

## **Shitike Creek Restoration Project**

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Shitike Creek is the first major tributary to the lower Deschutes River downstream of the Pelton–Round Butte Hydroelectric Complex near Warm Springs, Oregon. Shitike Creek enters the Deschutes River at river mile 97, with a drainage area of 105 square miles, and provides habitat for native, self sustaining stocks of Mid-Columbia summer steelhead, redband trout, bull trout, spring and fall Chinook salmon, and Pacific lamprey. Due to its source in the high Cascade Mountains at Harvey Lake, Shitike Creek is considered to have excellent water quality. In the lower reaches water temperatures and simplification of aquatic habitat have combined to limit salmonid production. Similar too many salmonid streams in the Columbia Basin, Shitike Creek has been affected by development within the floodplain, straightening, floodplain berming, along with road building, logging, and grazing in the uplands. In light of these effects Shitike Creek has retained essential habitat components such as; intact riparian vegetation composition and associated fish assemblage.

In 2009 the Habitat Program of the Tribes Natural Resources Branch implemented a restoration project aimed at protecting public infrastructure, reducing the risk of flooding, and enhancing fish habitat. The pre-project alignment of the creek was located adjacent to the Tribes wastewater treatment facility, in particular two retired wastewater lagoons. Through the processes of reestablishing its equilibrium after floodplain clearing and channel straightening in the 1960s, the creek began to regain a natural meander pattern or more appropriate sinuosity. Through this process the active channel was laterally migrating towards the retired wastewater lagoons. The proposed restoration action moved the active channel away from the lagoons and returned it to an alignment similar to its path until the 1960s. In addition, improved access to the floodplain reduced effects from flooding. Fish habitat was enhanced by constructed features appropriate for the given channel type that encouraged salmonid production. The retired lagoons were removed and a wetland complex connected to the active stream channel was constructed. These constructed features provided additional floodplain access, diversity, and habitat for fish and wildlife.

A reference site was selected upstream of the project reach to describe appropriate habitat features and inform restoration design channel geometries. The project realigned 3,300 feet of mainstem channel and constructed 2,800 feet of side channel habitat. Six new pool-glide-riffle-run features were constructed in the main channel. Engineered large wood features were constructed at each pool location using trees with root wads attached. Spawning habitat was created using constructed glide features seeded with a four inch minus gravel mixture with a D50 of 2-3 inches. Side channel features were constructed to add diversity and complexity for a variety of juvenile salmonid life stages. Three pond features were constructed and connected to the main channel through side channel features within the footprint of the retired lagoons.