



Watershed Update

Missisquoi River Basin Association

Fall 2011

River Festival 2011

A new addition to this year's River Festival was the paddle toss. Throwing a paddle through a tire (pictured below) – not as easy as it sounds, but it provided fun and a challenge for the young and not-so-young who attended MRBA's second annual River Festival on Saturday, August 27, at the Rec Field in Montgomery Center. Tied for first place in the paddle toss were Lucas Salmon and Eric Royce.



We again lucked out with incredibly beautiful weather, and missed the onslaught of Tropical Storm Irene by one day.

Back by popular demand was the portage race, this year with a separate competition for men and women. Nikita Salmon won the men's competition and Kari Hoss won the women's.

Many thanks to our three bands the Missisquoi River Band, EchoRev, and Sweet Jayne for their lively, foot stomping music, and to our vendors The Belfry, Fresh Bettie's, the Snow Shoe Lodge & Pub, Montgomery Conservation Commission, Montgomery Catering, and Rick Lansing for making food and beverage available to a hungry and thirsty crowd.

We also thank our sponsors John Cote, Little Painters, Missisquoi Construction, TJ's Country Store, and The Belfry, Community National Bank, Green's Ace Hardware, Peoples Trust, Sylvester's Market, and Ken Whitehead Electrical Services. And for donating prizes, we thank Jay Peak, LaRose Gulf, Precious Things, Modern Touch, and Frank Wirth. We truly appreciate your support!

It takes an incredible amount of 'staffing' to make this sort of undertaking run smoothly, and the help provided by Bobby Anderson and over 2 dozen volunteers was invaluable. Thank you all for your time which made MRBA's fundraiser such a success!

Bands, vendors, donors, sponsors, volunteers, and festival attendees, thanks for everything. We hope to have your participation again next year!

River Clean-up



Pictured above are 11 of the 13 participants in our June 18 river clean-up which took place on the Missisquoi River in Swanton. About 200 lbs of trash was picked up and included 5 tires, a vacuum cleaner, and house siding.

Thanks to all our paddlers for helping to beautify the river for the recreational enjoyment of us all.

Water Sampling

The water sampling season started and ended with high water. Heavy spring rains meant rushing rivers and Tropical Storm Irene brought an early end to MRBA's water sampling for 2011. Since the start of our water sampling program 6 years ago, we have taken our water samples to the Larosa Laboratory in the state office complex in Waterbury. Many of you know that we are lucky to have Lilla Lumbra bring the samples to



Phosphorus sample bottle

Waterbury where she works. Shortly after Tropical Storm Irene hit, we got the word that the Larosa Lab was closed down due to major flooding. We were able to get samples from June through most of August.

We appreciate all of the volunteers who collected samples,

brought them to the MRBA office and collected the bottles for the next sample date. We will sponsor a public meeting in the spring to learn about what this year's data showed and we hope to continue our program next year.

Wendy Scott

Bugworks

During the months of April, May, and June 2011, MRBA's educational consultant, Jane Williams of Fairfield, delivered the 'Bugworks' program to 8 elementary schools in the watershed (Berkshire, Richford, Swanton, Fairfield, Montgomery, Bakersfield, Sheldon and Enosburg), reaching over 185 students as well as many teachers and paraeducators.

Two sessions were held with each class, during which the students learned about watersheds, water quality, and macroinvertebrates; each student then wrote a report. The program promotes an understanding of the importance of water quality and how the presence of certain macroinvertebrates helps to determine the quality of water.



Students collect bugs during 'Bugworks' session

'Bugworks' was developed by science teacher John Little of Montgomery Center and is offered free of charge by MRBA to schools in the Missisquoi watershed.

We are very grateful to the Lake Champlain Basin Program for the grant which made 'Bugworks' possible in 2011.

2011 Field Work

The first volunteer workday of this year was a tree planting at Arnold and Linda Mercy's farm in Montgomery on April 30. The planting sites were along the south branch of the Trout River and a couple tributaries. About 25 volunteers planted more than 200 trees including red maple, sugar maple, shrub willow, white pine, paper birch, black cherry, speckled alder, basswood and silky dogwood. These species are selected to best match the natural vegetation communities that would typically be found in the on-site soil types and riparian areas.

