Date Submitted: September 27, 2007

Project Title: Elk River Watershed Priority Lakes Phosphorus Reduction

Project Sponsor: Elk River Watershed Association

Project Representative: Mark Basiletti, Sherburne Soil and Water Conservation District

Contract Number: A56180

Contract Start Date: October 1, 2002 Contract End Date: August 31, 2007

I. Summary

Project partners consisted of the members of the ERWSA Joint Powers Board: Benton SWCD, Benton County, Sherburne SWCD, Sherburne County, Appointed at-large citizens from Benton and Sherburne Counties. Other agency partners included USDA-NRCS and the Central Minnesota Joint Powers Board Engineering staff. Non profit organization partners included the Briggs Lake Chain Association, Lake Orono Improvement Association and Little Elk Lake Improvement Association. Volunteers with Citizen Lake Monitoring Program and the Citizen Stream Monitoring Program provided water quality monitoring data.

This grant focused on managing agricultural and lakeshore activities including: 1) Installing high visibility manure management BMP demonstration plots to illustrate that proper manure management improves water quality and is profitable; 2) Installing filter strips and buffer strips in highly sensitive riparian areas; 3) Installing low cost common sense feedlot practices on small to medium sized lots to reduce phosphorus discharged directly into surface waters; 4) Demonstrate the re-establishment of natural shoreline vegetation and implement projects to reduce runoff from developed areas using filter strips and methods to promote infiltration. Streams were sampled for fecal coliform bacteria, phosphorus, dissolved oxygen and temperature to assess water quality during the project. Stream flow was monitored and a phosphorus mass balance was calculated for four watershed lakes. Volunteers conducted lake monitoring for secchi disc transparency, phosphorus and chlorophyll-a. The goal for stream monitoring in this project was to establish the current water quality status. We do not have data for a sufficient number of years to do a trend analysis.

For Big Elk Lake, the phosphorus mass balance showed that 99% of the phosphorus load was contributed by stream inflow. Shoreland runoff and ground water contributes a relatively small part of the phosphorus load. For the Briggs Lake Chain, 81% of the phosphorus load was contributed by stream inflow. The shoreland and ground water contribution were 8% and 7% respectively. Fecal coliform monitoring showed that the reach of the Elk River above Big Elk Lake exceeded state standards for two of four months and the reach below Big Elk Lake exceeded state standards for one of four months. In-lake monitoring showed that Big Elk Lake, the Briggs Lake Chain and Lake Orono would all be considered hypereutrophic.

II. Project Goals

A Watershed Restoration Action Strategy (WRAS) was developed for this project. The goals were stated in the WRAS as follows:

Goal 1: Reduce nutrient loading to water resources from livestock.

Objective	Target	Actual
Establish low cost feedlot management practices	3 sites	3 sites
Install fencing to exclude livestock	2 sites	0
Implement manure management plan demonstration plots.	30 plots	34 plots

Goal 2: Reduce nutrient loading from agricultural non-point sources.

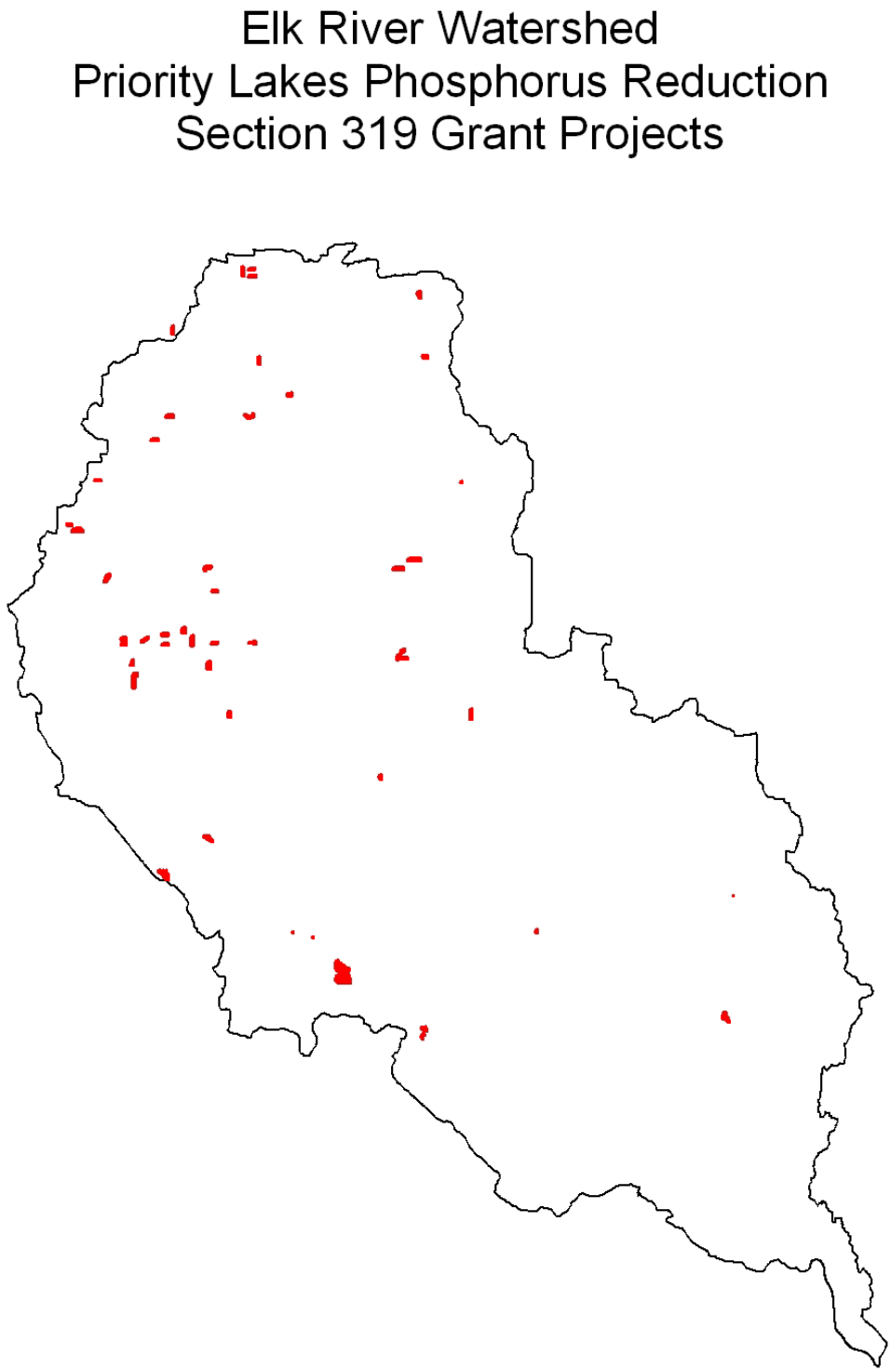
Objective	Target	Actual
Establish riparian forested buffers	150 acres	12.3 acres
Establish filter strips	75 acres	102.1 acres

Goal 3: Reduce nutrient loading to surface water from runoff from urban and residential areas

Objective	Target	Actual
Establish lakeshore buffer demonstration sites in residential areas	4 sites (revised to 7)	8 sites
Install stormwater BMPs	6 sites (revised to 3)	6 sites

Significant progress toward achieving this goal was made during the period of this grant. Signs installed at the demonstration sites and the stormwater BMP sites call attention to the BMPs. The public has been informed on these practices through articles published in Sherburne County's Environmental Educator. Several articles in local newspaper have also appeared on rain gardens and other BMPs. The Briggs Lake Chain Association has promoted these practices in its newsletter and through two workshops sponsored in the spring of 2007. To augment the demonstration sites funded through the 319 Grant, the Briggs Lake Chain Association obtained a grant from Minnesota Waters to help fund shoreland BMPs. Ten projects were implemented through the Association’s program. The 319 Grant demonstration sites and workshops provided the technical basis for additional rain gardens and bio-retention projects installed in the City of Elk River and Sherburne County.

We were able to distribute the BMPs throughout the watershed. The map below shows the location of all BMPs completed with this project.



III. Quantifiable Environmental Changes

Estimated Pollution Reduction

Manure Management Test Plot Results:	No. of Plots	Total Acres Treated	Nitrogen reduction * lbs/yr*	Phosphorus reduction * lbs/yr*
2004	7	342	20,934	35,880
2005	18	690	50,979	65,013
2006	16	778	37,127	35,525

* Nitrogen and phosphorus reductions represent the reduction in nutrients applied through manure and commercial fertilizer on land that will be treated by the BMP.

Low cost feedlot management practices – rain gutters	No. of Projects		COD reduction lbs/ 2 year event	Phosphorus reduction lbs/2 year event
2006	3		171.9	3.5

Filter strip results	amount applied acres	Soil Saved tons/yr[1]	Sediment Reduction tons/yr[1]	Phosphorus Reduction lbs/yr[1]
2004	43.2	52.7	89.0	118
2005	30.7	55.3	55.92	82.2
2006	17.1	60..0	136.77	168.66
2007	2.0	6.0	14.81	17.14

Riparian buffer results	amount applied acres	Soil Saved tons/yr[1]	Sediment Reduction tons/yr[1]	Phosphorus Reduction lbs/yr[1]
2004	12.3	5.32	5.21	502

Shoreline re-vegetation results	amount applied sq. ft.	Soil Saved tons/yr[1]	Sediment Reduction tons/yr[1]	Phosphorus Reduction lbs/yr[1]
2004	4,802	2.32	2.32	2.27
2005	6,100	4	6.97	6.8
2006	7,862	2.47	2.59	3.45

Stormwater BMPs results	amount applied sq. ft.	Soil Saved tons/yr[1]	Sediment Reduction tons/yr[1]	Phosphorus Reduction lbs/yr[1]
2006	16,542	5.43	5.43	6.25
2007	38,901	0.88	0.66	1.12

Estimated Totals	Soil Saved tons/yr[1]	Sediment Reduction tons/yr[1]	Nitrogen reduction lbs/yr[1]	Phosphorus Reduction lbs/yr[1]
	194.42	319.68	109,040	137,329
	No. of Plots	**Total Acres Treated/Applied**	**Amount Applied sq. ft.**	**COD reduction lbs/ 2 year event**
	41	1,915.3	74,207	171.9

1. tons/yr and lbs/yr in the above tables refer to the amount of the pollutant that will be reduced per year during the life of the project, which is at least 10 years.

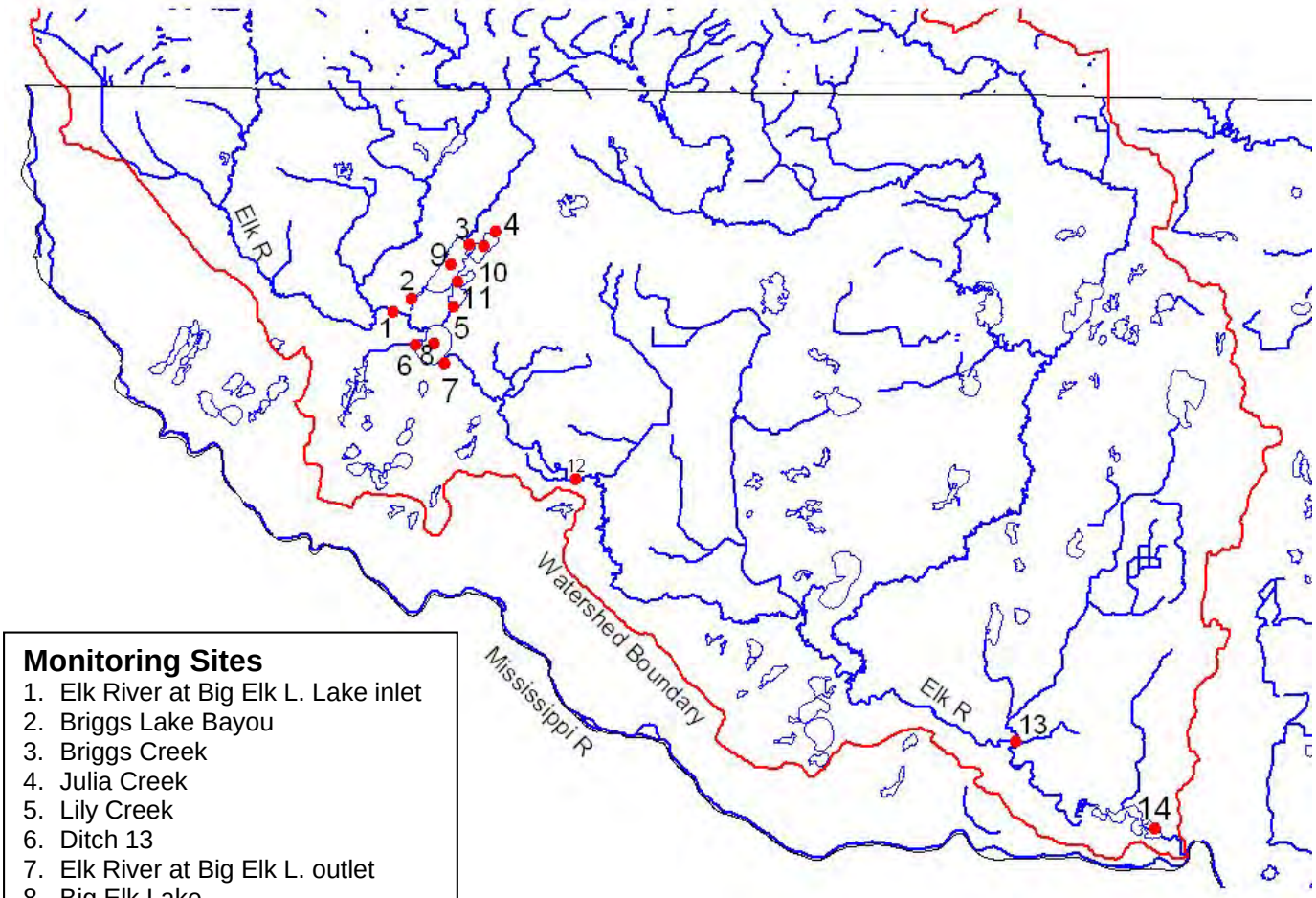
Water Quality Monitoring Results: Streams

The work plan for this project identified continuation of macro-invertebrate monitoring. This was not feasible because lab services from St. Cloud State University were no longer available to analyze the samples. We were unable to locate another lab that could do the analysis within our budget. A new monitoring plan was developed as described below.

Monitoring has shown that the Briggs Lake Chain and Big Elk Lake are hypereutrophic. Phosphorus has been shown to be limiting for these lakes. However, the relative sources of phosphorus loading have not been adequately documented. The following were monitored in order to calculate a phosphorus mass balance for the lakes: total phosphorus, bacteria, temperature, dissolved oxygen, stage and stream flow.

