

SECTION 319 NONPOINT SOURCE POLLUTION CONTROL PROGRAM
WATERSHED PROJECT FINAL REPORT

Firesteel Creek / Lake Mitchell Watershed Project – Segment 2

Sponsor

Davison Conservation District

David Kringen

September 2010



This project was conducted in cooperation with the State of South Dakota and the United States Environmental Protection Agency, Region 8

Grant # C-998185-07 and C-998185-08

EXECUTIVE SUMMARY

PROJECT TITLE: Firesteel Creek / Lake Mitchell Watershed Project – Segment 2

SECTION 319 GRANT NUMBERS: 9998185-07 and 9998185-08

PROJECT START DATE: 11 Sep 2007

PROJECT COMPLETION DATE: 30 Jun 2010

FUNDING:

Funding Sources	<u>Original</u>	<u>Additional Amended</u>	<u>Actual Expenditures</u>
EPA Grant 07	\$250,000		\$220,675.16
EPA Grant 08		\$150,000	\$0.00
State (GF&P/SDRCF/SDSU)	\$8,250		\$0.00
Other Federal	\$136,510	\$126,000	\$76,347.00
Local	\$199,694	\$100,001	\$141,852.36
Total:	\$594,454	\$376,001	\$438,874.52

SUMMARY OF ACCOMPLISHMENTS

The Firesteel Creek / Lake Mitchell Watershed Project – Segment 2 is the continuation of a previous implementation project (Segment 1) whose overall long-term goal is to:

Reduce the nutrient (phosphorus) and sediment loading into Lake Mitchell by 50 percent by the year 2015 in order to restore water quality to a level that supports its priority use as a domestic water supply, and other multiple uses.

The Davison Conservation District sponsored the implementation project with partnership from the City of Mitchell, Aurora, and Jerauld Conservation Districts. The initial Segment 2 project grant became effective May 15, 2007. With amendments and additional funding, the project continued until June 30, 2010. The objectives of this project segment (summarized) were:

1. Implement Best Management Practices in the Firesteel Creek watershed to reduce phosphorus loading by an additional 4 percent, and sediment loading by an additional 2 percent to Lake Mitchell.
2. Provide information to a minimum of 250 watershed landowners and 30,000 area citizens about project activities, progress, and goals for water quality to gather local support and input, and to increase the implementation of BMPs by landowners.
3. Monitor and document project accomplishments, finances, and milestone progress to provide information needed to manage and administer the project in a manner that will result in reaching project objectives and attaining the project goal.

BMPs installed under Objective 1 included animal waste storage facilities (AWSF), rotational grazing, riparian management, seeding of perennial vegetation on cropland, wetland restoration, grassed waterways, filter strips, and shoreline stabilization.

Information and education activities under Objective 2 included newsletters, newspaper articles, tours, mailings, and project updates and presentations. Several of these items can be found in Exhibit B of this report.

For Objective 3, project progress and expenses were documented using the on-line SD NPS Project Management System (or BMP Expense Tracker). Grants Reporting & Tracking System (GRTS) reports were completed either on an annual or semi-annual basis showing target/milestone progress and project status.

Table 11 lists all the milestones set for the project and the amount achieved. Most goals set for the project were met or exceeded.

Based on the STEPL computer-modeled nutrient reduction estimates, a phosphorus reduction of 13,296.3 lbs/yr (6.6 tons/yr) were realized from project activities implemented through June 2010. Nitrogen and sediment reductions were estimated at 57,505.4 lbs/yr (28.8 tons/yr) and 630.8 tons/yr respectively. The N and P load reductions were accomplished by focusing primarily on improvements to priority feeding operations along the main branches of Firesteel Creek, while the sediment reductions came primarily from grazing improvements, riparian management, and seeding cropland to perennial vegetation. Because the STEPL estimates are on-site reductions and not necessarily delivered reductions, it is difficult to estimate a percent reduction delivered to Lake Mitchell from Best Management Practice (BMP) installation. Future water quality sampling and/or an update to the AGNPS computer model may help determine if designated beneficial uses and water quality targets are being met.

During the spring of 2010, it was decided to roll the existing, stand-alone Firesteel Watershed Project into the larger Lower James River Implementation Project, sponsored by the James River Water Development District. A resolution dated June 2010 was submitted by the Davison Conservation District de-obligating the remaining balance of 319 funds in the amount of \$179,278.41 from the Segment 2 budget, which was then transferred to the Lower James Project. BMP implementation will continue in the Firesteel Creek/Lake Mitchell watershed through the Lower James project.

ACKNOWLEDGEMENTS

The Firesteel Lake Mitchell Project would like to thank all those involved with this segment of the implementation of practices recommended from the 1993 Firesteel Creek/ Lake Mitchell Water Quality Assessment. The efforts of all those involved from the following organizations are greatly appreciated and have been essential to the success of this project.

Davison Conservation District

Aurora Conservation District

Jerauld Conservation District

City of Mitchell

Local area farmers, ranchers, and landowners

United States Environmental Protection Agency (EPA)

South Dakota Department of Environment and Natural Resources (DENR)

United States Department of Agriculture Natural Resources Conservation Service (NRCS)

James River Water Development District (JRWDD)

Lower James Resource Conservation & Development Council

Lake Mitchell Development Committee

United States Department of Agriculture Farm Service Agency (FSA)

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INTRODUCTION

Lake Mitchell is a man-made reservoir located on Firesteel Creek in the James River Basin geological subdivision of the glaciated Central Lowland Province in southeastern South Dakota (HU 10160011 + 100). Lake Mitchell has served as the sole source of drinking water for the city of Mitchell since 1928 and the Davison Rural Water System since 1985. The lake is also a hub for recreational activity for area residents. The approximately 351,000 acre Firesteel Creek watershed is located in Davison, Aurora, and Jerauld counties (Figure 1). Landuse in the watershed reflects the diversified agriculture of the region; with 42 percent of the land classified as rangeland, 36 percent cropland, 17 percent pastureland, and 5 percent other.

Firesteel Creek is divided into two main tributaries. The east fork begins north of Wessington Springs and travels south until it reaches the confluence of the west fork. The west fork begins in the Wessington Springs Hills northwest of Plankinton and travels east until it reaches the confluence with the east fork in Blendon Township in northwest Davison Country. Firesteel Creek, from the lake to the confluence of the east and west forks, is designated as a permanent warm water fishery with limited contact recreational usage. The east fork from the east-west confluence to state highway 34 is assigned the water quality standards for a semipermanent fishery and limited contact recreation. The beneficial uses designated for the west fork from the east-west confluence to Lake Wilmarth is a marginal warmwater fishery with limited contact recreation (Figure 2). Table 1 lists the water quality parameters and limits assigned for the designations indicated.

Table 1. South Dakota water quality standards for specific stream segments.

Designation	Parameter	Limits
Permanent warmwater fishery and limited contact recreation	unionized ammonia	< 0.04 mg/L
	dissolved oxygen	> 5.0
	pH	> 6.5 and < 9.0 su
	suspended solids	< 90 mg/L
	temperature	< 26.67° C
	fecal coliform*	< 2000 / 100 ml
	alkalinity	< 750 mg/L
Semipermanent warmwater fishery and limited contact recreation	nitrates	< 50 mg/L
	unionized ammonia	< 0.04 mg/L
	dissolved oxygen	> 5.0
	pH	> 6.5 and < 9.0 su
	suspended solids	< 90 mg/L
	temperature	< 32.22° C
	fecal coliform*	< 2000 / 100 ml
Marginal warmwater fishery and limited contact recreation	alkalinity	< 750 mg/L
	nitrates	< 50 mg/L
	unionized ammonia	< 0.05 mg/L
	dissolved oxygen	> 4.0
	pH	> 6.0 and < 9.0 su
	suspended solids	< 150 mg/L
	temperature	< 32.22° C
	fecal coliform*	< 2000 / 100 ml
	alkalinity	< 750 mg/L
	nitrates	< 50 mg/L

*grab sample

During 1992, Mitchell city officials contacted the Department of Environment and Natural Resources (DENR) regarding concerns of declining water quality in Lake Mitchell. Continuous taste and odor problems with drinking water and excessive annual algae blooms were among the primary concerns commonly expressed by city residents, lake-shore property owners, and recreational users. DENR initiated a watershed assessment study (1993) under the Nonpoint Source (NPS) management program to identify, prioritize, and present alternatives to correct potential NPS pollution in the watershed. The watershed assessment study was completed during 1996 and a comprehensive final report (Phase I Lake Mitchell/Firesteel Creek Diagnostic Feasibility Study) was finalized during 1997. The report

recommended an 11% reduction in chlorophyll-*a* (algae biomass) through a 50% reduction in total phosphorus loading from Firesteel Creek. Phosphorus reduction potential was based on Agricultural Nonpoint Source (AGNPS) land use modeling. The study ultimately focused on improving the trophic state of Lake Mitchell.

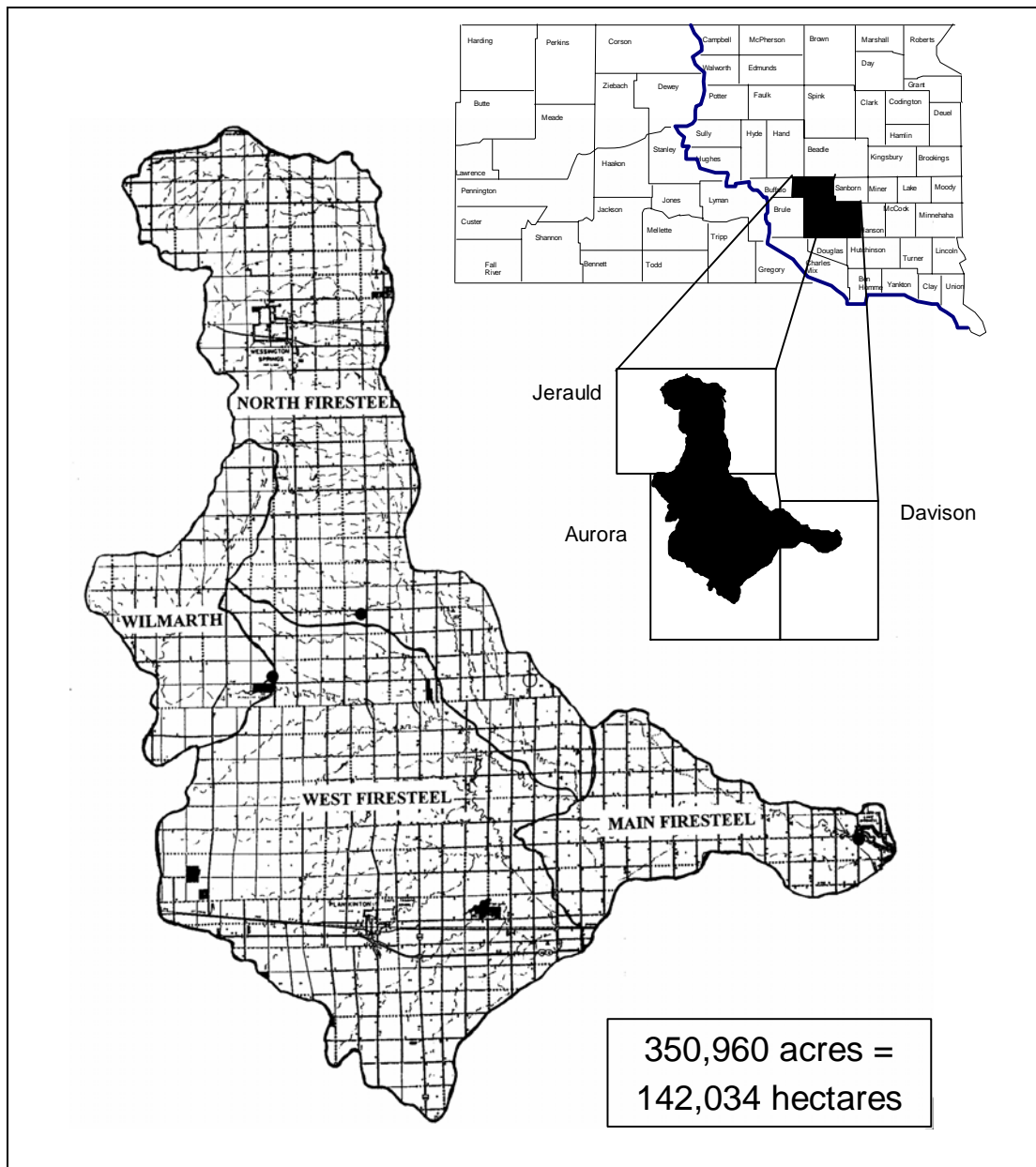


Figure 1: Firesteel Creek Watershed.

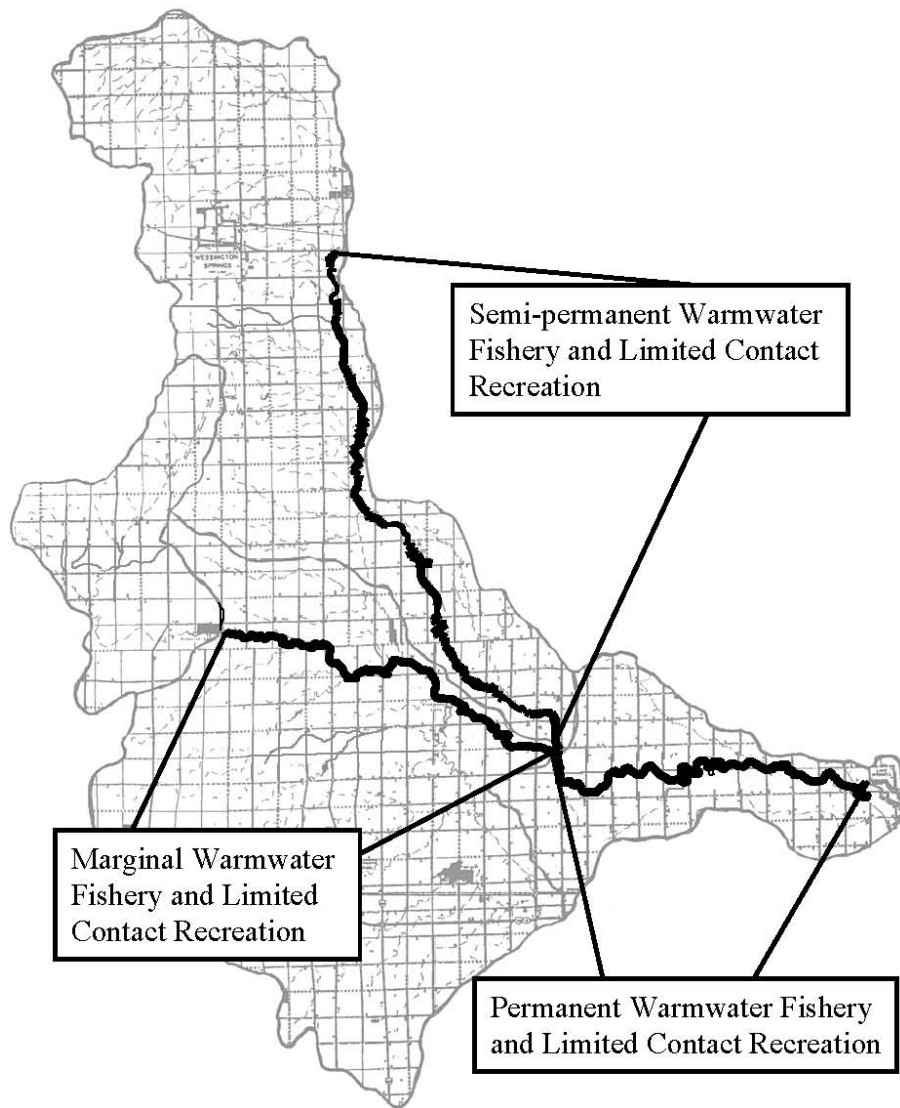
DENR prepared the first impaired waterbodies list in 1998 to satisfy biennial requirements of section 303(d) of the federal Clean Water Act. All impaired waterbodies require Total Maximum Daily Load (TMDL) development. Lake Mitchell and Firesteel Creek were considered impaired for nutrients prior to the 1998 listing cycle. EPA Region 8 granted DENR special TMDL approval for the nutrient impairment based on content during the 1997 watershed assessment final report. DENR relied on the average Trophic State Index (TSI) value of assessed

lakes to make impairment decisions for the 1998 listing cycle. Lake Mitchell exceeded the TSI criteria and the beneficial uses were considered non-supporting though the lake was not placed on the 1998 303(d) list based on prior special approval for nutrients.

DENR continued to generate a 303(d) list of impaired waterbodies on a biennial schedule. During 2004, DENR combined the 303(d) list of impaired waterbodies with the 305(b) Surface Water Quality Assessment into an Integrated Report (IR). The warmwater permanent fish life beneficial use assigned to Lake Mitchell continued to have a non-support status for Trophic State Index (TSI) until the 2008 reporting cycle. The 2008 IR and 2010 IR placed Lake Mitchell in full support of all designated beneficial uses.