The volunteer planting was part of a larger planting project, covering 11 acres of land along the river and tributaries. The funding and technical support was provided by the Conservation Reserve Enhancement Program (CREP), a collaboration of the USDA Natural Resource Conservation Service (NRCS) and the Vermont Agency of Agriculture, Food and Markets (VT AAFM). Additional funding and support is provided through the US Fish and Wildlife Service's (USF&WS) Partners in Wildlife Program. The Mercy's have signed up for a 15-year agreement to maintain portions of their rented pastures, hay and corn field lands in a forested riparian buffer. The entire project included the planting of 2,900 trees.

This site was identified as a project opportunity through previous MRBA administered projects for Phase II Geomorphic River Assessment and Project Development in the Trout River watershed. The implemented forested riparian buffer will decrease sediment and nutrient loading through vegetation of bare soils and filtration of runoff. The geomorphic stability of the channel should be improved through establishment of woody vegetation in the corridor and floodplain areas, and wildlife habitat will be improved through reestablishment of native tree species, shading of the river and deposition of woody debris.

The second volunteer work site was a tree planting at Fabian Parent's farm, Creeks End Farm, in Sheldon on May 14. This planting site included 700 trees and willows along the bank of Black Creek, just prior to its confluence with the Missisquoi River. Most of the site involved establishing a forested riparian buffer along a pasture for heifers. An additional portion of the creek bank was planted along the edge of a rented hay field. A separate MRBA project through a VT AAFM grant paid for the fencing to complete the livestock exclusion in the areas where trees were planted. The fencing eliminated hoof traffic on the steep streambanks and will reduce erosion.

The May 14 volunteers included a number of Boy Scouts and parents from St. Albans Troop 70. Approximately 400 trees were planted on that Saturday. A second workday on May 18 was with 5th grade students from Sheldon Elementary from the classes of teachers Ashley Longe and Lyn Mayhew. Several parents also joined in the planting of 300 trees and willows. Live willow stakes (about 20-24" long) were pounded into the areas closest to and at the top of the streambank.

The planting portion of the project was funded and supported by a "Trees for Streams" grant project through the Franklin County Natural Resource Conservation District (FNRCD). This program was intended to provide an additional opportunity for landowners to implement forested riparian buffers that might not meet all the criteria for the CREP buffers.

The third volunteer project site was at Diana Bailey and Greg Hunter's property in Fairfield, adjacent to Wanzer Brook. A portion of their hayfield was planted to trees, connecting a

forested riparian buffer to a Wanzer Brook floodplain restoration project completed in 2010 on Dwight and Louise Callan's property. This project was also through the FNRCD Trees for Streams program.

On May 17 the 7th grade class of Andrew Evans at Fairfield School came to plant 110 trees. The students were able to plant all the trees within 2 hours, in spite of wet and squishy conditions and thick sod. Fairfield reading specialist and MRBA board member Wendy Scott also helped organize the workday and came to plant trees as well.

The fourth project site of the year was a different volunteer effort – the eradication of invasive Japanese Knotweed plants along West Hill Brook in Montgomery, just upstream of its confluence with the Trout River. The Montgomery Conservation Commission co-organized the workdays on June 11 and September 10, led by its chair and local forester Charlie Hancock. Both workdays involved cutting the bamboo-like plants just above the ground and removing the shoots from the site. The cuttings were stockpiled for later burning and feeding to goats! After the second cutting, Charlie applied an herbicide to the remaining stems to kill the root systems. This will be a multi-year effort at this site and provide a learning opportunity for best local strategies to address this widespread invasive plant.



Members of Troop 70 help cut Japanese Knotweed

These practices followed the procedures developed by the Nature Conservancy, the Lake Champlain Basin Program and other partners to control Japanese Knotweed. While different invasive species cause different levels of concern, this plant has spread quickly around the Trout River and other local watersheds. Its root system can propagate with underground runners,

but it does not provide deep rooting for stream and riverbank stabilization and is a concern for erosion. This plant also crowds out native shrubs and young trees, upsetting the food sources for wildlife that utilize riparian areas, and decreasing habitat value.

