

COWICHAN RIVER – STOLTZ BLUFF REMEDIATION

The Cowichan River is a prominent BC watershed with significant anadromous and resident fish resources having an estimated annual economic value of CDN\$ 5.4-6.2M (1997). Industrial development and expanding urban growth over the last 100 years have caused widespread habitat impacts. Changes in the river's floodplain and flood hydrology have increased bank instability, erosion and sedimentation. Significant reductions in salmon egg to fry survival were documented in lower 20 km where sand and silt are most prevalent. For Chinook salmon, when marine survival drops below 3.5%, survival during early life stages (i.e., freshwater) becomes critical in dictating future adult returns.

After ensuring adequate base flows during the summer, Stoltz Bluff Remediation was ranked as the 2nd highest priority by the Cowichan Stewardship Roundtable (Cowichan Tribes, MoE, DFO, Catalyst, BCWF, Cowichan SFAC, CVRD, CVNS, CLSES, CCLT, etc.).

A sediment stabilization strategy was proposed for Stoltz Bluff to address fisheries and water quality concerns related to excessive sediment loading. The target fish species to benefit from this project included fall Chinook, coho and chum salmon, as well as winter steelhead and resident trout species. The strategy was implemented in three distinct phases. Phase 1 studies, completed in 2005, determined the relative contribution from Stoltz Bluff (10-28,000 m³/year) at 35-45% of the total estimated suspended sediment load in the Cowichan River. River-based rehabilitation measures were designed and constructed under Phase 2 in 2006. The objective of the channel stabilization works was to limit lateral erosion and undercutting of the bluff by the river and included:

- Constructing a permanent access road for construction equipment beginning at the upstream end of the Stoltz Pool Campground and proceeding upstream along the left bank (when looking downstream) and along the toe of Stoltz Bluff. The access road will also function over the long term to stabilize the toe of existing gullies on the Bluff;
- Constructing a berm and terrace primarily of gravels and cobbles excavated from the mainstem channel and protecting the berm with large rip-rap;
- Establishing a new mainstem channel on the inside of the meander curve;
- Constructing 11 bendway weirs along the constructed bank terrace; and
- Constructing bed-level rock sills at the upstream and downstream ends of the berm to provide grade control for the river channel.

