

2018

A Year in Review



City of Lakeville

Environmental Resources



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Total 2018 Grant Funds Received: \$274,787

1,518 Volunteers
Recruited

4 Outreach Projects
Implemented

I. Projects



2018 Irrigation Audits

Overview

2018 was the first year of an initiative to reduce urban water usage by optimizing private irrigation system efficiency. Stage II irrigation audits were conducted on two homeowners associations (HOAs) which included reviewing system components (controllers, sprinkler heads, rain sensing technology), scheduling practices, and uniformity of water application. The audits provided HOAs a list of items that could be implemented to:

- 1) Keep more water within local groundwater aquifers
- 2) Reduce the potential for pollutants to enter South Creek and Lake Marion and
- 3) Save annual irrigation costs.



A pitched sprinkler (like the one seen below) can lead to drowning grass directly adjacent to dry lawn spots



One broken sprinkler head (like the one above) can waste thousands of gallons per week!

Practices

- ◆ Urban water conservation
- ◆ Sustainable suburban turfgrass

Project Benefits

- ◆ Groundwater conservation
- ◆ Reduction in stormwater needing treatment
- ◆ Civic engagement and education
- ◆ Reduced private irrigation costs
- ◆ Reduced need for City infrastructure addition

Partners

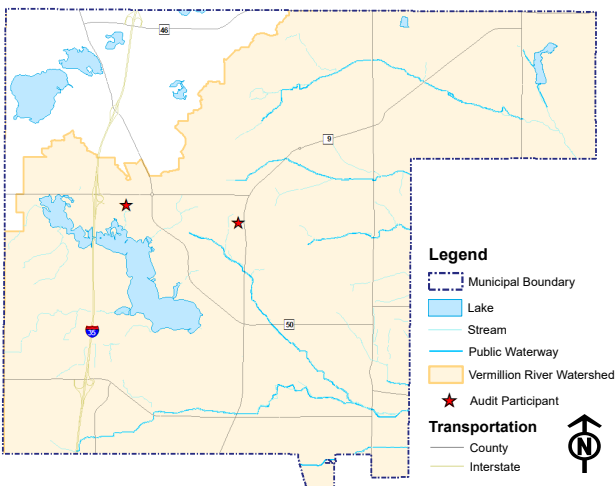
- ◆ City of Lakeville
- ◆ Vermillion River Watershed JPO
- ◆ Century Ridge HOA
- ◆ Orchard Meadows HOA

Contractor

- ◆ Water in Motion

Timeline

- ◆ Audits conducted Aug.– Sept., 2018
- ◆ Program continuation in 2019



Funding

City of Lakeville: Staff time
 Vermillion River JPO: \$13,340
 HOA Cost: \$0

Project Cost: \$13,340



(Below) Water in Motion staff assemble catch cans for distribution uniformity test.



(Above) Water in Motion staff describe the benefits of weather dependent irrigation scheduling adjustments.



(Left) Significant runoff is observed next to a broken rotor.



(Above) Sprinkler spraying into a conifer (area not meant for irrigation).



(Left) Several sprinklers observed watering a house.



(Right) Sprinklers observed watering sidewalk.



2018 Legacy Park Conservation Turf

Overview

In addition to playgrounds and an open lawn play area, the newly constructed Legacy Park boasts nature trails, fort building pods and natural climbing areas. To foster an early environmental ethic, the City was awarded grant funds to implement a low-mow fescue turfgrass with three levels of soil enhancement including:

- 1) Compost and topsoil supplement
- 2) Compost only supplement
- 3) Fescue seeded directly onto native soil.

The three areas of varying enhancement will allow staff to determine, and show the community, how different soil practices promote healthy, lower maintenance turf.



Adding compost to soil helps lawns retain moisture and nutrients

Fescue grasses are disease and insect resistant and drought tolerant, requiring less water and fertilizer use!

