

NEWRY RIVER CURRENTS

December 30, 2008
Jeff Stern, editor



*T' was the week after Christmas and Jeff had an i-dear;
"Tell Newry folks 'bout what went down this past year."*

Town Completes Sunday River Outward Bound Project

On August 27, 2008, officials from the Federal and Maine Emergency Management Agencies (FEMA/MEMA) toured and signed off on an innovative town-sponsored project built in July to stabilize a severely eroding riverbank where the Sunday River threatened to wash out the Sunday River Road.

Newry was awarded an \$87,000 grant from FEMA which was matched by \$29,000-worth of donations in cash and volunteer labor from the Town of Newry, Sunday River Ski Corporation, Hurricane Island Outward Bound School and town residents.

Newry employed cutting-edge methods new among Maine towns to control the runaway erosion, estimated at 180 tons of soil annually.

Four hundred feet of eroding riverbank where the Sunday River Road meets the Outward Bound Road were treated by installation of a series of six rock vanes that jut out into the river facing upstream. The vanes deflect flows away from the vulnerable bank back toward the middle of the river.

An excavator moved huge 6-7 foot boulders into place. The vanes slope down into the water; a design that ensures their effectiveness at different water levels. They were keyed into the bank to prevent washout during flood events.

For added protection, five "bar buddies" were installed between the rock vanes. Hemlock trees were used. Each bar buddy consists of an anchor tree that was driven into the riverbed about 20-25 feet with the root mass poking above the water surface. Additional trees were attached to the anchor tree with high-strength cable and positioned horizontally along the toe of the slope.

The project was designed by Field Geology Services of Farmington (John Field), aided by Town Engineer Jim Sysko, and built by Caribou Springs LLC of Gilead (Jay Milot). D.A. Wilson & Co. of Bethel hauled rocks and trees to the site.



Bank erosion crept so close to the road a car roof is visible in upper center of this 2006 photo taken from the river 2 years before construction.



Rock vanes (blue outlines) deflect flows away from bank into middle of channel and create calm water at toe of bank (left of dashed red line) to protect the bank. View down river. A bar buddy is visible between the vanes.

Sunday River (*continued from page 1*)

Newry contracted with Jeff Stern of Fiddlehead Environmental Consulting in Harrison to coordinate the project and to write permits.

The excavator worked in the river to build the rock vanes and bar buddies. Permits were obtained from the U.S. Army Corps of Engineers, Maine Department of Environmental Protection, Newry Planning Board (shoreland zoning) and Newry Code Enforcement Officer (floodplain). An archeological survey was conducted.

Short-term disruption of the aquatic ecosystem during construction will be offset by long-term benefits. This site was identified as a major source of erosion during a survey of the watershed in 2000. The phenomenal amount of erosion smothered fish spawning beds and destabilized riverbanks and structures downstream.

Prior to construction, only 15 feet of rapidly-eroding riverbank remained between the Sunday River and its namesake road. The Sunday River Road is the only way to access logging sites, the former Outward Bound school, homes, camps, and jeep and hiking trails in the Upper Sunday River Watershed.

Studies throughout the United States indicate rock vanes provide more effective and long lasting protection for eroding riverbanks compared to the traditional approach of covering banks with rip-rap. Rip-rap transfers erosion problems to the next downstream bank and has a tendency to wash out. Rock vanes, on the other hand, are embedded in the river system. Vanes blend into the natural landscape whereas rip-rap creates an artificial wall of rock that's a big eyesore.

Vanес and bar buddies improve fishery habitat in ways rip-rap can't; vanes will narrow and deepen the formerly overwidened river channel at the site to provide habitat more suitable for trout while the root masses of bar buddies provide cover for fish.

After work was completed, bare areas on the riverbank were seeded with winter rye and mulched. Students from Hurricane Island Outward Bound School and town residents then planted seedling pine trees. The deep and extensive roots these fast-growing trees put down will further stabilize the once-eroding bank.

Similar Work Done in Bear River off Lone Pine Road



View upriver. Photo on left taken July 27, 2007 a year before construction. Photo on right taken Sept. 29, 2008 after installation of four rock vanes and two bar buddies. Logs were added to the existing jumble of trees on the shore. Winter rye that was planted on the upper, re-shaped bank is growing in. Seedling pine trees were planted on the bench below the winter rye. Three of the vanes are captured in the photo at right. Can you spot them?

The week after we finished work at Sunday River Outward Bound, we moved over to the other side of town to fix a vexing erosion problem along the Bear River.

A high eroding bank threatened to undermine Lone Pine Road. This was a high priority site documented in the 2004 Bear River Watershed Survey.