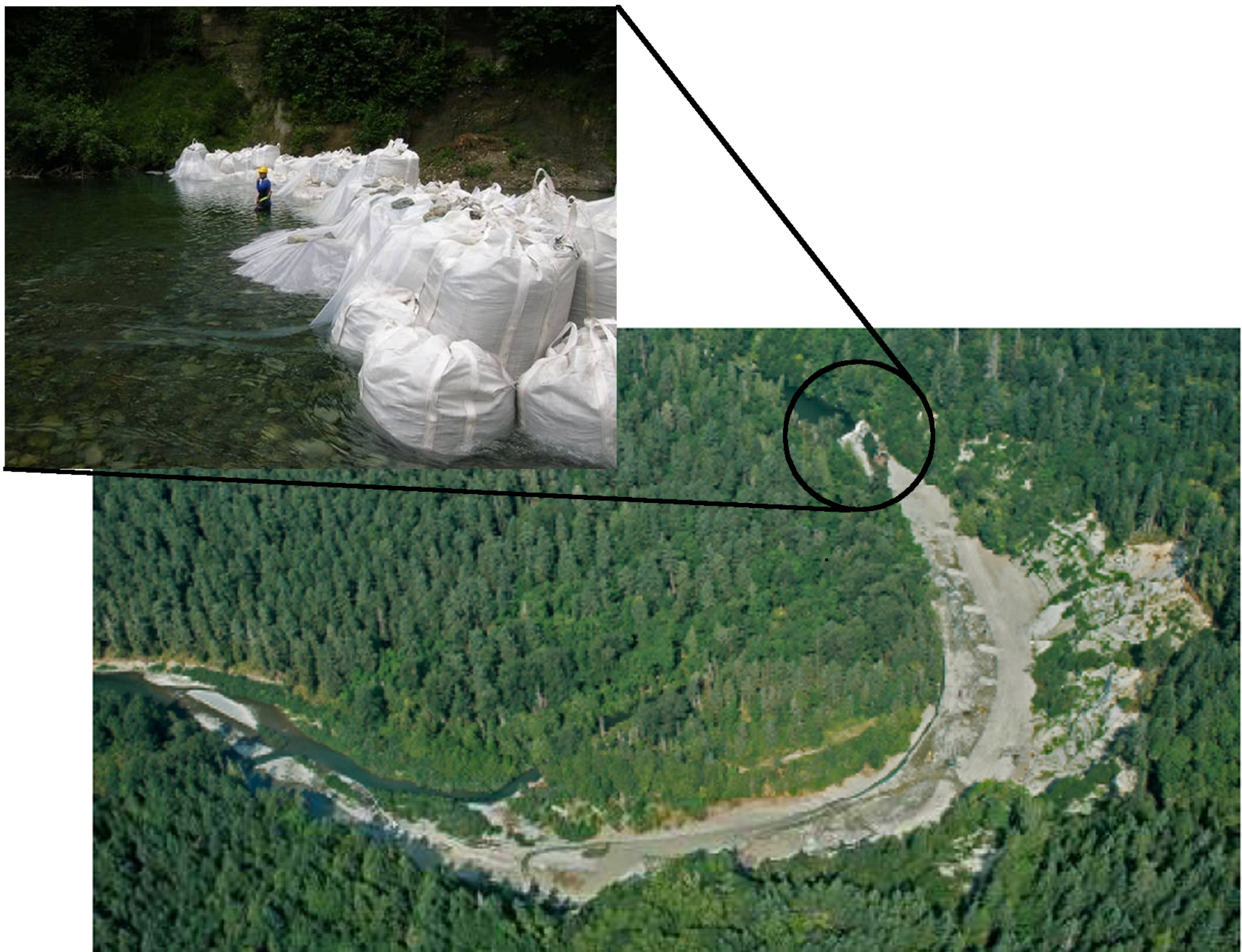
Phase 3 in 2007 included inspection of 2006 works; streambank bio-engineering; raising access road elevations; design and construction of terrace, sediment containment berms and drainage paths; extension of bank protection below access road; surveys and general maintenance. Topographic surveys in spring 2007 determined a volume of ~7,000 m³ of sediment had deposited on the terrace. No significant impacts to bendway weirs, the berm or access road occurred as a result of 2006/07 winter flood events. Sediments deposited in subsequent years amounted to 2,900 m³ (2007/08) and 1,300 m³ (2008/09). 2009/10 results pending.

Project Proponents: BC Ministry of Environment, Fisheries & Oceans Canada, BC Conservation Foundation. Major Funding Partners: Living Rivers-Georgia Basin/Vancouver Island, Pacific Salmon Commission Southern Fund, Ministry of Transportation Environmental Enhancement Fund, TimberWest Forest Ltd.(in-kind), Habitat Conservation Trust Fund, Catalyst Paper Corp., Nillex Inc. (in-kind); DFO (in-kind), BC Conservation Foundation. Project Cost: CDN\$ 1.4 million (includes feasibility, design, construction and maintenance to date).

Planned in 2010: Biophysical Monitoring to compare against baseline data collected pre-remediation.



Stoltz Bluff (pre-remediation), March 2003.



Stoltz Bluff during construction, August 2006. Note bulk bag diversion dam at top of project section and side-channel passing 4.5cms during construction period.



Stoltz Bluff Remediation project – Phase 1 complete, September 2006.



Stoltz Bluff Remediation project, June 24, 2010.

Fish Habitat Restoration

- ***Stoltz Bluff remediation (2006/07) a structural success and now largely self-maintaining (in-stream effectiveness monitoring phase 2010)***
- ***Project nationally recognized at Heritage Rivers Conference in Ottawa, June 14-17/09***
- ***Sediment impacts flagged as major limiting factor by Cowichan Chinook Technical Working Group***

