

**Mad River Forested Riparian Buffer and Grass Filter Strip
Initiative**

May 1999 to September 2003

**Winooski Conservation District
Berlin, Vermont**

Project Summary

Project Purpose: The purpose of the Buffer Initiative was to create a cost share/incentive program that would encourage landowners to install riparian buffers along commodity crop fields (fields that are annually tilled) adjacent to the main stem of the Mad River. This pilot program would address the dollar value of feed/crop losses associated with land use change from commodity crop production to perennial buffer vegetation.

Project Background: In May, 1999, the Winooski Conservation District and its partners, the Friends of the Mad River and the Natural Resources Conservation Service, were awarded a \$120,00 EPA 319 Grant to implement a pilot riparian buffer project in the Mad River Valley of Vermont.

At that time there was a nationwide initiative to encourage the installation of riparian buffers. The USDA incentive program being offered to agricultural landowners to encourage buffers was based on field rental rates-a strategy that worked well with the large acreage fields of the Midwest but not the narrow valleys of the upper Winooski watershed with limited crop acreage and highly productive soils. Landowners in the upper watershed were not showing an interest in the federal program which offered very little financial incentive.

With the goal of increasing the use of riparian buffer practices in the watershed, the District developed a pilot program which based its incentive payments on the economics of the crop loss incurred to the landowner when high producing cropland is converted permanent vegetation. The incentive payment calculations developed by the District for this project were later used by the Vermont Department of Agriculture, Food and Markets, as a basis for the Conservation Reserve Enhancement Program.

The Mad River, largest tributary to the Winooski River, was chosen because it typified the narrow fertile valleys of the upper watershed, had a highly active watershed association and its agricultural producers had a long history of working with the District and USDA on conservation programs. The Mad River had suffered a major flood event in 1998 and flood plain issues and flood damage were a current topic.

Project Location: The Mad River has its headwaters in the Green Mountains and winds its way north through the central Vermont communities of Warren, Waitsfield and Moretown, outleting in the Winooski River. The Mad River watershed is the largest contributing subwatershed to the Winooski River. The narrow floodplain of the Mad River is typical in the Upper Winooski watershed and its flood plain soils are some of the most productive in the State.

Project Process:

Outreach/Signup: The project targeted cropland owners along the main stem of the Mad River. Aerial photography, USDA records and field assessments were used to identify eighteen qualifying landowners with 480 acres of commodity cropland located along 12.25 miles of riparian corridor. Six of the landowners were full time dairy producers who in addition to their own crop fields, rented from 11 landowners. The remaining landowner rented to an organic vegetable producer.

A letter introducing the project and a project fact sheet were sent to the targeted landowners. Letters were also sent to pasture or permanent hayfield owners who did not qualify for the program informing them of other programs with USDA and the US Fish & Wildlife available to help them improve their riparian corridors. An article on the program was published in the local newspaper. During the same time period, the six active farmers were invited to an informal meeting to explain the program and to let them know the District would be contacting owners of the land they were currently renting. Fifteen of the eighteen landowners signed up for the program. The three that elected not to sign up felt their riparian corridor was in satisfactory condition and were not interested in assessments.

Assessments: Each of the fifteen landowners who signed up was provided with a written field assessment of their stream corridor which included maps as well as a narrative. The District hired Richard Czaplinski, water quality consultant and Michael Blazewicz, watershed coordinator for the Friends of the Mad River, to conduct the assessments. The assessments broke the riparian corridor along each field into reaches and addressed condition of the existing buffer, vegetative species identification, presence of invasive species, bank erosion, stream activity, noting flood chutes and potential problem areas.

Field assessments were compared with aerial office assessment done of the riparian corridor early in the program and appropriate spreadsheet updates were made.

