necessary.