The assessed segment of Firesteel Creek includes the West Fork of Firesteel Creek to the Mouth of the James River. This segment of Firesteel Creek was also given special approval for nutrients prior to the 1998 listing cycle. Firesteel Creek was intended to be listed as impaired for Total Dissolved Solids (TDS) and water temperature in the 2004 IR. However, both parameters were mistakenly linked to the special approval nutrients TMDL and appeared as impaired with an approved TMDL. This was corrected in the 2006 IR and Firesteel Creek remained on the impaired waterbodies list for TDS and water temperature through the 2008 reporting cycle. Firesteel Creek was delisted for temperature in the 2010 IR based on compliance of new data in accordance with the listing methodology. The 2010 IR listed the segment of Firesteel Creek as impaired for TDS and *E.Coli* bacteria.

Figure 2. Firesteel Creek beneficial use locations.



Assessment project water quality sample results and computer modeling indicated that although the sediment loading was low compared to other eastern South Dakota watersheds, nutrient (phosphorus) concentrations were high. Analysis of the results indicated that the most likely sources of the nutrient loading were animal feeding operations (AFOs) and/or intense summer long grazing. The impact of grazing was difficult to quantify. AFOs were estimated to contribute 51 percent of the soluble phosphorus (P) load in the watershed. The AGNPS reduction response model estimated that a 50 percent reduction in P inputs would reduce in-lake phosphorus by 17 percent and decrease chlorophyll *a* concentrations sufficient to reduce the TSI for chlorophyll-*a* to a mesotrophic level (Phase I Final Report).

It was recommended that AFOs with an AGNPS non-corrected rating of > 30 or a distance corrected rating > 20 be targeted for treatment. Of the 241 animal feeding operations assessed,

116 were identified as having a non-corrected AGNPS ranking > 30; 155 feeding operations a distance corrected AGNPS ranking of > 20 (Table 2.). Computer simulations indicated that if the potential runoff from the 37 feedlots with a non-distance ranking of > 50 were addressed; the soluble P concentrations delivered to Lake Mitchell would be reduced by approximately 37 percent.

Table 2. AGNPS rating for animal feeding operations (AFOs).

Rating	Non-distance corrected	Distance corrected
91 - 100	0	0
81 - 90	0	0
71 - 80	6	1
61 - 70	7	1
51 - 60	24	0
41 - 50	36	4
31 - 40	43	26
21 - 30	48	51
11 - 20	37	72
0 - 10	40	86
TOTALS	241	241

AGNPS rank 81 - 100 = extremely critical

AGNPS rank 61 - 80 = very critical

AGNPS rank 41 - 60 = critical

AGNPS rank 21 - 40 = possibly critical

AGNPS rank 0 - 20 = not critical

The Firesteel Creek Watershed Project is the result of recommendations made by the diagnostic/feasibility study. Funding for project activities was made possible, in part, by grants awarded by the United States Environmental Protection Agency to the South Dakota Department of Environment and Natural Resources. A \$250,000 EPA 319 grant was awarded during September 2007 to continue efforts began in Segment 1 designed to reduce nutrient loading to Lake Mitchell. A \$150,000 amendment to the grant was awarded in May 2008 to partially fund the Firesteel Creek Riparian Area Management (RAM) program designed to provide landowners an incentive to establish buffer strips along Firesteel Creek in order to improve the water quality of Lake Mitchell.

PROJECT GOALS, OBJECTIVES, AND ACCOMPLISHMENTS

The goal of the implementation project is reduce the nutrient (phosphorus) and sediment loading into Lake Mitchell by 50 percent by the year 2015 in order to restore water quality to a level that supports its priority use as a domestic water supply, and other multiple uses. Objectives to reach this goal include:

Objective 1. Implement Best Management Practices in the Firesteel Creek watershed to reduce phosphorus loading by an additional 4 percent, and sediment loading by an additional 2 percent to Lake Mitchell.

Task 1. Design and construct livestock nutrient management BMPs – animal waste storage facilities (AWSF) and nutrient management plans (NMP).

Product 1. Animal Waste Storage Facilities: 3 units planned

Accomplishment: During the Segment 2 project period, 3 AWSF were installed at priority feeding operation sites previously identified in the assessment study. Two of the facilities are located in Jerauld County and one in Davison County. Two of the facilities were constructed using USDA Environmental Quality Incentives Program (EQIP) funds, while the third was cost shared using EPA 319 dollars. All AWSF were conventional systems designed with sediment basins and evaporation ponds to contain 100 percent of the feedlot runoff. All systems were designed and certified by NRCS engineering staff.

Table 3. Product 1 nutrient load reduction estimates.

Type of Operation	Year Built	Animal Units	Days of Confinement	N Reduction (lbs/yr)	P Reduction (lbs/yr)
Beef	FY08	1000	365	17,336.5	3900.7
Beef	FY09	999	365	14,736.0	3315.6
Beef	FY10	999	365	17,336.5	3900.7
TOTALS		2,998		49,409.0	11,117.0

Nutrient reduction estimates from STEPL: Spreadsheet Tool for the Estimation of Pollutant Load v. 4.0

During the Segment 2 project period, 5 nutrient management plans (NMP) were planned of which 3 were also applied. All nutrient management plans were written by the NRCS Agricultural Nutrient Management Team.

Task 2. Plan and install grassland management systems

Product 2. Rotational Grazing Systems: 2000 acres planned

Accomplishment: A total of 1,946 acres of pastureland/rangeland were reported as improved within the watershed boundary during the project period through the NRCS EQIP program. Improved acres are reported using the term “prescribed grazing” which is generally defined as a rotational grazing system which ensures that livestock forage demand is balanced with forage supply, has planned periods of growing season rest within grazing units, and season-of-use is alternated between years.

Table 4. Product 2 nutrient load reduction estimates.

Product	Acres Planned	Acres Completed	N Reduction (lbs/yr)	P Reduction (lbs/yr)	Sediment Reduction (tons/yr)
Rotational Grazing	2000	1946	2575.0	342.9	151.0

Nutrient reduction estimates from STEPL: Spreadsheet Tool for the Estimation of Pollutant Load v. 4.0

Product 3. Riparian Management (Amended Product): 475 acres planned

The Firesteel Creek Riparian Area Management (RAM) Program began as an amendment to the Segment 2 grant agreement to provide landowners an incentive to establish buffer strips along Firesteel Creek in order to improve the water quality of Lake Mitchell. The initiative was intended to complement the USDA Continuous CRP buffer program by making it possible to enroll areas into the RAM program beyond the maximum average width that CRP offers, or other areas that may not be eligible for CRP. It was thought that enrolling these additional acres would give the landowner more flexibility to square up a buffer on crop ground or make it easier to fence off a riparian area in a pasture. Fifteen year lease agreements or longer-term conservation easements were available to landowners along the main stems of Firesteel Creek. Funding for the RAM program came from an amendment to the EPA 319 grant awarded in FY08 as well as local funding from the City of Mitchell, the James River Water Development District, and the Lower James Resource Conservation and Development Conservation Innovation Grant.

Accomplishment: Three (3) lease agreements and one (1) permanent easement were signed under the Firesteel RAM program. Each lease contains both Continuous CRP CP30 (Marginal Pastureland Wetland Buffer) and RAM acres. RAM lease agreements coincide with the effective date of the Continuous CRP contract. All signed lease agreements are within the first 5 miles of the Lake Mitchell inlet in Davison County.

Table 5. Riparian Area Management (RAM) contracts during Segment 2 project period.

	Lease 1	Lease 2	Lease 3	TOTALS
Contract Length	10/1/08 – 9/30/23	10/1/08 – 9/30/18	12/1/08 – 9/30/23	
RAM acres	138.7	75.8	29.1	243.6
CP30 acres	52.8	19.2	4.8	76.8
TOTALS	191.5	95.0	33.9	320.4
Livestock Exclusion	100 cow/calf pairs	45 c/c pairs	30 c/c pairs	

Lease #2 is a 10-year contract instead of a 15-year as stipulated under the original RAM program guidelines. Because of this, only local dollars were used for the RAM acres.

A permanent easement was purchased during December 2008 for land along the east fork of Firesteel Creek in Aurora County under the authorization of the RAM program using EPA 319 and City of Mitchell funds. The 28.8 acre tract along crop ground was seeded to grass in the spring of 2009 which is to be maintained for the life of the easement. The easement is held by Northern Prairies Land Trust of Sioux Falls, SD.

Table 6. Product 3 nutrient load reduction estimates.

Product	Acres Planned	Acres Completed	N Reduction (lbs/yr)	P Reduction (lbs/yr)	Sediment Reduction (tons/yr)
Riparian Management	475	349.2	1273.4	881.2	30.5

Nutrient reduction estimates from STEPL: Spreadsheet Tool for the Estimation of Pollutant Load v. 4.0

Task 3. Implement BMPs on 200 acres of cropland through the establishment of perennial vegetation, restoration of wetlands, and the installation of filter strips and grassed waterways to reduce sediment loads. No project funds were used for this task of the project. All accomplishments were in conjunction with other programs. There was great participation with these programs; the goals achieved are listed in the following tables for product 4 through product 6.

Product 4. Seeding of cropland to perennial vegetation: 50 acres planned

Accomplishment: Continuous CRP CP37 (Duck Nesting Habitat) and CP38 (SAFE Wildlife Habitat for Pheasants) are relatively new practices that began in FY07 and FY08 respectively. The CP37 practice is used to enhance duck nesting habitat on the most duck productive areas of the state while CP38 can be used with other corresponding practices to seed areas (minimum of 20 acres) to grass, forbs, and legumes best suited for pheasant cover.

Table 7. Product 4 nutrient load reduction estimates.

Product	Acres enrolled	N Reduction (lbs/yr)	P Reduction (lbs/yr)	Sediment Reduction (tons/yr)
CP2 (Est. of Native Grasses)	6.0	28.5	9.2	5.7
CP28 (FWP – buffer)	51.5	192.0	53.5	30.2
CP37 (Duck Nesting Habitat)	172.8	701.5	218.8	127.5
CP38 (SAFE Wildlife Habitat for Pheasants)	140.2	565.4	176.0	102.3
TOTALS	370.5	1487.4	457.5	265.7

Nutrient reduction estimates from STEPL: Spreadsheet Tool for the Estimation of Pollutant Load v. 4.0

Product 5. Wetland Restoration: 10 wetlands for a total of 50 acres planned

Table 8. Product 5 activities.

Product	Acres enrolled	N Reduction (lbs/yr)	P Reduction (lbs/yr)	Sediment Reduction (tons/yr)
CP23/23A (Wetland Restoration)	77.7	NA	NA	NA
CP27 (FWP – Cropped Wetland)	23.4	NA	NA	NA
TOTALS	101.1			

Product 6. Filter strips and grassed waterways: 100 acres of filter strips planned
1000 LF of grassed waterways planned

Table 9. Product 6 nutrient load reduction estimates.

Product	Acres enrolled	N Reduction (lbs/yr)	P Reduction (lbs/yr)	Sediment Reduction (tons/yr)
CP8A (Grass Waterways)	2253 LF (2.9 ac.)	359.0	94.1	48.4
EQIP open channel	2900 LF (5.2 ac.)	2387.5	399.4	131.7
CP22 (Riparian Buffer)	3.0 ac.	12.2	3.5	2.1
TOTALS	11.1 ac.	2758.7	497.0	182.2

Nutrient reduction estimates from STEPL: Spreadsheet Tool for the Estimation of Pollutant Load v. 4.0

For the grass waterways, subwatersheds above the applied BMP were taken into consideration when estimating the nutrient load reduction. For the CP8A grass waterway, a 110 acre subwatershed (100% cropland) was used and a 1,026 acre subwatershed (50% pastureland : 50% cropland) was used for the EQIP open channel.

Task 4. Restore 2200 LF of shoreline along Lake Mitchell to protect the shoreline from erosion

Product 7. Shoreline Stabilization: 2200 LF planned

In 2009, the City of Mitchell installed rip-rap along 215 linear feet of previously eroding shoreline on the southwest side of Lake Mitchell.

Gabions installed on Lake Mitchell during the 1980s have failed over the last several years because of water level fluctuations during freezing and thawing. An inspection report by the NRCS national engineering staff determined the failure to be related to the lifespan of the wire on the gabions. The City of Mitchell completed the Redstone Stabilization Project during September 2006 by replacing approximately 2200 linear feet of failed gabions with rip-rap.

The City of Mitchell is currently using Nonpoint Source funds received through a Clean Water State Revolving Fund loan to replace failed gabions near the Lake Mitchell campground on the south side of Lake Mitchell during the fall of 2010.

Table 10. Product 7 nutrient load reduction estimates.

Product	Linear Feet	N Reduction (lbs/yr)	P Reduction (lbs/yr)	Sediment Reduction (tons/yr)
Shoreline Stabilization	215	1.9	0.7	1.4

Nutrient reduction estimates from STEPL: Spreadsheet Tool for the Estimation of Pollutant Load v. 4.0

Objective 2. Provide information to a minimum of 250 watershed landowners and 30,000 area citizens about project activities, progress, and goals for water quality to gather local support and input, and to increase the implementation of BMPs by landowners.

Task 5. Plan and implement 11 information activities that increase BMP implementation by landowners, and project participation by partners and the general public.

Product 8. Increased BMP installation: 11 activities planned

Accomplishment:

Presentations/Updates

- Mitchell City Council, Mitchell, SD (Oct 2008)
- Focus 2020 subcommittee group, Mitchell, SD (Oct 2008)
- Lower James RC&D/Watershed Coordinators meeting, Mitchell, SD (Mar 2009)
- Lake Mitchell Development committee meeting, Mitchell, SD (Apr 2009, May 2009)
- EPA 319 Coordinators meeting, Pierre, SD (Mar 2010)

Tours

- Watershed tour for conservation district board members, county commissioners, and area state legislatures (Sep 2009)

Other

- Sixteen (16) newspaper articles in the regional daily newspaper concerning the Firesteel watershed project or Lake Mitchell (12,000 household circulation)
- Three (3) Firesteel Creek newsletters sent to watershed producers and area residents (Mar 2009, Sep 2009, Apr 2010)
- Continuous CRP/RAM postcard sent to landowners along main stems of Firesteel Creek (Feb 2010) – approximately 75 sent
- AWS factsheet sent to priority feeding operations
- RAM program article for Aurora County Conservation District newsletter (Mar 2010)
- Lake Mitchell webpage development for City of Mitchell website (Spring 2010)

Objective 3. Monitor and document project accomplishments, finances, and milestone progress to provide information needed to manage and administer the project in a manner that will result in reaching project objectives and attaining the project goal.

Task 6. Complete project reports and monitor project progress to meet SD Department of Environment and Natural Resources (DENR) 319 program requirements.

Accomplishment: Completed

Project progress and expenses were documented using the on-line SD NPS Project Management System (or BMP Expense Tracker). Grants Reporting & Tracking System (GRTS) reports were completed either on an annual or semi-annual basis showing target/milestone progress and project status.

PLANNED AND ACTUAL MILESTONES

Planned and actual milestones completed for Segment 1 and 2 of the Firesteel Creek/Lake Mitchell Watershed Project can be found in Table 11. Some milestones will continue on after the completion of this project through the Lower James Implementation Project sponsored by the James River Water Development District.

