WOODJAM CREEK STREAMBANK PRESCRIPTIONS

Introduction

In the fall of 2001, 14 actively eroding streambanks along Woodjam Creek were treated with a variety of live and dead structures in order to protect banks, mildly train the streamflow, and reverse the erosion processes (i.e. armoring, induced sedimentation, streambank building, and revegetation). Forty-five open grown bushy medium-size spruce trees, 5 horizontally placed live alder clump transplants, various large wood debris catchers, 31 live spruce and alder transplants, and root wads were placed along banks and bars to direct flows, protect banks, and most importantly to induce sedimentation. Trees without branches were disfavored. Structures were held in place by a combination of ¾" rebar pins (4-6 ft long), buried cedar posts using heavy 9 gauge tie wire and 8 inch spike attachments, earth anchors with cable and chain (chain used above ground), and tree bundling with chain and wire.

Of the 14 sites treated and following a 25-year flood event (spring 2002), all but one are intact and functioning according to design. Tons of sediment have been deposited among and behind the branches of the spruce deflectors and revetments thereby rebuilding lost soils and providing new planting mediums for an intensive planting program which followed this spring.

Objectives of the prescriptions also included, demonstrating (exploring) techniques that utilize materials and tools commonly available to a typical landowner. Prescriptions using this soft approach were designed to utilize natural structures and processes inherent in the character and dynamics of this particular stream.

Due to the relative success of this approach (so far) the following prescriptions are designed to build upon (refine) the knowledge gained during the 2001 project. Sites are numbered consecutively going upstream. Sites 4 through 10 are flagged with orange ribbon and numbered.

Prescriptions

Site #1 **-** Priority 2. Near ranch house 100 meters up from the bridge. Silty clay soils – moderate erosion – 1½ meters high bank - 48 meters long - sharp meander bend, bank sloping back slightly – clumps of sod falling down with some re-rooting lower on bank – Roll #1 Photos 15, 16, 17.

Prescription – Pull bank back to 1½:1 – use a hydroseed application on exposed soils to protect against stream siltation - reposition sod on face of bank – armor toe of bank with bushy spruce revetment secured with rebar pins and cedar posts driven deeply into substrate. Earth anchors can also be used where floating pressure is great. Need 6-8 medium size trees cut into lengths that fit tight to the curve, butts and tops overlapped by ¼. Trees available on far side of field (200 meters) should be transported and ready when the excavator arrives. Plantings of willow and cottonwood should occur in the fall.

Site #2 – Priority 2. Upstream 100 meters or so from Site #1 – similar to Site #1 – bank sloughing with sod re-rooting at lower positions – 26 meters long – sharp corner – Roll #1 Photos 12, 13, 14.

Prescription – Same as Site #1. Pull bank back to a stable angle to provide a planting surface and disperse high flow energies — use a hydroseed application on exposed soils to protect against stream siltation - place sod on sloping bank. Use 4 bushy spruce trees anchored with rebar pins and tied to posts. Can use earth anchors where needed. Overlap trees and cut in lengths to shape to corner. Transplant alder/willow clumps on pullback if available. Plant with willow, cottonwood, and alder in the fall.

Site #3 – Priority 2 - Upstream 100 meters or so from Site #2 – Sod covered bank nearly vertical due to a higher clay content and more consolidated soils – sharp corner with a 12-15 meter radius. Bank 1.6 meters high. Roll #1 Photos 9, 10, 11.

Prescription –- Same as Site #1 and #2 – Pullback, apply hydroseed - reposition sod, shape bushy spruce revetments to fit toe of bank. Stack 6-8 spruce trees two high overlapping tops and butts by 1/3 . Need approximately 6-8 trees. Secure with posts and wire, rebar pins, earth anchors as needed. Add transplants if available. Examples of this technique that are functioning well with these kinds of soils and condition can be seen at two bends below the bridge.

Site #4 – Priority 1 - Between old sites #4 and #5. new erosion this spring – 1.2m high – 18-meter length – sod covered bank. Roll #2 Photos 10 and 11

Prescription – Pull back lip and place sod on sloped bank – tease stream flowing against bank to a secondary channel with sand bags – place 2 spruce trees from top of jam to a functional position at toe of bank – nest one more bushy spruce on top to increase high bank protection – secure with earth anchors, posts and #9 gauge wire, and/or ¾" rebar as needed. Transplant alder clumps.

Site #5 – Priority 3 – Original site #5 – 150 meters below bridge – 90% functioning – 1 spruce floated out of position. Roll #2, Photo 12, 13, 14, 15

Prescription – Reposition spruce to a functional position and secure

Site #6 – Priority 1 – Bridge washout – 42 meters of bank collapsing- highly erodible gravels – major channel widening - stream needs training back to original channel– major sediment deposition needed. Roll #2 Photos 17, 18, 19

Prescription – Breakdown eroding bank repositioning sod wherever possible – tease secondary flow back into main channel with a dozen sandbags – reposition large cottonwood (see drawing) and secure with two 6 ft rebar pins notched 10" into cottonwood with chainsaw' – utilize 4 large bushy spruce revetments stacked (nested) 2 high and connect to cottonwood (medium large spruce nearby)– notch (bury) spruce into bank at stable point next to shrubbery – place bushy spruce revetments at inside base of cottonwood – bundle spruce – transplant alder clumps and spruce saplings in washed out area, transplant horizontally some live alder revets behind spruce, scatter (bury) large debris catchers from nearby pile in washed out area – see sketch

Site #7 Priority 1 – Revetments at old site #11 could be improved with extension. Roll #3 Photos 5,6,7

Prescription – Place 10 sandbags to redirect spill over channel back to main channel – place two bushy spruce to extend current revetments and generate additional sedimentation behind – place one behind and one in front of existing alder clump - secure with rebar pins and posts – transplant spruce and alder to newly deposited sediment bars – scatter debris catchers (partly buried) from nearby large woody debris piles – distribute behind and in sediment deposition areas

Site #8 Priority 1 – Newly eroding site – 27 meters of fresh bank erosion –major channel widening – major sediment deposition needed - Roll #3 Photos 8,9,10,11

Prescription – Four or five medium sized bushy spruce needed - two at toe of eroding bank – push bank down to a 1½:1 slope – reposition sod on slope – place spruce tightly against bank to armor – in addition train stream channel back to original by tucking two stacked revetments with butt keyed in under alder and extending along low flow path (see sketch) – bushy spruce not far away – secure with rebar pins and posts or earth anchors – In the area between the spruce deflectors and the armoring revetments transplant alders, spruce saplings, and bury some debris catchers – bundle the two nested spruce with chain.

Site #9 Priority 1 – Major new site unraveling – active channel is now 5 times as wide – debris catchers and sedimentation is needed – eroded site 63 meters long and 30 meters wide. Roll #3 Photos 12, 13, 14, 15, 16, 17.

Prescription – Need 8 bushy spruce trees – push bank down to a 1½:1 slope utilizing sod on bank face – along the edge of the current low flow channel place spruce deflector/dissipaters starting with first tree anchored in under cottonwood snag – overlap trees by ¼ and nest 2 high – secure bottom tree with rebar pins – bundle trees together with chain – use buried posts or earth anchors as needed – transplant alder clumps and small spruce trees onto gravel bar – scatter debris catchers on gravel bar (see sketch).

Site #10 Priority 2 – Old site #13 – functioning well except at the upper end where some erosion has occurred behind trees – pull revets back tight against bank and add one more
Roll #3, Photos 18, 19