

## 6. HABITAT RESTORATION ACTIVITIES

The Cowichan Stewardship Roundtable with representatives from the Cowichan Tribes, DFO, federal and provincial governments, industry, Living Rivers Society and NGOs, coordinate current instream habitat restoration activities in the Cowichan watershed. Numerous in-stream restoration projects have been undertaken in the Cowichan to improve or restore fish habitat with over 1.5 million dollars spent between 2005 and 2010 in the study area. More recent restoration efforts in the Cowichan basin include:

- 2012: Fish Gut Alley re-alignment and complexing, Tooshley island gravel removal and log jam dismantled with distribution and placement of LWD planned for 2013 as part of compensation works for construction of setback dikes, dike maintenance at JUB sewage treatment plant (Current Environmental, CT and DNC)
- 2010: Sh-hwuykwselu (Busy Place) Creek historical channel restoration (defining and complexing 6000 m<sup>2</sup> of year round habitat), off channel pond excavation and complexing, riparian restoration, landscaping and green infrastructure (S. Wong, MOT, Cowichan Tribes (CT's), Kathy O'Donnell/Koksilah Elementary school Streamkeepers).
- 2009+: Habitat and Flow Restoration in side channels in the lower Cowichan River (John Charlies, Major Jimmy's, Hatchery Channel, Bible Camp channel etc) with MOT as Lead Partner, CT's and support from DFO
- Side channel habitat improvements in lower Cowichan River at Rotary channel, Five Fingers complex
- 2008/2010: Bonsall slough relic channel restoration and extensions (2000 m<sup>2</sup> of new habitat and 8000 m<sup>2</sup> restored habitat), LWD complexing, substrate improvements and riparian planting. Good performance of channel observed with clean gravels and good groundwater flows (MOT Environmental enhancement fund)
- 2007: Habitat Improvements projects: Cowichan Lake tributaries including Sutton Creek sediment removal, channel restoration in Holt Creek, Holmes Creek and Norrie Creek
- 2006 - 2008+: Stoltz Sediment Stabilization and Follow Up with Living Rivers and BCCF – lead partners
- 2008: JC's groundwater fed channel excavation and LWD complexing. Total of 8,000 m<sup>2</sup> of habitat restored (S. Wong, MOT Environmental enhancement fund, CT's)
- 2006-2009: Five Fingers channel LWD complexing (250 pieces), construction of groundwater fed off channel area and flow improvements. Total of 30,000 m<sup>2</sup> of habitat restored. Throughout the lower Cowichan, channel depths were typically 1.5 – 2.5 m to intercept groundwater and provide summer cool refuge habitat (S. Wong, MOT Environmental enhancement fund)
- 2005 – 2006: JUB outfall maintenance that included gravel removal, bank stabilization works including construction of 3-4 rock weirs and 3-4 LWD placements along the left bank (District of North Cowichan, Cowichan Tribes)
- 2005+: Lower Cowichan at Mariners Pool, Monica's Pool and JUB outfall: gravel removal, bank stabilization using rock groynes, habitat complexing

- 2004+: Side channel construction, habitat and flow improvements at Lamb's Side channel (2004), 70.2 mile, 83A, Bonsall slough Somenos Creek channel restoration and flow improvements
- 2000: various lower Cowichan channels were re-watered including installation of river intakes to Five Fingers and John Charlie's channel, JC's flow also augmented by surplus well water from upstream private hatchery (DFO and CT's)

In 2009, the Cowichan Stewardship Round Table (CSRT) received the National River Conservation Award for the 3-year river restoration project completed at Stoltz Bluffs. Slope stabilization works at the Stoltz site represented the largest instream restoration project undertaken to date on Vancouver Island. The Stoltz slide site is predominantly made of fine-grained glacial lake bottom sediment deposit that extends for 600 m along an outside meander bend and reaches a height of 50-60 m (Fig 1, Photo 3, LGL 2005). The slide area was responsible for contributing 10,000+ cubic meters of sediment annually to the river. Major remedial works at the Stoltz slide in 2006 and 2007 included moving the river channel away from the erosion face constructing eleven bendaway weirs and installing a 650 m long riprap berm and erosion control along the main terrace. This has successfully reduced erosion and the contribution of sedimentation by approximately 90% at that site (Photo 4, LRS 2007, LGL and BCCF 2012).



**Photo 1. Aerial upstream view of the Stoltz slide that releases fine clay sediments and extends for 600 m along the left bank for the mainstem Cowichan River. Remedial works undertaken in 2006 and 2007 have successfully reduced bank erosion and sedimentation (Sheng and Bonnell 2010).**



**Photo 2. Downstream view of a series of 11 bendaway weirs constructed to train the thalweg away from the left bank along the Stoltz Slide in order to minimize bank erosion and the contribution of fine sediments (date and ref?)**

The Living Rivers Trust in partnership with the CSRT partners and other fund partners have been instrumental in the assessment and remediation of the bank erosion and clay bank failures that contribute a fine sediments to the mainstem Cowichan. Additional slope and bank stabilization projects are proposed for erosion control works at 3 other sites including 3 Firs, Broadway Run and Block 51 area (Sykes and O'Brien 2010, Gaboury 2010).

In 2013, additional restoration works in the lower Cowichan mainstem were completed as part of compensation works associated with construction of setback dikes for the Cowichan River Flood Management Project. The main project included the installation of a culvert into the South-side spur dike to increase flows to a larger series of previously constructed side-channels in the vicinity of John Charlies Channel.

The Cowichan Community Land Trust Society, Cowichan Tribes and MELP have been instrumental in organizing and coordinating habitat restoration and land acquisition efforts in the Cowichan estuary. They have collectively hosted public workshops involving the local and the scientific community to identify future monitoring and restoration priorities for the Cowichan estuary. Water quality (PCP contamination, sewage and ballast dumping) and habitat loss were the two primary issues of concern regarding the future health of the Cowichan estuary in a public forum held in 2004 (CCLT 2004). Past instream restoration projects would benefit from an ongoing and long-term monitoring and maintenance program.

There have also been significant habitat restoration efforts undertaken to restore estuary habitat that include removal of dikes, enhancement of wetlands on agricultural lands, enhancement of swales for water control and restoration of the Koksilah Marsh. The Pacific Estuary Conservation Program has been instrumental in the following projects (Vis-a-vis 2005):

- 2011: small scale pilot kelp enhancement project in the estuary
- 2005, 2008, 2009: Eelgrass inventory and transplants in estuary with Cowichan Community Land Trust and Seachange Marine Conservation as lead partners
- Westcan Access Rd: buried 3000' of overhead wire to prevent bird strikes
- Cowichan Estuary Farm: removed livestock and fencing, created swales and stop log structures
- Koksilah Marsh: breached dike to connect to existing swale, improved 2 natural breaches in dike
- Rooke Rodenbush property: hog fuel removal, re-established back channel and built up dike for flood protection of adjacent land
- Doman's/WFP sawmill property: breached dike in 4 places to re-establish tidal influence

The results of restoration efforts in the estuary include higher waterfowl densities than most other estuaries in BC with a 100% increase in utilization by dabblers, swans and geese in comparison to use between 1992-1997 (Clermont 2009).

Cowichan Tribes hosted a workshop May 25, 2010 to discuss options for restoring the Cowichan estuary.