In recent years, there have been frequent warnings posted at the Lake Orono beach because of high Fecal coliform baceria counts. Lake Orono is a reservoir on the Elk River. Fecal coliform was sampled on the Elk River and several tributaries to determine whether any stream reaches exceeded state standards for this parameter.

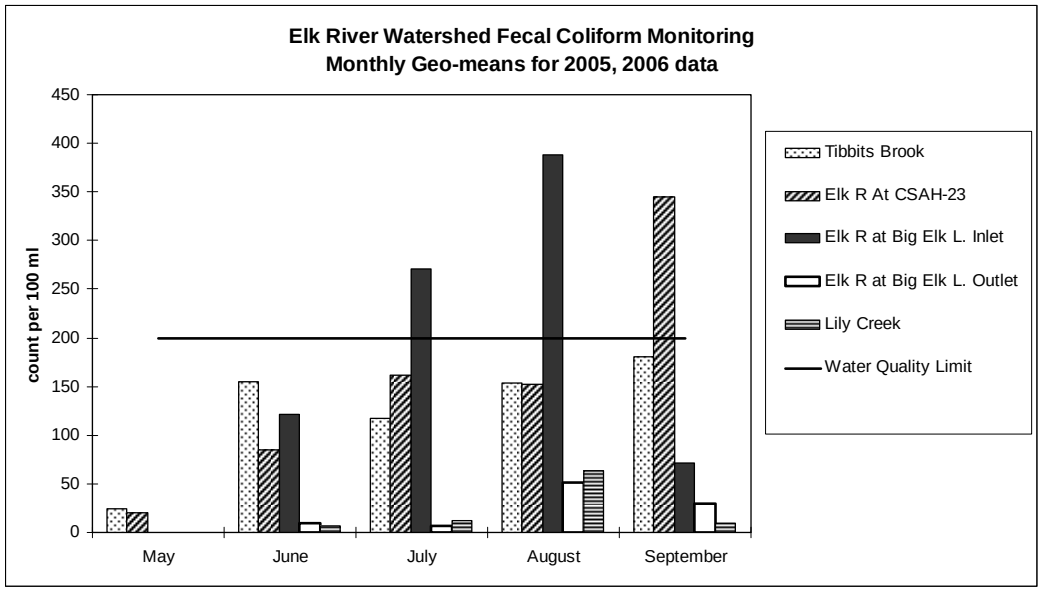
The goal for stream monitoring in this project was to establish the current water quality status. We do not have data for a sufficient number of years to do a trend analysis. Monitoring sites referenced in this report are shown on the map below.



Monitoring Sites

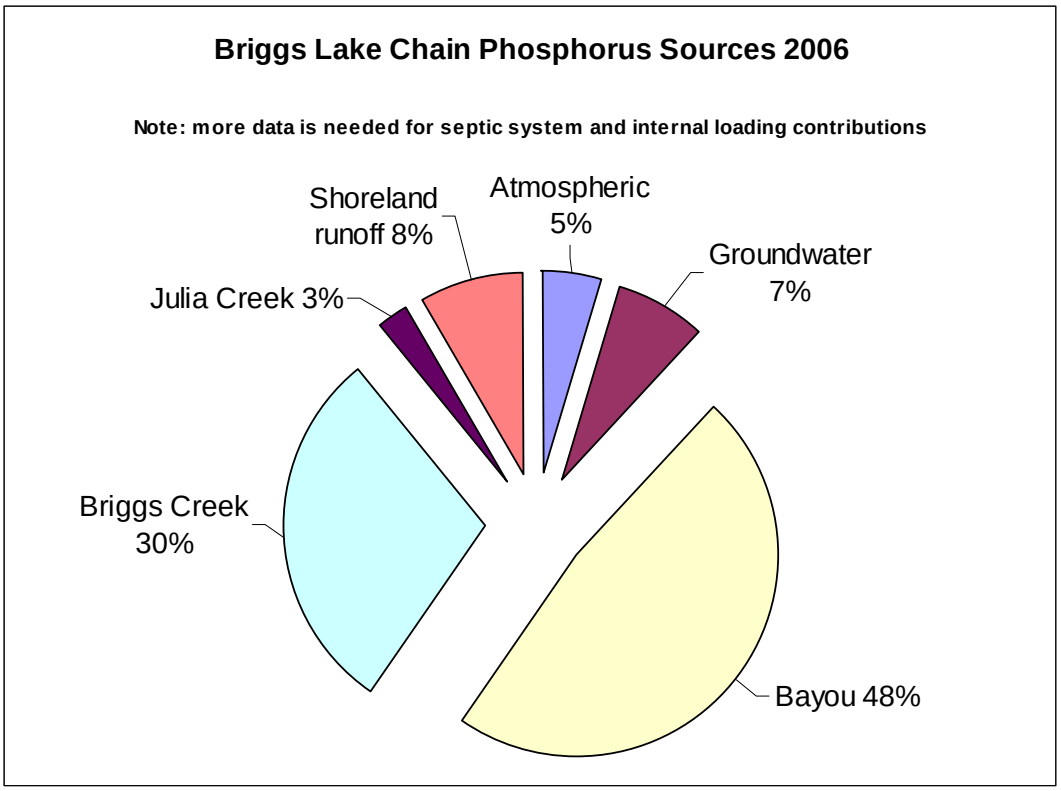
1. Elk River at Big Elk L. Lake inlet
2. Briggs Lake Bayou
3. Briggs Creek
4. Julia Creek
5. Lily Creek
6. Ditch 13
7. Elk River at Big Elk L. outlet
8. Big Elk Lake
9. Briggs Lake
10. Julia Lake
11. Rush Lake
12. Elk River at CSAH 23
13. Tibbits Brook at CR 35
14. Lake Orono

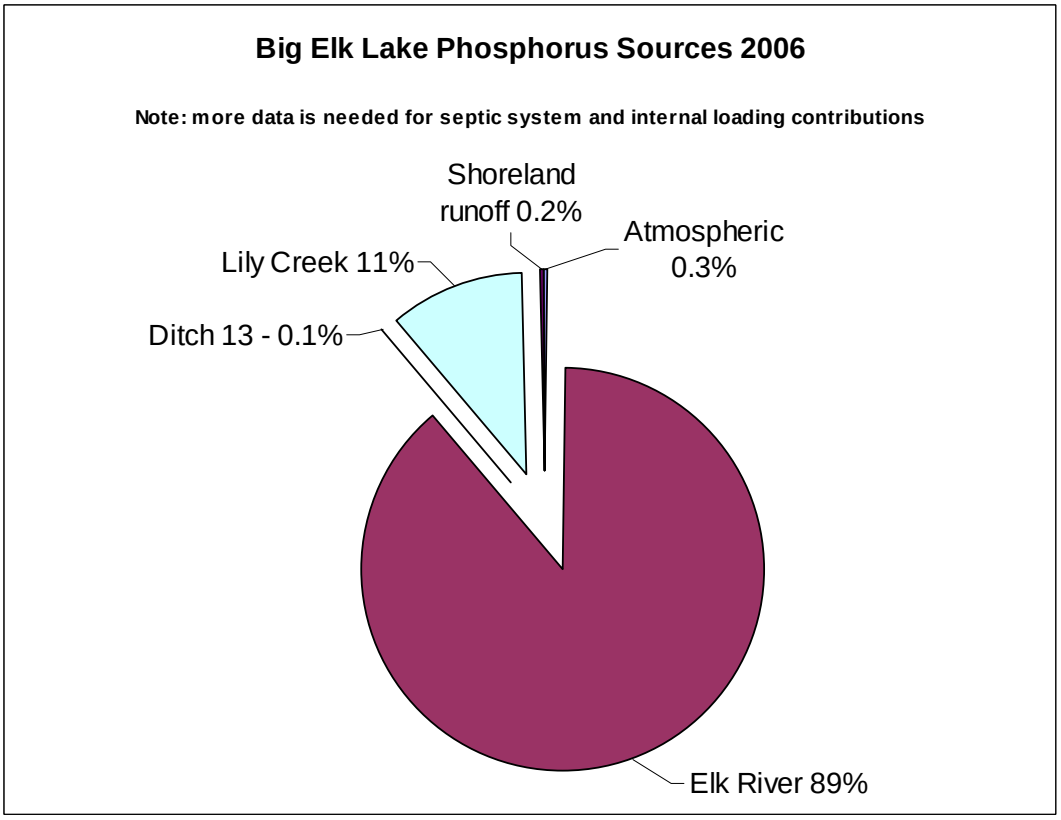
The graph below shows the fecal coliform sampling results for 2005 and 2006.



Total phosphorus was sampled for streams flowing into and out of Big Elk Lake and the Briggs Lake Chain. Stream flow was also measured for these streams using a Swoffer model 2100 flow meter. Multiple flow measurements were made across the stream cross section. The stream was divided into finite vertical sections and flow measurements were made for each section. Instantaneous stream flow is the sum of the discharge for all sections. The number of measurements was determined by stream channel configuration such that depth and velocity did not vary greatly between points of measurement. Velocity measurements were made at 60% of the depth. For small streams, flow was measured as discharge at the culvert. Stage measurements were recorded daily. Rating curves were developed for each stream and a phosphorus mass balance was calculated for the Briggs Lake Chain and Big Elk Lake.

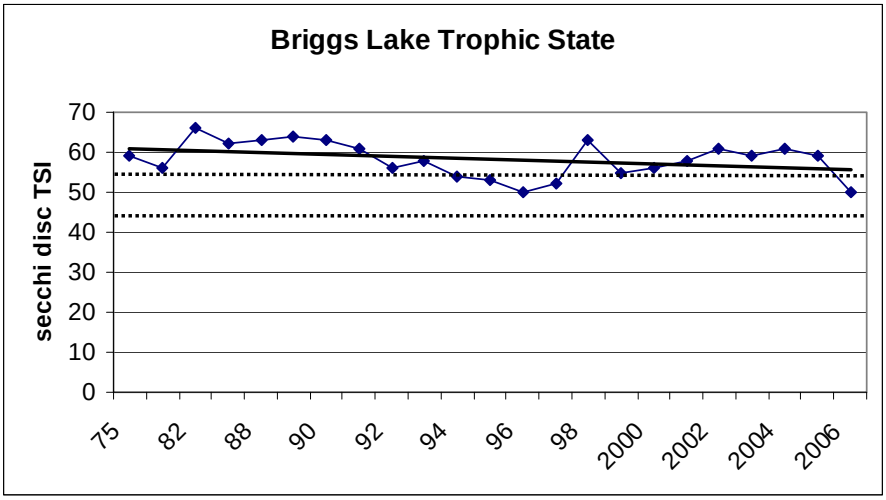
The charts below show results.

