



Prior Lake- Spring Lake Watershed District

Annual Report

2016

Mission: To manage & preserve the water resources of the Prior Lake-Spring Lake Watershed District to the best of our ability using input from our communities, sound engineering practices, and our ability to efficiently fund beneficial projects which transcend political jurisdictions.

PRIOR LAKE - SPRING LAKE
WATERSHED DISTRICT

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INTRODUCTION

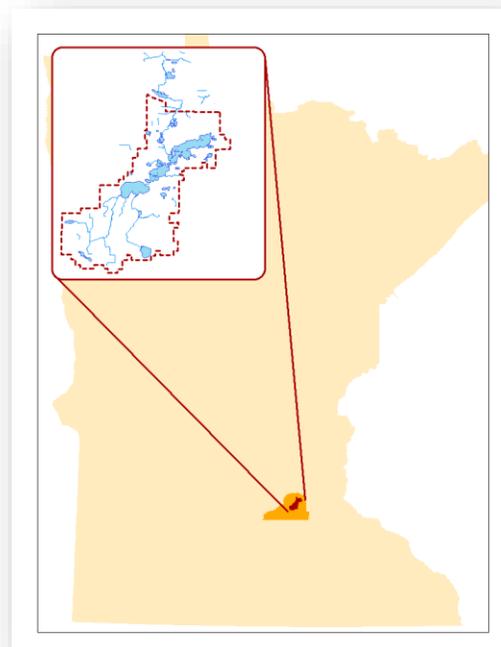
This report has been prepared by the Prior Lake-Spring Lake Watershed District (PLSLWD, or District) and details the activities of the District through the calendar year 2016. The report will focus on the District's program and project accomplishments relative to the approved Capital Improvement Plan established in the 2010 PLSLWD Water Resources Management Plan, and annual work plan. Annual reporting requirements listed in Minnesota Rules Chapter 8410.0150, Subpart 3 will also be included in this report.

ABOUT THE DISTRICT

BACKGROUND

The Prior Lake-Spring Lake Watershed District was established on March 4, 1970 by order of the Minnesota Water Resources Board (MWRB) under the authority of the Minnesota Watershed Act (Minnesota Statutes, Chapter 112). The order was in response to a petition filed by resident landowners within the watershed on June 24, 1969. This citizen petition sought establishment of the District for the purposes of wisely managing and conserving the waters and natural resources of the watershed.

The PLSLWD is approximately 42 square miles in size and is located in north central Scott County, Minnesota, encompassing parts of the cities of Prior Lake, Shakopee, and Savage and parts of Sand Creek and Spring Lake Townships. In addition, a portion of the Shakopee Mdewakanton Sioux Community tribal lands are located within the District.



Location of PLSWD

BOARD OF MANAGERS

The PLSLWD is administered by a five-person Board of Managers (Board) appointed by the Scott County Commissioners. All of the District's policies, goals, and accomplishments are directed by the citizens who serve on the Board. The Board of Managers meets the second Tuesday of the month at 6:00 PM at the Prior Lake City Hall, located at 4646 Dakota St. SE, Prior Lake, MN 55372. Meeting notices, agendas and approved minutes are available on the District website at www.plslwd.org/meetings.

Board members serving during the calendar year 2016 are listed below.

Fred J. Corrigan

Manager

Term: 3/3/16-3/2/19

Resides in Prior Lake

8075 E. Martindale Dr.
Prior Lake, MN 55372

952-445-9681
fcorrigan@armofmn.com

Marianne Breitbach

Vice President

Term: 3/3/15-3/2/18

Resides in Prior Lake

14890 Pixie Point Circle SE
Prior Lake, MN 55372

952-440-7561
jmbreit@gmail.com

Curtis Hennes

President

Term: 2/5/2013-6/11/19

Resides in Spring Lake Township

17286 Sunset Trail SW
Prior Lake, MN 55372

952-440-7443
clphennes@gmail.com

Charlie Howley

Secretary

Term: 7/26/14-7/25/17

4291 Coachman Lane NE
Prior Lake, MN 55372

952-440-5800
chowley@htpo.com

Woody Spitzmueller

Treasurer

Term: 3/3/16-3/2/19

4279 Grainwood Circle
Prior Lake, MN 55372

952-440-7607
bwspitz@integra.net

CITIZEN ADVISORY COMMITTEE

The Prior Lake-Spring Lake Watershed District formalized its Citizen Advisory Committee (CAC) in 2011. The CAC consists of residents who provide input and recommendations to the Board on projects, reports, prioritization and act as the primary interface for the Board to integrate the current issues of concern of the local citizens. The CAC meets monthly on the last Thursday of the month at 6:30pm at the Prior Lake City Hall, located at 4646 Dakota St. SE, Prior Lake, MN 55372.

Citizen Advisory Committee members that served during the calendar year 2015 are listed below.

Paul Krueger
Resides in Spring Lake Twp

Steve Pany
Resides in Prior Lake

Larry Rundell
Resides in Prior Lake

Kim Silvernagel
Resides in Prior Lake

Elizabeth Schramm
Resides in Prior Lake

Roger Wahl
Resides in Prior Lake

Jim Weninger
Resides in Spring Lake Twp

Adam Fitzpatrick
Resides in Prior Lake

Joe Schramm
Resides in Prior Lake

James Goodchild
Resides in Prior Lake

Jodi See
Resides in Prior Lake

STAFF

Day-to-day operations of the Prior Lake-Spring Lake Watershed District are managed by a District Administrator and staff. All staff can be contacted through the main District phone number, 952-447-4166, or at the District Office, 4646 Dakota Street SE, Prior Lake, MN 55372.