Table 11. Planned Versus Completed Project Activities

Objective/Task/Product	Segment 1	Segment 2		Total
	Actual	Planned	Actual	Achieved
OBJECTIVE 1: BMPs to reduce Phosphorus and Sediment Loading.				
Task 1. Livestock Nutrient Management BMPs				
Prod. 1. Animal Waste Mgt. Systems				
AWMS design and construction	15	3	3	18
Nutrient Mgt. Plan	15	3	3	18
Task 2. Grazing Mgt. Systems				
Prod. 2. Rotational Grazing Mgt.	12,483 ac.	2,000 ac.	1946 ac.	14,429 ac.
Prod. 3. Riparian Area Grazing Mgt.		475 ac.	349.2 ac.	349.2 ac.
Task 3. Cropland BMPs				
Prod. 4. Seeding	479.5 ac.	50 ac.	370.5 ac.	850 ac.
Prod. 5. Wetland Restoration		50 ac.	101.1 ac.	101.1 ac.
Prod. 6. Filter strips/grassed waterways	615 ac.	100 ac.	9.1 ac.	624.1 ac.
Task 4. Shoreline Stabilization				
Prod. 7. Shoreline & streambank stabilization	825 LF	2,200 LF	215 LF	1040 LF
OBJECTIVE 2: Public Information Campaign				
Task 5. I & E activities				
Prod. 8. I & E activities				
Newsletters		4	3	3
Tour	8	1	1	9
Presentations	9	2	5	14
News releases	4	4	17	21
Fact Sheet		0	1	1
Webpage Development		0	1	1
OBJECTIVE 3: Progress Reporting				
Task 6. Reporting				
Prod. 9. Reports				
Mid-year report		3	0	0
Annual report		2	2	2
Final report	1	1	1	2

MONITORING RESULTS

Table 12. Load reduction summary by Product

Product	N Reduction (lbs/yr)	P Reduction (lbs/yr)	Sediment Reduction (tons/yr)
Prod. 1. AWSF	49,409.0	11,117.0	0.0
Prod. 2. Rotational Grazing Systems	2575.0	342.9	151.0
Prod. 3. Riparian Management	1273.4	881.2	30.5
Prod. 4. Cropland to perennial vegetation	1487.4	457.5	265.7
Prod. 5. Wetland Restoration	0.0	0.0	0.0
Prod. 6. Filter strips/grassed waterways	2758.7	497.0	182.2
Prod. 7. Shoreline Stabilization	1.9	0.7	1.4
TOTALS	57,505.4	13,296.3	630.8

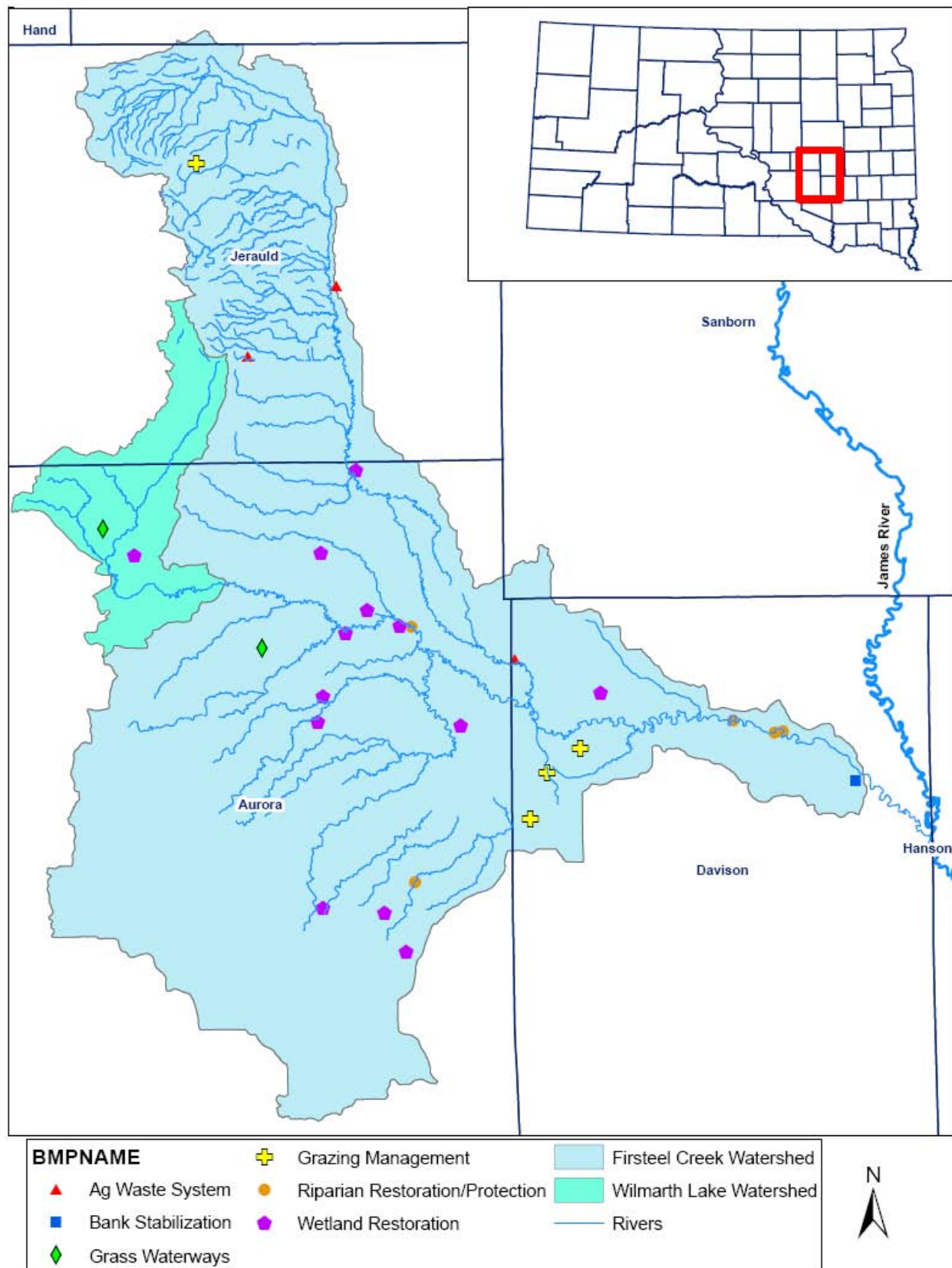


Figure 3: Project BMP Locations.

BUDGET

Table 13. Project Original Budget and Actual Expenditures.

Firesteel Creek/Lake Mitchell Watershed Project Budget						Original Budget			Actual Expenditures		
Category	EPA 319	State GF&P/SDRCF SDSU	Federal NRCS/US&FW LJRC&D	Local Producers/City CD's, etc.	Total	EPA 319	State GF&P/SDRCF SDSU	Federal NRCS/US&FW LJRC&D	Local Producers/City CD's, etc.	Total	
Personnel											
Project Coordinator (benefits included)	\$115,500				\$115,500	\$96,731.74				\$96,731.74	
Project Administration/Management (Liability insurance/Audit/SHPO)	\$2,500			\$1,150	\$3,650				\$130.00	\$130.00	
Office Space/Supplies/Operations											
Office Space Rent (150 sq ft x \$13.80 per sq ft) ^{amended}	\$0					\$626.75				\$626.75	
Supplies/Operations	\$450		\$1,210	\$60	\$1,720	\$0.00		\$0.00	\$17.60	\$17.60	
Travel											
Vehicle Mileage (3,500 miles/yr. @ \$.32/mi.)/Lodging	\$2,825				\$2,825	\$643.91				\$643.91	
Subtotal: Personnel, Administration, Office Supplies, Travel	\$121,275	\$0	\$1,210	\$1,210	\$123,695	\$98,002.40	\$0.00	\$0.00	\$147.60	\$98,150.00	
Objective 1: BMP installation to Reduce Phosphorus & Sediment Loading											
Task 1. Design & Construct Livestock Nutrient Management BMPs											
Product 1. Three (3) Animal Waste Management Systems	\$123,150		\$61,875	\$62,475	\$247,500	\$44,554.41		\$76,347.00	\$15,027.54	\$135,928.95	
Task 2. Implementation of Grazing Management Systems (2,475 acres)											
Product 2. Rotational Grazing Management Systems Implementation											
2,000 acres planned and installed	\$5,075	\$3,375	\$8,195	\$8,895	\$25,540	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Product 3. Riparian Area Management (RAM) Program Implementation											
Land Use Agreements/Long-term Easements/Fencing & Alternative Water		\$3,125	\$41,230	\$6,785	\$51,140	\$77,695.00		\$0.00	\$82,691.80	\$160,386.80	
Task 3. Establishment of BMPs on 200 acres of Cropland											
Product 4. Seeding of Croplands to Perennial grasses (50 acres)											
Grass Seedings: 50 acres @ \$70/ac. (Seedbed prep, seeding, seed)		\$1,750		\$1,750	\$3,500		\$0.00		\$0.00	\$0.00	
Product 5. Wetland Restoration (50 acres)											
Wetland Restoration: 10 each @ \$2,000 each @ 5 acres each			\$15,000	\$5,000	\$20,000			\$0.00	\$0.00	\$0.00	
Product 6. Filter Strips/Grassed Waterways on Cropland (100 acres)											
100 acres of Filter Strips, 1000LF of Grassed Waterways			\$9,000	\$3,000	\$12,000			\$0.00	\$0.00	\$0.00	
Task 4. Shoreline Stabilization											
Product 7. Shoreline and Streambank Stabilization (2200 LF)				\$109,999	\$109,999				\$42,627.92	\$42,627.92	
Objective 2. Public Information Campaign											
Task 5. Information and Education Activities											
Product 8. I & E Activities (11 activities)	\$500			\$580	\$1,080	\$423.35			\$1,357.50	\$1,780.85	
Project Subtotal	\$250,000	\$8,250	\$136,510	\$199,694	\$594,454	\$220,675.16	\$0.00	\$76,347.00	\$141,852.36	\$438,874.52	
Match Ineligible For This Project: (Federal or Allocated to Another Project)			\$136,510.00					\$76,347.00			
Project Match (Eligible):				\$207,944.00					\$141,852.36		
	55%			45%		61%			39%		

COORDINATION EFFORTS

The Davison Conservation District served as the main sponsor with the City of Mitchell and the Aurora and Jerauld Conservation Districts serving as co-sponsors of the watershed project. District staff for the Davison CD included the project coordinator, a district manager, and a district secretary supervised by a Board of Supervisors. The district coordinated project activities, reported on progress, vouched for grant funds and provided record keeping services. Coordination efforts with other agencies are described below.

STATE AGENCIES

South Dakota Department of Environment and Natural Resources, Clean Water Act Section 319 and Consolidated Water Facilities Construction Program (CWFCP). CWFCP grant used for the design and construction of animal waste management systems and shoreline stabilization projects associated with the Firesteel Creek watershed.

USDA

USDA Natural Resource Conservation Service (NRCS) and Farm Service Agency (FSA) for technical and financial assistance for BMP installation through Conservation Reserve Program (CRP) and the Environmental Quality Incentive Program (EQIP).

South Dakota Nutrient Management Team, Nutrient management planning and design assistance for animal waste management systems. Team funded through NRCS and the South Dakota Association of Conservation Districts (SDACD).

OTHER FEDERAL

US Environmental Protection Agency (EPA) Clean Water Act Section 319 grants awarded through SDDENR for project personnel, I & E activities, and BMP installation.

OTHER

City of Mitchell for technical and financial assistance towards watershed BMP installation, in-lake activities, and shoreline stabilization projects.

Lake Mitchell Development Committee - committee appointed by mayor designed to advise city staff and councils on issues pertaining to Lake Mitchell.

Landowners who participated by contributing in-kind and cash match through the installation of watershed BMPs.

SUMMARY OF PUBLIC PARTICIPATION

Along with watershed activities, an in-lake treatment began in 2010 in an attempt to reduce or prevent blue-green algae blooms that continue to plague the lake during the summer months. During the Spring of 2010, the Lake Mitchell Development Committee, with the help of the City of Mitchell, purchased and installed a SolarBee water-circulation device in Kippes Bay in Lake Mitchell. The lone unit is to act as a demonstration project to help alleviate algae blooms by disrupting the blue-green algae life-cycle through water circulation in stagnant water. If shown to be effective, up to 5 more units may be used to cover the entire lake. Because of the heavy precipitation that the watershed received in 2010, water continually ran over the Lake Mitchell spillway during the entire growing season, and conditions were never conducive for the circulation device to be demonstrated. Results are unclear after the first season.

ASPECTS OF THE PROJECT THAT DID NOT WORK WELL

It was hoped that participation in the Firesteel Creek Riparian Area Management (RAM) program would have been met with more enthusiasm than it was after the program's initial sign-ups. Several contributing factors may play into a decision to enroll riparian areas for exclusion: flooding, fencing along a moving waterbody, taking land out of production for a long period of time, landowner indifference, etc. Improvements to the program to fit the needs of landowners and producers may be necessary in the future.

The installation of filter strips along cropland did not seem to be a popular program either. The continual rise in land prices and the desire to convert ground to a farmable state may attribute to this fact.

RESULTS AND FUTURE ACTIVITY RECOMMENDATIONS

Based on the STEPL computer-modeled nutrient reduction estimates, a phosphorus reduction of 13,296.3 lbs/yr (6.6 tons/yr) were realized from project activities implemented through June 2010. Nitrogen and sediment reductions were estimated at 57,505.4 lbs/yr (28.8 tons/yr) and 630.8 tons/yr respectively. The N and P load reductions were accomplished by focusing primarily on improvements to priority feeding operations along the main branches of Firesteel Creek, while the sediment reductions came primarily from grazing improvements, riparian management, and seeding cropland to perennial vegetation.

As part of the Firesteel Creek watershed assessment, an Agricultural Nonpoint Source (AGNPS) land-use computer model was used to estimate annual loading inputs to Lake Mitchell. Based on the model and water quality sampling, it was estimated that 63.3 tons of phosphorus, 166 tons of nitrogen, and 39,370 tons of sediment were being delivered on an annual basis to Lake Mitchell prior to restoration activities. Because the STEPL estimates are on-site reductions and not necessarily delivered reductions, it is difficult to estimate a percent reduction delivered to Lake Mitchell from Best Management Practice (BMP) installation. Future water quality sampling

and/or an update to the AGNPS computer model may help determine if designated beneficial uses and water quality targets are being met.

Along with Animal Waste Storage Facility (AWSF) installation as a part of ongoing activities, the Firesteel Creek Riparian Area Management (RAM) program will continue under the Lower James River Implementation Project. Improvements to the program to fit the needs of landowners and producers may be necessary in the future.

LITERATURE CITED

South Dakota Department of Environment and Natural Resources. 1997. Phase I Diagnostic Feasibility Study Final Report. Lake Mitchell / Firesteel Creek, Davison County, South Dakota. South Dakota Watershed Protection Program, Division of Financial and Technical Assistance.

APPENDIX A

EPA 319 Project Budgets

Firesteel/Lake Mitchell Watershed Project – Segment 2. Initial budget.

Category	Year 1	Year 2	Year 3 (4 months)	Total	EPA 319	State GF&P/SDRCF/SDSU	Federal NRCS/US&FW LJRC&D	Local Producers/City CD's, etc.
Personnel								
Project Coordinator (benefits included)	\$49,000.00	\$50,000.00	\$16,500.00	\$115,500.00	\$115,500.00			
Project Administration/Management								
General Liability Insurance	\$500.00	\$500.00	\$150.00	\$1,150.00				\$1,150.00
Audit		\$1,500.00		\$1,500.00	\$1,500.00			
State Historical Preservation Surveys/Clearances (2 @ \$500 each)	\$500.00	\$500.00		\$1,000.00	\$1,000.00			
Office Supplies/Operations								
Paper	\$200.00	\$200.00	\$50.00	\$450.00			\$450.00	
Postage	\$100.00	\$100.00	\$30.00	\$230.00	\$170.00			\$60.00
Computer Maintenance	\$100.00	\$100.00		\$200.00			\$200.00	
Internet Service (\$20/month)	\$240.00	\$240.00	\$80.00	\$560.00			\$560.00	
Phone (\$10/month)	\$120.00	\$120.00	\$40.00	\$280.00	\$280.00			
Travel								
Vehicle Mileage (3,500 miles/yr. @ \$.32/mi.)	\$1,120.00	\$1,120.00	\$360.00	\$2,600.00	\$2,600.00			
Lodging and Per Deim (1/yr. @ \$75)	\$75.00	\$75.00	\$75.00	\$225.00	\$225.00			
Subtotal: Personnel, Administration, Office Supplies, Travel	\$51,955.00	\$54,455.00	\$17,285.00	\$123,695.00	\$121,275.00	\$0.00	\$1,210.00	\$1,210.00
Objective 1: BMP installation to Reduce Phosphorus & Sediment Loading								
Task 1: Design & Construct Livestock Nutrient Management BMPs								
Product 1: Three (3) Animal Nutrient Management Systems	\$162,500.00	\$82,500.00	\$2,500.00	\$247,500.00	\$123,150.00	\$0.00	\$61,875.00	\$62,475.00
Task 2: Implementation of Grazing Management Systems (2,500 acres)								
Product 2: Rotational Grazing Management Systems Implementation (2,000 acres planned and installed)								
Best Management Practices	\$8,660.00	\$16,880.00	\$0.00	\$25,540.00	\$5,075.00	\$3,375.00	\$8,195.00	\$8,895.00
Product 3: Riparian Area Grazing Management Systems Implementation (500 acres planned and installed)	\$22,160.00	\$28,980.00	\$0.00	\$51,140.00		\$3,125.00	\$41,230.00	\$6,785.00
Task 3: Establishment of BMPs on 200 acres of Cropland								
Product 4: Seeding of Croplands to Perennial grasses (50 acres)								
Grass Seedings: 50 acres @ \$70/ac. (Seedbed prep, seeding, seed)	\$0.00	\$3,500.00	\$0.00	\$3,500.00		\$1,750.00		\$1,750.00
Product 5: Wetland Restoration (50 acres)								
Wetland Restoration: 10 each @ \$2,000 each @ 5 acres each	\$8,000.00	\$12,000.00		\$20,000.00			\$15,000.00	\$5,000.00
Product 6: Filter Strips/Grassed Waterways on Cropland (100 acres)	\$2,500.00	\$9,500.00		\$12,000.00			\$9,000.00	\$3,000.00
100 acres of Filter Strips, 1000LF of Grassed Waterways								
Task 4: Shoreline Stabilization								
Product 7: Shoreline and Streambank Stabilization (2200LF)								
Shoreline Stabilization: 2200LF	\$110,000.00			\$110,000.00				\$110,000.00
Objective 2: Public Information Campaign								
Task 5: Information and Education Activities								
Product 8: Information and Education Activities (11 activities)	\$240.00	\$840.00	\$0.00	\$1,080.00	\$500.00			\$580.00
Newsletters: 4 each (Distribution to 250/newsletter).								
Producer Tour: (Grazing, Feedlot, Livestock) 1 @ \$600 each (25 attendees)								
Presentations: 2 each: (Costs included in Personnel) (100 attendees)								
News Releases: 4 each: (Costs included in Personnel) (30,000 circulation)								
Objective 3: Project Progress Monitoring and Reporting								
Task 6: Reporting (Costs included in Personnel Costs)								
Product 9: Reports/Project Management								
Included in the Personnel Budget Section	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Project Subtotal:	\$366,015.00	\$208,655.00	\$19,785.00	\$594,455.00	\$250,000.00	\$8,250.00	\$136,510.00	\$199,695.00
Match Ineligible For This Project: (Federal or Allocated to Another Project)				\$136,510.00			\$136,510.00	
Project Match (Eligible):				\$457,945.00	\$250,000.00	\$8,250.00		\$199,695.00
					55%	2%		44%

Firesteel/Lake Mitchell Watershed Project – Segment 2. First amendment budget.