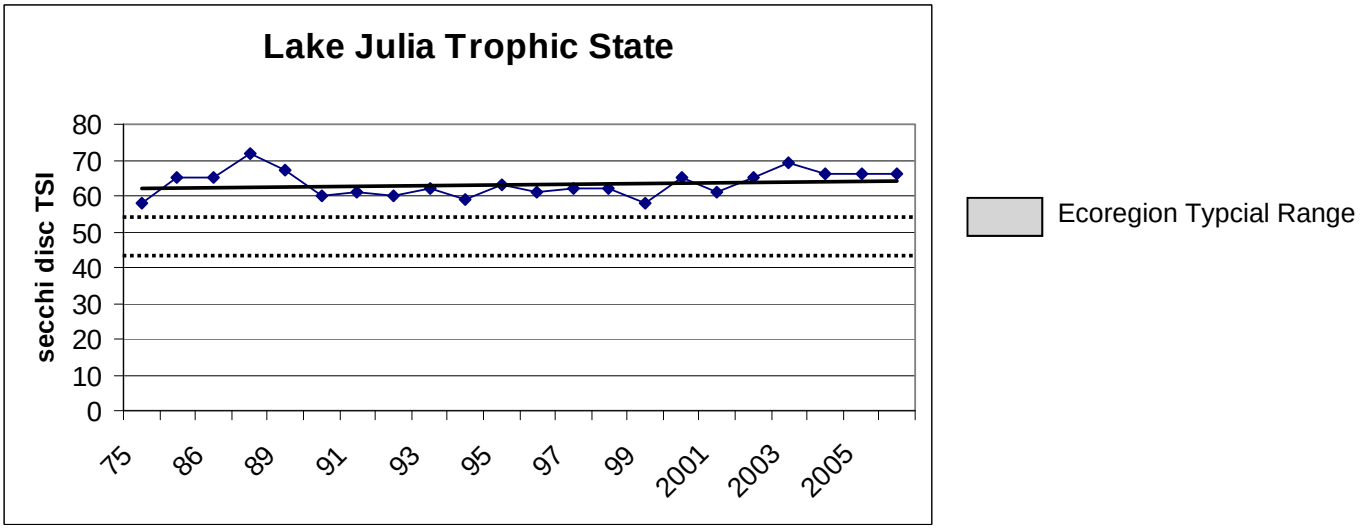


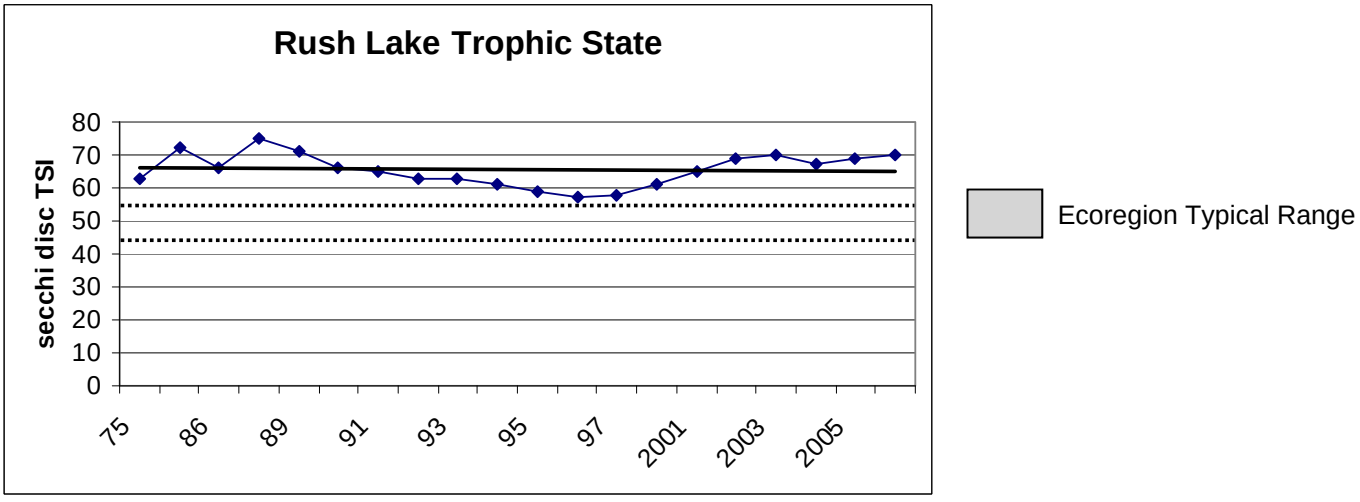


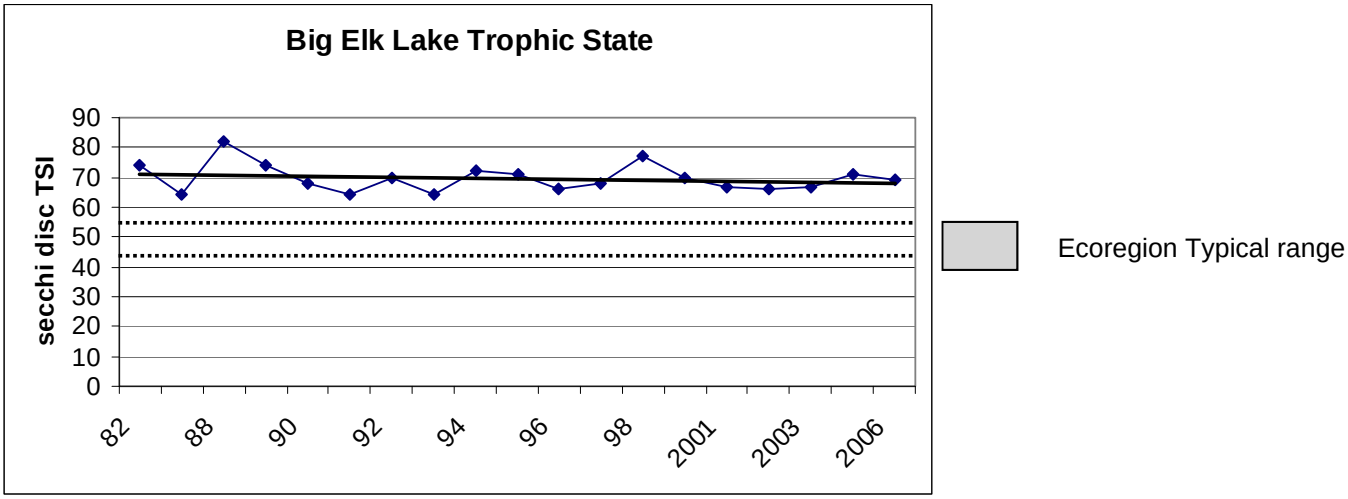
Water Quality Monitoring Results: Lakes

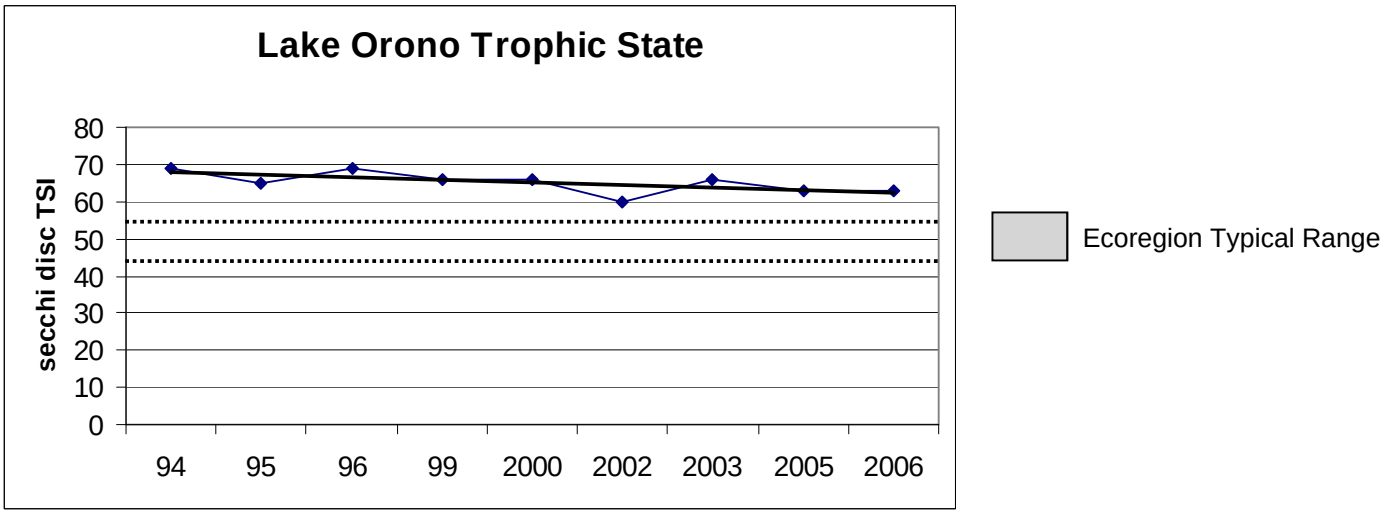
Volunteers have conducted water quality monitoring on several lakes in the project area. The graphs below show results of volunteer monitoring and other data available in STORET.











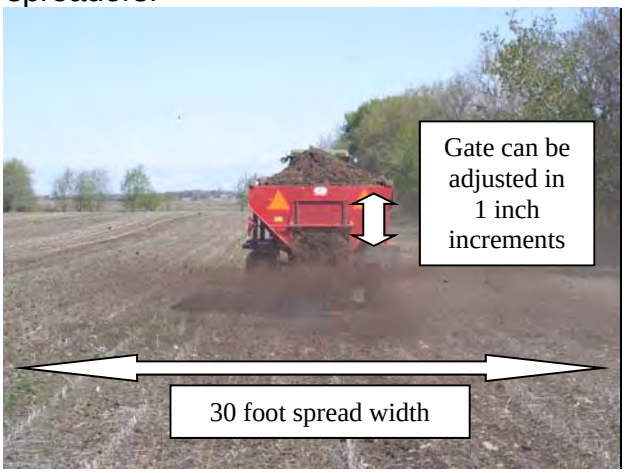
A trend line was fit to each graph of the Trophic State based on the annual average secchi disc transparency for five lakes. A small improvement trend is apparent for Briggs Lake, Rush Lake and Big Elk Lake and a slight decrease in water quality is apparent for Julia Lake. In 2005, the MPCA analyzed the data for these lakes up through 2004 and found no statistically significant trend. Most likely the apparent trends through 2006 are also not significant. There appears to be a more pronounced trend toward improvement for Lake Orono, however, statistical analysis should be done to determine if the trend is significant given the degree of year to year fluctuation.

IV. Lessons Learned, What Worked, What Did Not

Goal 1: Reduce nutrient loading to surface water from livestock.

In many cases in the watershed, feedlots have excessive amounts of clean water that flow through the lot. This causes manure to be carried in the runoff water which adds to phosphorus and pathogen problems in the watershed. We were able to demonstrate improvements to water quality, animal health and convenience by installing roof gutters at three feedlot sites. The concept of installing rain gutters is to keep the clean water (roof water) clean and reduce the amount of manure flushed from the feedlot. The clean water is diverted to an area that does not affect the lot. The rain gutters simply reduce the amount of water that is available to flush the feedlot which reduces the amount of manure being washed away.

One of the main methods to address nutrient loading from livestock was to establish thirty four manure management test plots. These test plots were customized for each farmer and compared Best Management Practices for nutrient management to the farmers' normal nutrient management strategies. For users of poultry manure, in nearly all cases the manure spreaders being used were not capable of spreading chicken manure at a rate low enough to reduce the nutrient application to recommended rates for crop needs. To overcome this barrier specialized manure spreading equipment was purchased with this project and used by cooperators. Unlike most box type spreaders that were being used, the gate on this spreader can be adjusted to control the volume of manure being applied. Additionally, the spread width is around 30 feet compared to around 8 feet with most box spreaders.



Chandler Poultry Manure SpreaderTypical Box Spreader

This proved to be a key component in assisting users of poultry manure to adopt manure management BMPs. One method to measure the success of this project is to evaluate changes in the behavior of those involved. We are aware of one farmer who has already purchased his own Chandler manure spreader utilizing the SWCDs low interest loan program as a result of participating in this program and others are considering purchasing their own equipment as well. This indicates that the farmers are changing their behavior as a result of using the spreader. We also learned that poultry litter from one barn is commonly distributed to more than one user and through working with the owner of the barn we were able to demonstrate the BMP to all users of the litter.

Below is an example of one of the nutrient management test plot plans that was installed.

2005 Manure Management Test Plot

This plot evaluates manure spread at recommended rates for nitrogen verses over application of manure. 1st and 2nd year nitrogen manure credits are considered.

BMP plot received 4.0 tons/acre chicken manure in 2004.
Will receive 4.0 tons/acre chicken manure in April with no incorporation within 4 days of application.
Will recieve 100# of 17-10-30 starter fertilizer.

	Nitrogen	Phosphorus	Potassium
Previous Crop	0		
2004 Manure	43		
2005 Manure	97	167	130
Fertilizer	17	10	30
Total	157	177	160
U of M Recommendation	160	10-15	10-15

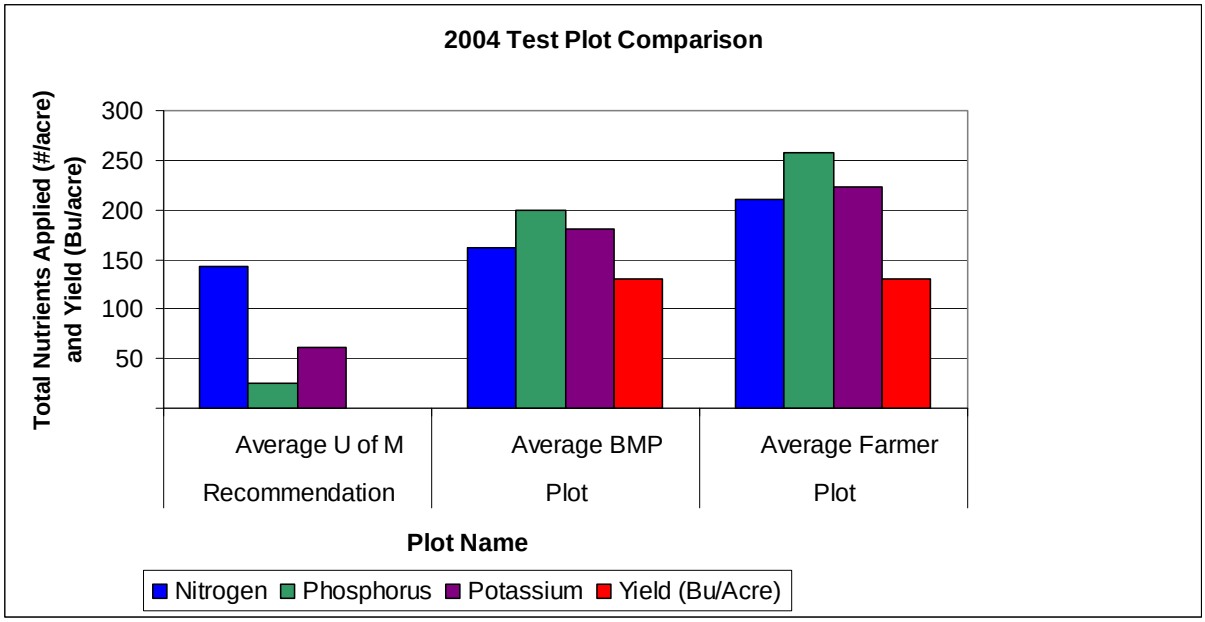
Farmer plot received 4.0 tons/acre chicken manure in 2004.
Will receive 6.0 tons/acre chicken manure in April with no incorporation within 4 days of application.
Will recieve 100# of 17-10-30 starter fertilizer.

	Nitrogen	Phosphorus	Potassium
Previous Crop	0		
2004 Manure	43		
2005 Manure	145	251	195
Fertilizer	17	10	30
Total	205	261	225
U of M Recommendation	160	10-15	10-15

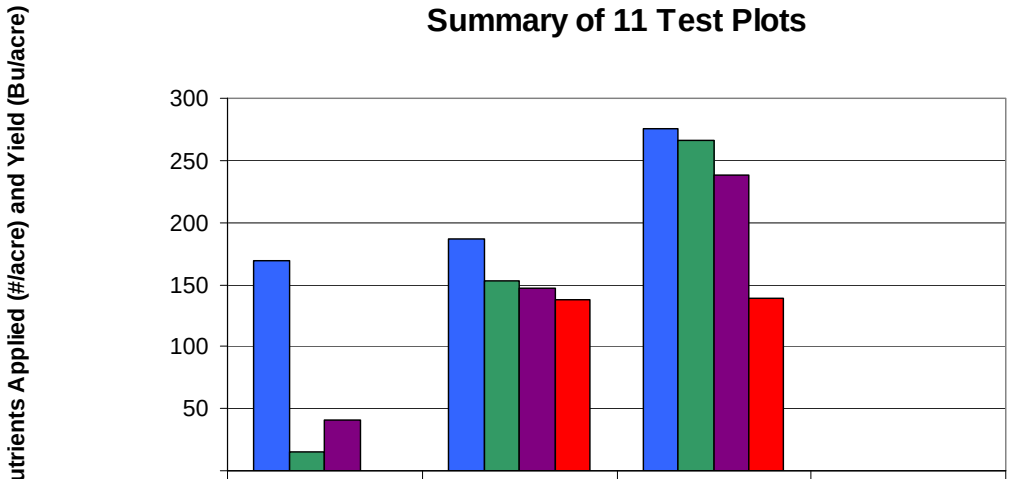
In this example you will notice that the manure application rate for the BMP plot was based on the nitrogen needs for the crop. Surplus phosphorus and potassium were applied. This is typical for land receiving poultry manure because poultry manure has a relatively high concentration of phosphorus and potassium. In general it is not possible or practical to apply poultry manure at rates based on phosphorus or potassium needs. In this example the phosphorus applied was reduced by 84 pounds

per acre. In addition to the reduction in phosphorus applied, another benefit is that the farmer has become aware of the value of the manure as fertilizer. Manure can be applied to land that is in need of these nutrients (low fertility fields).