Resource assessments were completed on 10.8 miles of riparian corridor adjacent to 434 acres of commodity crop fields. In addition to resource inventory data gathered, the assessments proved to be an excellent outreach tool. The District learned from these

site visits that during high water, flood chutes in several of the crop fields were by passing existing buffers. The sediment and nutrient water quality issues associated with these chutes were addressed by giving the landowner an opportunity to treat the whole field as a filter strip. Field assessment costs came in under budget. See project spreadsheet for cost and inventory data for both initial office aerial photo assessment and actual field inventory.

Contracting: Based on needs shown by the assessments, the District created a proposal for each landowner that gave them recommendations for improving their riparian corridor plus cost estimates for implementing needed conservation practices through the pilot buffer program. Based on the needs assessment, owners were offered the program practices and incentives listed below. Practice requirements were based on Natural Resources Conservation Service standards and specification. Targeted water quality issues were sediment and nutrient runoff. Practice requirement sheets are available upon request.

Incentive payments were based on the dollar value of the crop being lost by the conversion of cropland to buffer vegetation. Incentive payments were paid upon completion of contracted practices and cash discounted at the current savings rate of five percent. Crop values were calculated using information from New England Agricultural Statistics, UVM Extension and the Farm Service Agency.

Grass Filter Strip – Minimum width 25 feet, practice life span 10 years, soil test required every three years, no application of manure or pesticides, two to three cuts of hay recommended each season, limited livestock access- only with an approved rotational grazing plan in place, grass must be maintained at a height of six inches from November 1 to April 1, any commercial fertilizer application must be based on soil test results for both the buffer and the adjacent crop field. 75% cost share available for establishment based on actual cost. In addition, an incentive payment will be paid out when all contracted practices are in place. The incentive payment equals the net value of the corn crop lost minus the net value of the hay crop being taken off the filter strip multiplied by the 10 year life of the filter strip practice. Payments paid on production figures provided by Farm Service Agency. Average incentive payment per acre-\$950.
Installed 49.32 acres

Forested Riparian Buffer – Minimum width 35 feet, practice life span 15 years, grazing and pesticide application not allowed in buffer, plantings based on NRCS design reflecting knowledge of natural communities and use of native species, fertilizer or lime spread on fields adjacent to buffer must be based on recommendations of soil test results. 75% on plant materials. In addition an incentive payment will be paid out when all contracted practices are in place. The incentive payment equals the net value of the corn crop lost multiplied times the 15 year life span of the practice. Payments were based production figures provided by the Farm Service Agency. Average payment per acre - \$3915. *Installed - .75acres*

Enhancement of Existing Buffers - Enhancement of existing buffers with additional plantings based on needs identified by resource assessment, planting materials based on design by NRCS reflecting knowledge of natural communities, invasive issues and use of native species. 75% cost share for plant materials. *Enhanced – 6.35 acres Plantings were done with volunteer labor organized by the Friends of the Mad River, the District and landowners.*

Species used: White Pine, Balsam, Cottonwood, Yellow Birch, White Ash, Green Ash, Sugar Maple, American Beech, Red Oak, Silky Dogwood, Red Osier Dogwood, StreamCo Willow, Serviceberry, High Bush Cranberry

Planting Numbers: 610 trees, 1100 shrubs, 56 willow/red osier willow wattles. 2-3' bare root stock was used for the most part, mulched with burlap bags, trees staked and covered with hardware cloth.

Streambank Stabilization – 60% cost share on bank stabilization paid on actual cost; stable bank is required as a prerequisite for practices listed above, 10 year life span, designed and approved by NRCS and the State of Vermont Installed practices included rock vanes, bioengineering and rock riprap. *Installed: 1743 linear feet (7 rock vanes, 925 lf of bioengineering, 215 lf of riprap)*

See program/practice summary spreadsheets for more cost information.

After District and NRCS representative reviewed the assessments and practice proposals with each sign-up, thirteen of the fifteen landowners expressed an interest in contracting with the program. Of those that chose not to participate, one was an elderly, out of state landowner who did not want to make any financial investments in his land; the second was a full time agricultural producer who felt 100% cost share should be offered considering the state controlled stabilization practices on the river. This landowner had several erosion sites involving expensive repair solutions. He felt that the many repairs he had invested in over decades had not held up and felt this was in part to the State's management of the river. The landowner was referred to the State's stream alteration engineer.