Category	Year 1	Year 2	Year 3 (4 months)	Total	EPA 319		State GF&P/SDRCF/SDSU	Federal NRCS/US&FW LJRC&D	Local Producers/City CD's, etc.
					FY07	FY08			
Personnel									
Project Coordinator (benefits included)	\$49,000.00	\$50,000.00	\$16,500.00	\$115,500.00	\$115,500.00				
Project Administration/Management									
General Liability Insurance	\$500.00	\$500.00	\$150.00	\$1,150.00					\$1,150.00
Audit		\$1,500.00		\$1,500.00	\$1,500.00				
State Historical Preservation Surveys/Clearances (2 @ \$500 each)	\$500.00	\$500.00		\$1,000.00	\$1,000.00				
Office Space/Supplies/Operations									
Paper	\$200.00	\$200.00	\$50.00	\$450.00				\$450.00	
Postage	\$100.00	\$100.00	\$30.00	\$230.00	\$170.00				\$60.00
Computer Maintenance	\$100.00	\$100.00		\$200.00				\$200.00	
Internet Service (\$20/month)	\$240.00	\$240.00	\$80.00	\$560.00				\$560.00	
Phone (\$10/month)	\$120.00	\$120.00	\$40.00	\$280.00	\$280.00				
Travel									
Vehicle Mileage (3,500 miles/yr. @ \$.32/mi.)	\$1,120.00	\$1,120.00	\$360.00	\$2,600.00	\$2,600.00				
Lodging and Per Diem (1/yr. @ \$75)	\$75.00	\$75.00	\$75.00	\$225.00	\$225.00				
Subtotal: Personnel, Administration, Office Supplies, Travel	\$51,955.00	\$54,455.00	\$17,285.00	\$123,695.00	\$121,275.00		\$0.00	\$1,210.00	\$1,210.00
Objective 1: BMP installation to Reduce Phosphorus & Sediment Loading									
Task 1. Design & Construct Livestock Nutrient Management BMPs									
Product 1. Three (3) Animal Nutrient Management Systems	\$162,500.00	\$82,500.00	\$2,500.00	\$247,500.00	\$123,150.00		\$0.00	\$61,875.00	\$62,475.00
Task 2. Implementation of Grazing Management Systems (2,475 acres)									
Product 2. Rotational Grazing Management Systems Implementation (2,000 acres planned and installed)									
Best Management Practices	\$8,660.00	\$16,880.00	\$0.00	\$25,540.00	\$5,075.00		\$3,375.00	\$8,195.00	\$8,895.00
Product 3. Riparian Area Management (RAM) Program Implementation (475 acres planned and installed)									
Land Use Agreements/Long-term Easements	\$200,000.00	\$200,000.00		\$400,000.00		\$150,000.00		\$150,000.00	\$100,000.00
Fencing and Alternative Water	\$10,160.00	\$16,980.00		\$27,140.00			\$3,125.00	\$17,230.00	\$6,785.00
Task 3. Establishment of BMPs on 200 acres of Cropland									
Product 4. Seeding of Croplands to Perennial grasses (50 acres)									
Grass Seedings: 50 acres @ \$70/ac. (Seedbed prep, seeding, seed)	\$0.00	\$3,500.00	\$0.00	\$3,500.00			\$1,750.00		\$1,750.00
Product 5. Wetland Restoration (50 acres)									
Wetland Restoration: 10 each @ \$2,000 each @ 5 acres each	\$8,000.00	\$12,000.00		\$20,000.00				\$15,000.00	\$5,000.00
Product 6. Filter Strips/Grassed Waterways on Cropland (100 acres)	\$2,500.00	\$9,500.00		\$12,000.00				\$9,000.00	\$3,000.00
100 acres of Filter Strips, 1000LF of Grassed Waterways									
Task 4. Shoreline Stabilization									
Product 7. Shoreline and Streambank Stabilization (2200 LF)									
Shoreline Stabilization: 2200 LF	\$110,000.00			\$110,000.00					\$110,000.00
Objective 2. Public Information Campaign									
Task 5. Information and Education Activities									
Product 8. I & E Activities (11 activities)	\$240.00	\$840.00	\$0.00	\$1,080.00	\$500.00				\$580.00
Newsletters: 4 each (Distribution to 250/newsletter).									
Producer Tour: (Grazing, Feedlot, Livestock) 1 @ \$600 each (25 attendees)									
Presentations: 2 each: (Costs included in Personnel) (100 attendees)									
News Releases: 4 each: (Costs included in Personnel) (30,000 circulation)									
Objective 3. Project Progress Monitoring and Reporting									
Task 6. Reporting (Costs included in Personnel Costs)									
Product 9. Reports/Project Management									
Included in the Personnel Budget Section	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Project Subtotal	\$554,015.00	\$396,655.00	\$19,785.00	\$970,455.00	\$250,000.00	\$150,000.00	\$8,250.00	\$262,510.00	\$299,695.00
Match Ineligible For This Project: (Federal or Allocated to Another Project)				\$262,510.00				\$262,510.00	
Project Match (Eligible):				\$707,945.00	\$250,000.00	\$150,000.00	\$8,250.00		\$299,695.00
					57%		1%		42%

Firesteel/Lake Mitchell Watershed Project – Segment 2. Second amendment budget.

Category	Year 1	Year 2	Year 3 (4 months)	Total	EPA 319		State GF&P/SDRCF/SDSU	Federal NRCS/US&FW LJRC&D	Local Producers/City CD's, etc.
					FY07	FY08			
Personnel									
Project Coordinator (benefits included)	\$49,000.00	\$50,000.00	\$16,500.00	\$115,500.00	\$115,500.00				
Project Administration/Management									
General Liability Insurance	\$500.00	\$500.00	\$150.00	\$1,150.00					\$1,150.00
Audit		\$1,500.00		\$1,500.00	\$1,500.00				
State Historical Preservation Surveys/Clearances (2 @ \$500 each)	\$500.00	\$500.00		\$1,000.00	\$1,000.00				
Office Space/Supplies/Operations									
Office Space Rent (150 sq ft x \$13.80 per sq ft) ^{amended}					\$2,600.00				
Paper	\$200.00	\$200.00	\$50.00	\$450.00				\$450.00	
Postage	\$100.00	\$100.00	\$30.00	\$230.00	\$170.00				\$60.00
Computer Maintenance	\$100.00	\$100.00		\$200.00				\$200.00	
Internet Service (\$20/month)	\$240.00	\$240.00	\$80.00	\$560.00				\$560.00	
Phone (\$10/month)	\$120.00	\$120.00	\$40.00	\$280.00	\$280.00				
Travel									
Vehicle Mileage (3,500 miles/yr. @ \$.32/mi.)	\$1,120.00	\$1,120.00	\$360.00	\$2,600.00	\$2,600.00				
Lodging and Per Diem (1/yr. @ \$75)	\$75.00	\$75.00	\$75.00	\$225.00	\$225.00				
Subtotal: Personnel, Administration, Office Supplies, Travel	\$51,955.00	\$54,455.00	\$17,285.00	\$123,695.00	\$121,275.00		\$0.00	\$1,210.00	\$1,210.00
Subtotal: Personnel, Administration, Office Supplies, Travel^{amended}					\$123,875.00				
Objective 1: BMP installation to Reduce Phosphorus & Sediment Loading									
Task 1. Design & Construct Livestock Nutrient Management BMPs									
Product 1. Three (3) Animal Nutrient Management Systems	\$162,500.00	\$82,500.00	\$2,500.00	\$247,500.00	\$123,150.00		\$0.00	\$61,875.00	\$62,475.00
Product 1. Three (3) Animal Nutrient Management Systems^{amended}					\$120,550.00				
Task 2. Implementation of Grazing Management Systems (2,475 acres)									
Product 2. Rotational Grazing Management Systems Implementation (2,000 acres planned and installed)									
Best Management Practices	\$8,660.00	\$16,880.00	\$0.00	\$25,540.00	\$5,075.00		\$3,375.00	\$8,195.00	\$8,895.00
Product 3. Riparian Area Management (RAM) Program Implementation (475 acres planned and installed)									
Land Use Agreements/Long-term Easements	\$200,000.00	\$200,000.00		\$400,000.00		\$150,000.00		\$150,000.00	\$100,000.00
Fencing and Alternative Water	\$10,160.00	\$16,980.00		\$27,140.00			\$3,125.00	\$17,230.00	\$6,785.00
Task 3. Establishment of BMPs on 200 acres of Cropland									
Product 4. Seeding of Croplands to Perennial grasses (50 acres)									
Grass Seedings: 50 acres @ \$70/ac. (Seedbed prep, seeding, seed)	\$0.00	\$3,500.00	\$0.00	\$3,500.00			\$1,750.00		\$1,750.00
Product 5. Wetland Restoration (50 acres)									
Wetland Restoration: 10 each @ \$2,000 each @ 5 acres each	\$8,000.00	\$12,000.00		\$20,000.00				\$15,000.00	\$5,000.00
Product 6. Filter Strips/Grassed Waterways on Cropland (100 acres)	\$2,500.00	\$9,500.00		\$12,000.00				\$9,000.00	\$3,000.00
100 acres of Filter Strips, 1000LF of Grassed Waterways									
Task 4. Shoreline Stabilization									
Product 7. Shoreline and Streambank Stabilization (2200 LF)									
Shoreline Stabilization: 2200 LF	\$110,000.00			\$110,000.00					\$110,000.00
Objective 2. Public Information Campaign									
Task 5. Information and Education Activities									
Product 8. I & E Activities (11 activities)	\$240.00	\$840.00	\$0.00	\$1,080.00	\$500.00				\$580.00
Newsletters: 4 each (Distribution to 250/newsletter).									
Producer Tour: (Grazing, Feedlot, Livestock) 1 @ \$600 each (25 attendees)									
Presentations: 2 each: (Costs included in Personnel) (100 attendees)									
News Releases: 4 each: (Costs included in Personnel) (30,000 circulation)									
Objective 3. Project Progress Monitoring and Reporting									
Task 6. Reporting (Costs included in Personnel Costs)									
Product 9. Reports/Project Management									
Included in the Personnel Budget Section	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Project Subtotal	\$554,015.00	\$396,655.00	\$19,785.00	\$970,455.00	\$250,000.00	\$150,000.00	\$8,250.00	\$262,510.00	\$299,695.00
Project Subtotal^{amended}					\$250,000.00				
Match Ineligible For This Project: (Federal or Allocated to Another Project)				\$262,510.00				\$262,510.00	
Project Match (Eligible):				\$707,945.00	\$250,000.00	\$150,000.00	\$8,250.00		\$299,695.00
					57%		1%		42%

Firesteel/Lake Mitchell Watershed Project – Segment 2. Third amendment budget.

Category	Year 1	Year 2	Year 3 (4 months)	Total	EPA 319		State GF&P/SDRCF/SDSU	Federal NRCS/US&FW LJRC&D	Local Producers/City CD's, etc.
					FY07	FY08			
Personnel									
Project Coordinator (benefits included)	\$49,000.00	\$50,000.00	\$16,500.00	\$115,500.00	\$115,500.00				
Project Administration/Management									
General Liability Insurance	\$500.00	\$500.00	\$150.00	\$1,150.00					\$1,150.00
Audit		\$1,500.00		\$1,500.00	\$1,500.00				
State Historical Preservation Surveys/Clearances (2 @ \$500 each)	\$500.00	\$500.00		\$1,000.00	\$1,000.00				
Office Space/Supplies/Operations									
Office Space Rent (150 sq ft x \$13.80 per sq ft)			\$2,600.00	\$2,600.00	\$2,600.00				
Paper	\$200.00	\$200.00	\$50.00	\$450.00				\$450.00	
Postage	\$100.00	\$100.00	\$30.00	\$230.00	\$170.00				\$60.00
Computer Maintenance	\$100.00	\$100.00		\$200.00				\$200.00	
Internet Service (\$20/month)	\$240.00	\$240.00	\$80.00	\$560.00				\$560.00	
Phone (\$10/month)	\$120.00	\$120.00	\$40.00	\$280.00	\$280.00				
Travel									
Vehicle Mileage (3,500 miles/yr. @ \$.32/mi.)	\$1,120.00	\$1,120.00	\$360.00	\$2,600.00	\$2,600.00				
Lodging and Per Diem (1/yr. @ \$75)	\$75.00	\$75.00	\$75.00	\$225.00	\$225.00				
Subtotal: Personnel, Administration, Office Supplies, Travel	\$51,955.00	\$54,455.00	\$19,885.00	\$126,295.00	\$123,875.00		\$0.00	\$1,210.00	\$1,210.00
Objective 1: BMP installation to Reduce Phosphorus & Sediment Loading									
Task 1. Design & Construct Livestock Nutrient Management BMPs									
Product 1. Three (3) Animal Nutrient Management Systems	\$162,500.00	\$53,221.59		\$215,721.59	\$91,271.59		\$0.00	\$61,875.00	\$62,575.00
Task 2. Implementation of Grazing Management Systems (2,475 acres)									
Product 2. Rotational Grazing Management Systems Implementation (2,000 acres planned and installed)									
Best Management Practices	\$8,660.00	\$16,880.00	\$0.00	\$25,540.00	\$5,075.00		\$3,375.00	\$8,195.00	\$8,895.00
Product 3. Riparian Area Management (RAM) Program Implementation (475 acres planned and installed)									
Land Use Agreements/Long-term Easements	\$200,000.00	\$50,000.00		\$250,000.00		\$0.00		\$150,000.00	\$100,000.00
Fencing and Alternative Water	\$10,160.00	\$16,980.00		\$27,140.00			\$3,125.00	\$17,230.00	\$6,785.00
Task 3. Establishment of BMPs on 200 acres of Cropland									
Product 4. Seeding of Croplands to Perennial grasses (50 acres)									
Grass Seedings: 50 acres @ \$70/ac. (Seedbed prep, seeding, seed)	\$0.00	\$3,500.00	\$0.00	\$3,500.00			\$1,750.00		\$1,750.00
Product 5. Wetland Restoration (50 acres)									
Wetland Restoration: 10 each @ \$2,000 each @ 5 acres each	\$8,000.00	\$12,000.00		\$20,000.00				\$15,000.00	\$5,000.00
Product 6. Filter Strips/Grassed Waterways on Cropland (100 acres)	\$2,500.00	\$9,500.00		\$12,000.00				\$9,000.00	\$3,000.00
100 acres of Filter Strips, 1000LF of Grassed Waterways									
Task 4. Shoreline Stabilization									
Product 7. Shoreline and Streambank Stabilization (2200 LF)									
Shoreline Stabilization: 2200 LF	\$110,000.00			\$110,000.00					\$110,000.00
Objective 2. Public Information Campaign									
Task 5. Information and Education Activities									
Product 8. I & E Activities (11 activities)	\$240.00	\$840.00	\$0.00	\$1,080.00	\$500.00				\$580.00
Newsletters: 4 each (Distribution to 250/newsletter).									
Producer Tour: (Grazing, Feedlot, Livestock) 1 @ \$600 each (25 attendees)									
Presentations: 2 each: (Costs included in Personnel) (100 attendees)									
News Releases: 4 each: (Costs included in Personnel) (30,000 circulation)									
Objective 3. Project Progress Monitoring and Reporting									
Task 6. Reporting (Costs included in Personnel Costs)									
Product 9. Reports/Project Management									
Included in the Personnel Budget Section	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Project Subtotal	\$554,015.00	\$217,376.59	\$19,885.00	\$791,276.59	\$220,721.59	\$0.00	\$8,250.00	\$262,510.00	\$299,795.00
Match Ineligible For This Project: (Federal or Allocated to Another Project)				\$262,510.00				\$262,510.00	
Project Match (Eligible):				\$528,766.59	\$220,721.59	\$0.00	\$8,250.00		\$299,795.00
					42%		2%		57%

Appendix B

Information & Education

Council to look at Firesteel Creek plan

By **SETH TUPPER**
The Daily Republic

Some grazed, trampled and eroded banks along Firesteel Creek could be converted to densely vegetated buffer zones that would guard the creek and Lake Mitchell from polluted runoff, if the Mitchell City Council adopts an ordinance scheduled to be introduced today.

The council will meet in special session at 5:30 p.m. at City Hall. Also on the agenda is a discussion of a proposed events center survey.

The Firesteel Creek initiative, officially known as a "riparian management" plan, is being spearheaded by Dave Kringen. He is the manager of the nine-year-old Firesteel Creek/Lake Mitchell Watershed Project, which already has taken numerous measures to reduce harmful runoff entering the creek and lake.

Kringen said the new project would target pastures along the main stems of Firesteel Creek.

"It would be similar to CRP, where we would lease the land," Kringen said, referring to the federally funded Conservation Reserve Program, "but we would be extending beyond the borders of what CRP offers — farther away from the creek, with the hope of getting

more people interested in the program."

Kringen is asking the Mitchell City Council for a contribution of \$100,200. An ordinance to appropriate that sum is scheduled to receive its first reading this evening and seems to have broad support, according to Mayor Lou Sebert.

"Personally, I feel it's probably a wise step," Sebert said. "And I think most of the council probably agrees that we should do things upstream if we can, and this would be a step in that direction."