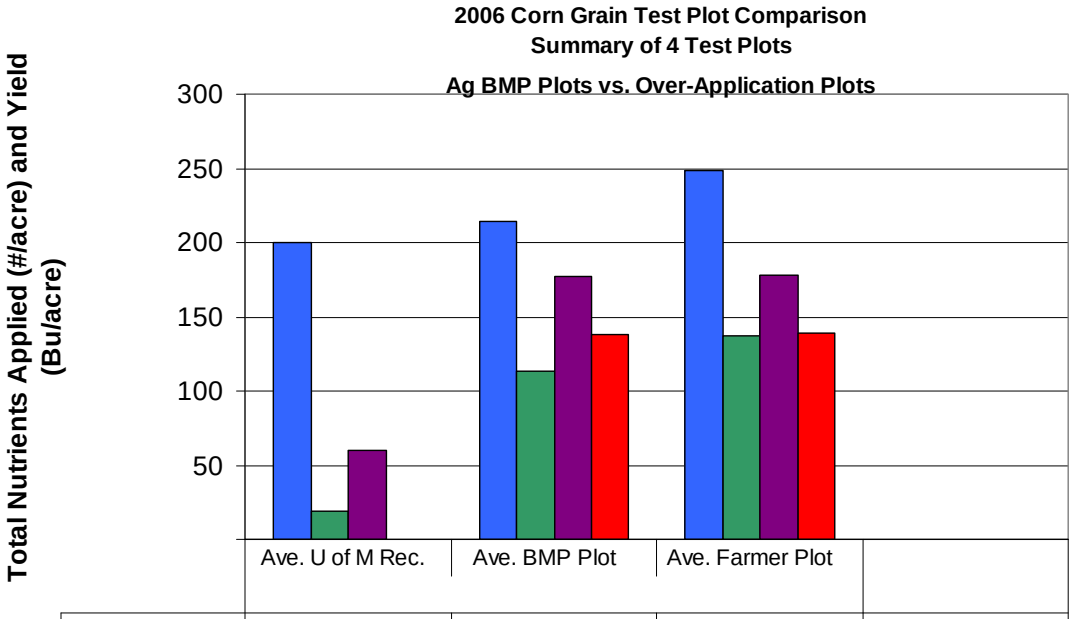
Yield checks were completed on the plots in the fall to demonstrate that BMP's maintain yields and are profitable. Some of the results from three years of test plots are displayed below.



2005 Corn Grain Test Plot Comparison
Summary of 11 Test Plots



	Average U of M Recommendation	Average BMP Plot	Ave. Comparison Plot	
Nitrogen	169	187	276	
Phosphorus	15	153	267	
Potassium	40	147	238	
Yield (Bu/Acre)		138	139	



	Ave. U of M Rec.	Ave. BMP Plot	Ave. Farmer Plot	
Nitrogen	200	214	248	
Phosphorus	19	114	137	
Potassium	60	178	178	
Yield (Bu/Acre)		138	139	

The first sets of bars (blue) in the graphs represent the average nitrogen recommended to be applied in the BMP plot and the average amount actually applied in the BMP and farmer plots. The next two sets of bars (green and purple) represent the same for phosphorus and potassium. The red bars represent the average yield obtained in the BMP and farmer plots. This data shows that there was a dramatic reduction in nutrient application within the BMP test plots with little effect on average yield. When this data was shown to the farmers it was easy for them to adopt the BMP on other acres the following years. We measured the success of these test plots by asking the farmers if they plan on making these changes the following year and if so how many acres they would apply these changes to. In total the farmers indicated they would change their manure and fertilizer strategies on over 1,800 acres.

“Water Quality Improvement Project” signs and self serve brochure boxes were installed at many BMP sites to educate area farmers about the projects. The brochure boxes contained a copy of the plan (similar to the one on page 15) and an information sheet about the program. Over the first two years over 125 plans and information flyers were taken from the boxes. We feel that this method of education and promotion was very successful.

We distributed a survey to all cooperators who installed manure management BMP's to determine the effectiveness and usefulness of the program. The results from this survey are included in the appendix on pages 4 – 6 with this report and indicate the program was very effective. When asked "Would you recommend others participate in this program", every respondent answered yes. There were also several responses that indicated specific changes the farmers have made to their manure and fertilizer management as a result of installing the BMP plot.

Goal 2: Reduce nutrient loading from agricultural non-point sources.

This program was very successful in promoting and installing filter strips in the watershed. Previous attempts to promote cropland filter strips have been less successful. We believe that part of the popularity of this program is due to the ability of participants to harvest the grass/hay from the filters, which is not allowed with the federal Conservation Reserve Program. We were less successful in promoting the conversion of riparian pastures to buffer strips. We have not determined why our success rate was lower but was possibly due to the requirement to cease grazing on these lands.

Goal 3: Reduce nutrient loading to surface water from runoff from urban and residential areas.

1. Behavioral changes.

Providing education on BMPs and partnering with local organizations and local government is key to the on-going establishment of BMPs.

Workshops were conducted for lakeshore revegetation and rain gardens. For lakeshore revegetation, three classroom design work shops were held and five "hands on" planting workshops were held. Two rain garden design workshops were held. The effect of these classes was to generate interest,

identify possible demonstration sites and provide a means to involve staff and cooperators in the design process. When cooperators are involved in all aspects of planning a project they are more likely to take ownership over the results and perform on-going maintenance. Through workshops and hands-on experience, cooperators become knowledgeable about choosing plant species, identifying native vs. non-native species, identifying planting zones, and methods of installation. After installing a project, workshop participants and cooperators become a resource for further promoting the practice. They can provide information in newsletters and by word of mouth. Some cooperators are independently assisting neighbors in planning and installing projects. This process is necessary for the on-going establishment of these practices on the lakes so that buffers of native vegetation and stormwater BMPs will become significant features in the riparian area.

Partnering with the lake associations in promoting and implementing BMPs was also key. The largest number of practices was established on the Briggs Lake Chain where the association was instrumental in promoting project workshops, independently sponsoring workshops for contractors, realtors and homeowners, and in promoting practices in their newsletter.

Partnering with local government is needed to ensure that the demonstrated BMPs will continue to be implemented. This is evident in the following examples. We were able to install a rain garden and filter strip in Lake Orono Park through the support of the City of Elk River Parks Director and the City Environmental Specialist. The City has ordered interpretive signs for these projects at their expense. The City of Elk River has developed plans to install rain garden and bio-retention projects on City property. They have also required private interests to install bio-retention for commercial developments. In addition, volunteers who worked on the Lake Orono rain garden requested that the City of Big Lake include rain gardens as part of a city road improvement project. The Sherburne County Highway Engineer attended a rain garden workshop sponsored through this grant and has installed a rain garden in a county highway right of way.

2. Technical aspects – shoreline re-vegetation.

Some shorelines will re-vegetate with native plants naturally if mowing stops. In some cases, the resulting plant community is dominated by native species and in others it may be dominated by invasive species, usually reed canary grass. On one lot, half the shoreline was dominated by native species and half by reed canary grass. In this case, only the non-native buffer needed to be re-vegetated. On another shoreline, after not mowing for a season, most of the shoreline was dominated by native species. Reed canary grass was spot controlled and “islands” of native plugs were planted in these areas. In general, each shoreline should be assessed as to whether natural re-vegetation verses re-planting is the most cost effective means of restoration.

Assessing existing native plants on a lake in relatively undisturbed areas is important. Species that occur naturally should be considered in developing a re-vegetation site plan. On one shoreline we were able to observe species that appeared to function effectively for erosion control. For example, where prairie cord grass and false indigo occurred naturally, there appeared to be far less erosion from wave action as opposed to mowed areas on the same lot.

A thorough site assessment is needed for success. Aspect, exposure, soil conditions, slope, existing native species and planned land use should be thoroughly assessed prior to developing a plan. Provisions for controlling herbivores also need to be incorporated into plans. Geese and muskrats are the primary problems. Squirrels have also disturbed some upland plantings. Geese are only a problem in the initial establishment period and can easily be deterred using flagging tape. Muskrats disturb aquatic vegetation. Aquatic plants that are adapted to tolerating muskrat herbivory should be

selected and aquatic plants should be protected with temporary fencing during establishment. In some cases muskrat trapping may be needed.

Many sites have existing rip rap and it is desirable to find ways to vegetate the rip rap to naturalize this part of the buffer. Several methods were tried in this project. Vegetation which can be grown from cuttings such as shrub willow can simply be inserted into the underlying soil between the rocks after making a pilot hole. If soil has accumulated between rocks, plugs can be planted between them. Adding top soil between rocks and planting into it was tried. This was only partially successful and probably not cost effective. Waves could also wash out the soil if water levels increase. It has been observed that plant roots will penetrate the geo-textile that often is placed under rip rap. Subsequently, broadcasting seed into the rip rap may be the best alternative for establishing herbaceous vegetation within rock rip rap. However, this has not yet been done as part of this project. In many cases, “volunteer” native species begin establishing within rip rap.

3. Technical aspects – stormwater BMPs.

Infiltration methods such as rain gardens work well on coarse textured soils which predominate in the lower half of the watershed. On sites where the water table is too high to allow for adequate infiltration, filter strips are preferred. Incorporating a low berm across the filter strip perpendicular to the flow direction, helps attenuate runoff and provides for some infiltration.

As with shoreline re-vegetation, a thorough site assessment is recommended. A soil boring should be done at each site to determine soil textures and depth to the water table. For some projects, engineering assistance is needed due to the size of the contributing watershed and other site conditions.

Technical guidelines often recommend the addition of 1 to 3 feet of a compost/sand mix for the bottom of a rain garden or bio-retention basin. This method was not implemented in this project. Soils on all rain garden sites in this project are coarse textured. From observations following 2 inch 24 hour rainfall events, infiltration appears to be adequate without the compost/sand mix. Only two rain gardens have been in place for more than one growing season. On both sites, the basin bottom soil has sufficient organic matter and plant growth has been vigorous. For two sites installed this year, the rain garden bottom soil was low in organic matter but initial plant establishment has been adequate.

Adequate erosion control is needed for the in-flow to both filter strips and rain gardens to prevent soil erosion during the plant establishment period. Attempting to establish native plants from seed or plugs in the inflow area resulted in erosion. Either rock or turf grass should be considered for the inflow area. If an inlet swale is to be turf grass, sod is preferred to seeding in that seed can be washed out before it establishes even if an erosion blanket is used. Lining an inlet swale with rock should be considered. The inflow area for a filter strip can either be turf or a gravel spreader. If turf is to be used, laying sod is preferred.

V. Project Funding

All of the grant funds were spent. The following tables compare the projected and actual expenditures per workplan element.

319 Grant Funds

Workplan Element	Projected Grant Budget	Actual Grant Funds Spent
Admin.	5,000.00	5,000.00
Agric. BMPs	90,500.00	80,098.39
Res./Urban Runoff BMPs	16,580.00	29,084.31
Monitoring	7,500.00	5,914.27
Education	3,200.00	2,683.03
Grant Total	122,780.00	122,780.00

Other Sources (Cash and in-kind)

Workplan Element	Projected Match Budget	Actual Match
Admin.	10,600.00	26,319.45
Agric. BMPs	68,720.00	27,297.90
Res./Urban Runoff BMPs	18,400.00	48,226.80
Monitoring	31,300.00	36,115.40
Education	6,000.00	12,605.79
Match Total	135,020.00	150,565.34

Total Project Cost

Workplan Element	Projected Total Expenditures	Actual Total Expenditures
Admin.	15,600.00	31,319.45
Agric. BMPs	159,220.00	107,396.29
Res./Urban Runoff BMPs	34,980.00	77,311.11
Monitoring	38,800.00	42,029.67
Education	9,200.00	15,288.82
Total	257,800.00	273,345.34

VI. Follow Up

Implementation of BMPs and demonstration sites initiated in this program will be continued in conjunction with a second 319 grant, Elk River Watershed Priority Lakes II. New practices to be included are wetland restoration, enhancement and creation. The partners are also seeking to work with the MPCA to implement a TMDL study for impaired waters in the watershed.

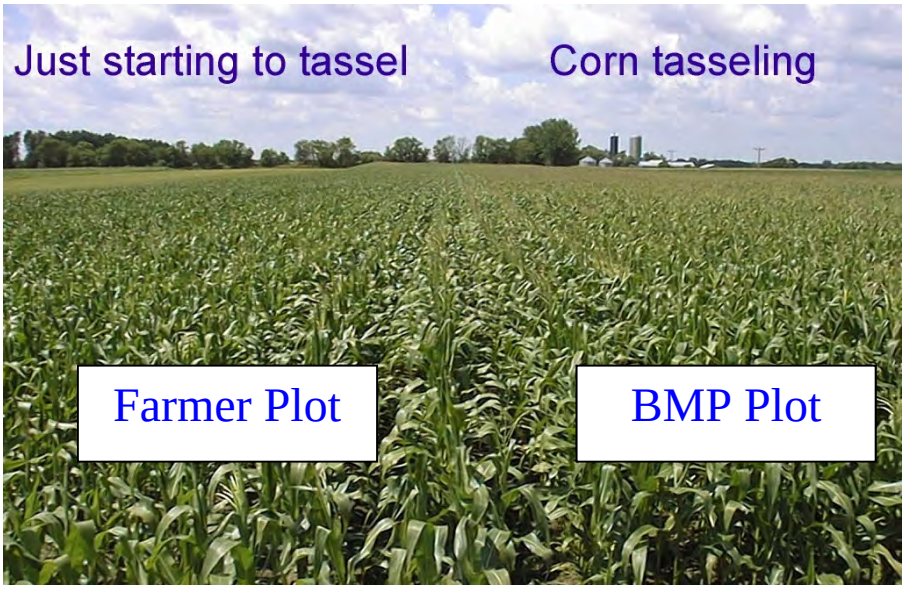
VII. Photos

Agricultural BMPs

An example of a gutter installed on a roof to divert clean water from flowing through the feedlot.

Chandler spreader purchased with 319 Grant funds applying manure to an AgBMP plot.

Calibrating the Chandler manure spreader.



A set of test plots during the growing season. Even though the reduction in applied nutrients in the BMP plot changed the timing of corn tasseling, yield was not affected.

Completing yield checks for the BMP and farmer test plots.

In the foreground, a filter strip recently seeded to trap sediments and nutrients from entering the wetland.

Residential and Urban Runoff BMPs

Stormwater runoff from Lake Orono Park to the lake.