Of the thirteen contract candidates, eight signed contracts. Four of the landowners backing out did so because of death, inability to meet landowner portion of streambank cost share, and plans to go out of business in near future. The fifth, an active agricultural producer had concerns about a long term commitment; he did however put in a filter strip on his own. Landowners who backed out for personal reasons, not dissatisfaction with the program incentives, were counted as willing participants. The final count was 12 willing participants out of 18 possible landowners. Of those willing participants, 4 were active agricultural producers.

Contracts were signed with eight landowners on eleven tracts of land addressing 5.6 miles of riparian corridor resulting in the conversion of 50 acres of cropland to

vegetated buffers. Acres of applied practices are listed with the above practice descriptions.

Results: The pilot project ended September 1, 2003. Program signup was 83% of the targeted landowners resulting in field assessments on 90% of the identified crop acres and 10.8 miles of riparian corridor. The assessments identified 8.6 miles in need of buffer improvement; 5.6 miles have been contracted for conservation practices through the pilot program on eleven tracts of land with eight landowners, 3 of those landowners are full time dairy farmers. Twelve landowners, or 67 percent of the target were willing program participants. The District accepted \$100,000 of the grant funds. Total project cost was \$81, 444.27. See accompany spreadsheets for cost breakdown. The District will apply to use the remaining funds to create a “Cover Crop Incentive Program” to be offered on all commodity crop fields in the Mad River watershed as a supplement of the Mad River Buffer Project.

Successful?: Was the project successful? All landowners showing an interest in the program agreed that the incentives based on net crop loss were fair. They were based on real costs and actual production figures. From a taxpayer’s point of view, the incentive payments offered per acre did not exceed the averaged appraised dollar value of agricultural land. The incentive payment based on crop loss did prove to be a successful approach that with tailoring could be repeated in other watersheds.

The most popular practices were grass filter strips and buffer enhancement. With the grass filter strip practice, the farmer lost corn land but retained the ability to have a hay crop. All program participants elected to “beef up” their existing buffers with new plantings through the buffer enhancement practice. In general, the end result was a minimum 35-40 foot wide buffer composed of a 12-15 foot wide *improved* existing buffer plus a 25 foot plus wide grass filter strip.

If the incentives were fair, why not 100 percent participation? That question can only be answered by those who chose not to participate. The three landowners out of the original eighteen who chose not to sign up for the program stated quite simply that they felt their was in adequate condition and did not want any involvement. Would higher incentive payments have brought any of these landowners to the table? The answer is most likely yes but this raises another question. What values would be used to justify incentives that exceed land or crop values? At the time the pilot project was initiated there was no research available that assigned a dollar value to riparian buffers. If economists could assign a dollar value to the water quality, wildlife and societal benefits of buffers, it would provide a basis to set incentives at levels that attract full watershed participation.

Landowners who did signup for the program but then chose not to participate brought up some very important issues, issues that were also brought up by the agricultural producers who did participate.

- Long term commitment to changes in land use ie crop loss, even it limited, is risk during a shaky farm economy

- State/federal government control activities in and along the river yet the landowner has financial responsibility for repairs, damage and crop loss
Government should bear more of the responsibility that goes along with control
- Landowners agreed that it is time to manage the river as a system, not piece meal, not one size fits all for stabilization solutions or buffer locations

Farmers were not interested in the forested riparian buffer practice. Money was not the issue. Because the cropland base in the valley is limited they felt the need to keep the farms viable for the next generation, losing cropland to permanent trees and shrubs for a 15 year period was not considered. The landowners the agricultural producers rented from had more interest in forested buffers. It was important to them to maintain the positive long standing relationships they had with their farmers and consulted with them before decided on conservation practices.