Diane Lynch
District Administrator
dlynch@plslwd.org

Amy Tucci
Administrative Assistant
atucci@plslwd.org

Jaime Rockney
Water Resources Specialist
jrockney@plslwd.org

Sarah Mielke
Monitoring Assistant
smielke@plslwd.org
(seasonal employee)

Kathryn Keller-Miller
Conservation Assistant
kkeller-miller@plslwd.org

Maggie Karschnia
Water Resources Project
Manager
mkarschnia@plslwd.org

Andrea Slotke
GreenCorps Member
aslotke@plslwd.org
(temporary employee)

CONSULTING SERVICES

Solicitation for consulting services for 2016/17 were made in September 2015 with the exception of auditing services, which was a year contract. Solicitation for auditing services for 2017 was conducted in October 2016 and Abdo, Eick and Meyers, LLP, was selected for a year contract. The following are the consulting firms selected for 2016/17:

Abdo, Eick and Meyers, LLP
Audit Services
Andy Berg
Phone: 952-835-9090
www.aemcpas.com
(2016 Only)

Blue Water Science
Ecological Services
Steve McComas
Phone: 651-690-9602

Emmons and Olivier Resources, Inc
Engineering Services
Carl Almer
Phone: 651-770-8448
www.eorinc.com

Messerli and Schadow, PLLP
Accounting Services

Smith Partners, PLLP
Legal Services

Chris Schadow
Phone: 952-927-8350
www.messerli-schadow.com

Charles Holtman
Phone: 612-344-1400
www.smithpartners.com

WATER RESOURCES MANAGEMENT PLAN

The Minnesota Board of Water and Soil Resources (BWSR) approved the District's third generation Water Resources Management Plan (WRMP) on June 23, 2010 and the District Board adopted the plan at its July 13, 2010 meeting. A copy of the WRMP is available electronically on the District website or by request, or in hard copy format at the District office.

In 2013, a major update to the WRMP was approved by BWSR in August and adopted by the District Board in September. The three major categories to the amendment included:

1. Goal Revisions
2. Reorganized Policies and Projects
3. Additional and Revised Implementation Projects

Goals Revision: Previously the District had 13 goals. This led to some confusion about what the top priorities of the District were as it related to Board actions. This plan update narrows the goals to just 5, which will make it easier for the Board and staff to focus on the priorities of the organization. The revised goals can be found in Section 2.3, and are as follows:

1. To minimize the negative effects of water level fluctuations in the District.
2. To maintain or improve the quality of all water resources within the District.
3. To maintain and expand the recreational, aesthetic, and wildlife habitat benefits associated with surface water and natural spaces in the District.
4. To improve understanding of local water resources and practices among all stakeholders in the District.
5. To be as efficient and effective as possible in all District activities.

In 2016, the Board of Soil and Water Resources conducted a Performance Review and Assistance Program (PRAP) Level II of the District and the results were very positive.

ASSESSMENT OF 2015 WORK PLAN

The following is a summary of the activities completed in 2016 organized by District's revised 2013 WRMP.

1. Capital Projects
2. Operations and Maintenance
3. Planning
4. Monitoring and Research
5. Regulation
6. Education and Outreach
7. Prior Lake Outlet Channel

CAPITAL PROJECTS

ARCTIC LAKE

A Subwatershed Analysis Project between City of Prior Lake, Shakopee Mdewakanton Sioux Community (SMSC), and PLSLWD resulted in an implementation strategy that addressed water quality and other impairments in Arctic Lake that impact Upper Prior Lake. The District applied for a grant from the Minnesota Board of Soil and Water Resources and received funding to implement the plan. The District's portion of the project included carp management (electrofishing, seining and installing a carp barrier); and wetland protection, which included installation of a water control structure to restore wetland hydrology and an iron-enhanced sand filter to filter stormwater before entering the water control structure. SMSC funded a lake aeration system, an enhanced berm/level swale across the wetland, wetland restoration (also funded by the Three Rivers Park District) and lake bottom restoration. Engineering and installation was completed in 2016.

COUNTY ROAD 12/17 WETLAND RESTORATION PROJECT

When Scott County planned to improve the County Road 12/17 area in 2013, the PLSLWD saw an opportunity to work collaboratively with the City of Prior Lake and Scott County to restore a wetland near the intersection of County Road 12 and County Road 17 that would reduce stormwater volume runoff and nutrient loading into Spring Lake. This project was partially funded by a Clean Water Fund grant through the Board of Water & Soil Resources.

The City of Prior Lake is the owner of the property and as per an executed cooperative agreement with PLSLWD, is prohibited from altering the flood retention, water quality or ecological function of the wetland for 25 years. This agreement also holds the District responsible for maintaining the wetland and uplands plantings on the property for the first 5 years. It is expected that no further maintenance work on the vegetation is necessary after this period.



12/17 Wetland Restoration

In 2016, the District worked with AES to ensure the continued advancement of native vegetation established at the site. Invasive species were treated with herbicide and areas were spot-mowed to discourage growth.

Carp was observed in the eastern-most basin. As a result, carp barriers were purchased and installed in two of the three outlet structures. Water levels were manipulated to encourage desired plant growth. The District will continue to manage the vegetation at the site over the next two years to ensure native plant establishment. A prescribed burn event and the planting of native species plugs are planned for 2017.

LOWER PRIOR LAKE PROTECTION PROJECT IMPLEMENTATION

Lower Prior Lake is located within the City of Prior Lake and is approximately 960 acres, with a maximum depth of 60 feet. It currently meets water quality standards, but degraded water quality is a concern in the late summer when algae is prolific. A 2013 Clean Water Partnership (CWP) Diagnostic Study concluded that the water quality of the upper bay of Lower Prior Lake is strongly influenced by the water quality of Upper Prior Lake but even more so by the phosphorus loading from the watershed.

In 2014, a Minnesota Clean Water Partnership grant was successfully obtained from the Minnesota Pollution Control Agency to implement BMPs identified in the diagnostic study that could potentially result in maintaining or improving the water quality conditions in the Upper Basin as much as 10% within 10 years. The proposed projects will reduce phosphorus by 33 lb./yr, or 10% of the total drainage area phosphorus load of 326 lb./yr. to Lower Prior Lake.

As part of this grant project, the District partnered with the City of Prior Lake to complete a shoreline restoration at Watzl's Beach in 2015. This restoration included the removal of invasive species and undesirable woody plants, and planting native prairie and lakeshore species that will help to stabilize the shoreline and provide habitat for wildlife. Additional shoreline work will be completed in 2017.

In 2016, the District installed a biofiltration basin on the east side of Indian Ridge Park in Prior Lake. It was designed to filter out sediment and nutrients from the stormwater that runs off properties and streets in the Indian Ridge neighborhood.



An innovative biofiltration basin will also be installed at an additional site in Prior Lake in 2017. Water quality improvements are also planned for Sand Point Beach Park in Prior Lake in 2017.