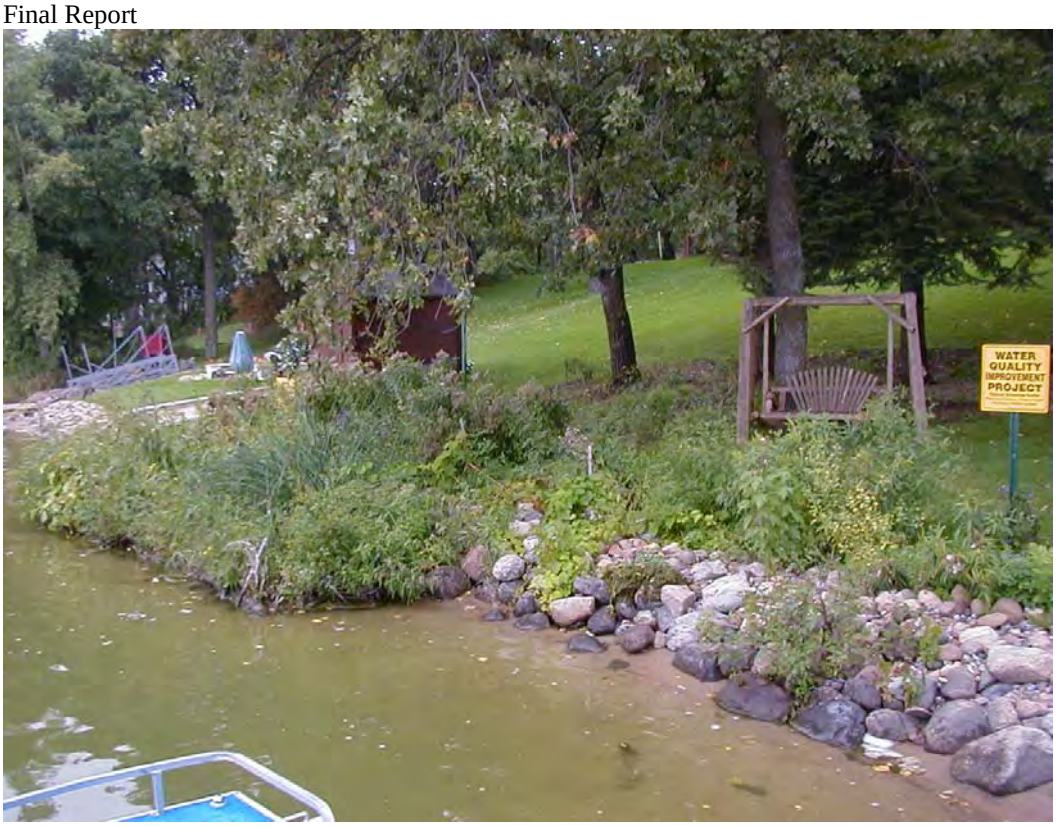
Lake Orono Park Rain Garden Construction

Lake Orono Park -
Completed Rain Garden

Filter strip installed at
Lake Orono Park
2006

Filter strip at Lake Orono Park in 2007

2005
Tom Koontz Shoreline, Briggs Lake – Before



2006
Tom Koontz
Shoreline, Briggs Lake – After installing shoreline buffer

USDA NRCS
Natural Resources
Conservation Service

B · E · N · T · O · N
SOIL & WATER
CONSERVATION DISTRICT

14 Second Avenue West
Foley, MN 56329

Phone: (320) 968-5300 Ext. 3
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Manure Management (Ag. BMP) Demonstration Plots

Similar to variety test plots, manure management plots are used to evaluate management strategies. A small strip of cropland in your field will be used to evaluate the U of M's nutrient recommendations for your crop, usually corn. The strip will receive manure and fertilizer according to U of M guidelines. You will decide how much manure and fertilizer to apply on adjacent land. You can apply at higher or lower rates. Yields are checked in the fall to determine if yields were affected by following the U of M recommendations. Although not required, we encourage you to keep track of any increases or decreases in your expenses within the plot so that cost/benefit analysis can be completed. This will help aid you in making your decision to adopt U of M recommendations in future years.

Below are some additional details about the manure management demonstration plot program.

- ✓ **Manure Management (Ag. BMP) Demonstration Plots** can be up to 5 acres in size. Plots can be planned for any area receiving manure and can be for any manure type (poultry, dairy, swine, etc.)
- ✓ **Mid-season leaf samples** will be collected and analyzed for nutrient content. This information when combined with yield results will help determine the effectiveness of the test plot. The analysis will be paid for by the grant for each set of plots.
- ✓ **Soil tests will be paid for** by the grant for each set of plots. The soil test will be for P, K, pH and organic matter. A second "high phosphorus" test may be completed for phosphorus tests which exceed 100 ppm.
- ✓ **Incentive Bonuses of $150 per plot** will be offered.
- ✓ **Manure testing will be paid for** through the grant. The manure will be tested for N, P and K.
- ✓ **Manure Spreader Calibrations** will be offered free of charge.
- ✓ **Signs may be posted** on those sites that are visible from roadways (with landowner permission) to promote and explain the plots.

(continued on the back)

Poultry Manure Spreader

A **Poultry Manure Spreader** has been purchased to provide an opportunity to spread poultry manure at agronomic rates. Past experience has shown that applying poultry manure at these low rates is not possible with most box spreaders currently being used. **Only farmers who are establishing test plots are eligible to use the manure spreader. When available**, we encourage farmers establishing plots to use the spreader on additional land however; priority will be given to individuals needing to spread within their test plot.

In order to cover on-going maintenance costs a fee will be assessed *each time* the spreader is used. The maintenance fee for up to ½ day use will be $100, or $200 per full day.

To reduce the risk spreading disease, the exterior surfaces of the spreader must be cleaned and sprayed with a disinfectant. A $100 deposit will be collected to ensure the spreader is cleaned and disinfected before it is returned to Foley Farm Supply. This will be refunded if the spreader is returned to Foley Farm Supply in satisfactory condition. Landowners assume all risk inherent with shared equipment.

The manure spreader is 22' long, holds approximately 8 tons of poultry manure, requires a 130+ hp tractor, 1000 rpm pto, and a 15 gallon/minute hydraulic pump volume. The spinners are operated with the hydraulic system and the apron is operated by pto. The spreader was purchased new in 2004 for $13,890.

Foley Farm Supply has offered to coordinate scheduling, maintenance and minor repair of the manure spreader. **Remember to thank them for their assistance** in providing you this opportunity to evaluate your manure management strategies. If you wish to try out the spreader, the first step is to contact the Benton SWCD to set up a test plot and determine application rates. After setting up the plot, you can schedule use of the spreader by contacting Todd Rothfork at Foley Farm Supply at (320) 968-7940. Their hours are 8:00 A.M. to 5:00 P.M. Monday through Friday and 8:00 A.M. to 12:00 P.M. Saturday. If you experience a breakdown, contact Todd also.

If you are interested in establishing a demonstration plot contact Gerry, Pat or Mike at the Benton SWCD / NRCS office at (320) 968-5300 extension 3.

Elk River Watershed Association – 319 Grant Test Plot Questionnaire

This questionnaire will be used to evaluate the effectiveness and usefulness of the nutrient/manure management test plots through the ERWA – 319 Grant. Please take a few moments to answer the questions below and return to the Benton SWCD in the provided envelope.

Please complete and return by Wednesday February 28, 2007.

- Overall, how effective was the program in helping you better utilize the nutrients from your livestock operation?
  III II IIII Ave. 4.1
  1 2 3 4 5
  Not Effective Very Effective

- How useful were the various components in the manure/nutrient management plans that you were provided:

  - Calibration of manure spreader equipment to determine actual application rates.
    III IIIIII Ave. 4.7
    1 2 3 4 5
    Not Useful Very Useful

  - Analysis of livestock manure to determine actual N, P, and K content.
    I II IIIIII Ave. 4.6
    1 2 3 4 5
    Not Useful Very Useful

  - Soil testing to determine pH, organic matter, and fertility levels of cropped fields.
    II IIIIIII Ave. 4.8
    1 2 3 4 5
    Not Useful Very Useful

  - Tissue analysis results that determined the nutrient content in the crops.
    II II III II Ave. 3.6
    1 2 3 4 5
    Not Useful Very Useful

  - Crediting of nitrogen from legumes (alfalfa, clover, and soybeans) in the rotation.
    I IIIII III Ave. 4.2
    1 2 3 4 5
    Not Useful Very Useful

  - Tables showing nutrients available the same crop year that manure is applied, as well as tables showing nitrogen (N) available the crop year following manure application.
    IIII IIIII Ave. 4.6
    1 2 3 4 5
    Not Useful Very Useful

  - Tables showing nitrogen (N) available the crop year following manure application.
    IIIIII III Ave. 4.3
    1 2 3 4 5
    Not Useful Very Useful

  - Field specific nutrient management plans that show the amount of N, P, and K available needed for the planned crop.
    I I IIIIIII Ave. 4.4
    1 2 3 4 5
    Not Useful Very Useful

- Were the forms and information that our office provided easy to understand?

III III III Ave. 4.0

1 2 3 4 5

Difficult Very Easy

- Did you use the Chandler manure spreader that was purchased by the Benton Soil and Water Conservation District? IIIII

IIII

Yes No

- If you answered "yes" to the question above, do you feel this was a worthwhile purchase by the District to assist landowners?

III I II Ave. 3.8

1 2 3 4 5

Not Worthwhile Very Worthwhile

- How knowledgeable was the office staff that worked with you? Were they able to completely explain the information provided to you?

IIII IIIII Ave. 4.6

1 2 3 4 5

Very Poor Very Good

- Was participating in the nutrient/manure management test plots worthwhile in regards to your time?

II IIIII Ave. 4.9

1 2 3 4 5

Not Worthwhile Very Worthwhile

- Would you recommend others participate in this program?

IIIIIIII

Yes No

Elk River Watershed Association – 319 Grant Test Plot Questionnaire Responses

As a result of the information that you gained through participation in this program, have you or do you expect to change your fertilizer use or methods of manure application?

- **If you answered "yes" to the above question, how will/did you change your fertilizer use or methods of manure application?** ***Example: I have reduced my manure application rate from 20 Tons/acre to 5 Tons/acre.***

  - *"We can more accurately apply our starter and nitrogen on our corn acres."*
  - *"I reduced my starter from 250 to 225."*
  - *"The information showed me the second year credit of the manure. And allowed me to cut back on the commercial fertilizer the second year also."*
  - *"Will reduce amount of bought nitrogen put on manured fields."*
  - *"I spread chicken waste on 3 times as much ground as I did before with the same amount of manure."*
  - *"I have begun to incorporate the manure as quickly as possible."*
  - *"Manure wasn't as strong as we thought."*
  - *"I have reduced my use of commercial fertilizer and gave more credit to manure fertilizer on corn and some beans."*

What changes, if any, would you suggest for conducting nutrient/manure management test plots?

- *"The program was run very well. I would not change the program too much."*
- *"The nutrient test or leaf samples were not conveyed to me as to how the plants were doing."*
- *"No changes."*
- *"More years of tissue analysis to get more accurate readings and information from analysis."*
- *"A better was of putting all the information together into a form to map a producers fields, so the producer could expand this to all his fields, and for years to come."*

Additional Comments:

- *"It was too dry for this to be accurate this last summer."*
- *"It showed me how to better manage the nutrients in the manure to get the most value from the manure and therefore save me money by using less commercial fertilizer."*
- *"This was very helpful, I tripled the amount of acreage with the same amount of chicken waste and didn't lose yield. Gerry Maciej was a big help – Thanks Gerry. He took the time to explain a lot of things. The test plot was very useful. I am very happy I did the test plot."*

The Elk River Watershed Association Sponsors Lake Friendly Projects

The Elk River Watershed Association, a water quality improvement partnership between Sherburne and Benton Counties, is working with property owners to install water quality projects on lakes and streams in the Elk River Watershed. The Association will provide cost share to residential property owners to install shoreland buffers of natural vegetation and rain gardens.

The Sherburne and Benton Soil and Water Conservation Districts provide staff for Association programs which are funded through State of Minnesota Grants and donations from private organizations. Since it was formed in 1994, the ERWSA has primarily focused on working with agricultural producers in the watershed. In recent years, the Association has added programs to address runoff from the growing developed areas in the watershed.

The Elk River Watershed comprises about 70% of the two counties and includes the Elk River, St. Francis River and smaller tributaries. Lakes within the watershed include the Briggs Lake Chain, Big Elk Lake, Big Eagle Lake, Big and Mitchell Lakes, Lake Orono, Lake Fremont, Little Elk Lake, Cantlin Lake, Ann Lake, Birch Lake and many smaller lakes.

The Association has provided cost share to establish natural shoreline buffers on the Briggs Lake Chain, Big Elk Lake and on Little Elk Lake. Studies have shown that storm water runoff from residential lakeshore lots can be 10 times higher than for undeveloped lakeshore resulting in a dramatic increase in pollutant loading to lakes and streams. The pollutants found in storm water include phosphorus and nitrogen which cause algae blooms in lakes. The increase in runoff is caused by hard surfaces such as rooftops, driveways and roads, compacted soils and removal of natural vegetation. A shoreline buffer consisting of a dense cover of native grasses, forbs and shrubs filters out much of the pollution in runoff. Soils with natural cover also tend to absorb more water because they have deeper root systems and they are not compacted.

Shoreline buffers will also create habitat for wildlife. Property owners who have installed buffers in recent years have reported seeing frogs, turtles, humming birds and butterflies that were not present when the cover consisted of only turf grass.

This buffer of natural vegetation on Rush Lake filters pollutants and provides habitat.

Rain gardens are gardens planted in a shallow depression and located where storm water will flow into them from roof tops, driveways, roads or parking lots. This reduces direct runoff to a lake or stream. Rain gardens are designed to allow most of the storm water to infiltrate into the soil. The plant roots increase the infiltration capacity of the soil and the soil and plants tie up phosphorus, nitrogen and other pollutants in storm water runoff. The rain garden depression is formed by excavating to a depth of about 6 inches to 1 foot. The excavated soil is used to build the soil up on the down slope side.

A large rain garden was installed at Lake Orono Park in Elk River to treat runoff from a road and parking area. However a rain garden suitable for a typical residential lot would measure about 10 feet by 30 feet or smaller in size. You don't have to own a lakeshore lot to benefit water quality by installing a rain garden. Most residential areas in cities are designed so that storm water runoff flows via curb and gutters to nearby lakes, streams or wetlands. If you want to determine whether installing a rain garden on your lot would benefit water quality, simply look at where your runoff water flows. If your street has curbing, runoff flows to a lake, stream or wetland. If you do not have curbing, determine whether the road ditches flow to nearby surface water. Newer developments usually have ponds to treat runoff. In this situation a rain garden would still be a good idea because the treatment ponds are not capable of treating all of the pollutants in storm water runoff.

