Stream Restoration Techniques to Mitigate the Yellowstone Hydroelectric Decommissioning Project in Duchesne County, Utah¹

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Abstract: Moon Lake Electric Association, Inc. (Moon Lake) is applying to the Federal Energy Regulatory Commission for a surrender of license for the Yellowstone Hydroelectric Project. The Yellowstone Hydroelectric Project is located on the Yellowstone River in Duchesne County, Utah. Originally licensed in 1943, the Yellowstone Hydroelectric Project consists of a 4.6 meterhigh, 113-meter long timber, rock, and steel composite dam that impounds a reservoir, a 4,307meter long penstock pipeline, and a powerhouse with a capacity of 900 kilowatts. Based on findings during the relicensing process, a determination was made that the costs to operate and repair infrastructure, in addition to the low power generation, it is in the best interest of Moon Lake to decommission the project and to satisfy their customers from other sources of power. The project area is on lands managed by the U.S. Forest Service (USFS) in the Ashley National Forest (ANF) Duchesne Ranger District and on private land owned by Moon Lake. This project created a unique opportunity to restore the historic multi-thread channel configuration and mitigate impacts for the removal of the facilities. This presentation focuses on the stream restoration components of the project. Reference reaches were identified and surveyed to define design parameters. The stream restoration design restores the historic valley floor by reestablishing a main channel, side channel, and riparian and wetland floodplain habitats. The design optimizes the geomorphic and hydrologic processes to maintain existing hyporheic conditions of the spring feed channels and wetland habitats at the head of the reservoir. Natural analog in-stream structures are planned to maintain vertical and horizontal stability utilizing local natural materials and maximizing transplanting to provide a cost-effective design. In-channel structures include toe wood, log j-hooks, sod mats, log-boulder riffles, and boulder grade control structures.

Additional Key Words: FERC, Natural Channel Design, Ecosystem Function.

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