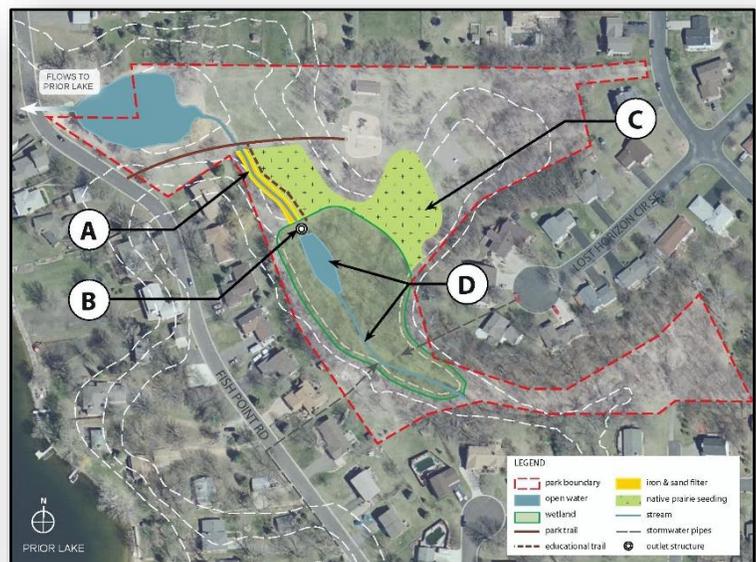
FISH POINT PARK RETROFITS

As one of the projects identified in the Lower Prior Lake Protection Project, the Fish Point Park Water Resources Improvements Project combines the efforts of both the District and the City of Prior Lake to reach the water quality goal in this subwatershed. In the CWP Diagnostic Study, the Fish Point Park subwatershed was identified as having the fourth largest phosphorus loading to the Lake, making it a high priority area to install BMPs

Partially funded by a grant from the Clean Water Fund (CWF) through the Board of Soil & Water Resources (BWSR), the Fish Point Park Water Resources Improvements Project aims to reduce erosion and treat incoming stormwater before it reaches the lake. Three BMPs were identified to reduce phosphorus loading and control stormwater rates and volumes: 1) retrofitting an existing ditch section with in-line iron sand filters; 2) creating a wetland for storage; and 3) installing a new predictive control structure. These three BMPs work together to enhance their collective effectiveness, making the overall project benefits greater than the sum of the benefit provided by each part.

The project was completed in the Fall of 2015. The three BMPs together will remove an estimated 34 pounds of phosphorus from Lower Prior Lake each year, resulting in a 66% decrease of phosphorus loading from this subwatershed. In 2016, the District worked with the City of Prior Lake to continue the efforts to establish native vegetation at the project site. Eleven native trees and 36 native shrubs were planted at the site to enhance the restoration. In 2016, the Board of Soil and Water Resources audited the Fish Point Park grant as a normal part of their role as a grantor.

In 2017, the District will coordinate a volunteer planting event with the local school district's Eco Club to enhance the wetland edge and native prairie restoration areas. A Neighborhood Park Party with Prior Lake will be held in June to help publicize the success of the project and its outcomes.



Fish Point Park Water Quality Improvements Project

OPERATIONS AND MAINTENANCE

AQUATIC VEGETATION MANAGEMENT

Based upon a recommendation from Blue Water Science, 20.4 acres were treated for curlyleaf pondweed on Spring Lake, 2.2 acres were treated for curlyleaf pondweed on Lower Prior Lake and 15.8 acres on Upper Prior Lake. This treatment was a partnership between PLSLWD and the City of Prior Lake. An Aquatic Invasive Plant Control grant from the Scott County paid for the treatment. The curlyleaf was treated by PLM Lake and Land Management.

COST SHARE

The District has a residential incentive program and a rural cost share program coordinated with the Scott Soil and Water Conservation District. The residential incentive program included 1 native prairie restoration, 5 raingardens, and 3 shoreline protection projects. The District approved rural cost-share projects such as 5 well decommissions, 7 filter strips, 1 cover crop, 1 grade stabilization, 3 grassed waterways, and 4 nutrient management projects for a total of 27 projects for 23 landowners.



**Water Quality Improvement Award
Winner**

FARMER-LED COUNCIL

The Farmer Led Council (FLC) was created in 2013 to help the District reduce nutrient loading to Spring Lake to levels that meet or exceed state water quality standards. Agricultural lands make up the majority of the landscape in the Spring Lake & Upper Prior Lake watersheds. As such, farmers are the most important stewards of the land and their active input and participation is critical to achieving water quality goals.

Represented by local leaders in the farming community, the role of the FLC is to develop and guide the implementation of strategies that PLSLWD will use to accomplish agriculture's share of the nutrient reduction goal. Specifically, the FLC aims to:

- Inform decision makers and the general public about practical issues and opportunities related to soil and water conservation on agricultural lands
- Identify base-level and site-tailored practices that are available and needed
- Define the approach for engaging with and assisting farmers to implement practices
- Establish a schedule with reasonable milestones and timelines for progress
- Identify potential barriers to implementation, along with tools and resources are needed to overcome them

The District held four FLC meetings in 2016 where a variety of agricultural topics related to water quality were discussed.

The FLC also helped to organize and promote a Farmer Listening Session in February that helped gather information and feedback from farmers in the upper watershed about the Stormwater Management and Flood Mitigation Study that was completed in late 2016.

An FLC Variable Rate Application cost-share program was promoted in 2016. The FLC also initiated a new inlet protection program which included offering free Agri-Drain water quality inlets to farmers.

The FLC explored the possibility of promoting the State's Ag Certainty Program as part of an FLC initiative, but decided that it was too restrictive and addressed more issues than phosphorus, which is the District's main pollutant concern. The FLC decided to develop a similar, local program that focuses more on lower the amount of phosphorus reaching Spring Lake. This "Lake Friendly Farm" program will be piloted by FLC member in 2017 and is planned to be released to the rest of the farmers in the District in 2018.

In 2017, the FLC will sponsor a "Cover Crop Reverse Auction," where farmers will provide bids to fund the planting of cover crops. Proposals will be selected based upon soils, slope, impacts to water and other factors. The FLC will also encourage participation in free incentive programs, such as alum treated biologs; water quality inlets and free interseeder rental for cover crops.

FERRIC CHLORIDE TREATMENT FACILITY

A desiltation pond was built in 1978 to capture phosphorus before the stormwater from County Ditch 13 reached Spring Lake. In 1998, a Ferric Chloride plant was constructed to use this chemical upstream of the desiltation pond to bind up phosphorus.

In 2013, the system was redesigned to release a Ferric Chloride (FeCl_3) solution into a desiltation basin, rather than the stream, per a MPCA permit requirement. Initial targets for design parameters, with input and agreement by regulatory agencies, was to allow flows up to approximately 30 cfs into the desiltation pond for the majority of normal operations. High flows were to overtop a high flow bypass weir east of the existing pond which flows directly to Spring Lake to prevent possible resuspension and flushing within the desiltation pond. An analysis of the redesign was conducted in 2016 and it was determined it was constructed as designed.