A rain garden on Big Elk Lake installed to treat runoff from a road

If you would like more information about installing a shoreline buffer, a rain garden or cost sharing, call Sherburne Soil and Water Conservation District at (763) 241-1170 ext. 3. - Mark Basiletti, Sherburne Soil and Water Conservation District

Fertilize Your Lawn and Not the Lake

Many homeowners fertilize their lawn several times per season to ensure healthy and vigorous growth. In fact, healthy turf has environmental benefits. It reduces soil erosion and removes carbon dioxide, a “green house” gas from the atmosphere. The sandy soils so typical of Sherburne County tend to have low fertility so fertilizing will most likely be needed to maintain quality turf. However, when applying fertilizer be aware that you may be fertilizing more than your lawn.

Improper fertilizing methods and using the wrong blend can pollute nearby lakes and streams. The phosphorus found in fertilizers is the main problem for lakes and streams because it stimulates algae growth turning waters green in color. With increasing phosphorus levels, algae blooms are more frequent, fish habitat is degraded and the lake is undesirable for recreation.

To preserve the quality of our waters, use zero phosphorus fertilizer for your lawn. Soil testing shows that Sherburne County soils tend to be naturally high in phosphorus and there is more than enough to maintain turf grass. Research has also shown that the on-going application of phosphorus to soils that are high in phosphorus results in some of the excess running off to local lakes. The phosphorus applied to most turf is not needed to make the grass green but it will green up the lake by stimulating the growth of algae. If fact, it is the nitrogen part of fertilizer that greens up the lawn not phosphorus.

Any fertilizer which is spilled or inadvertently applied to driveways, streets or other non-turf surfaces will probably be flushed down a storm sewer to a nearby lake or river with the next rainfall. Avoid getting fertilizer on these surfaces and sweep up any that is spilled or spread on hard surfaces.

Moreover, using zero phosphorus fertilizer and cleaning up spills is the law. In 2005, a lawn fertilizer law went into effect for Minnesota which states that phosphorus cannot be applied to lawns unless a soil test shows that it is deficient in this nutrient. Exceptions are made for gardens, golf courses and for starting new turf. Every fertilizer bag has three numbers. The first number is nitrogen, the middle number is phosphorus and the last number is potassium. For lawns, the middle number should be zero. If you want to be sure you are using the right fertilizer, have your soil tested. The test will tell you how much nitrogen to apply and if any phosphorus is needed. Usually, no phosphorus will be recommended. Instructions for soil testing are available from Sherburne Soil and Water Conservation District. Stop by the District office or call (763) 241-1170 ext. 3 for more information on soil testing.

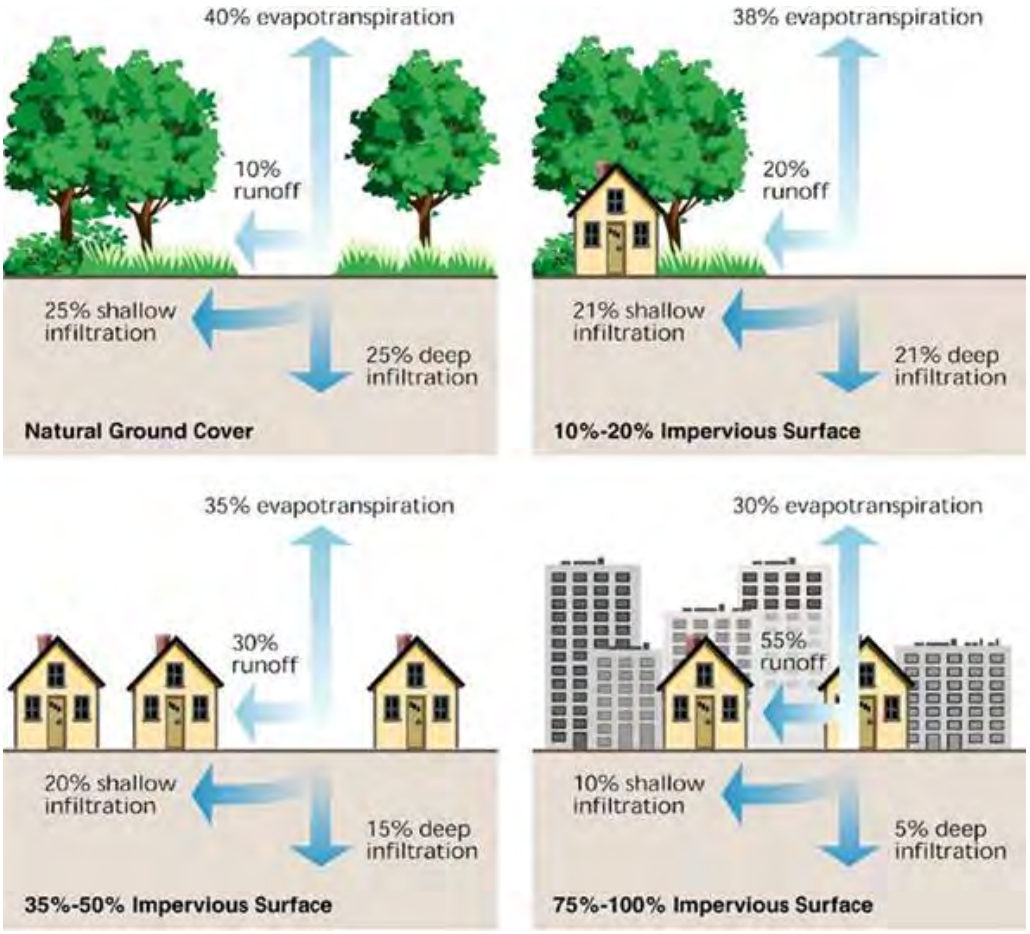

FERTILIZER → LAWN AND PAVEMENT → STORM SEWER → LAKES and RIVERS
Anything that enters a storm drain goes directly to a lake or river


22·0·15
Turf Food
Lawn Fertilizer
blended with
slow-release
nitrogen, sulfur
and iron!
22·0·15
For lawns, use zero phosphorus fertilizer.
The middle number is phosphorus.

Rain Gardens
A Water Quality Project for Residential Property Owners

Would you like to make a positive contribution to improving lakes and streams in Sherburne County? If so, installing a rain garden could make a difference. Rain gardens are established in a shallow depression where they can capture storm water runoff from hard surfaces such as roof tops, driveways and parking lots. They allow the runoff to seep slowly into the soil. Most importantly, rain gardens help protect and preserve nearby lakes, streams and wetlands by reducing the amount of runoff and filtering pollutants. Compared to a typical lawn, a rain garden allows about 30% more water to soak into the ground.

Why do we need features such as rain gardens in cities and residential areas? As land is developed and replaces forests and agricultural land, runoff increases dramatically due to covering soil with hard surfaces. Stormwater runoff from developed areas increases flooding and carries pollutants from streets, parking lots and even lawns into local streams, lakes and wetlands. The pollutants found in urban storm water runoff include fertilizer residue, sediment, oil and heavy metals. All of these are harmful to surface water. By reducing stormwater runoff, rain gardens can be a valuable part of changing these trends. While an individual rain garden may seem like a small thing, collectively they produce substantial neighborhood and community environmental benefits. The rain garden soil and plants filter these pollutants from the runoff as it percolates into the ground.



With natural ground cover, most rainfall infiltrates into the soil. After development, as much as 55% runs off to streams, lakes and wetlands.

You don't have to live directly on a stream or lake to have an impact on these water resources. For example, if you have curbing and storm water catch basins in your neighborhood, runoff from your property goes directly to a stream, lake or wetland and usually is not treated.

A common rain garden installation consists of a garden in a shallow depression located down gradient from a rain gutter downspout. A size of about 10 by 30 feet or smaller is usually adequate. The depression is formed by building up a low berm on the down gradient side with soil excavated to form the depression. The depth is usually not more than about 6

inches. Native plant species of grasses, wild flowers and shrubs are best because their deep root systems help promote infiltration and the plants take up nitrogen and phosphorus in the stormwater. A rain garden can be a formal landscaped garden with plants arranged in rows or it can be a small patch of native prairie depending on location and individual tastes. Rain gardens are designed to infiltrate water in a short period of time. They should not hold water for more than 48 hours following rainfall. When selecting a site for your rain garden do not choose a site where the soil tends to stay wet for longer periods of time because water will not infiltrate into the soil at these locations. Plants are selected which tolerate fluctuating soil moisture and ponding for short periods. If soils are sandy, infiltration in a short period of time should not be a problem. For most of Sherburne County, rain gardens should work very well on the existing soil. On soils with more clay content, it may be necessary to over excavate the basin and add about 2½ feet of a sand and compost mix for better infiltration or as an alternative the rain garden can be made larger on these types of soils.

Rain gardens are also being used by cities and businesses to treat runoff from parking lots and roadways. Some communities have funded projects to treat storm water runoff using rain gardens. In Burnsville, citizens were concerned about the impact of untreated stormwater on Crystal Lake. The city selected two similar streets, which drained to the lake to study the performance of rain gardens. First, they sampled the runoff from each street for two seasons. One street was then selected to install rain gardens. 85% of the homeowners decided to participate resulting in 17 rain gardens installed. Monitoring after installation showed a 90% reduction in pollution for the street with the rain gardens. In this example, some rain gardens were installed adjacent to the street and runoff from the street entered the garden at a dropped section in the curb.

A large rain garden is being installed at Lake Orono Park in Elk River. Runoff from park roads and parking lots flows directly into Lake Orono. The rain garden will capture part of this runoff. In addition, a vegetated swale, a second type of natural storm water treatment system, is being installed next to the boat ramp to filter runoff from hard surfaces at the north end of the park. The rain garden was excavated by the Elk River Parks and Recreation Department last summer and planted by the Soil and Water Conservation District working with volunteers from the Sherburne County Master Gardeners and Elk River Girl Scout Troop 290. The Elk River Watershed Association obtained a Minnesota Pollution Control Agency grant to fund the Lake Orono Park storm water project.

Volunteers plant the rain garden at Lake Orono Park

Lake Orono Park rain garden – the finished product

If you want to determine whether installing a rain garden on your lot would benefit water quality, simply look at where your water flows. If your street has curbing, runoff flows to a lake, stream or wetland. If you do not have curbing, determine whether the road ditches flow to nearby surface water. Newer developments usually have ponds to treat runoff. In this situation a rain garden would still be a good idea because the treatment ponds are not capable of treating all of the storm water runoff.

If you decide to install a rain garden, the information you will need is readily available. The Wisconsin Department of Natural Resources and University of Wisconsin Extension have published “Rain Gardens a How-to Manual for Homeowners” which has all of the information you would need to plan and install a project. This can be obtained on the internet at no cost at http://clean-water.uwex.edu/pubs/raingarden. If you don’t use the internet, call the Sherburne Soil and Water Conservation District at (763) 241-1170 ext. 3 and request a copy.

The Elk River Watershed Association is looking for sites to install storm water treatment projects such as rain gardens to demonstrate this technique in the watershed. Cost share is available to fund the selected projects. Residential, business or public land would be eligible. If you would like more information about this program, please call the Sherburne Soil and Water Conservation District at (763) 241-1170 ext. 3. - Mark Basiletti, Sherburne Soil and Water Conservation District

Rehabilitating Shorelines with Native Vegetation

Shoreline classes held this year by the Sherburne County Rural Living Task Force have resulted in three shoreline re-vegetation projects on Sherburne County lakes. The projects involved planting a buffer along the lakeshore consisting of plants native to this area. Vegetated buffers will enhance a lake's ecology and water quality by filtering pollutants from run-off, providing for wildlife habitat and protecting the shoreline from erosion.

Twenty shoreline property owners attended two class room sessions held in February and March. In June, class participants helped plant two shoreline re-vegetation demonstration sites. The workshop sites are located at the Dean and Stacey McDevitt residence on Little Elk Lake and at the Terry and Cindy Schwartz residence on Big Elk Lake. A third shoreline buffer located on Big Elk Lake is being installed by Barb Tucker. For those who would like to view these projects, signs will be installed at all three shoreline sites identifying them as water quality improvement projects. The Elk River Watershed Association, a partnership between Benton and Sherburne Counties, helped fund the installation of these demonstration sites through a grant from the Minnesota Pollution Control Agency.

The workshops were taught by Mary Blickenderfer, a University of Minnesota Extension Educator specializing in shoreline re-vegetation and aquatic plants. Mary has highlighted the Sherburne County workshops as being one of the most successful series of shoreline workshops she has taught pointing out that "citizen and agency participation has been very impressive".

The Elk River Watershed Association will continue to fund shoreline buffer demonstration sites through 2006. Plans call for the installation of about three sites per year on Sherburne County lakes.

The Rural Living Task Force consists of Sherburne Soil and Water Conservation District, Sherburne County Zoning, the City of Elk River, University of Minnesota Extension and the USDA-Natural Resources Conservation Service. If you would like information on planting native vegetation on your shoreline, call the Sherburne Soil and Water Conservation District at (763) 241-1170 ext. 3. - Mark Basiletti, Sherburne Soil and Water Conservation District

Workshop Participants Planting Native Plants

Elk River Watershed Association
Announces New Programs to Improve Water Quality

The Elk River Watershed Association (ERWA) has recently announced incentive programs to landowners who complete practices that improve water quality in the Elk River Watershed. Some of these programs may be enhanced by additional payments through the Conservation Reserve Program (CRP) that accompany the ERWA incentives. While several practices are eligible for this program, this week we look at Riparian Buffers.

Riparian Buffers

A Riparian Buffer is a strip of land located alongside streams, rivers, lakes and certain wetlands that is designed to protect water quality. Buffers may be up to 180 feet wide and are planted to trees and shrubs.
Buffers provide many benefits…

- The vegetation in buffers removes pollutants and sediment, resulting in cleaner, clearer streams
- Improved water quality as a result of livestock exclusion
- Streambanks are stabilized by trees, reducing erosion and helping to create a stable stream channel
- Fish habitat is improved and spawning areas are enhanced due to the shading and habitat provided by trees
- Travel corridors and habitat are created by establishing buffers

The Conservation Reserve Program (CRP) has been one of the most popular and effective conservation programs that the USDA administers. Through CRP, landowners enter into a 10 to 15 year contract and agree to establish cover which conserves our soil and water resources and provides habitat for wildlife. In return, the landowner receives cost-share for establishing the cover, annual rental payments and a one time signing bonus from the program.
Historically, landowners could only enroll in CRP during announced "sign-up" periods. Since September of 1996, however, landowners have been able to sign up any time during the year for certain high priority conservation practices through the "Continuous" Conservation Reserve Program (CCRP). Unlike other continuous CRP practices, Riparian Buffers are not restricted to cropland. Rather, they can be established on any type on land as long as that area is capable of supporting trees and shrubs.
Size Requirements: Minimum width is 35', maximum average width is 180'.
Exclusions: Livestock must be excluded for the life of the contract and haying is not allowed
Payment Rate: Flat rate of $52.60 per acre for non-cropland
Contract Length: Minimum of 10 years, maximum of 15 years
Signing Bonus: $100 to $150 per acre, depending upon contract length
Cost-Share: 90% cost-share provided by the program for establishing the practice (fencing may also be cost-shared).
Mid-Term Maintenance: Cost-share is available for Mid-term maintenance (thinning, replanting, etc.)