The City Council has struggled in recent years to find effective methods for reducing algae levels in Lake Mitchell, which is fed by Firesteel Creek. The council decided this year to cancel the last of five planned in-lake applications of aluminum sulfate, because some said the treatments had been ineffective.

Sebert said the \$130,000 that was budgeted for the canceled alum application could be reallocated to cover the new \$100,200 request. Kringen is seeking additional funding from other sources, including \$300,000 of federal grant money, but he said he might not know until December if he has enough funding to do the project.

Council gives its support to Firesteel Creek project

Members give initial approval to donation

By SETH TUPPER
The Daily Republic

The Mitchell City Council unanimously supported a \$100,200 donation Wednesday evening toward the creation of buffer zones that would help protect Firesteel Creek and Lake Mitchell from polluted runoff.

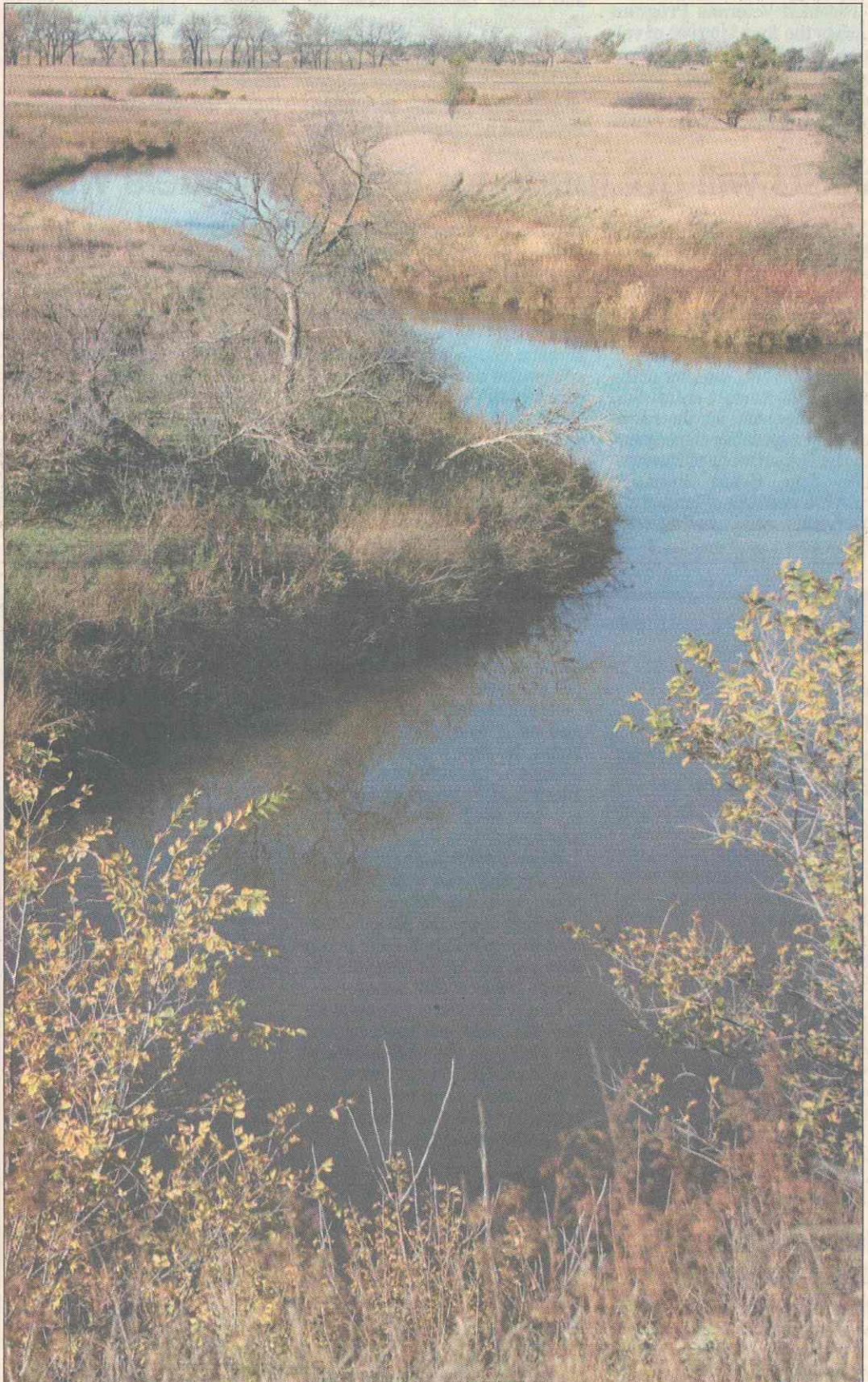
The council, which met in special session, approved the first reading of an ordinance that would appropriate the money to the project. The second reading and final vote will likely come at the next regular council meeting, Nov. 5.

Additional money is being sought for the project from other sources, including from state and federal grant programs and from the James River Water Development District. The total cost of the project for 2008-2009 is an estimated \$798,000, with potential future costs depending on the popularity of the project with eligible landowners.

The aim is to convert grazed and eroded pasture land along the creek banks to densely vegetated buffer zones that would filter out polluted runoff before it enters Firesteel Creek, which feeds Lake Mitchell. It's thought that agricultural runoff in the creek's watershed is a primary contributor to the annual summer algae blooms in the lake.

The City Council tried to reduce the algae blooms in recent years with in-lake applications of aluminum sulfate, but that project was scrapped earlier this year because of questions about its effectiveness. The \$130,000 that was budgeted for that canceled effort will now be tapped for the new project.

"Recently, I think we've been trying to treat the symptom and not treat the problem," said Councilman Britt Bruner. "And I think



Laura Wehde/Republic

Firesteel Creek winds its way along a state game production area northwest of Mitchell. At Wednesday's meeting, the Mitchell City Council approved a \$100,200 donation toward the creation of buffer zones that would help protect the creek and Lake Mitchell from polluted runoff.

CREEK

Continued from Page 1

this will go a long way to treat the problem.”

The project is spearheaded by Dave Kringen, manager of the existing Firesteel Creek/Lake Mitchell Watershed Project. A primary focus of that nine-year-old initiative, which is sponsored by the Davison Conservation District and receives some city funds, has been the upgrading of waste management practices by animal feeding operations in the watershed. Kringen said Wednesday that 15 new waste management systems have been



BRUNER

installed so far, and he said those efforts will continue.

Kringen said the new project will be called the Firesteel Creek Riparian Area Management (RAM) Program. Owners of pasture land along the creek will first be encouraged to enroll in the federally funded Conservation Reserve Program, which



KRINGEN

pays landowners to convert marginal agricultural land to vegetative cover.

Landowners who do not qualify for CRP or who want to enroll additional acres that are not eligible for CRP will be invited to enroll in the Firesteel Creek RAM Program. Landowners could sign 15-year, 30-year or perpetual agreements to refrain from using enrolled land for agricultural purposes, with the exception of some scheduled hayings or mowings. The program would pay the landowners annual rent or a lump sum, depending on the type and length of agreement, and Kringen would inspect the land on a regular basis to ensure compli-

ance with the rules.

Kringen said he should know in December whether the project will be awarded a \$300,600 grant from the Environmental Protection Agency. With that key piece of funding in place, he said, he could start advertising the program and enrolling landowners.

Kringen said the support from the Mitchell City Council is a good first step.

“I think if the city signs off on this, that will go a very long way with the EPA,” Kringen said. He added that everything he’s heard so far from the state Non-point Source Task Force, which administers the EPA grant program, has been positive.

Attack problem, not symptoms

The City Council on Wednesday gave its unanimous support to help fund a project to further clean up Firesteel Creek.

A donation of \$100,200 of city money is headed to a project that will create buffer zones along certain areas of the creek upstream from Lake Mitchell. The idea is to use those buffer zones — grassy strips, really — to help keep polluted runoff from reaching Firesteel and, eventually, the lake.

Wednesday's special meeting was just the first reading of the proposal to donate the money, but it appears it will easily slide through when the council next meets, on Nov. 5.

Why is this important?

Because Firesteel Creek and Lake Mitchell are a mess and previous attempts to reduce the algae in the lake simply have not worked.

Aluminum sulfate treatments have been ongoing for four years but have brought little results, if any. Of course, those treatments cost the city \$297,000, along with \$340,500 in grant money. In hindsight, it wasn't money well-spent, although we do not fault the council for trying.

Some of the money that was budgeted for that process — about \$130,000 — remains.

We always have felt that the problem isn't necessarily the algae growing up from the bottom of the lake — it's the nutrients that enter the lake from upstream sources, such as livestock operations.

But before the problem can be fixed, people need to recognize possible solutions.

The \$100,200 that appears headed toward the Firesteel Creek Riparian Area Management project is recognition of the problem. It's not enough money to fix the entire problem, but it's enough to get the ball rolling. Hopefully, grants will help pay for the remainder of the estimated \$798,000 price tag for 2008-09.

Councilman Britt Bruner said at Wednesday's meeting that in the past, efforts have been exhausted to "treat the symptoms and not treat the problem."

He's right, and today, we applaud the council for understanding that the lake's problem — and not its annual summer symptoms — should be getting the city's monetary attention.

S.D. scientists hope to find sources of mercury pollution

By BOB MERCER
Republic Capitol Bureau

PIERRE — A state review panel recommended funding Tuesday to help pay for a scientific investigation into the sources of mercury polluting lakes and streams in South Dakota.

Leading the project is James Stone, an associate professor of civil and environmental engineering at the South Dakota School of Mines and Technology in Rapid City.

"Right now our hands are tied," Stone said. "We don't know where this mercury is coming from."

He said the assumption is the mercury is coming from the atmosphere.

Concentrations of mercury gradually collect in areas where the flow of water slows or comes to a stop, such as cattail areas.

Fish samples taken to measure water quality show mercury levels are higher than the South Dakota acceptable standard in seven lakes scattered throughout the state. Fish samples from other lakes are near the threshold.

Stone plans to work with other faculty at School of Mines and South Dakota State University.

The review panel voted to recommend \$60,000 of funding from a federal Environmental Protection Agency program.

The project had requested \$159,254 originally, but state Department of Environment and Natural Resource officials said they plan to tap other sources to cover the difference.

A total of 10 projects applied for \$4.1 million Tuesday, with only \$2.6 million available in this

Local Firesteel Creek project recommended for funding aid

By BOB MERCER
Republic Capitol Bureau

PIERRE — A state review panel recommended funding Tuesday for further steps in cleaning up the water flowing into Lake Mitchell and Firesteel Creek.

The money would be used to pay for conservation easements as a method to reduce erosion and slow down the run-off carrying pollutants.

Project coordinator Dave Kringen said he hopes agreements can be reached with landowners to put about 10 miles of strips into grass.

It's part of a comprehensive approach to improving the watershed, which also includes Wilmarth Lake and Twin Lakes.

The review panel voted to recommend \$150,000 of funding from a federal Environmental Protection Agency program.

The Firesteel-Lake Mitchell application now moves to the state Board of Water and Natural Resources, whose members will make the final official recom-

mendation to the regional EPA office in Denver for its decision next spring.

The project had requested \$159,254 originally, but state Department of Environment and Natural Resource officials said they plan to tap other sources to cover the difference.

A total of 10 projects applied for \$4.1 million Tuesday, with only \$2.6 million available in this

mentation to the regional EPA office in Denver for its decision next spring.

The project request was \$300,000 originally.

A total of 10 projects applied for \$4.1 million Tuesday, with only \$2.6 million available in this funding round. Nine projects received recommendation, each for less than requested.

"Folks, you see our problem," the panel's chairman, Rick Vallery from South Dakota Wheat, said. "None of these decisions is easy."

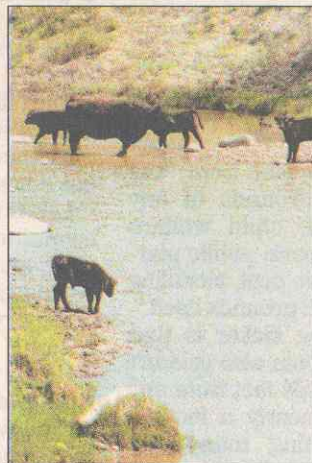
The review panel is known as the Non-Point Source Task Force. Its members represent various agricultural organizations, water and conservation districts, and a variety of state, federal and tribal agencies involved in environment, agriculture and land use.

The Firesteel-Lake Mitchell project received a \$250,000 federal grant in the past year to promote agriculture management practices for animal feeding, grazing and wetland restoration.

The final official recommendation to the regional EPA office in Denver for its decision next spring.

The review panel is known as the Non-Point Source Task Force. Its members represent various agricultural organizations, water and conservation districts, and a variety of state, federal and tribal agencies involved in environment, agriculture and land use.

Envisioning change along the banks of **Firesteel Creek**



Republic file photos/Laura Wehde

A new program will pay owners of land along Firesteel Creek to refrain from haying and grazing cattle. The hope is to convert some of the creek banks from eroded areas like the cattle pasture shown in the top photo to areas of lush vegetation like the state game-production area pictured above. Vegetated areas help filter harmful runoff that negatively impacts water quality.

New program will pay landowners to move cattle away from waterway

By **SETH TUPPER**
The Daily Republic

If a new conservation effort succeeds, some of the trampled and eroded banks along Firesteel Creek will be replaced by oases of densely vegetated grasslands.

The local program will pay owners of land along the main creek stems to refrain from haying and grazing cattle. Landowner applications will be accepted now through March 10, and success-

ful applicants could be participating in the program by this spring. A second sign-up period could be conducted next year.

The new project is known as the Firesteel Creek Riparian Area Management (RAM) Program. It's coordinated locally by Dave Kringen, who's been managing a larger watershed cleanup effort since 1999. The new project is an offshoot of that existing effort, which is known as the Firesteel Creek

and Lake Mitchell Watershed Project.

A primary focus of the existing watershed project has been the relocation of cattle feedlots away from the creek, and the construction of waste-management systems to contain feedlot



KRINGEN

CREEK

Continued from Page 1

runoff. Kringen said those efforts may be reaching their end potential, with 15 systems installed so far and three more tentatively scheduled for installation soon.

"There's not always going to be those ag-waste systems to install," Kringen said, "so that's kind of why we're changing gears and looking at this new program."

Both the existing watershed project and the new RAM program aim to improve the water quality in Firesteel Creek and its impoundment, Lake Mitchell, by reducing the amount of harmful runoff in the watershed.

Land enrolled in the RAM program is expected to sprout dense vegetation that will naturally filter runoff entering the creek.

Of particular interest to Mitchell residents is the RAM program's potential impact on the algae problem in Lake Mitchell. Kringen said the program could help reduce the amount of algae-fueling nutrients that enter the creek and lake.

The RAM program is open to owners of creek-side land below

state Highway 34 on the creek's east branch, below the Wilmarth Lake spillway on the west branch, and above the inlet of Lake Mitchell on the main branch.

The program is especially suited, though not limited to, landowners who are enrolled in the Continuous Conservation Reserve Program. Continuous CRP is a federal government program that pays landowners lease payments and incentives to protect environmentally sensitive land.

Kringen said Continuous CRP enrollments extend only so many feet back from the creek bank, a fact that sometimes complicates the decision to enroll. The new RAM program will piggy-back on Continuous CRP by offering payments to landowners on additional acres adjacent to Continuous CRP tracts.

"You don't have to be in CRP," Kringen said, "but that's where the money is for providing alternative water sources and fencing."

Kringen said the current base rate for CRP payments is \$54 per acre in Davison County and \$48 per acre in Jerauld and Aurora counties. Payments from the new RAM program will be 75 percent of the base CRP rates.

The RAM program will offer 15-year leases and could potentially offer 30-year easements and permanent easements. The lease agreements will offer annual payments, and the easements would offer lump-sum payments.

Landowners will retain access rights to their land for activities such as hunting and recreation.

"What you gain," the project brochure tells landowners, "(is) an opportunity to improve your area's public water quality for you and your community's use, and be an example of agriculture's commitment to clean water and environmental stewardship."

Funding for the program comes from local and federal sources. The state has awarded the program a \$150,000 grant from the federal Environmental Protection Agency; the Mitchell City Council has contributed \$120,000; and the James River Water Development District has contributed \$38,100. Additional funding may be sought, depending on the popularity of the program.

Landowners interested in participating should contact Kringen at the Mitchell USDA Service Center, or their local Natural Resources Conservation Service district office.

Rural-pollution program meets skepticism

State task force studies projects, including Firesteel Creek-Lake Mitchell plan

By **BOB MERCER**
Republic Capitol Bureau

PIERRE — More than \$2 million of federal funding is spent annually across rural South Dakota on conservation projects intended to reduce pollution flowing into lakes, rivers and streams. No one involved in the 319 program

suggests the funding is enough.

But whether the money might be better spent on different approaches acceptable to more farmers and ranchers came into question publicly Wednesday.

A state task force reviewed some of the recently complet-

ed work and learned that the Kingsbury Lakes project finished far from meeting many of its goals for enrolling producers or cleaning up the water, while the Firesteel Creek-Lake Mitchell project is reaching or surpassing its work targets but isn't stopping the massive algae bloom each

summer in the lake.

Two of the more problematic contaminants, nitrogen and phosphorus, come mostly from commercial fertilizers and from livestock manure. Just as those chemical elements are essential to crop growth, they also spur algae and underwater vegetation,

putting agricultural producers and recreational water users at odds, and drawing other big uses of fertilizers, such as for golf courses and city lawns, into the discussion.