The fifth project site was at the Brownway site in Enosburg Falls along the Missisquoi River. This site was planted in 2003-2006 through the CREP and Partners in Wildlife Program, establishing about 20 acres of riparian buffer in the floodplain and adjacent areas. County Forester Nancy Patch, who organized the original project, returned on June 18 with a crew of Boy Scouts to perform tree maintenance and stewardship. The Boy Scouts were on a canoe trip that took them from Richford to Lake Champlain and were able to contribute their service during the journey.

The tree protectors had done their job protecting the young saplings from rodent damage but were now restricting tree growth on some trees. The crew carefully removed about 200 tree protectors without further damaging the bark. We hope to return to this site to continue tree stewardship and site maintenance as needed.

The sixth project site was on James Welch's property on the Tyler Branch in Enosburg. Two workdays were held on September 22 and 29 to install tree revetments along an eroding streambank. Tree revetments are a bioengineering technique to protect bare streambanks from scouring and undercutting at the toe of the bank slope. Revetments are considered "green armoring" or "soft armoring" versus the hard armoring of stone rip-rap. The tree branches and stem deflect the energy of water and sediment and can provide stream edge cover for small fish and other aquatic organisms.

In 2010, Mr. Welch had established a CREP buffer along hay fields and also set up a corridor easement with the VT Agency of Natural Resources River Management Program (RMP) and the Vermont River Conservancy. The corridor easement is a permanent protection of the area adjacent to the stream channel, prohibiting channel management such as dredging, stone armoring or channel straightening. The MRBA workdays were set up with Staci Pomeroy of RMP to address some accelerating streambank erosion that was

threatening newly planted trees and working towards the corridor easement boundary.



Volunteers hammer in anchor and cable to hold tree revetment in place

Mr. Welch cut a number of small hemlock (softwood) trees to use as the revetments. The tops of these trees were cut 10' to 20' in length and dragged to the streambank. The bottom row was set at the toe of the bank slope, duckbill anchors were pounded into the bank and metal cable secured the tree revetments to the bank. The revetments overlapped each other like shingles and eventually layered like shingles, three rows high. 19 revetments were installed over the 2 workdays as well as some willow stakes in the gaps of the trees. Volunteers were able to finish the project just before one of our multi-day rain storms began. We'll observe this site after winter and spring runoff to watch how well this practice worked.

The last workday was held on the Bessette Farm in Highgate along ditches feeding into the Rock River. This project was done in collaboration with the Composting Association of Vermont (CAV) as a demonstration project. Compost Filter Socks (CFS) were installed at the edge of fields where points of runoff went into ditch networks. CFS are 9" diameter mesh tubes, ranging from 8' to 20' in length, that are filled with mixtures of woody mulch and finished compost. They work to capture sediment, especially fine sediment like clays, and slowly release water through the filter sock. In the immediate drainage area above the points of runoff, winter rye and winter triticale were used as cover crops to help stabilize the bare soils of recently harvested corn silage. The seed was then mulched with hay and approximately an acre of area at the three points of runoff was covered.

The combination of practices can be described as the multi-barrier approach or a "treatment train". Multiple conservation practices have been shown to have improved results versus single practices and we will see how effective the CFS and critical area cover

cropping are at these sites.



Compost filter socks will prevent field runoff from reaching Rock River

Thanks to all the volunteers for their efforts in all kinds of weather and conditions. Please feel free to contact myself (933-8336, jeros@together.net) or Cynthia (933-9009, mrba@pshift.com) with additional project ideas.

Brian Jerose, MRBA Technical Advisor

Geomorphic Assessment

At a public meeting held in Westfield on September 20, Dori Barton of Arrowwood Environmental presented the findings of an assessment she conducted on the Missisquoi River in Orleans County.



Dori Barton presents findings from geomorphic assessment on the Upper Missisquoi River in Orleans County

The study area covered 22 reaches (a reach is a section of stream with similar characteristics) of river/stream draining approximately 140 square miles of the watershed from Lowell to the Canadian border in North Troy. In addition to the Missisquoi River, the study included parts of tributaries Burgess Branch located in Lowell, and Taft and Mill Brooks both located in Westfield.

In general, this stretch of river has a low gradient, is meandering, and has a well developed floodplain. Based on its stream type and geomorphic condition, it is also considered to be quite sensitive. There are a number of areas lacking adequate streambank buffers and where undersized culverts exist.