Additional ERWA Incentives

The ERWA programs can be added incentives to the Conservation Reserve Program (CRP) or can be installed without enrolling in CRP.
Riparian Buffers can be established in areas that meet the current CRP riparian buffer eligibility.
Cost-Share reimbursement for non-CRP riparian buffers will be up to 75%, not to exceed out of pocket expenses (cooperators will not be reimbursed for their labor or equipment). Cooperators in-kind expenses can be used as a 25% required match. Cost-Share cannot exceed established CRP rates. There is no cost-share for land enrolled in CRP.
Incentive Bonuses will be offered for establishing riparian buffers. Buffers enrolled into the CRP program will be eligible to receive a one time incentive bonus of $50 per acre. Areas not enrolled in the CRP program will be eligible to receive a one time incentive bonus of $100 per acre.
For more information, please contact our office at (320) 968-5300 Ext. 3. And watch for next week's article to find out what additional practices are eligible for these programs.

Elk River Watershed Association
Announces New Programs to Improve Water Quality

The Elk River Watershed Association (ERWA) is announcing incentive programs to landowners who complete practices that improve water quality in the Elk River Watershed. Some of these programs may be enhanced by additional payments through the Conservation Reserve Program (CRP) that accompany the ERWA incentives. Several practices are eligible for this program and during the next several weeks we will elaborate on each of them. This weeks article focuses on Filter Strips.

Filter Strips

A filter strip is an area of cropland adjacent to rivers, streams, ditches, lakes, or certain wetlands that is established to grasses and/or legumes. This area acts to physically separate the water from adjacent cropland. The grasses and/or legumes remove sediment and pollutants that would normally enter the water body. Not only do the filter strips act to improve water quality, but they can also provide excellent cover and nesting habitat for upland game birds.

The Conservation Reserve Program (CRP) has been one of the most popular and effective conservation programs that the USDA administers. Through CRP, landowners enter into a 10 to 15 year contract and agree to establish a conservation cover on the land, typically grasses. In return, the landowner receives cost-share for establishing the cover, annual rental payments and a one time signing bonus from the program. CRP Filter Strips can be designed to square up odd shaped fields or to cease farming of low areas that can be difficult to farm.

Historically landowners could only enroll during announced "sign-up" periods. Since September of 1996, however, landowners have been able to sign up anytime during the year for certain high priority conservation practices through the "Continuous" Conservation Reserve Program (CCRP).

Size Requirements: Minimum width is 20', maximum average width is 120'.
Payment Rate: 120% of the CRP prevailing cash rental rate ($35 - $53 per acre).
Contract Length: Minimum of 10 years, maximum of 15 years.
Signing Bonus: $100 to $150 per acre, depending upon contract length.
Cost-Share: 90% cost-share provided by the program for establishing the practice.
Mid-Term maintenance: Cost-share is available for Mid-term maintenance (mowing, burning, etc).

ERWA additional Incentives

The ERWA programs can be added incentives to the Conservation Reserve Program (CRP) or be installed without enrolling in CRP.

Filter Strips can be established in areas that meet the current CRP filter strip eligibility. Haying will be allowed in non-CRP filter strips until September 1.

Cost-Share reimbursement for non-CRP filter strips will be up to 75%, not to exceed out of pocket expenses (cooperators will not be reimbursed for their labor or equipment). Cooperators in-kind expenses can be used as a 25% required match. Cost-Share will not exceed established CRP rates. There is no cost-share for land enrolled in CRP

Incentive Bonuses will be offered for establishing filter strips. Filter strips enrolled into the CRP program will be eligible to receive a one time incentive bonus of $50 per acre. Filter strips that are not enrolled in the CRP program will be eligible to receive a one time incentive bonus of $100 per acre.

For more information, contact us at (320) 968-5300 Ext. 3. Watch for next week's article to find out what additional practices are eligible for these programs.

Elk River Watershed Association
Water Quality Program – Manure Management

This is the fourth in a series of articles that describes the new conservation program that is available to property owners in the Elk River Watershed who would like to help improve water quality. This new grant has been made available by the Elk River Watershed Association (ERWA) and the Minnesota Pollution Control Agency (MPCA). This week's article focuses on manure management.

This program will be similar to past programs where farmers plant small "test plots" in their field where the application rate of manure, timing of manure incorporation or fertilizer rates are varied. The purpose of this program is to demonstrate the effectiveness of the University of Minnesota fertilizer recommendations and manure/legume crediting at no risk to the producer, and reduce the amount of excess nutrients that may be applied to cropland. Two plots will be set up. In the first plot the landowner will follow the U of M recommendations for fertilizing their crop, giving proper credit for soil nutrient levels, manure applied, and the previous crops. The landowner will treat the second plot (the rest of the field) the same way he/she normally farms the field. Yields will be checked in the fall to determine the effectiveness of the U of M recommendations.

Program Highlights

- Our office will do the following:
  - Calibrate manure spreaders to determine the application rate of manure.
  - Collect and submit manure samples for N, P and K analysis.
  - Collect soil samples and submit for analysis for P, K, pH and organic matter.
  - Provide fertilizer/manure recommendations for the test plot.
  - Do yield checks at harvest to determine the effectiveness of U of M recommendations.

- All services and testing will be provided free of charge.

- Participants will be compensated for any reduction in yield in the test plot.

- All participants will receive $100 per test plot established

How can this program benefit you and the environment? Nearly 10 years of manure sampling, manure spreader calibrations and manure management planning at the Benton SWCD/NRCS have shown that in many cases, manure application rates or supplemental fertilizer rates exceed what is needed for the crop. Adjusting your management program may reduce the amount of fertilizer you need to purchase for the crop and often times reduces the amount of nutrients applied to cropland, which can improve water quality.

New Manure Spreader Available

We have also observed that many "box" type spreaders are not capable of spreading poultry manure at rates low enough meet crop nutrient needs. To overcome this problem, we will be using grant money to purchase a manure spreader that does an excellent job at spreading poultry litter at lower rates. We will be offering this spreader to those who are planting test plots with poultry manure. The spreader will be available in a few weeks.

This program offers you a chance to take a closer look at your manure and fertilizer management program on a small scale, requiring minimal time, no risk and no expense on your part. The small amount of time required for this program has provided many benefits to former participants including:

- Satisfaction of doing their part to protect water quality

- Better understanding of fertilizer and manure management
- Smaller fertilizer bills
- Sale of excess poultry manure
- Tools needed to comply with MPCA manure spreading regulations

The following is a quote from Rick Gilbertson, owner of Pro Ag Crop Consultants, Inc. Many of Rick's clients have planted test plots in the past. "Manure spreader calibration is the only way to know how much product you are applying to the land. This is the basis for determining commercial fertilizer reductions. I strongly encourage my clients to calibrate their spreaders for different manure types".
To participate in this program, contact the Benton SWCD at 968-5300 extension 3 or Sherburne SWCD at 763-241-1170 extension 3.

Elk River Watershed Association
Announces New Programs to Improve Water Quality

The Elk River Watershed Association (ERWA) is announcing incentive programs to landowners who complete practices that improve water quality in the Elk River Watershed. Some of these programs may be enhanced by additional payments through the Conservation Reserve Program (CRP) that accompany the ERWA incentives. Several practices are eligible for this program and during the next several weeks we will elaborate on each of them. This weeks article focuses on Marginal Pastureland Wetland Buffer.

Marginal Pastureland Wetland Buffer

The purpose of a Marginal Pastureland Wetland Buffer is to remove nutrients, sediment, organic matter, pesticides, and other pollutants from surface runoff and subsurface flow. This protects surface water and subsurface water quality while enhancing the ecosystem of the water body. The goal is to enhance water quality, reduced nutrient and pollutant levels, and improve wildlife habitat.

The Conservation Reserve Program (CRP) has been one of the most popular and effective conservation programs that the USDA administers. Through CRP, landowners enter into a 10 to 15 year contract and agree to establish a conservation cover on the land, typically grasses. In return, the landowner receives cost-share for establishing the cover, annual rental payments and a one time signing bonus from the program.

Historically landowners could only enroll during announced "sign-up" periods. Since September of 1996, however, landowners have been able to sign up any time during the year
for certain high priority conservation practices through the "Continuous" Conservation Reserve Program (CCRP).

Eligibility: The marginal pastureland offered must be currently or recently pastured and immediately adjacent and parallel to 1 of the following:

- Stream or ditch having perennial flow
- Seasonal stream or ditch

Size Requirements: Minimum width is 20', maximum average width is 120'
Payment Rate: $50.60 - $55.60 per acre
Contract Length: Minimum of 10 years, maximum of 15 years
Signing Bonus: $100 to $150 per acre, depending upon contract length
Cost-Share: 90% cost-share provided by the program for establishing the practice.
Mid-Term maintenance: Cost share is available for Mid-term maintenance

ERWA additional Incentives

The ERWA programs can be added incentives to the Conservation Reserve Program (CRP) or be installed without enrolling in CRP.

Marginal Pastureland Wetland Buffer can be established in areas that have been cropped or pastured within the last 5 years and meet the current CRP CP-30 eligibility.

Cost-Share reimbursement for non-CRP buffer strips will be up to 75%, not to exceed out of pocket expenses (cooperators will not be reimbursed for their labor or equipment). Cooperators in-kind expenses can be used as a 25% required match. Cost-Share will not exceed established CRP rates. There is no cost-share for land enrolled in CRP

Incentive Bonuses will be offered for establishing buffer strips. Buffer strips enrolled into the CRP program will be eligible to receive a one time incentive bonus of $50 per acre. Buffer strips that are not enrolled in the CRP program will be eligible to receive a one time incentive bonus of $100 per acre.

For more information, contact us at (320) 968-5300 Ext. 3. Watch for next weeks article to find out what additional practices are eligible for these programs.

Sponsored by the MPCA

Elk River Watershed Association
Water Quality Program – Feedlot Management

This is the last article in a series of articles that describes the new conservation program that is available to property owners in the Elk River Watershed who would like to help improve water quality. This new grant has been made available by the Elk River Watershed Association (ERWA) and the Minnesota Pollution Control Agency (MPCA). This week's article focuses on feedlot management.

Many landowners have environmental concerns about the runoff water leaving their feedlot.

- Diverting clean water away from a feedlot so that the feedlot is not "flushed" during a storm or spring snowmelt.
- Installing grass filter strips down slope from a feedlot to help remove nutrients, sediment and bacteria.
- Reducing the size of the feedlot.
- Installing buffer zones along streams, lakes and ditches.
- Relocating a feedlot to a less sensitive area.

We are looking for **voluntary** participation. We can often provided assistance with **no out of the pocket expense** to the landowner. We will work with you to determine which options will work best on your property. These options will be designed to meet both the environmental requirements and your needs at the same time.

For more information about Low Cost Feedlot and Pasture Options please contact Gerry at 968-5300 extension 3.

Program Highlights

- Our office will do the following:
  - Calibrate manure spreaders to determine the application rate of manure.
  - Collect and submit manure samples for N, P and K analysis.
  - Collect soil samples and submit for analysis for P, K, pH and organic matter.
  - Provide fertilizer/manure recommendations for the test plot.
  - Do yield checks at harvest to determine the effectiveness of U of M recommendations.
- All services and testing will be provided free of charge.
- Participants will be compensated for any reduction in yield in the test plot.
- All participants will receive $100 per test plot established

How can this program benefit you and the environment? Nearly 10 years of manure sampling, manure spreader calibrations and manure management planning at the Benton SWCD/NRCS have shown that in many cases, manure application rates or supplemental fertilizer rates exceed what is needed for the crop. Adjusting your management program may reduce the amount of fertilizer you need to purchase for the crop and often times reduces the amount of nutrients applied to cropland, which can improve water quality.

- Satisfaction of doing their part to protect water quality
- Better understanding of fertilizer and manure management
- Smaller fertilizer bills
- Sale of excess poultry manure
- Tools needed to comply with MPCA manure spreading regulations

The following is a quote from Rick Gilbertson, owner of Pro Ag Crop Consultants, Inc. Many of Rick's clients have planted test plots in the past. "Manure spreader calibration is the only way to know how much product

you are applying to the land. This is the basis for determining commercial fertilizer reductions. I strongly encourage my clients to calibrate their spreaders for different manure types".
To participate in this program, contact the Benton SWCD at 968-5300 extension 3 or Sherburne SWCD at 763-241-1170 extension 3.