On the Kingsbury Lakes project, so few producers chose to participate that the

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POLLUTION

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project's managers were able to spend only \$250,000 of their 319 funding and are turning back about \$160,000 of the grant. The project, started in 2005, was shut down this year ahead of schedule.

"We were hoping to build two or three waste-management systems this year, but that didn't materialize," Roger Strom, the interim coordinator, said.

Design problems led to cost overruns at several livestock feeding lots, discouraging other producers from signing up. Some farmers didn't want to break from their traditional practice of applying manure to fields during winter, and therefore, wouldn't participate.

None of the lakes in the Kingsbury chain came close to the nutrient reductions sought. The aim for Lake Preston was a 40 percent drop,

but 6 percent was achieved. For Whitewood, the target was 32 percent, while the result was 10 percent. The goal for Lake Thompson was 24 percent, the finish 14 percent.

Strom said producers might be more willing to use vegetation treatment areas — parcels of grassy ground where feedlot manure can flow — rather than construct expensive holding ponds.

South Dakota State University associate professor Todd Trooien is evaluating the performance of VTAs at working feedlots in Meade, Haakon, Miner and Roberts counties. He said they generally have worked well, but more phosphorus and nitrogen collect in the soil than the grasses and alfalfa can use.

"We're taking off a bunch, but we're adding more," Trooien told the task force members. "That would have to be part of the design equation: What accumulation are we willing to take?"

Meanwhile, the Firesteel

Creek-Lake Mitchell project met or surpassed its targets for signing up producers to change grazing practices, build new animal-waste systems and better manage nutrients to reduce runoff. Even so, those steps were literally drops in a very big bucket that isn't making a dent so far in the algae bloom.

The algae problem so frustrated local residents that nearly \$550,000 of 319 and city funds were spent over the course of 2002 through 2006 to treat the lake with alum. Each summer saw the same pattern: early results, followed by the algae booming back up to pre-treatment levels.

The Firesteel Creek watershed covers 350,000 acres in Aurora, Davison and Jerauld counties, flowing into a 670-acre lake, making the goal of reducing the lake's phosphorus content by 50 percent an immense challenge. "Sixteen ag-waste systems isn't going to do it yet," project manager Dave Kringen said.

On the other hand, the Lake Hanson project produced pleasing results, according to Curt Hart of Alexandria. He acknowledged the project didn't attract a lot of interest from ag producers in the watershed upstream, but a waste-management plan is in development for the major source of livestock pollution reaching the lake, and approximately half of the ag ground around the lake has been enrolled into the federal Conservation Reserve Program as grassland.

There also was the unusual good fortune of the dam breaching during a big rain in May 2007, which temporarily drained the lake nearly entirely and flushed two to three feet of sediment from one end.

"We were really satisfied with the way the whole thing turned out," Hart told the task force members. "Those are things we just never would have gotten done without the 319 money."

First permanent easement along Firesteel Creek signed

By **SETH TUPPER**
The Daily Republic

The effort to improve water quality in Firesteel Creek and Lake Mitchell was boosted Friday morning by the placement of a permanent conservation easement on a 28.8-acre parcel of land along the creek.

It was the first permanent easement arranged by the new Firesteel Creek Riparian Area Management (RAM) program, which was created last winter with funding from

several public sources. The program uses leases and easements to create grass buffer strips that keep harmful runoff out of the waterway.

The first permanent easement covers land along a branch of Firesteel Creek in Aurora County that is owned by GaDak Farms, a six-member partnership represented Friday by Steve Brinkman. The easement will be held by Northern Prairies Land Trust, of Sioux Falls. GaDak Farms

See **EASEMENT**, Page 13



Seth Tupper/Republic

Patrick Anderson, center, director of Northern Prairies Land Trust, discusses a conservation easement Friday at the County Fair Banquet Hall in Mitchell with Steve Brinkman, to Anderson's right, of the GaDak Farms partnership. Seated at left are Mitchell Public Works Director Tim McGannon, Firesteel/Lake Mitchell Watershed Project Manager Dave Kringen and Deb Bartscher, of the Davison Conservation District. At right is Mitchell City Councilman Marty Barington.

EASEMENT

Continued from Page 1

received an upfront, lump-sum payment from the RAM program as part of the agreement.

The land in the easement has been used for agricultural purposes but now must be planted with grasses and maintained in a natural state for the life of the easement. The landowner group will maintain rights to use the

property — including for hunting — under the terms of a management agreement, and the easement holder will monitor the land to ensure that the terms of the agreement are being upheld.

Patrick Anderson, executive director of Northern Prairies Land Trust, said the easement will help accomplish important environmental goals.

"It's a good grass buffer, so it protects the water body," he said. "And as a side benefit, it

provides a lot of nice wildlife habitat."

The RAM program is an arm of the Firesteel/Lake Mitchell Watershed Project, which is headquartered in the Davison Conservation District office in Mitchell and managed by Dave Kringen.

The project's goal is to reduce the amount of harmful runoff from animal wastes, farming operations and other sources that enters Firesteel Creek.

The polluted runoff not only harms water quality in the creek, but also the water downstream in Lake Mitchell, where the nutrients in the runoff fuel unsightly summertime algae blooms.

The city of Mitchell undertook an in-lake program of aluminum sulfate treatments in recent years to combat the algae, but the program was halted because of uncertainty about its effectiveness. The Mitchell City Council has since

turned to upstream efforts, such as the RAM program, as a means of reducing the algae problem.

The RAM program was created last winter with funding of \$150,000 from the Environmental Protection Agency, and about \$100,000 from the city of Mitchell, \$38,000 from the James River Water Development District and \$15,000 from the Lower James Resource Conservation and Development Council.

About \$175,000 has been spent so far. In addition to Friday's easement agreement, the RAM program has arranged three shorter-term lease agreements.

The total acreage of new buffer strips resulting from the four agreements is 243.6, and the RAM program has assisted in enrolling an additional 76.8 acres in a similar Conservation Reserve Program administered by the federal government.

FIRESTEEL CREEK NEWS

Volume 10, Issue 1

March 2009

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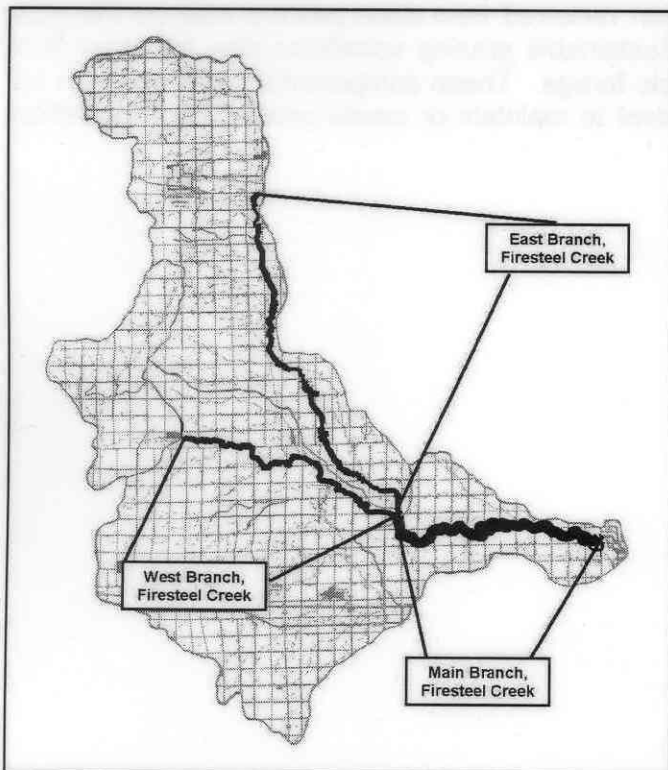
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Money Still Available for Buffer Program

Applications are still being accepted for the Firesteel Creek Riparian Area Management (RAM) program to install buffer strips along the main stems of Firesteel Creek in order to improve water quality of Lake Mitchell. This locally-sponsored initiative is intended to complement the USDA Continuous CRP buffer program by making it possible for a producer to enroll areas into the RAM program beyond the 120 foot maximum average width that CRP offers, or other areas that may not be eligible for CRP. Fifteen year lease agreements or longer-term conservation easements are available to landowners along the main stems of Firesteel Creek. Land below Hwy 34 (East Branch) and below the Wilmarth Lake spillway (West Branch) to the inlet of Lake Mitchell is eligible to apply.



Fifteen Year Lease Agreements

Land offered should currently be used as grazing land for livestock or cropped up to the streambank. If additional acres are offered beyond what is eligible for Continuous CRP, the landowner will receive 75% of the base CRP rental rate for areas up to 500 feet wide and 50% of the rental rate beyond 500 feet through the RAM program. For example, if the CRP rental rate is \$54/acre for the first 120 feet, then the rental rate for areas between 121 – 500 feet wide will be \$40.50 and \$27 for areas beyond 500 feet. Annual payments for the additional acres will be made by the Davison Conservation District by October 15 for the duration of the RAM contract.

Thirty Year or Permanent Conservation Easements

Land offered should currently be used as grazing land for livestock or cropped up to the streambank. Easements can be placed on land that is eligible for, or currently under, a USDA Continuous CRP contract. Buffers will be a minimum of 75 feet and a maximum of 150 feet from the streambank. The conservation easements will be held by Northern Prairies Land

Trust based in Sioux Falls, SD. Landowners will receive a one-time, lump sum payment for the conservation easement.

Since its inception last year, 3 lease agreements have been enrolled in Davison County and 1 permanent easement signed in Aurora County. See your local NRCS District Conservationist or contact the Firesteel Creek Watershed Project for more information.

What a Grazing Plan Can Do for You

Mitch Faulkner, Rangeland Management Specialist

Developing a grazing plan is the first step of, and is the key for meeting grazing land objectives. Grazingland objectives can range from improving livestock distribution to minimizing undesirable species, increasing preferable plant species composition, increasing stocking rates, decreasing bare ground, eliminating livestock trailing, etc. The first step in the grazing plan process is inventory. This includes defining location of fences, water sources, indentifying the kinds and productivity of vegetation, recording resource concerns such as weed invasion or overutilization, etc. This information is required to plan needed practices (such as fence and livestock water), and design grazing use and rest periods.

Perhaps the greatest purpose of a grazing plan is to assist landowners meet their resource objectives. When properly designed and applied, a grazing plan will, over time, result in a productive, resilient, and healthy grassland. First, a grazing plan outlines the class and number of livestock grazing a specific grazing unit or pasture, the available grazing fields and their carrying capacities (how much grazable vegetation they will likely produce), and plans periods of grazing and rest for each pasture. This is usually accomplished using a "rotational" style grazing system where a herd or herds are moved between pastures during the grazing season. Movements are scheduled to best utilize available pastures (such as crested wheatgrass in the spring and rangelands later) and provide appropriate rest periods (usually 30 days of consecutive rest per pasture during period of fast plant growth and 45 days of consecutive rest per pasture during slow plant growth). These moves are planned based on plant growth stage, and the plants ability to regrow. In addition, it is optimum to plan for changing the season of use (the time of the year) that each pasture is grazed between years, in attempt to continuously vary the stage of growth when plants are grazed in each pasture. Finally, the amount of vegetation removed from each pasture may be the most critical to plant health and future pasture productivity. Sustainable grazing schedules plan for about 50% removal by weight (or take half-leave half) of the desirable forage. These components combined with on-the-ground observations and decision making are important to maintain or create productive and resilient plant communities.



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Davison Conservation District
1820 North Kimball, Suite B
Mitchell, SD 57301

Improve, then truly market, Lake Mitchell

A true story: A visitor from a nearby town was on an impromptu driving tour of Mitchell, and especially the area on the north edge of town near Lake Mitchell.

As the avid fishermen motored around the lake, he marveled at its sheer size.

"I had no idea," he said, "that it was this big."

We imagine many others also would be amazed at the lake's size, its beauty and its recreational opportunities. Mitchell simply does not do much to promote the manmade lake as a destination, perhaps a place to spend a day or even a night at the city-owned Lake Mitchell Campground.

Recommendations made by the Lake Mitchell Development Subcommittee of the planning group Focus 2020 may prompt changes in the way we as Mitchell residents look at the lake, but also how we as Mitchell residents market and promote the lake.

The subcommittee's four main goals are to:

- Improve the lake's water quality;
- surround the lake with a system of recreational trails;
- improve and better maintain the facilities around the lake;
- and market the lake so the public knows what recreational opportunities are available.

OK, go ahead. Insert the latest joke or snide comment about the lake's water quality here. It's true that Lake Mitchell does gain a certain green sheen as the summer progresses, but it still should be promoted and maintained as the important recreational source that it is.

Although the Lake Mitchell Development Subcommittee announced no specific plan to improve water quality, it hopes something can be done within 20 years. We do, too, and we commend any and all efforts that have been taken in recent years to rid the lake of algae — especially efforts to clean up the upstream watershed.

The subcommittee has targeted 14 locations around the lake that should be improved and better maintained, and numerous additions — ranging from more sidewalks to additional beaches — have been suggested.

The overall goal of the subcommittee is to "see Lake Mitchell and the surrounding shores become a major destination for local and regional recreation and entertainment enthusiasts through increased awareness of improved and maintained trails, facilities, lake access and water quality."

Lake Mitchell is a good lake. With work and an improved focus, it can be a great lake. So many events and tourist activities could be taking place on its waters or its shores, yet today, even people from nearby towns have no real idea what the lake offers or even what it looks like.

We like the Lake Mitchell Development Subcommittee's ideas and hope they someday become reality.

FIRESTEEL CREEK NEWS

Volume 10, Issue 2

September 2009

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Manure Handling Demonstration and Cover Crop Field Day Thursday, September 17, 2009 · Mitchell, SD



Learn how manure and cover crops can maximize crop production:

- **Reduce costs** for commercial fertilizer
- Protect and improve **water quality**
- **Improve soil quality** by increasing soil organic matter
- Determine **economic value of manure**

DIRECTIONS: The demonstration site is located 10 miles south of Mitchell on Hwy 37, then go 1½ miles west on Hwy 42.

The event is **open to the public**, and a noon lunch will be served for \$5. Registration begins at 9:30 a.m. and demonstrations and presentations will begin at 10 a.m. and will run until mid afternoon.

Please RSVP by September 11
by calling (605) 996-1564 Ext. 5
or send an email to john.lentz@sd.usda.gov



- See the latest in solid manure application equipment in action, including the new vertical beater technology for optimum manure distribution.
- See liquid application equipment, including low disturbance injection systems for no-till, alfalfa, or pasture.
- See the latest in GPS and Auto Steer technology in action.
- Tour in field plots and discuss the use of cover crops to improve soil quality, uptake and store nutrients for next year's crop, and provide cost effective forage.
- Learn how to calibrate your manure spreader, and calculate application rates to maximize crop yield and profitability.

Sponsored by:

- SD Natural Resources Conservation Service (NRCS)
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- Custom manure applicators from SD, IA, MN, NE.

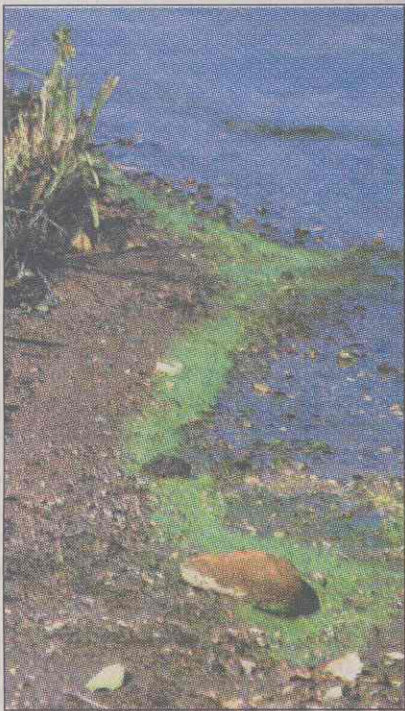
USDA is an Equal Opportunity Employer and Provider



Dirtwork for a new animal waste management system was recently completed at the Broken Heart Ranch in southern Jerauld County. The existing feedlot near Firesteel Creek will be abandoned in favor of the new relocated facility. Funding for the project is being provided by the landowner and the Firesteel Creek Watershed Program.

Davison Conservation District
1820 North Kimball, Suite B
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Laura Wehde/Republic

Algae, shown here, lines the shores of Lake Mitchell on Tuesday.

Experts say algae not as bad as reported

National news report cautioned of poisoning

By SETH TUPPER
The Daily Republic

Some experts in South Dakota say the human health risks from this state's blue-green algae blooms are not as grave as a recent news story may have made them appear.

Monday, The Daily Republic published an Associated Press story from Wisconsin about blue-green algae. The story called the algae "potentially deadly" and said increasing amounts of blue-green algae in Midwest waters "will eventually lead to more human poisoning." Wisconsin officials, the story said, are "telling people who live on algae-covered lakes to close their windows, stop taking walks along the picturesque shorelines and keep their dogs from drinking the rank water."

Those statements might have concerned people who use Lake Mitchell or live on its shores, but scientists who work for the South Dakota Department of Environment and Natural Resources downplayed the human health risks from blue-green algae during Tuesday interviews.

"I wouldn't be overly concerned about it," said Rich Hanson, a DENR environmental program scientist.

Blue-green algae can contain deadly toxins under certain conditions, but as the Wisconsin story acknowledged, there have been no known human deaths from blue-green algae toxins

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ALGAE

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in the United States. There have been animal deaths from consumption of blue-green algae, and there have been reports of various human symptoms — such as skin rashes — from contact with blue-green algae.

