Stream Rehabilitation with Large Organic Debris

Fisheries biologists stress that a fundamental concept of fish habitat management is that fish production is limited by "bottlenecks", or specific habitat factors that limit specific phases of the life cycle. Habitat aspects that limit fish population must be identified, and habitat rehabilitation efforts should focus on those aspects. For example, improving spawning/early rearing habitat to increase the production of young fish is of little help if there is a shortage of cover or rearing habitat for medium size fish in a river system.

Exactly this situation may exist in the Slocan River. There is very limited habitat available for medium sized fish, which require shaded, hiding habitat in cool water areas. A possible way of helping the Slocan River ecosystem is by adding Large Organic Debris (LOD, more commonly called "trees") in cool water areas. Natural LOD would have been supplied by large cedar, hemlock, and cottonwood trees falling into the river from the riparian forest. The source of and rate of addition of these large structures has been greatly reduced by floodplain logging and settlement. Fish habitat managers recognize a need to provide artificially placed LOD habitat while planning for the long term recovery of riparian ecosystems, and the restoration of the natural LOD cycle.

A LOD habitat enhancement project should create a mixture of large and small habitat features that provide the preferred habitat for the target species. To accomplish this, we must identify the preferred habitat which is needed, and plan to add structures to provide this habitat.

Natural streams the size of the Slocan River generally contain full sized trees laying within and across the streams, and huge chunks of wood protruding form the bed gravel. Large wedges of spawning gravel are held back by logs, and plunge pools and log dam pools are found. These streams may have drift jams which can redirect the river flow, resulting in channel and floodplain diversity

While drift dams and floodplain diversity are critical issues in the long term, they are not a realistic starting point of habitat rehabilitation work. Projects to add specific LOD structures and small LOD concentrations are realistic, and may have very substantial ecosystem benefits. Scour pools caused by water deflection by small LOD complexes, and the hiding habitat within accumulated debris, may help to expand trout habitat bottlenecks.

Work to add LOD to stream channels is a developing science. The persistence of human installed structures has been varied. Most of past problems have been associated with structures being washed away or damaged by floods. Practitioners are learning from past efforts, and engineering and design of habitat enhancement is improving. As a natural lake head system, the Slocan River is more hydrologically stable than many western rivers. This is conducive to instream habitat restoration work.

From: Rehabilitating Steam Channels and Fish Habitat Using Large Woody Debris. Jef Cedarholm, Larry Dominguez and Tom Bumstead. In: Fish Habitat Rehabilitation Procedures. Watershed Restoration Technical Circular No. 9. Ministry of Environment Lands and Parks.