The streambank stabilization cost share practices attracted many landowners who were able to use their incentives payments to cover their 40% cost share for stabilization.

The application of conservation practices through this pilot program as well as landowner participation was significant and the implementation costs justifiable. Although hindsight has shown many ways to improve future initiatives, overall this program has illustrated that a conservation incentives program tailored to address the resources and economic realities of a specific watershed can be successful. In this project, using net crop loss as a payment incentive in a watershed with a high percentage of crop fields was appropriate.

Added Benefits

- The University of Vermont School Natural Resources made use of the project's field assessment data to check their interpretation of riparian buffers using satellite imagery with actual ground data.
- Added outreach efforts to pasture/hay owners not eligible for the program resulted in buffers along the Mad River via the US Fish & Wildlife Program
- Strengthened relationship with local watershed group, The Friends of the Mad River
- Vermont Department of Agriculture, Food and Markets was able to use the program's incentive payment calculations as a basis for their Conservation Enhancement Reserve Program

- Opportunity to introduce a new conservation practice-“Buffer Enhancement”. A practice which all program participants took advantage of to improve their existing buffers with plantings.
- Positive outreach through meetings and personal visits avoided issues that might have affected the relationship between agricultural producer and rental landowner over loss of cropland to buffers.
- Opportunity to address a specific resource concern by direct outreach to targeted landusers. Opportunity to put significant amount of conservation on the land in a direct manner.
- Unlike national programs, the pilot project allowed landowners to harvest the Grass filter strip, allowing to function as a filter strip. Ability to harvest was important to the success of the project.
- Opportunity to work with Regional Planning Commission on GIS data layers for the area
- Assessments for individual landowners came in under budget and were an excellent public relations tool-an opportunity to provide a service to landowners and heightened their awareness regarding their riparian corridor as well as familiarity with the District and Friends of the Mad River.
- The streambank stabilization practice (a stable bank was a prerequisite for buffer plantings) allowed several landowners an opportunity to address some serious erosion problems. Many were able to use their incentives payments to cover their 40% cost share for the practice while the program covered 60%.
- Opportunity to treat fields abutting buffers. Landowners were required to apply any nutrients adjacent to buffers according to soil test recommendations. Soil tests required every three years.
- The Mad River Bike Path Association, whose path along the Mad became part of several filter strips, were provided with the filter strip practice requirements and agreed to follow them as part of their maintenance procedure . Provided them with recommendations for spot seeding worn path areas.

Lessons Learned...Improvements for Next Program

- Farmers were polled by phone for program interest prior to initiating the actual program but a meeting with all agricultural producers to “brainstorm” program concepts would have resulted in greater ownership
- Start with a watershed where a Phase I and Phase II assessment has been done. This would help with early identification of trouble spots and planning for bank stabilization work, flood chutes etc Streambank stabilization, not the focus of this project, was looked at as a short term solution to protect the buffer.
- Use 5-6’ balled and burlap plant materials, planting fewer but larger material. Budget dollars for paid planting help. Use volunteers or watershed groups for long term maintenance of plant materials rather than planting- “adopt a site” Competition from invasives, tall grass, and wildlife was a chronic problem when using smaller plant material. Didn’t evolve to use of larger material until the end of the program.
- Have a plan and budget in place for invasive control. Japanese knotweed is a serious problem in the Mad River.
- Offer a wider range of supporting conservation practices including cover cropping and nutrient management to control what is coming off the fields on to the buffers. This program did require nutrient application based on soil testing (required every three years) but the cover cropping and nutrient management practices would have had a greater impact. Wildlife practices, including fish habitat should be offered as well.
- Include landowner education component for plant identification and care with assistance from County Forester and Natural Heritage and NonGame Program
- Alert non-agricultural landowners ahead that program payments are reportable income and may affect income taxes. Most agricultural producers are already familiar with this from working with federal and state programs.
- Have more informal information meetings prior to signup. Greater use of visuals illustrating the various benefits and types of buffers.