South Dakota keeps no file of such reports, Hanson said, because they're so infrequent.

"We've got algae that can become toxic, and we get algae blooms all the time," Hanson said. "But yet we just don't get many reports of dogs getting sick or people getting sick. That tells us that conditions have to become very specific, and it's just not hap-

pening very often."

Nels Troelstrup, of the Department of Biology and Microbiology at South Dakota State University, offered a similar assessment.

"People are out swimming in our lakes all summer long, and the number of reports we're getting by comparison from people who are using the lakes frequently is very, very small," Troelstrup said.

He added that just because there is little likelihood of health problems resulting from blue-green algae, "that doesn't mean you should be stupid."

Aaron Larson, another environmental program scientist with the DENR, agreed and offered this advice:

"If there's a pretty signifi-

cant green scum of algae on the surface, you might want to consider not swimming, especially if the algae is pretty concentrated," Larson said. "You might want to keep your pets and other animals away from the water to avoid them drinking it if it's a visibly significant algae bloom at that time."

Blue-green algae are actually bacteria that feed on excessive nutrients in water. Studies of Lake Mitchell have shown that its blue-green algae blooms are fed primarily by nutrient-rich runoff from agricultural operations upstream in the Firesteel Creek watershed. The creek was impounded to form Lake Mitchell during the 1920s.

Hanson said the only preventative measure that can be

taken against algae is to keep the lake water as clean as possible. An existing, publicly funded program, the Firesteel Creek/Lake Mitchell watershed project, attempts to do that by offering assistance to agricultural producers and landowners who undertake practices that keep nutrients out of the creek.

The project is managed by Dave Kringen, who said Tuesday that he's heard of some dogs getting sick after drinking Lake Mitchell water but has never had any firsthand knowledge of a person being adversely affected by algae in the lake.

"It might smell a little bit," Kringen said of the algae, "but I've never heard of any other issues from it."

Local lake green, but not unsafe

The late-summer algae that sometimes chokes Lake Mitchell is sometimes smelly and always unsightly.

We never, however, have considered it deadly or a serious health hazard.

Experts quoted in an Associated Press report earlier this week, however, think otherwise. The story noted the prevalence of blue-green algae in the upper Midwest and said increasing amounts of algae in Midwest waters "will eventually lead to more human poisoning." In Wisconsin, health officials are urging people who live on algae-covered lakes to close their windows and stop taking walks along the shorelines.

Here in Mitchell, such comments could cause serious concerns. Lake Mitchell, as we all know, does tend to gather algae during the warm months of summer. The City Council has addressed this problem several times in recent years, but it has never been determined that the lake has levels of algae that are dangerous to humans.

According to a scientist from the state Department of Environment and Natural Resources, it's much ado about nothing.

"I wouldn't be overly concerned about it," scientist Rich Hanson told The Daily Republic Tuesday.

He said blue-green algae can contain deadly toxins under certain conditions but there have been no known human deaths. He also noted that there are no files kept on algae-related illnesses because they are so infrequent in the state. A biologist from South Dakota State University also said there is no reason to be alarmed.

That said, the South Dakota experts said that if there is a "significant" film of algae scum on the surface, consider not swimming there and keep pets away.

That seems like simple common sense to us.

After talking with scientists and biologists in South Dakota, and after hearing no reports of real illness being linked to Lake Mitchell's waters, we do not feel the lake is unsafe.

Does it become a bit unsightly as the summer months wear on? At times, yes.

Until we hear differently from confirmed sources and top experts, we consider the algae blooms nothing more than an inconvenience.

Firesteel project may lose its singularity



Seth Tupper/Republic

Lake Mitchell, pictured here during the late summer of 2009, has benefited for the past 12 years from a project to reduce algae-fueling runoff in the Firesteel Creek watershed. The project could end soon, because state officials want to roll it into the broader Lower James River Watershed Project.

Firesteel Creek/Lake Mitchell program could soon be added to larger James River Watershed plan

By **SETH TUPPER**
The Daily Republic

The end could be near for a watershed project that many believe is the best hope for reducing algae levels in Lake Mitchell.

Funding for the Firesteel Creek/Lake Mitchell Watershed Project is due to expire in June. When that happens, state environmental officials want to roll the Firesteel Creek/Lake Mitchell project into the Lower James River Watershed Project.

If that happens, there would no longer be a project focusing solely on the Firesteel Creek watershed and Lake Mitchell. Instead, the creek, its watershed and the lake would be part of a larger project focused on the entire lower James

River basin, which covers all or parts of 11 counties and stretches from the Wessington Springs area to Yankton.

Mitchell city leaders are concerned about the potential impact on lake-improvement efforts and are mulling their options.

"It's very concerning, because we want to continue to clean up that watershed," said Greg McCurry, chairman of the Lake Mitchell Advisory Committee. "That's part of what will improve the quality of the lake."

Lake Mitchell was created when Firesteel Creek was impounded during the late 1920s. The lake served for decades as Mitchell's water source, but the city now gets its water from a Missouri River

pipeline.

Development efforts at the lake now focus mainly on recreation, but those efforts are hindered by summertime blooms of unsightly and smelly algae. Studies that served as the basis of the Firesteel Creek/Lake Mitchell Watershed Project indicated that the algae is fueled in part by runoff from cattle feedlots and other agricultural operations in the Firesteel Creek watershed, an area that spans 366,000 acres of land located mainly in Jerauld, Aurora and Davison counties.

The Firesteel Creek/Lake Mitchell Watershed Project began in 1998 with a goal of decreasing the algae-fueling runoff in the watershed, and

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WATERSHED

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about \$3.7 million in combined federal, state and local funds have been authorized over the project's life. Progress has been made with the installation of 18 "ag-waste systems," which contain cattle-feedlot runoff that formerly drained into the creek. Additionally, the project has enrolled four areas of land along the creek in a buffer-strip program designed to filter runoff as it drains into the waterway.

During part of the project, the upstream efforts were paired with aluminum sulfate treatments in Lake Mitchell that were supposed to reduce algae levels. Some city leaders questioned the alum's effectiveness, and the treatments were ended. Research into other algae-reduction methods in the lake has continued, though city leaders have consistently said the only long-term fix is a continual effort to reduce algae-fueling runoff in the watershed.

That's why some city leaders are dismayed by the state Department of Environment and Natural Resource's recommendation that the Firesteel Creek/Lake Mitchell Watershed project be rolled into the Lower James River project. They worry that the Firesteel Creek watershed won't get the same level of attention it's received over the past 12 years.

Pete Jahraus, a DENR environmental senior scientist, said the recommendation to consolidate the projects stems from a new strategy emanating out of the state and the federal Environmental Protection Agency. That strategy holds that it's more efficient to combine various sub-watershed projects such as the Firesteel Creek/Lake Mitchell project into broader watershed efforts such as the Lower James River project.

"From our standpoint, it just makes more sense to not have two projects working the same area," Jahraus said.

Some local leaders are further dismayed by a bill in the Legislature that would roll back

funding for the James River Water Development District, which is the sponsoring agency for the Lower James River Watershed Project. The legislation was approved 33-0 this week by the state Senate because it seeks to close an unpopular loophole that allowed some water districts to dramatically increase their 2010 tax levies.

Some officials connected with Lake Mitchell, however, say the legislation will take away funding that the James River Water Development District could have directed, at least in part, to the Firesteel Creek area. Whatever happens with the legislation, the Lower James River Watershed Project already has a budget of about \$1.2 million that was authorized for projects starting in 2008 and continuing through 2011.

Jahraus said future efforts to reduce algae-fueling runoff in the Firesteel Creek area will depend largely on local sponsors. He said the Mitchell City Council, for example, could work with the James River Water Development District to focus some resources specifically on the Firesteel Creek area.

City officials or other interested local entities could also apply for funding to continue the Firesteel Creek/Lake Mitchell Watershed Project, Jahraus said, but the funding request would be subject to the approval of a DENR task force.

Given that the DENR wants the Firesteel Creek/Lake Mitchell project rolled into the Lower James project, approval of such a funding request may be unlikely.

Meanwhile, the Lake Mitchell Advisory Committee tentatively plans to discuss the issue with James River Water Development District Manager Darrell Raschke at a March 16 meeting. Dave Kringen, the manager of the Firesteel Creek/Lake Mitchell Watershed project, has also called an April 5 meeting for all interested parties to discuss future options.

McCurry, of the lake committee, said he's open to new ideas.

"We'll certainly do our best as we move forward with this to investigate every option," he said.

Leave alone the Firesteel Creek project

The future of an ongoing project designed to clean up the Firesteel Creek watershed is in danger and could threaten more than a decade of work.

The Firesteel Creek/Lake Mitchell Watershed Project is due to see its funding expire in June. State environmental officials are proposing that when the funding ends that the project be rolled into the Lower James River Watershed Project, which covers all or parts of 11 counties and stretches from Wessington Springs to Yankton.

So instead of a single project that is locally regulated and planned and designed to tackle a single problem, the local watershed cleanup could become part of a much larger program whose focus covers roughly an eighth of South Dakota.

We are wary about this proposal, as are city leaders and those associated with the Firesteel project. At present, the Firesteel project has a singular focus, i.e., cleaning up Firesteel Creek in hopes of eventually having less polluted runoff reach Lake Mitchell.

Each summer, the lake takes on a green hue from algae, which studies have shown is fueled in part by runoff from cattle feedlots and other agricultural operations in the Firesteel Creek watershed.

In 1998, the Firesteel Creek/Lake Mitchell Watershed Project began. Since then, approximately \$3.7 million in combined federal, state and local funds have been authorized for use in the project. That money has been used to install 18 "ag-waste systems" and to enroll four areas of land along the creek in a buffer-strip program designed to filter runoff, among other things.

The Department of Environment and Natural Resources figures it makes sense to consolidate the Firesteel and lower James River projects. We aren't so sure.

Too, we're concerned by a proposal in the state Legislature that would roll back funding for the James River Water Development District to 2008 levels. The JRWDD oversees the Lower James River Watershed Project.

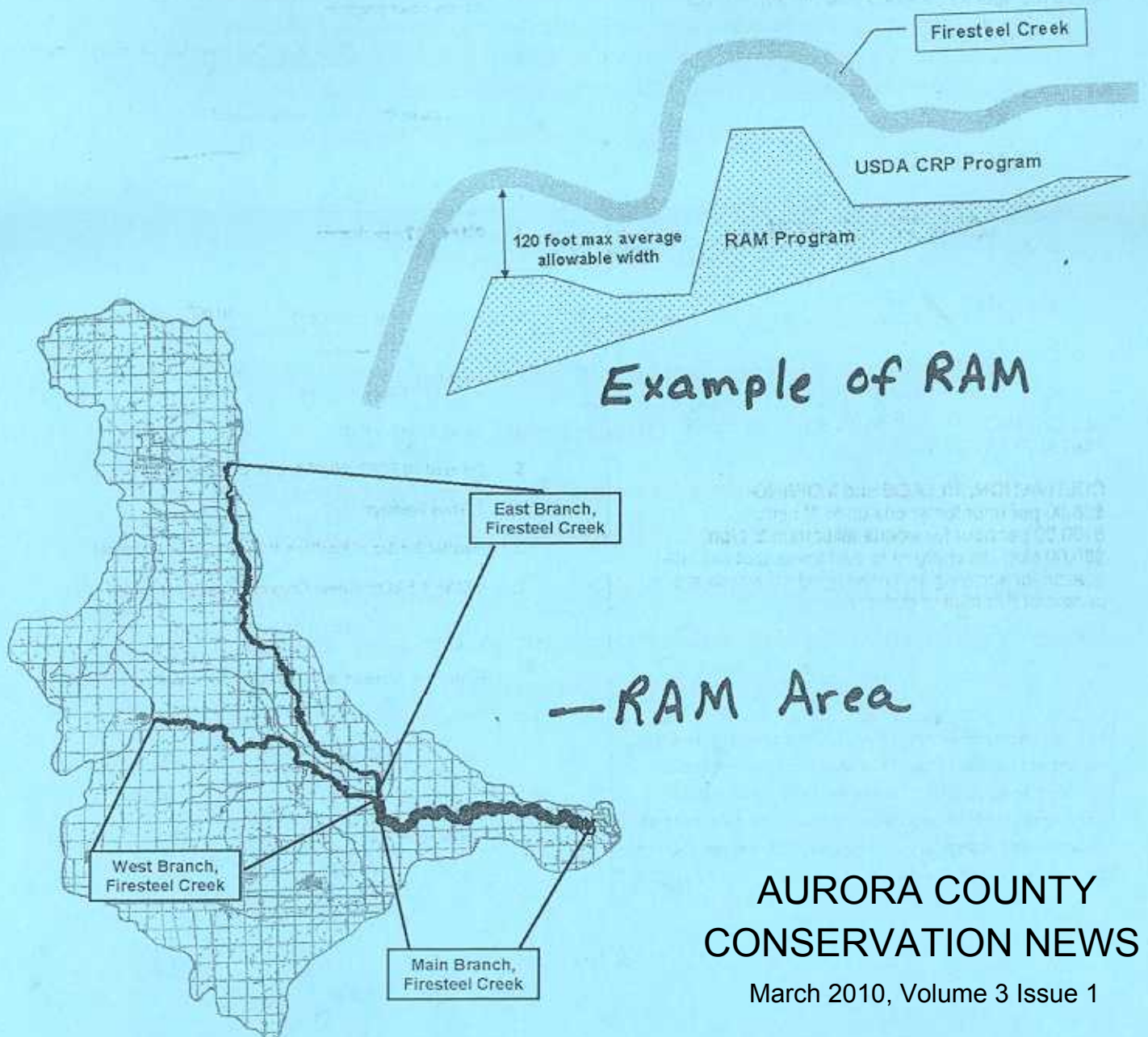
If the Firesteel Creek project is rolled into the larger Lower James River Watershed Project, will the Firesteel Creek project receive as much focused attention as it has in the past 12 years? Will the proposed rollback in taxes adversely affect the progress that's been made on the Firesteel?

There are just too many unknowns for us to digest.

For now, we prefer the Firesteel project be left on its own.

Firesteel Creek Buffer Program Available to Aurora County Producers

Producers in Aurora County who have land adjacent to the main stems of Firesteel Creek are eligible for the Firesteel Creek Riparian Area Management (RAM) program. The RAM program is designed to work with the USDA Continuous CRP buffer program by making it possible to enroll areas into the RAM program beyond the 120 foot maximum average width that CRP offers, or other odd areas that may not be eligible for CRP. Fifteen-year lease agreements or longer-term conservation easements are available. Land offered should currently be used as grazing land for livestock or cropped up to the streambank. Producers who have land along the East Branch of Firesteel Creek below Hwy 34 in Jerauld County, or along the West Branch below the Wilmarth Lake spillway in Aurora County, to the inlet of Lake Mitchell is currently eligible to enroll. If you would like more information about the Firesteel Creek RAM program, contact Dave Kringen, Firesteel/Lake Mitchell Watershed Coordinator, at 605-996-1564 ext. 131 or your local NRCS office.



**AURORA COUNTY
CONSERVATION NEWS**

March 2010, Volume 3 Issue 1

ALGAE

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SolarBee unit for about \$22,000 from a lake association in Minnesota. The city would also need to hire SolarBee workers to install the unit, for another \$3,000 to \$5,000.

The proposed location for

the used SolarBee is in Kippes Bay, a finger on the lake's west side between South Harmon Drive and Indian Village Road. If the unit proves successful in reducing algae levels there, the city could then consider purchasing additional units to cover the entire lake. New units cost \$50,000 apiece.

The 800-pound units float in the water, but are anchored to the lake bottom. The most visible part of a SolarBee is its solar panels, which power a pump that continually brings up thousands of gallons of water and disperses it out across a large area. The pump is very low power, and only a gentle ripple is seen on the

surface. Mitchell currently is not using any in-lake methods to combat algae. Treatments of aluminum sulfate were tried in recent years, but that project was terminated following questionable results. Upstream from the lake, the city continues to fund and support a project to reduce the

amount of polluted runoff that enters the lake via the Firesteel Creek Watershed. The members of the committee who were in attendance Wednesday seemed excited about the potential of the SolarBee.

No official action was taken, but the committee asked Ruckheim to prepare some official quotes for both the Kippes Bay test project and a long-term, six-unit project to address the entire lake. If the committee decides to support the installation of SolarBees, it will need to send a recommendation to the City Council.

Lake committee looks at algae bloom options

By SETH TUPPER
The Daily Republic

Water circulators could soon be proposed as a method for reducing algae blooms on Lake Mitchell.

The Lake Mitchell Advisory Committee heard a presentation Wednesday afternoon at City Hall from the SolarBee company, which is headquartered in Dickinson, N.D. The company has installed hundreds of its SolarBee circulators in various types of waterbodies.

Company officials do not know exactly how their product reduces algae blooms. They just know that, most of the time, it does produce a reduction in blue-green algae.

"It kills it," SolarBee Regional Manager Jim Ruckheim, of Excelsior, Minn., told the committee. "It dies. It's no longer dominant."

The committee is considering asking the City Council to buy one used

See ALGAE, Page 6

Officials: Efforts to clean lake, creek water to continue Watershed won't affect cleanup work

By SETH TUPPER
The Daily Republic

Two watershed project managers say efforts to clean up the waters of Firesteel Creek and Lake Mitchell will continue, regardless of what happens to the Firesteel Creek/Lake Mitchell Watershed Project.