The desiltation pond treated water with Ferric Chloride from March 11-November 10 in 2016. Samples were taken weekly during treatment to analyze efficiency of the treatment system. On average, the treated water decreased the concentration of total phosphorus by 36% and dissolved phosphorus by 64%. In other words, a total of 1,327 million gallons of water was treated, 323 pounds of total phosphorus were removed and 578 pounds of dissolved phosphorus were removed.

Results of the 2016 sampling can be found in the Annual Ferric Chloride Report available on www.plslwd.org.

ROUGH FISH MANAGEMENT

The District helped support the 4th Annual Carp Tournament on Prior and Spring Lakes on May 21, 2016. At this event, 10 teams competed and removed a total of 537 pounds of carp. \$2,100 in prizes was distributed to the winners. Following the event, the carp were transported to the Shakopee Mdewakanton Sioux Community Organics Recycling Facility by Buckingham Companies, Inc. for processing.

In 2016, the District continued into its second year with Carp Management in Spring and Prior Lakes, which was partially funded through a Clean Water Partnership grant from the Minnesota Pollution Control Agency. The project aims to improve the water quality of Spring, Upper Prior and Lower Prior Lakes by decreasing total phosphorus concentrations using integrated pest management. The project has several different components, including: track movement and population of carp, complete carp removals, install barriers at strategic locations, and engage local community through outreach materials and events. In 2016, the District radio-tagged 19 fish in Spring Lake, Upper and Lower Prior Lakes to help track their movement.



Including the 7 fish tagged in 2015, there is a total of 26 ratio-tagged fish. The carp were then tracked throughout the year and documented on the District’s website so that the public could see their locations.

In 2016, the District used another method to track carp. PIT tags were inserted into an additional 150 carp in Upper Prior Lake. Unlike the radio-tags, PIT tags are used to track movement of carp through a specific channel where a receiver is installed. This is a more economical way of tracking carp. In 2017, the District will install two receiver devices to study the movement of carp throughout different waterbodies which will help determine where to place future carp barriers.

A total of 17 telemetry surveys were conducted on Spring Lake and 8 surveys were conducted on Prior Lakes to determine aggregation areas and migration routes. These surveys guided timing and location of seine (carp removal) events and identified potential carp barrier locations.

Two seine (carp removal) events took place in 2016, one on Spring Lake and one on Upper Prior Lake:

	DATE	# OF CARP MARKED & RELEASED	# OF CARP REMOVED	TONS OF CARP REMOVED
Spring Lake	05/24/2016	22	-	-
Upper Prior Lake	12/01/2016	150	267	1.9

Four potential carp barrier locations were identified which were determined by the radio-tag monitoring, site visits, anecdotal information, and staff knowledge. Staff explored different carp barrier designs and conducted site visits to determine the barrier suitability for the sites. The District successfully applied for a MnDNR Clean Water Partnership grant for a new, innovative carp barrier on an identified carp spawning area that connects to Spring Lake. The barrier will be installed in 2017.

SPRING LAKE TOWNSHIP PARCEL

In 2015, the District partnered with Great River Greening (GRG) to help design a shoreline restoration project on the District’s Spring Lake Parcel.

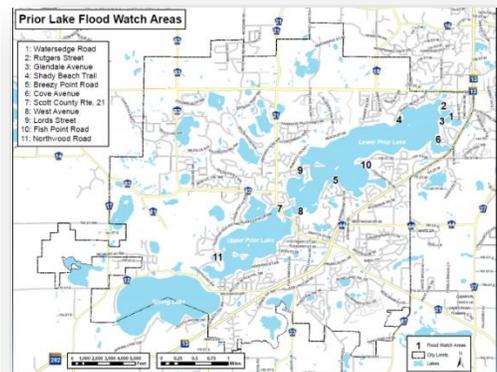
Eighty-three dedicated volunteers put on their boots and pulled up their sleeves to help restore over 1,000 feet of shoreline on the north side of Spring Lake on Saturday, May 21, 2016. The event was led by Great River Greening (GRG), an environmental conservation nonprofit, in partnership with the Prior Lake-Spring Lake Watershed District (PLSLWD) and Scott County.

Work completed that day included hauling 140 cubic yards of buckthorn, an invasive species, up the steep slopes and out of the shoreline restoration area. Volunteers then got their hand shovels out and planted more than 1,000 native plants. Other state-of-the-art erosion-preventing techniques were also installed, such as brush bundles and cedar revetments which will promote a natural plant barrier to protect the shoreline and prevent phosphorus runoff.

PLANNING

STORMWATER MANAGEMENT & FLOOD MITIGATION STUDY

Due to the extensive flooding in 2014, the District partnered with the City of Prior Lake and collaborated with Spring Lake Township to complete a study that updates the watershed's hydraulic and hydrologic model, reviews flood related issues and projects, identifies potential flood reduction strategies and develops an implementation plan. This Stormwater Management and Flood Mitigation Study began in 2015 and was completed in 2016.



2014 Flood Areas in Prior Lake

The project included four phases: Update the Watershed Model; Identify Flood Reduction Options; Evaluate Flood Reduction Options and Draft an Implementation Plan. A Steering Committee consisting of technical staff from the District's partners guided the process. An Advisory Group, consisting of representatives of the District's Citizen Advisory Committee, the City of Prior Lake's Lakes Advisory Committee, lake associations and appointed and elected officials provided input at critical junctures. The public was invited to recommend options for the Steering Committee to consider as well as to provide input throughout the project. The updated hydraulic and hydrologic model was used to test a series of mitigation options and their impact on flood levels. Initially, the public, public officials and staff identified 20 options, which were evaluated according to water quality and natural resource benefits; stormwater management benefits; legal authority; project readiness; human impacts and incremental costs. Those 20 options were evaluated and seven were modeled: Enhanced Protection; Spring Lake Storage; Prior Lake Outlet Modification; Upper Watershed Storage; Combination of Spring Lake Storage, Prior Lake Outlet Modification and Upper Watershed Storage; Floodproofing and Actively Manage the Prior Lake Outlet (low-flow gate). Ultimately, there were two short-term options and one long-term option selected by the three groups' policymakers. Short-term options included Enhanced Protection (coordinated temporary protection measures) and Actively Manage the Prior Lake Outlet (opening the low-flow gate in advance of large flows and keeping it open throughout the event). The long-term option included

securing Upper Watershed Storage. Ten sites were used as examples for modeling. The District will identify willing landowners and secure more upstream storage in the next few years.