2004 Manure Management Test Plots Results Are In

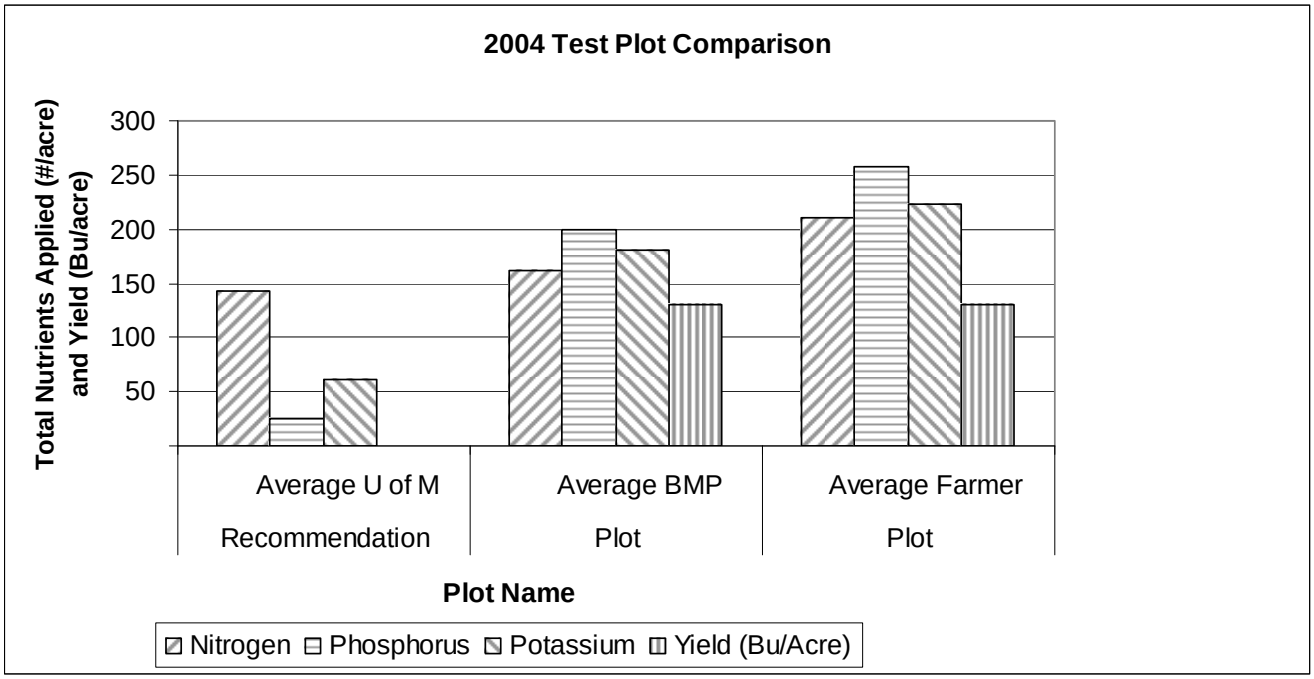
A number of farmers in Benton County planted manure management test plots this year to evaluate the effectiveness of the University of Minnesota's recommendations for applying manure and fertilizer on their farm. The plots are called Best Management Practice, or "BMP" plots because they represent the most economical and environmentally responsible way to manage crop nutrients. The program for establishing the BMP plots is available to farmers in the Elk River watershed through a grant from the Minnesota Pollution Control Agency. Here is how it works.

On a small test plot, the farmer applies manure and fertilizer based on U of M recommendations. The recommendations are based on realistic yield goals, previous year's crops, soil fertility and organic matter content, manure test results, and any manure that was applied within the last crop season. In most cases, the manure applied to the plot will provide excess phosphorus and potassium so the manure application rate is based on nitrogen.

On an adjacent plot, either more or less manure or fertilizer is applied. Most farmers choose to apply more. Yields are checked on both plots in the fall to determine the effectiveness of the recommendations.

Results from the test plots help farmers adjust their manure and fertilizer application rates. In most cases, manure and/or fertilizer can be applied at lower rates while maintaining yields. This results in spreading manure on more land and buying less fertilizer, and protects the environment by reducing the effects of over application, especially in sensitive areas.

The results from the plots are summarized on the graph below.



The left set of bars titled "Average U of M Recommendation" shows the average pounds of nitrogen, phosphorus and potassium that were recommended to be applied to the BMP plot with manure and/or fertilizer.

The center set of bars titled "Average BMP Plot" shows the average pounds of nitrogen, phosphorus and potassium that were applied to the BMP plot with manure and/or fertilizer.

The right set of bars titled "Average Farmer Plot" shows the average pounds of nitrogen, phosphorus and potassium that were applied to the comparison plot with manure and/or fertilizer.

The graph shows that the comparison plot received more nutrients than the BMP plot, by an average of 49 pounds of nitrogen, 57 pounds of phosphorus and 43 pounds of potassium. However, the average yield remained the same at 131 bushels per acre.

A number of the test plots evaluated poultry manure. In some cases the box spreader the farmer currently uses is not capable of spreading manure at the lower rate recommended in the BMP plot. In those cases, the farmers chose to use a Chandler manure spreader we purchased with grant dollars which is capable of spreading at the lower rate. Farmers who are establishing test plots often use the manure spreader on additional land as well.

We are now setting up more test plots for next year. Farmers interested in this program should contact Gerry or Pat at 968-5300 extension 3 for more information.

$5.21 Corn

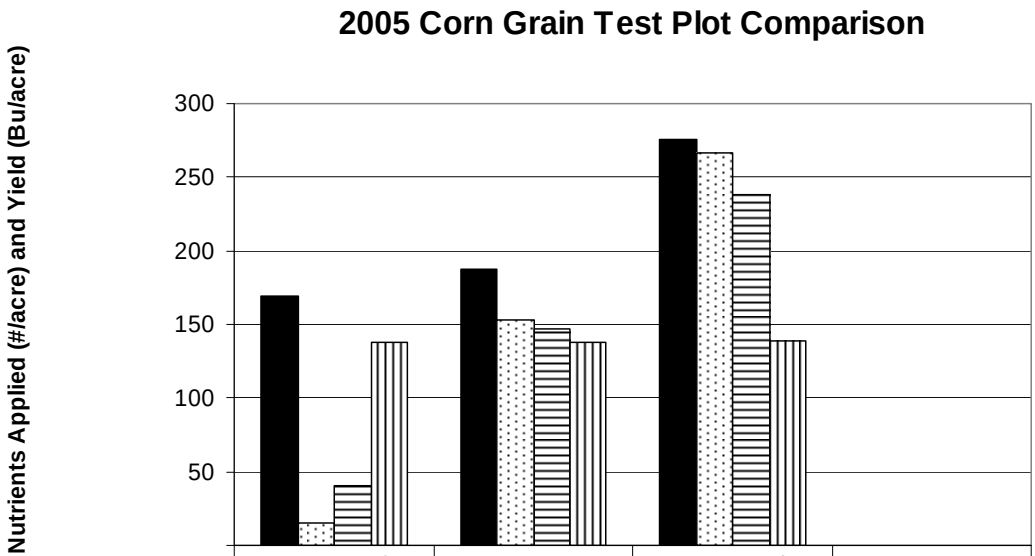
Several farmers in Benton County planted manure management test plots in 2005 to evaluate the effectiveness of the University of Minnesota's recommendations for applying manure and fertilizer on their farm. The plots are called Best Management Practice, or "BMP" plots because they represent the most economical and environmentally responsible way to manage crop nutrients. The program for establishing the BMP plots is available to farmers in the Elk River watershed through a grant from the Minnesota Pollution Control Agency. Here is how it works.

On a small test plot, the farmer applies manure and fertilizer based on U of M recommendations. The recommendations take into account realistic yield goals, the previous year's crop, soil fertility and organic matter content, manure test results, and previous manure applications. The manure application rate is based on nitrogen needs therefore in most cases, the manure applied to the plot will provide excess phosphorus and potassium.

On an adjacent plot, either more or less manure or fertilizer is applied. Most farmers choose to apply more. Yields are checked on both plots in the fall to evaluate the effectiveness of the U of M recommendations.

Results from the test plots help farmers adjust their manure and fertilizer application rates. In most cases, manure and/or fertilizer can be applied at lower rates while maintaining profitability. This results in spreading manure on more land and buying less fertilizer, which protects the environment by reducing the effects of over application, especially in sensitive areas.

The results from the corn grain BMP plots are summarized on the graph below.



	Average U of M Recommendation	Average BMP Plot	Ave. Comparison Plot	
■ Nitrogen	169	187	276	
□ Phosphorus	15	153	267	
▤ Potassium	40	147	238	
◫ Yield (Bu/Acre)	138	138	139	

The left set of bars titled "Average U of M Recommendation" shows the average pounds of nitrogen, phosphorus and potassium that were recommended to be applied to the BMP plot with manure and/or fertilizer, as well as the average yield goal the farmers were planning for. The center set of bars titled "Average BMP Plot" and right set of bars titled "Average Comparison Plot" shows the nutrients that were applied and yield results for the plots.

The graph shows that the comparison plot received more nutrients than the BMP plot, by an average of 89 pounds of nitrogen, 114 pounds of phosphorus and 91 pounds of potassium. However, the average yields only increased by 1 bushel per acre.

Even on the 9 corn grain plots that showed a yield increase, the additional yield was not justified with the additional expense. One way to evaluate the effectiveness of the U of M recommendations is to place a value on the additional nitrogen that was applied to the comparison plot. Based on October 31st 2005 nitrogen fertilizer prices ($0.38/pound), the average cost

to raise each additional bushel of corn in these comparison plots was $5.21. This does not include application costs for applying additional nitrogen nor does it place any value on the additional phosphorus or potassium in the manure.

A number of the test plots evaluated poultry manure. In some cases the box spreader the farmer currently uses is not capable of spreading manure at the lower rate recommended in the BMP plot. In those cases, the farmers chose to use a Chandler ® manure spreader that was purchased with grant dollars. The spreader is capable of spreading at the lower rate. Farmers who are establishing test plots often use the manure spreader on additional land as well.

We are now setting up more test plots for next year. Farmers interested in this program should contact Gerry at 968-5300 extension 3 for more information.

Reduce Production Costs with Test Plots

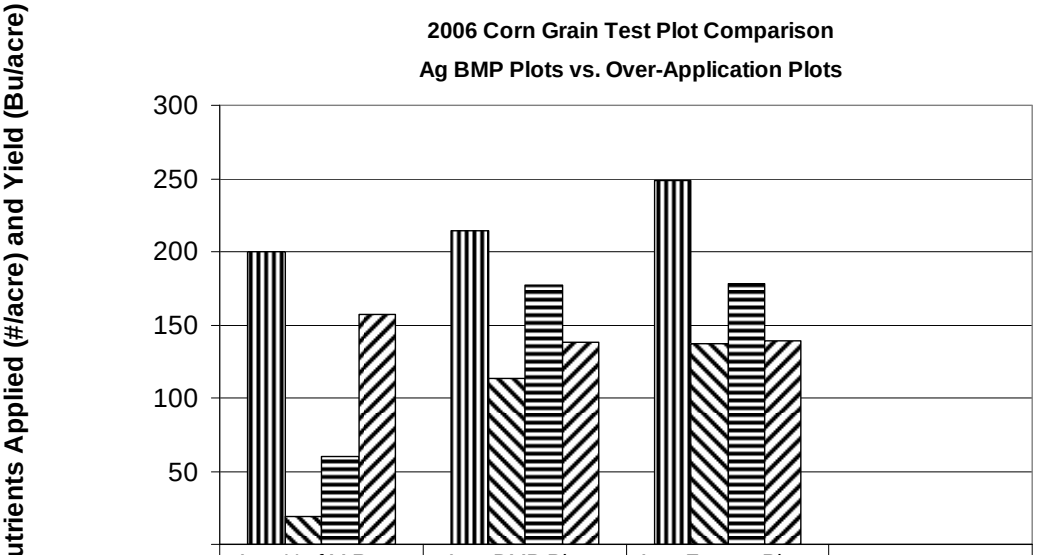
Several farmers in Benton County planted manure management test plots in 2006 and will again in 2007 to evaluate the effectiveness of the University of Minnesota's recommendations for applying manure and fertilizer on their farm. The plots are called Best Management Practice, or "BMP" plots because they represent the most economical and environmentally responsible way to manage crop nutrients. The program for establishing the BMP plots is now available to farmers in the entire county through grants from the Minnesota Pollution Control Agency and Board of Water and Soil Resources. Here is how it works.

On a small test plot, the farmer applies manure and fertilizer based on U of M recommendations. The recommendations take into account realistic yield goals, the previous year's crop, soil fertility and organic matter content, manure test results, and previous manure applications. The manure application rate is based on nitrogen needs therefore in most cases, the manure applied to the plot will provide excess phosphorus and potassium.

On an adjacent plot, either more or less manure or fertilizer is applied. Most farmers choose to apply more. Yields are checked on both plots in the fall to evaluate the effectiveness of the U of M recommendations.

Results from the test plots help farmers adjust their manure and fertilizer application rates. In most cases, manure and/or fertilizer can be applied at lower rates while maintaining profitability. This results in spreading manure on more land and buying less fertilizer, which protects the environment by reducing the effects of over application, especially in sensitive areas.

Some of the results from last years corn grain BMP plots are summarized on the graph below.



	Ave. U of M Rec.	Ave. BMP Plot	Ave. Farmer Plot	
Nitrogen	200	214	248	
Phosphorus	19	114	137	
Potassium	60	178	178	
Yield (Bu/Acre)	158	138	139	

The left set of bars titled "Average U of M Recommendation" shows the average pounds of nitrogen, phosphorus and potassium that were recommended to be applied to the BMP plot with manure and/or fertilizer, as well as the average yield goal the farmers were planning for. The center set of bars titled "Average BMP Plot" and right set of bars titled "Average Comparison Plot" shows the nutrients that were applied and yield results for the plots.

The graph shows that the comparison plot received more nutrients than the BMP plot, by an average of 34 pounds of nitrogen and 23 pounds of phosphorus. However, the average yields only increased by 1 bushel per acre.

The additional yield was not justified with the additional expense and environmental risk. One way to evaluate the effectiveness of the U of M recommendations is to place a value on the additional nitrogen that was applied to the comparison plot. If you were to place a nitrogen value of $0.38/pound, the average cost to raise each additional bushel of

corn in these comparison plots was $12.92. This does not include application costs for applying additional nitrogen nor does it place any value on the additional phosphorus.

A number of the test plots evaluated poultry manure. In some cases the box spreader the farmer currently uses is not capable of spreading manure at the lower rate recommended in the BMP plot. In those cases, the farmers chose to use a Chandler ® manure spreader that was purchased with grant dollars. The spreader is capable of spreading at the lower rate. Farmers who are establishing test plots often use the manure spreader on additional land as well.

We are now setting up more test plots for next year. Farmers interested in this program should contact Mike or Gerry at 968-5300 extension 3 for more information.

Poultry Manure Spreader

A **Poultry Manure Spreader** has been purchased to provide an opportunity to spread poultry manure at agronomic rates. We are partnering with Foley Farm Supply to coordinate scheduling and maintenance of the spreader. Past experience has shown that applying poultry manure at these low rates is not possible with most box spreaders currently being used. Farmers who are establishing test plots are encouraged to use the manure spreader on their plots if their existing equipment can not spread at low enough rates. When available, we encourage farmers establishing plots to use the spreader on additional land however; priority will be given to individuals needing to spread within their test plot.

Tired of Farming Those Wet Spots?

Do you farm low ground along a ditch or stream that is always too wet to plant in the spring or harvest in the fall? Why not plant a filter strip to make your land easier to farm and improve water quality at the same time? Elk River Watershed landowners are eligible to receive additional assistance to establish filters through a grant made available from the MPCA. When combined with the CRP program the assistance includes:

- Up to $200 per acre signing bonus
- Up to 90% cost share for planting the grasses
- Annual rent payments for up to 15 years

For more information about this program contact the Benton or Sherburne SWCD.