The project's funding is scheduled to expire June 30. Dave Kringen, the project manager, said an April 5 meeting about the project's future should answer many questions.

"Everybody needs to take a breath until our meeting on the fifth, and everything will be fine," Kringen said Tuesday to the Lake Mitchell Advisory Committee at City Hall.

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WATER

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The state Department of Environment and Natural Resources wants to roll the Firesteel Creek/Lake Mitchell Watershed Project into the Lower James River Watershed Project, which covers a larger area. The Firesteel project has been operating since 1998 with a goal of reducing the pollutants from cattle feedlots and other sources that flow into Firesteel Creek and fuel summertime algae blooms in Lake Mitchell.

State officials think it will be more efficient to roll the Firesteel project into the James River project, because the Firesteel area is a sub-watershed within the James River watershed. Some Mitchell city leaders fear that Firesteel Creek and Lake Mitchell would receive less emphasis as part of a bigger project.

Dave Bartel, manager of the Lower James River Watershed Project, said that's not necessarily the case.

"No matter what happens, Firesteel Creek won't be abandoned," Bartel said.

The Lower James project began in 2008 and has funding through 2011. Bartel said the project specializes in the creation of "buffer strips" — areas along a waterway that are taken out of agricultural production and cultivated into densely vegetated cover that naturally filters runoff. Bartel works to convince landowners to join the program, and he uses funding from the federal government and other sources to help pay for the

work.

Bartel said he's been working hard. He pulled a disc in one farmer's field, for example, in exchange for the farmer listening to a pitch about the project. Those efforts have resulted in the protection of 500 acres of land — mostly along James River tributaries — in the past five months.

"I'm very proud of that, and I'm very happy with that so far," Bartel said.

He admitted, however, that he's done little to no work so far in Davison County and that his project area does not extend all the way to the source of Firesteel Creek in Jerauld County.

Bartel said Kringen is handling the work in the Firesteel area for now.

He doesn't know what will happen when the Firesteel project's funding expires, but he said that "in the worst case scenario," the Lower James project and the city of Mitchell could split the cost to hire Kringen so that he could continue his work along the Firesteel.

In other business Tuesday, Lake Mitchell Advisory Committee members:

■ Were told by city Parks, Recreation and Forestry Director Randy Ahrendt that the city is already applying mosquito larvacide to ice, so that the larvacide will be ready to kill mosquitoes when the ice turns to standing water.

■ Heard a report of a conversation that committee member Joe Kippes had with a city official from Houston, Texas, whom Kippes said had a very favorable opinion of the Solar Bee water circulators that the committee is studying

as a way to combat algae blooms in Lake Mitchell.

■ Agreed to conduct a vote sometime soon by e-mail on whether to recommend the purchase of a used Solar Bee to the City Council.

■ Were told that Sandy Beach and Kibbee Park, which are both located on the shores of Lake Mitchell, have been temporarily closed do to problems with rising water and mud.

■ Discussed further a proposal to recruit volunteer groups to clean up areas of the Lake Mitchell shoreline, with advice from Ahrendt to focus on the main public beach, the Sportsman's Boat Ramp, the West Boat Ramp, the Indian Village recreational trail, Sandy Beach, the West End Bridge, Kiwanis Woodlot Park and the public access area at the northern terminus of Ohlman Street.

■ Were told by committee member Mark Puetz that he has received permission from the city's Park and Recreation Board to gather volunteers to clear overgrowth and make other improvements this summer to a quarter-mile trail that extends from Kiwanis Woodlot Park to the amphitheater.

■ Were given copies of a 1930s master plan for the lake and a timeline of lake development from Puetz, who said the information was compiled by City Councilman Scott Houwman from the files of the Carnegie Resource Center.

■ Decided to research an "algaecide" product that Kippes said was recommended by a city official he spoke to from Houston, Texas, who said the product may be useful in small areas of the lake that are especially algae-prone.

Council approves circulator purchase

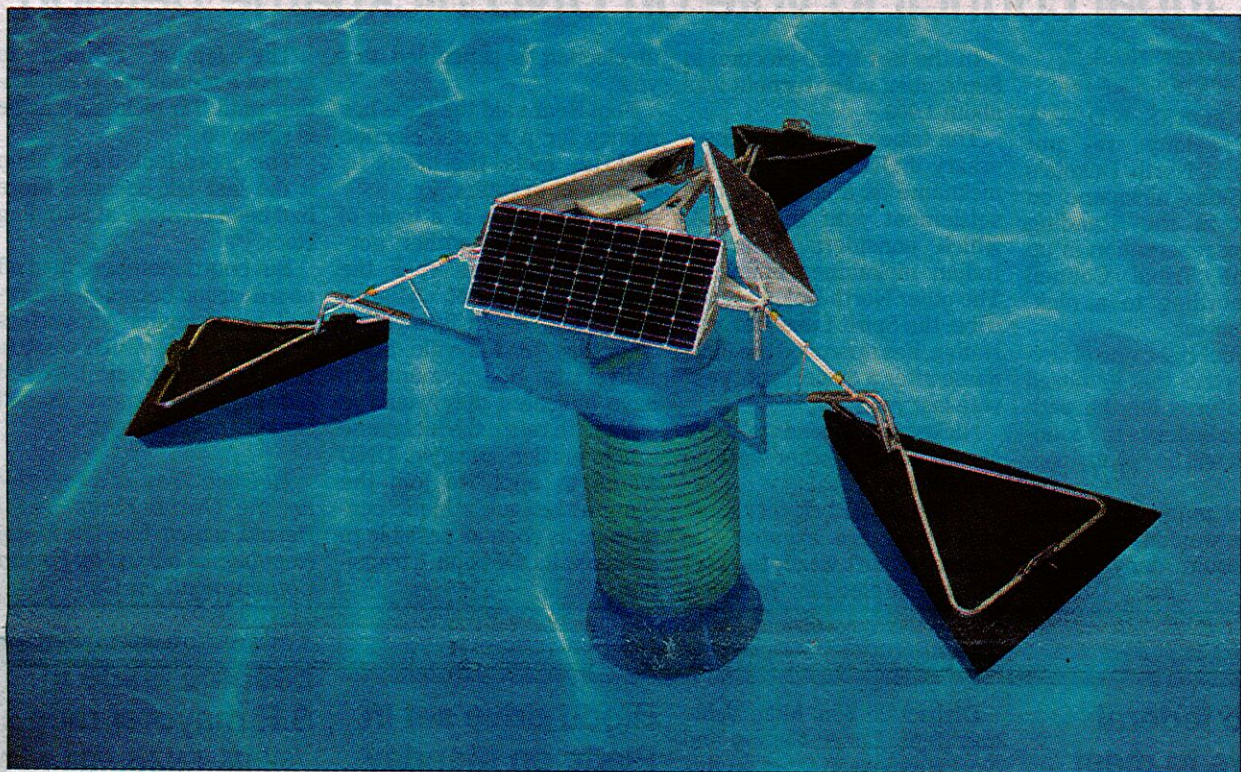


Image courtesy of SolarBee

This drawing shows the above- and below-water portions of the SolarBee water circulator.

SolarBee intended to reduce algae in Lake Mitchell

By AUSTIN KAUS
The Daily Republic

Members of the Mitchell City Council voted unanimously Monday evening at City Hall to approve the purchase of a used SolarBee water circulator to combat algae in Lake Mitchell.

The City Council's Finance Committee voted to provide \$20,250 for the purchase. The remainder of the necessary funds — \$6,750 — will come from the Lake Mitchell Advisory Committee as a 25 percent match.

The unit, which sells for approximately \$50,000 new, will cost \$22,000. Installation in Lake Mitchell will cost \$5,000.

The unit will be placed in Kippes Bay, a finger on Lake Mitchell's west side between South Harmon Drive and Indian Village Road. It is designed to reduce blue-green algae.

Mark Puetz, vice chairman of the Lake Mitchell Advisory Committee, told members of the Finance

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Photo courtesy of SolarBee

A SolarBee is seen on Sylvan Lake in South Dakota's Black Hills in this 2003 photo.

ALGAE

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Committee before the vote that the unit will be purchased from a lake association in Minnesota.

Puetz said the Minnesota association is selling the unit because their own lake is too large for a single unit to make a significant difference in algae reduction.

"We're excited to make some things happen out there," Puetz said.

The 800-pound unit will float in the water but be anchored to the lake bottom.

John McLeod, a member of the Lake Mitchell Advisory Committee, said the unit is expected to last for approximately 20 years. It will be lit at night and removed from the lake during the winter months.

If the unit is effective, McLeod said, he believes five additional units should be used to cover the entire lake.

McLeod said extra algae blooms may appear in the first year of operation. Results are expected to be seen in the second year.

Circulators will be the latest in a string of measures the city has attempted to reduce algae levels in Lake Mitchell. The city tried and abandoned in-lake applications of aluminum sulfate and continues to fund the placement of private property upstream along Firesteel Creek's banks into densely vegetated buffer strips, which naturally filter polluted runoff.

Firesteel project to be absorbed

Watershed cleanup to become part of broader, James River effort

By ROSS DOLAN
The Daily Republic

Details have yet to be finalized, but efforts to improve the Firesteel Creek watershed will likely fall under the management of the James River Water Development District beginning this summer.

A meeting earlier this month in Mitchell attended by state and local entities included discussion of options for the changeover, said Firesteel Creek/Lake Mitchell



KRINGEN

Watershed Project Manager Dave Kringen. He is currently employed by the Davison Conservation District, which has sponsored the watershed project since 1998.

"The state felt that it would be more efficient to roll the Firesteel/Lake Mitchell proj-

ect into the Lower James River Watershed Project," Kringen said. "It will continue the work we've been doing, and that work won't be diminished at all."

The watershed project has a goal of limiting contaminated runoff from feedlots and other sources from entering Firesteel Creek and, eventually, Lake Mitchell. That runoff has been blamed for feeding the algae blooms that plague Lake Mitchell each summer.

As things currently stand, Kringen said, he will likely become an employee of the James River Water Development District and assistant coordinator for the Lower James River Implementation Program — the updated name for the watershed project — probably on or about July 1.

Dave Bartel, manager for the Lower James River Implementation Program, which encompasses a six-

county area from Beadle to Yankton counties, agreed that combining both entities is likely, but he said Kringen's employment details have not been finalized. He is hopeful the city of Mitchell will contribute to Kringen's pay.

Kringen's knowledge of the watershed would be a welcome asset to the James River project, Bartel said. He foresees Kringen dedicating several days a week to the

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FIRESTEEL

Continued from Page 1

Firesteel area and the remainder of his time to other watershed projects.

The city has provided funding for the Firesteel watershed project, McGannon said,

but "it's really not a Mitchell project."

The Environmental Protection Agency and other government entities supply most funding dollars, he said.

Kringen expects that part of his time will be spent working in areas above Lake Mitchell. He said the project will continue to install vegetative buffer

strips along the banks of Firesteel Creek to naturally filter polluted runoff.

Federal EPA dollars will be used to fund the project and not tax money levied for the JRWDD.

Whatever happens, Kringen said, "I know what I'm going to be doing for the foreseeable future."

FIRESTEEL CREEK NEWS

Volume 11, Issue 1

April 2010

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BEST MANAGEMENT OPTIONS FOR CROPGROUND

With the amount of spring run-off that we witnessed this year, you may see some evidence of gully erosion as you begin to work your fields this month. If gully erosion is beginning to become an issue for you, a **GRASSED WATERWAY** may be an option to consider. Grassed waterways are strips of grass seeded in areas of cropland where water concentrates or flows off a field. The waterway is usually shaped and graded along the natural drainageway to carry surface water at a non-erosive velocity to a stable outlet. The vegetation will trap the sediment washed from the cropland and adsorb some of the chemicals and nutrients in the runoff water.



To enhance grass waterway effectiveness, you can combine a waterway with a **FILTER STRIP** along a stream, wetland, or lake to trap additional contaminants or field sediment. Both practices are available through the Continuous Conservation Reserve Program. And if your filter strip is situated on or near one of the main stems of Firesteel Creek, you may be eligible to enroll additional acres into the locally-sponsored Riparian Area Management (RAM) program to help square up both your filter and field.

the most environmentally sensitive areas of a watershed and are an essential part of a healthy stream. Loss of riparian vegetation by either crop production or overgrazing can cause streambank erosion, decrease water infiltration, and increase the amount of runoff and nutrients entering the water.

By buffering these waterways and riparian zones, we can improve water quality by trapping sediment, filtering nutrients such as nitrogen and phosphorus before they reach the surface water, and provide valuable habitat and corridors for fish and wildlife.

As more native range and pastureland gets converted to cropland along the tributaries and main stems of Firesteel Creek, the more vigilant we need to be about the potential effects that soil erosion and overfertilization can have on surface water. A combination of grassed waterways and filter strips can be an effective tool in keeping soil on the landscape and out of the water.



Davison Conservation District
1820 North Kimball, Suite B
Mitchell, SD 57301

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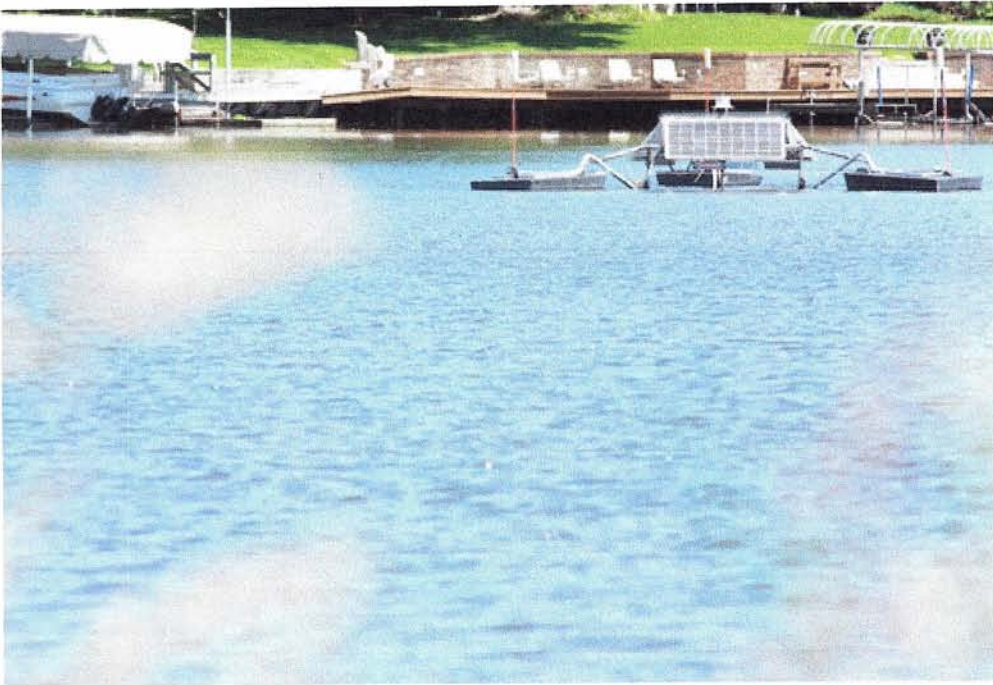
Check out the newly renovated Lake Mitchell webpage.

You will find information on and historical photos of Lake Mitchell, meeting minutes, and highlights of practices that both urban homeowners and rural landowners can participate in.

http://www.cityofmitchell.org/public_works/lake_mitchell/index.htm

SolarBee on Lake Mitchell to take sting out of algae blooms

By: [Tom Lawrence](#), The Daily Republic 6-3-2010



The Lake Mitchell Advisory Committee hopes the SolarBee water-circulation device, shown here, that was placed in the water May 21, will reduce the summertime algae blooms in a portion of the lake. (Laura Wehde/Republic Photo)

There's a large "Bee" at Lake Mitchell, but don't worry: It's not a threat to humans.

The Lake Mitchell Advisory Committee hopes the SolarBee water-circulation device that was placed in the water May 21 will reduce the summertime algae blooms in a portion of the lake.

Committee member John McLeod said some results may be known by late summer.

"It's an experiment to see if it works," McLeod said Wednesday.

The committee bought the 800-pound, used SolarBee from a Minnesota town. The Mitchell City Council provided \$20,250 and the committee kicked in another \$6,750 to purchase and install the bee. The device cost \$22,000, and another \$5,000 was spent to install it, a job that took SolarBee workers about a half-day to complete.

McLeod said the machine is two years old and is expected to work for 20 more years. The committee itself will observe the lake to see how the device is working, he said, but someone may be tasked with monitoring the SolarBee at a later date.

It's anchored to the bottom of the lake near Sportsman's Bay. The floating top resembles a solar panel, and the device is solar-powered.

The SolarBee was invented by a company of the same name based in Dickinson, N.D. The device blends cool and warm water together.

Blue-green algae thrive in warm, stagnant water, according to the SolarBee's company website, so the device is useful when it prevents warm water from serving as a breeding ground for algae.

If the Bee gets a passing grade, as many as five more may be placed in the lake in the future. McLeod said at first, more algae may appear, but the SolarBee will, in theory, reduce the problem in the future.

Algae blooms have long been a sore point in the manmade lake due to runoff from human activity around the lake and upstream in the Firesteel Creek watershed. The city has made several attempts over the years to reduce algae levels.