FLOOD DAMAGE REPAIR

The District sustained over \$1 million in damages in the Prior Lake Outlet Channel due to the flood. The District was approved for federal funding for repairs from the Federal Emergency Management Administration (FEMA) for Emergency Protective Measures (Temporary Spring Lake Dam); Culverts and Crossings; Downed Trees/Sediment Delta and Bank Erosion.



In addition, the District secured bonding authority during the 2015 Legislative Session to provide upfront funding for Bank Erosion which is estimated to cost over \$700,000. In 2016, the Culverts and Crossings were repaired and the Downed Trees were removed. Removal of the Sediment Delta has been delayed due to regulatory and weather challenges. Barr Engineering was selected as the lead engineer on design and construction

for the bank erosion project. It is anticipated the Sediment Delta and the Bank Erosion projects will be completed by mid-2018.

SEDIMENT CORE ANALYSIS

SPRING LAKE

A report on sediment coring was done on Spring Lake by the St. Croix Watershed Research Station in 2013. The report is titled “Historical water quality and ecological change in Spring Lake, Scott Co., MN” and concludes that historic, pre-settlement TP in Spring Lake was in the range of 60 ppb +/- 5 ppb. This information was used to apply to the Minnesota Pollution Control Agency (MPCA) for a Site Specific Standard for Spring Lake of 60 ppb so that the current TMDL goal of 40 ppb would be revised. The MPCA approved the application in 2015.

In 2016, the Minnesota Pollution Agency advised the District that the new Site Specific Standard of 60 ppb was accepted by the Environmental Protection Agency (EPA).

The complete report can be found at www.plslwd.org or by contacting the PLSLWD office.

UPPER PRIOR LAKE

Upper Prior Lake has a TMDL for nutrients and addressing poor water quality was identified in the District's Water Management plan. With upstream treatment of Spring Lake with alum to cap internal nutrient loading, lower concentrations of phosphorus are reaching Upper Prior Lake. However, as past studies have indicated, there is still an internal reservoir of phosphorus in Upper Prior Lake that continues to hinder the improvement of lake water quality. In early 2016, the District's Board authorized Emmons & Olivier Resources to prepare a report on Upper Prior Lake In-lake Phosphorus Management. Sediment core sampling at 12 sites confirmed the potential for internal phosphorus loading from bottom sediments and were used to recommend an alum dosing regimen. The management plan EOR developed included alum treatment, carp management and vegetation management. The Board chose to prioritize the District's efforts upon carp management first before pursuing the other options.

MONITORING AND RESEARCH

Monitoring was conducted in accordance with the Monitoring Plan and included a mix of staff, volunteer, and contract work which incorporated in-lake monitoring, stream water quality and flow measurements, precipitation and aquatic vegetation monitoring. Partners included Metropolitan Council Environmental Services, Three Rivers Park District, Shakopee Mdewakanton Sioux Community, Scott Soil and Water Conservation District (SWCD), Blue Water Science, and Emmons and Oliver Resources (EOR). The District also hired interns.

STREAM MONITORING DATA

STREAM CHEMISTRY SAMPLING

Stream chemistry samples were collected at 16 locations around the watershed by PLSLWD staff. Water temperature, conductivity, pH, turbidity, and dissolved oxygen were also measured at these locations using a Hydrolab MS5 multi-parameter meter.

- Three sites were sampled weekly to fulfill the MPCA permit requirements for the Ferric Chloride site (FC_CD1, FC_CD2, FC_CD3)
- Four monitoring sites were added in 2014 for a study in the Upper Watershed (ST_5B, ST_5C, ST_5D, ST_5E). These sites were monitored biweekly.
- The District Monitoring Program included four sites (ST_40, ST_19, ST_17, ST_14). These sites were monitored biweekly.
- Two agricultural monitoring sites were monitored biweekly for the Farmer-Led Council program. (T3 and B3). T3 is sampled where it flows out of the tile and B3 is located in a

channel downstream of T3. B3 is a tributary of Fish Lake and located approximately 100 feet before entering Fish Lake.

- ST_24, ST_24A, and ST_24B were sampled twice in 2016. These samples were taken due to direction from the board of managers during the summer. These sites are located on Cates Creek, a tributary to Upper Prior Lake.

STAGE AND FLOW MONITORING

Continuous stage and flow monitoring occurred in conjunction with the stream chemistry and lake monitoring. Stage and flow monitoring consists of level loggers that record stage continuously and flow measurements. By combining chemistry and stage/flow monitoring results, loads can be calculated using the FLUX modeling software. The sites mentioned in the Stream Chemistry section above (except T3 and B3) all had level loggers. In addition to those sites, stage and flow were monitored on the outlets of Fish, Spring, Prior Lakes (sites ST_08, ST_21, PL_OUT respectively).

Flow measurements were collected by PLSLWD, EOR and Scott SWCD. Flow meters used include FloMate 2000 and a Sontek Flowtracker. Continuous stage was recorded using level loggers, such as pressure transducers and ultrasonic distance sensors.



Stream Monitoring

DEPLOYMENTS

Deployment monitoring data was collected by installing sondes in the water for an extended amount of time (two weeks at a time). This method is used to collect continuous data upstream and downstream of a location of interest in order to view changes both spatially and temporally. Parameters collected include conductivity, temperature, turbidity, and dissolved oxygen. In 2015, Scott SWCD conducted the deployment study in the Upper Watershed.

LAKE MONITORING DATA

AUTOMATED LEVEL LOGGERS

Two automated level loggers were installed in 2014 to monitor the lake levels on Spring and Prior Lakes. The loggers were programmed to log the lake level every 15 minutes and then transmit the data to the PLSLWD website once per hour which was accessible to the public.

DNR STAFF GAGE

Three staff gages were monitored for the DNR on Pike, Spring, and Lower Prior Lake. Staff gages are surveyed in every year by DNR to tie the results to Mean Sea Elevation. Volunteers helped monitor the levels of Pike and Spring Lakes.

THREE RIVERS PARK DISTRICT

Three Rivers Park District monitored five lakes in 2016: Fish, Pike, Spring, Lower Prior and Upper Prior. These lakes are monitored approximately 13 times per year, and where possible, profile samples are collected.

CAMP VOLUNTEER LAKE MONITORING

The CAMP program was coordinated by Metropolitan Council, and locally coordinated by the PLSLWD. Three volunteers collected lake samples for the CAMP program in 2016.

Lake	Volunteer(s)
Lower Prior (site 2)	Steve Reinders
Haas	Tom Chaklos
Buck Lake	Steve Beckey

Samples were collected every other week during ice-free conditions, which include parameters such as secchi depth, phosphorus, and Chlorophyll-A.