Newry funded construction to the tune of \$75,000. Hefty as this was the cost would be much greater to replace the collapsed town road—a possibility in the near future given the amount of bank slumping going on. Much to their credit, Newry townspeople took a pro-active approach.

Erosion from this site contributed to gravel bar formation downstream that's pushing flows outward and attacking the riverbank near the cemetery.

The photos and box to the left describe what was done. Basically we used the same techniques as at Sunday River Outward Bound, though, of course, they were tailored to the unique features at this site.

Taken together, what was done here at Bear River Lone Pine and at Sunday River Outward Bound sets a huge precedent for Maine towns in dealing with riverbank erosion.

“Chop and drop” comes to North Newry

The Town of Newry is a partner in the Eastern Brook Trout Joint Venture (EBTJV), an exciting research project to restore habitat for native brook trout and to control erosion. Two streams in North Newry that flow to the Bear River, Branch Brook and Chase Hill Brook, were treated in early December 2008.

The technique being studied involves adding large woody debris to streams. Dubbed “chop and drop” by project participants, sawyers cut trees of various species and about 10”-18” in diameter at strategic spots along a stream bank. The trees fall across the stream. Chop and drop can improve a damaged



A sawyer cuts a tree for “chop and drop”.

stream’s shape, also known as its morphology. Depending on gradient, flow rates and other variables, chop and drop in one location might act as a dam to trap sediment contributed by nearby eroding roads. In another spot, chop and drop could cause bottom scouring to create deep pools that are favored by adult trout.

Adding large woody debris to streams mimics conditions that were thought to exist prior to modern land use practices, such as logging, that stripped streamside

vegetation and resulted in the tree-free streams we see today. Preliminary results using chop and drop at other locations in the Mahoosuc Mountains, including the Upper Sunday River Watershed, are positive.

Brook trout have fallen on hard times in Maine which is part of the fish’s native range. In recent decades, brook trout habitat throughout the state has shrunk. This species doesn’t tolerate shallow, wide and warm stream channels, or erosion-choked waterways, conditions that unfortunately occur in abundance in the Sunday River. Newry is working with the Androscoggin River Watershed Council (ARWC), University of Maine, U.S. Fish & Wildlife Service and the Maine Department of Inland Fisheries & Wildlife. Baseline biological, morphological and flow data were collected in the streams prior to treatment and will be monitored, post-treatment, for the next 2-3 years. ARWC received two grants totaling \$65,000 from the U.S. Fish & Wildlife Service to spearhead this work. Erosion in both Branch and Chase Hill Brooks at the Branch Road bridges was documented as a problem in the 2004 Bear River Watershed Survey.



Stream in the Upper Sunday River Watershed treated with “chop and drop” in 2007. Trees will settle into the water in subsequent years.

MDOT reduces erosion in headwaters of Bear River

Intrepid watershed surveyors documented numerous erosion problems in Grafton Notch State Park as part of the 2004 Bear River Watershed Survey.

Okay...the park isn’t in Newry. But it’s the headwaters of the Bear River which, of course, flows through town. What happens up there impacts everything downstream. The Bear River boasts Maine’s highest water quality classification...definitely worth protecting! Plus, Route 26 is a designated scenic byway. Seeing the need to take action, Newry applied for and received a \$100,000 project through the Maine Department of Transportation’s Surface Water Quality Protection Program (SWQPP).

MDOT completed work in fall 2007. In this photo, an excavator lines a road ditch with large rock and digs a plunge pool to intercept storm runoff before it can carry eroding soil into a brook that feeds the Bear River.

Seven priority sites in the state park that were identified in the 2004 watershed survey were fixed through SWQPP. Thanks, MDOT!



Yes...lots of great river work is happening in Newry! Residents can be proud the town has earned a reputation for being in the vanguard of river restoration activities in Maine. It's a privilege to work with all of you. Thanks so much for your support...Happy New Year!!!

Jeff Stern



No erosion control job is truly complete without vegetative plantings!

Bare areas created on the bank where equipment, boulders and trees were transported to the Sunday River were immediately seeded with fast-growing winter rye and mulched.

Two weeks after construction, students from the nearby Hurricane Island Outward Bound School planted seedling white pine and red pine trees amongst the green carpet of winter rye. (Blue flags mark planting locations for the trees.)

The extensive root systems the trees put down as they grow will further stabilize the once-eroding bank.

Similar post-construction plantings were done at the Bear River Lone Pine Road site.

Sunday River Outward Bound Project

(You can view *Newry River Currents* online at
www.newrymaine.com)



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