In addition to taking lots of measurements, the assessment notes the size/composition of river bottom material, adjacent land use, and many other observations including the stage of channel evolution that presently characterizes the river.

We thank the Vermont Agency of Natural Resources for the grant which enabled MRBA to hire Arrowwood to undertake the assessment. The final report will be located on the State's website (VT ANR Stream Geomorphic Assessment Data Management System).

Why is the Missisquoi so brown this year?

This letter is a synopsis of what I've discovered about the Missisquoi River in the past few days. It is based on personal observations, and not backed up yet with photos and turbidity measurements. I do hope however that these observations will lead to a remedying of the situation that has been ongoing throughout this summer. The Missisquoi River remains brown (and sometimes chalky white) no matter what the weather does. Normally (the past thirty years in my experience) it becomes brown with the rise of waters after a rain, and then the river clears out as the water drops to normal low summer levels.

On Saturday the 20th of August, I traveled down the Trout River to its confluence with the Missisquoi River, and then turned upstream and traveled all the way to Highwater, Mansonville and East Bolton Quebec, as well as to North Troy, VT. I checked all the feeder streams, and major tributaries for signs of murkiness (turbidity) as I traveled and made observations as I went. They were all looking pretty good as it hadn't rained hard for a day or two.....the exception being the Missisquoi itself. Oh yeah, there were five heifers under the bridge at the old Davis Farm on the Berkshire Rd. staying cool in the shade and the brook, but above them, the brook didn't look too bad. The Missisquoi itself though, was almost chalky white between E. Richford

and Richford as I stopped and talked to Craig Fuller about him not finding much fishing for his kid. At any rate, I went home from my road side survey empty handed that day. I was disappointed and determined to get in my canoe for a closer look.

On Monday the 22nd, I got an early start, and put my canoe in the Missisquoi du Nord at Highwater, PQ, and poled upstream to Mansonville. It wasn't long before I ran into something which I'm sure is the cause of much of the turbidity we have been experiencing in the lower Missisquoi River (that which is down stream from the Canadian border at E. Richford). It also explains why the river will occasionally turn a chalky gray/white. There is a large farm, which is growing corn and soy bean that borders the Missisquoi du Nord not far above where it crosses under Rt. 243. There were two large ditches leaking chalky white clay water into the river from this farm. As soon as I'd gotten above these, the water color was more normal, and I was able to see two or three feet into the river, allowing me to see the bottom where it wasn't too deep. In addition to this, there was a cut bank on the outside of one bend in the river. It was about 9 feet tall; six feet at the bottom was pottery quality clay, and there was about three feet of top soil on top of that. There was no vegetation on it at all, and the top had been gullied and rounded by water cascading down from above. When I finally made it to the top to see what was there, there was nothing to catch or filter the soil that would run out of the 50 odd acres of soy bean directly uphill of this opening to the river. Essentially this farmer was losing a lot of soil every time the skies dropped a little rain. The

clay is what is staying in the water so long, and making it all the way to Lake Champlain and Missisquoi Bay.

I hate to be pessimistic about this situation, but it is going to persist for a while, as it will take a long time to establish some filtering vegetation along this stretch of the river. The soil is bare and sloped between the spindly 4 inch high soy beans, and the growing season is drawing to a close soon, as is evidenced by my finally ripening tomatoes (well, only one so far!).

After viewing these spots, I continued up stream till the portage trail below Mansonville. I turned around, and headed down stream, much easier, passed my truck and paddled down to Glen Sutton. Along the whole trip, nearly 14 miles, I checked on all the feeder streams. While the Missisquoi River itself was varying shades of brown, or a chalky gray/white, the feeders were all putting clear water in. Depending on how much flow they contributed, there was either a large clear hole in the murky water around each one. They were trying to dilute the main stem, but not contributing enough to make a real dent in it. I hope I can find some folks with enough pull to effect some changes in this situation.

At this point, I'm going to be back in school real soon, and not able to dedicate a whole week day to showing this to folks who are interested, but I will do my best to help in whatever way I can. At the very least, pictures and turbidity measurements should be taken during a rain event, and afterwards to see what the differences are.

*John Little, August 22, 2011
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