AQUATIC VEGETATION SURVEYS

Blue Water Science conducted summer aquatic vegetation surveys on six lakes –Jeffers Pond, Buck, Cate’s, Arctic, Crystal, and Swamp Lake. These surveys include the type and density of vegetation at predetermined sampling locations throughout the lakes during summer, which is the time most vegetation is present.

Curlyleaf Pondweed surveys were completed in springtime on three lakes - Spring, Upper Prior, and Lower Prior Lakes to determine if treatment was needed. After treatment, an assessment was completed to determine the effectiveness of the treatment.

AQUATIC VEGETATION DENSITY MAPPING

A new program in 2013, lakes were mapped using a software called BioBase. BioBase software creates maps of aquatic vegetation density, bathymetry, and bottom hardness utilizing a depth finder mounted to a boat.

Volunteers and staff mapped all or parts of Spring, Arctic, Fish, Upper Prior, and Lower Prior Lakes.

A company called Platypus was hired to map ponds or lakes that were too small or too weedy to use a boat. By using a remote-controlled boat, Platypus mapped all or parts of Buck Lake, Cates Lake, Crystal Lake, Jeffers Pond, the Desilt Pond, Geis (Hwy 13) Wetland, Fish Point Park Pond, Swamp Lake, and Little Prior Lake.

Prior Lake Association has donated \$700 annually since 2013 towards the BioBase program. Your Boat Club donated the use of a boat for staff to map Prior Lake at no charge to the District. Volunteers donated their time and boats.

The benefits of this project included:

- A better understanding of density and location of vegetation in lakes
- More accurate bathymetric maps
- Lake bottom sediment composition maps
- Improved implementation and analysis of curlyleaf pondweed treatments
- Greater understanding of lake ecology and sediment deposition rates
- Better fisheries management and for sports fishing

Biobase Vegetation Density Mapping



PRECIPITATION

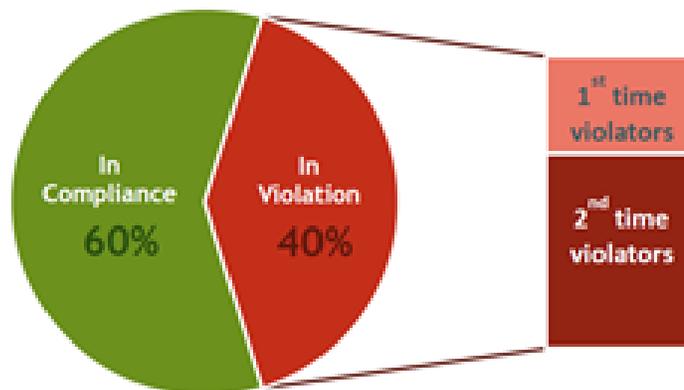
Three volunteers collected rain and snowfall data daily by Jonathan Cohen, Richard Schultz, and Larry Mueller. The PLSLWD then forwarded the data to the State Climatologist. District staff also recorded daily precipitation at the office location.

REGULATION

EASEMENT INSPECTIONS

The District holds many conservation easements and development agreements that were acquired while permits were being actively issued. These easement and agreement restrictions provide water quality benefits by protecting water resources with buffers and water quality features. The District’s conservation easement program contains three components to ensure protection of its investments: yearly monitoring inspections, effective communication with landowners and a strong enforcement policy.

2016 Landowner Violations Summary



In 2016, the District inspected 36 out of 40 total conservation easements, which represented 126 landowners. Out of the 126 landowners’ properties that were visited by District staff, 75 properties were in compliance with the easement terms, 17 had first-time violations and 34 were second time violators. Less than half of the first-time violators from the 2015 inspection were repeat offenders in 2016.

Staff wrote letters to all the landowners advising them of the violations and offering to provide them further assistance to ensure the violations would not continue. The most common easement violations were: mowing, yard waste, storage (wood etc.), dumping/trash, vegetable gardens, landscaping, planting non-natives and installing fences. During the 2017 inspections, staff will concentrate on monitoring the violating properties and working with landowners to resolve issues.

PERMIT ACTIVITY

The District inspected active permits to ensure that conditions of the permit were being met. The District issued one new permit in 2016: 16.01 Manitou Road Improvement Project. In order to meet the infiltration requirements of several old permits to close them out, the District initiated a lawn

aeration program. The District closed 7 permits in 2016 and anticipates that it will close several more permits in 2017.

MS4 ACTIVITY

The District drafted and approved new rules to comply with the MPCA's and EPA's expanded MS4 regulations regarding erosion and sediment control and stormwater runoff. In 2016, the District developed an Illicit Discharge Determination Plan, Spill Response Plan and updated its Education and Outreach Plan. In 2016, the Minnesota Pollution Control Agency required the District to undergo an MS4 Audit, which went very well and was very informative.

EDUCATION AND OUTREACH

CITIZEN ADVISORY COMMITTEE

PLSLWD staff continued to conduct and attend monthly Citizen Advisory Committee (CAC) meetings. CAC meeting minutes and monthly updates were included in every Board meeting package, and a Board member was assigned to attend regular CAC meetings. The CAC and City of Prior Lakes' Advisory Committee (LAC) coordinated Clean Water Clean-ups in the Spring and Fall, where over 150 citizens participated in preventing organic material in local parks from being deposited in lakes through stormwater runoff.

The CAC also coordinated community outreach at Lakefront Days in August.

In addition, the CAC initiated a Water Quality Improvement Award that was designed to award local citizens for water protection efforts. The first awards for \$100 each were presented in 2016 to four families for raingardens, rain barrels, native plantings and shoreline restoration. The Award amount will be increased to \$500 each and the program will be expanded in 2017.



COMMUNITY INVOLVEMENT

In order to demonstrate new and ongoing projects, the District conducted a boat tour for the Board of Managers, District partners, Citizens Advisory Committee and Lakes Advisory Committee members.

The City of Prior Lake, Scott SWCD and the District hosted two raingarden workshops, one prairie workshops and two shoreline restoration workshops. 34 attended the raingarden workshops, 79 attended the native prairie workshops and 27 attended the shoreline restoration workshop.

In addition, the District made PowerPoint presentations at the annual meetings of the Prior Lake and Spring Lake Associations.

In 2016, the District continued partnering with the Scott Clean Water Education Program (SCWEP) to extend its education and outreach efforts. The key message SCWEP promoted is, “Clean Water Starts with Me” and focused its efforts on illicit discharge, natural borders and stormwater runoff.

The District received staff assistance for Education and Outreach from MN GreenCorps. Andrea Slotke, the District’s GreenCorps member, focused her work on the Stormwater Management and Flood Mitigation Study and the flood damage clean-up on the Prior Lake Outlet Channel.

PRESS AND SOCIAL MEDIA

The District submitted 21 articles that were published in the Prior Lake American. It also provided articles for the Prior Lake and Spring Lake Association newsletters. Staff submitted 11 articles that were published in the Scott County SCENE.

In addition, other media outlets were used to publicize District tours, Spring Lake Demonstration site events, Carp Tournament and Clean Water Clean-Ups.

Staff organized the website so that it was more user-friendly and added and removed content, as necessary. Staff invited Manager and CAC Member input in the website revisions. The website was the primary communication outlet for the Stormwater Management and Flood Mitigation Study. In addition, staff utilized Twitter and Facebook heavily to publicize events and new information.

Lake levels for Prior and Spring Lakes were updated daily on the website during the monitoring season.

PRIOR LAKE OUTLET CHANNEL

STRUCTURE

The Prior Lake Outlet Structure was constructed in 1983 to address high lake level issues on Prior Lake, which does not have a natural outlet. The Outlet Structure released approximately 3,043 acre-feet of water from Prior Lake during 2015.

CHANNEL

The Channel is utilized by the District and other partners in managing lake levels on Prior Lake as well as providing a 7-mile stormwater conveyance system for the surrounding communities. There is a joint powers agreement between the City of Prior Lake, City of Shakopee, Shakopee Mdewakanton Sioux Community and the District that specifies operation and maintenance as well as cost-sharing.

The Channel is considered an MS4, municipal stormwater conveyance system and the District must secure permitting and submit annual reports.

Channel inspections were made throughout the year to ensure the integrity and efficiency of the system was maintained.

Continuous flow was recorded at four locations along the outlet channel (Prior Lake Outlet Structure, Pike Lake Trail, Deans Lake Inlet-by SWCD, and the Service Road). Sonde measurements were also taken at some culvert crossings.



WETLAND BANKING PROGRAM

The Prior Lake-Spring Lake Watershed District does not have a locally adopted wetland banking program within its jurisdiction.

STATUS OF LOCAL PLAN ADOPTION AND IMPLEMENTATION

With approval of the District's WRMP in June of 2010, local units of government (LGU) having land use planning and regulatory responsibility are required by statute to prepare or update existing local water management plans. There were no revisions in 2016. Revisions are expected in 2017 and 2018.

STORMWATER

The District does not participate in stormwater monitoring or drainage design performance standards.

FINANCIAL REPORT

The 2016 PLSLWD Audit was completed by Abdo, Eick and Meyers LLP, and includes both the District’s Annual Financial Report and the Independent Auditor’s Report on Compliance with Minnesota Legal Compliance Guide for Local Governments for the year ended December 31, 2016. A copy of the 2016 Annual Audit is available for review on the District website and at the District office after May 9, 2017, when it is approved by the Board of Managers.

2016 FINANCIAL SUMMARY

Values presented in the chart and graph below are unaudited. Please refer to the 2016 Annual Audit for more details, which can be found at www.plslwd.org

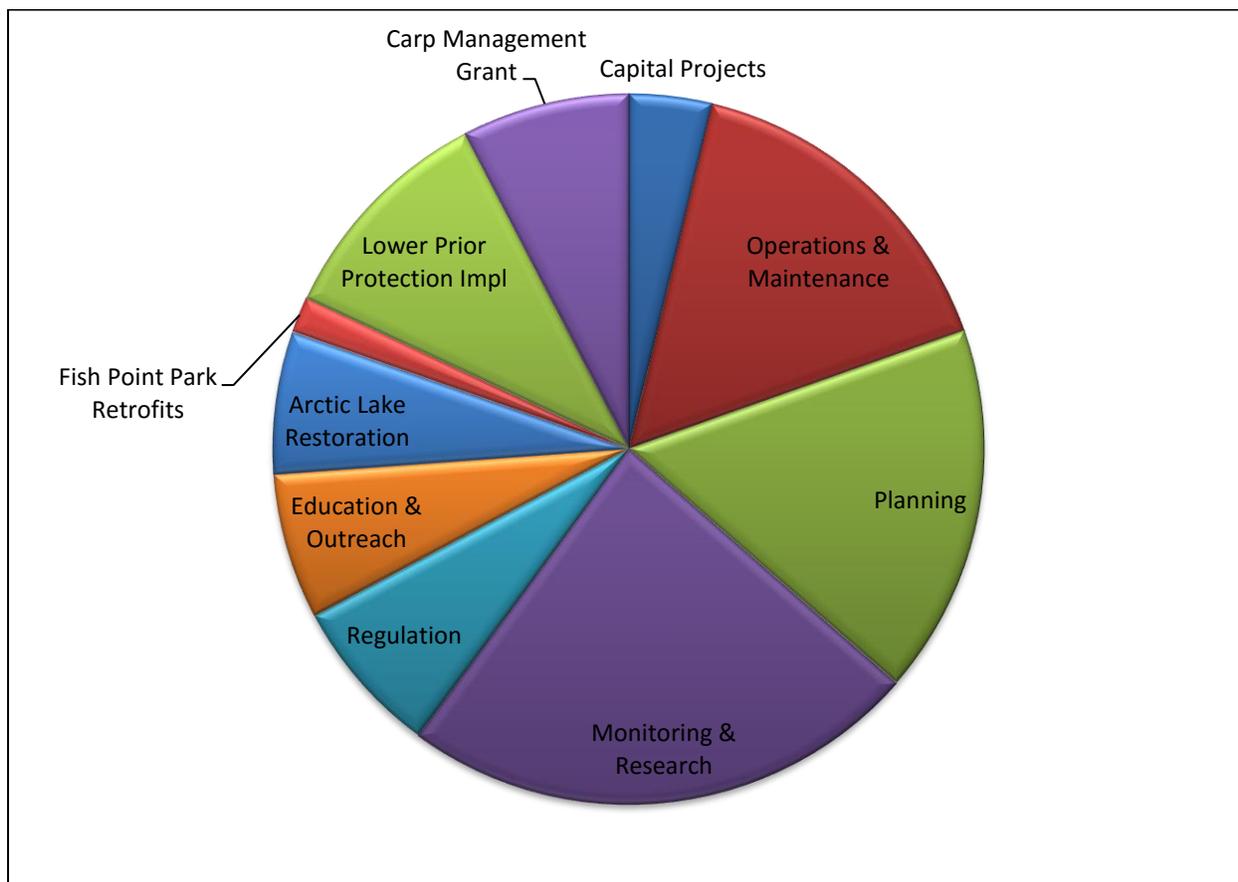
2016 FINANCIAL SUMMARY

Fund	Starting Balance	Approved Budget	Tax Levy Revenue*	Additional Revenue**	Transfers to/(from)	Expenditures	Ending Balance
General	\$145,366	\$98,000	\$98,694	\$201	\$0	\$76,690	\$167,571
509 Implementation	\$318,962	\$762,500	\$909,399	\$123,829	(\$146,018)	\$834,074	\$372,098
MOA/JPA Funds	\$451,101	\$375,338	\$0	\$160,589	\$146,018	\$238,348	\$519,360
Bond Debt Service	\$22,733	\$160,000	\$159,623	\$30	\$0	\$159,175	\$23,211
Total	\$938,162	\$1,395,838	\$1,167,716	\$284,649	\$0	\$1,308,287	\$1,082,240

*Tax levy revenues shown are actual tax levy dollars collected. The 2016 tax levy was 1,170,500.

** Additional revenue includes permit fees, investment income and grant funding used of \$222,332.

2016 Project Expenditures



GRANTS

Grants obtained by the District that were active in 2016 were as follows:

- Curly Leaf Pondweed Grant
Goal: Treat 20.4 acres of curlyleaf pondweed treatment on Spring Lake; 13.6 acres on Upper Prior and 2.2 acres on Lower Prior Lake
Funding Source: Scott County
Total Grant Amount: \$10,341
Effective: May 5, 2016
- Lower Prior Lake Protection Project Implementation grant
Goal: Reduce watershed phosphorus loading by 33 lb/yr, or 10% of the total drainage area phosphorus load of 326 lb/year

Funding Source: Clean Water Partnership Grant through the MN Pollution Control Agency
Total Grant Amount: \$142,522
Effective: October 7, 2014 to June 30, 2018

- Fish Point Park Retrofits grant
Goal: Implement three elements designed to reduce phosphorus loading and control stormwater rates and volumes of a significant subwatershed of Lower Prior Lake
Funding Source: Clean Water Fund Grant through the Board of Water & Soil Resources
Total Grant Amount: \$131,200
Effective: May 6, 2014 to December 31, 2016. Grant was closed out.

- Arctic Lake Restoration grant (paired with the Fish Point Park Retrofits Project)
Goal: Improve water quality through watershed retrofits, wetland restoration and carp control.
Funding Source: Clean Water Fund Grant through the Board of Water & Soil Resources
Total Grant Amount: \$58,000
Effective: May 6, 2014 to December 31, 2016. Grant was closed out.

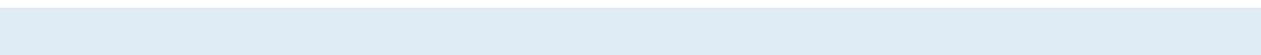
- Carp Management in Spring and Prior Lake grant
Goal: Utilize integrated pest management principles to effectively manage the common carp population to reduce the levels of phosphorus in the basin.
Funding Source: Clean Water Partnership Grant through the MPCA
Total Grant Amount: \$67,323
Effective: June 8, 2015 to June 30, 2018

2017 WORK PLAN

The following is a summary of implementation activities planned to be completed in 2017 and the amount budgeted for that activity.

The following is a summary of implementation activities planned to be completed in 2016 and the amount budgeted for that activity.

509 Implementation Fund	\$975,575
General Revenue	\$173,050
Debt Service Fund	\$161,375



CAPITAL PROJECTS

In 2017, the District will continue participating with the City of Prior Lake on the Lower Prior Implementation Plan and Carp Management in the Spring and Prior Lake system.

OPERATIONS AND MAINTENANCE

The Cost Share and Residential Incentives programs and Farmer-Led Council will be continued. Operation and Maintenance of the Ferric Chloride Facility will continue. Aquatic Vegetation Treatment will occur in both Prior and Spring Lakes. The District will support the Knotty Oar Marina in conducting a Carp Tournament to remove carp from both Spring and Prior Lakes. The Carp Management Program will continue and will be augmented by a Conservation Partners Legacy Grant to expand the Carp Management Program in Spring Lake. In addition, the District will initiate a new shoreline restoration demonstration project made possible through another Conservation Partners Legacy Grant at Raymond Park in Prior Lake, in partnership with the City and Great River Greening.

PLANNING

As indicated earlier, the Stormwater Management and Flood Mitigation Study implementation included: Short-term options included Enhanced Protection (coordinated temporary protection measures) and Actively Manage the Prior Lake Outlet (opening the low-flow gate in advance of large flows and keeping it open throughout the event). The long-term option included securing Upper Watershed Storage. The District will identify willing landowners and secure more upstream storage in the next few years.

The District will revise the Prior Lake Outlet Channel Structure Management Policy and Operating Procedures manual, which, once approved by the Department of Natural Resources (MDNR), will allow the District to “actively manage the Prior Lake Outlet.” The City of Prior Lake will move forward with “enhanced protection.” The District will investigate stormwater storage areas in the Upper Watershed and will partner with willing landowners to secure storage.

In 2013, the District planned on revised some of its rules. Those revisions were never approved. Revising those rules will be considered in 2017.

MONITORING AND RESEARCH

The District will continue its monitoring program in 2017, which includes stream monitoring, flow monitoring, lake quality, lake level, plant surveys, and plant density monitoring.

REGULATION

The District will continue to update its SWPPP to comply with the MS4 requirements. Permits will be reviewed and closed out.

EDUCATION AND OUTREACH

The District will continue its education and outreach program to meet the requirements of its MS4 permit and improve understanding of local water resources and practices among all stakeholders in the District. The District will continue working with the Scott County Clean Water Education Program (SCWEP) and will be participating in innovative public outreach and education opportunities. Updating the website and utilizing social media outlets will continue. The District's Education and Outreach Plan will be updated.

PRIOR LAKE OUTLET CHANNEL

The District will continue to coordinate the partnership between PLSLWD, City of Prior Lake, City of Shakopee and the Shakopee Mdewakanton Sioux Community. Major damage to the channel will be continue to be fixed with funding from FEMA and the State of Minnesota. Projects and other maintenance will be discussed and decided upon by the Technical Advisory Committee and the Cooperators (Memorandum of Agreement) members. The Memorandum of Agreement (joint powers agreement), which was approved in 2006, will be updated in 2017.