Practices

- ◆ Sustainable suburban turfgrass
- ◆ Soil enhancement
- ◆ Urban water Conservation

Project Benefits

- ◆ Fertilizer and herbicide reduction
- ◆ Reduced pollutant runoff
- ◆ Fossil fuel reduction
- ◆ Groundwater Conservation
- ◆ Reduced City maintenance costs
- ◆ Civic engagement and education

Partner

- ◆ Vermillion River Watershed JPO

Contractors

- ◆ KA Witt
- ◆ The Mulch Store

Timeline

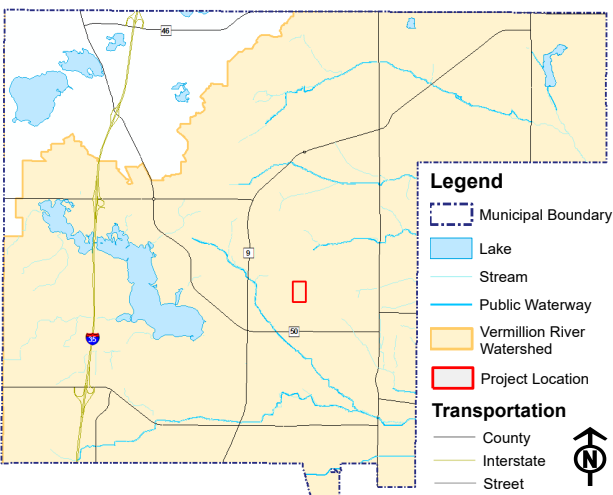
- ◆ Park construction – July—Sept. 2018
- ◆ Site showcase with MN Park and Sports Turf Management Association— Summer/Fall 2019

Funding

Vermillion River Watershed Stewardship Grant: \$5,000
City of Lakeville: \$2,688

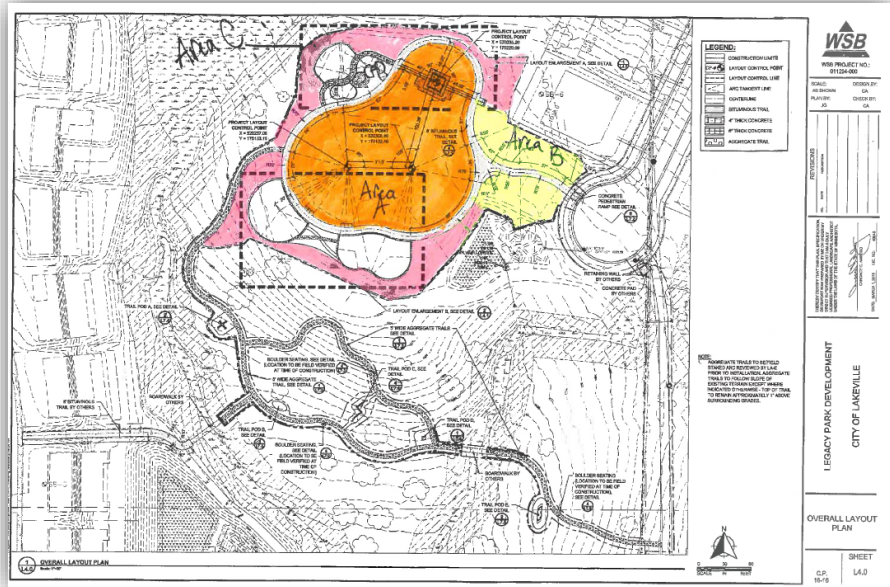
Project Cost: \$7,688*

*Only includes cost of compost and soil prep





(Above) Legacy Park master plan.



(Above) Seeding exhibit. Area A was supplemented by both compost and topsoil, Area B was supplemented by compost only, and Area C was fescue seeded on native soil.



(Above) Areas A and B post construction (first growing season).



(Above) Compost awaiting spreading during park construction.



(Left) Compost being spread.



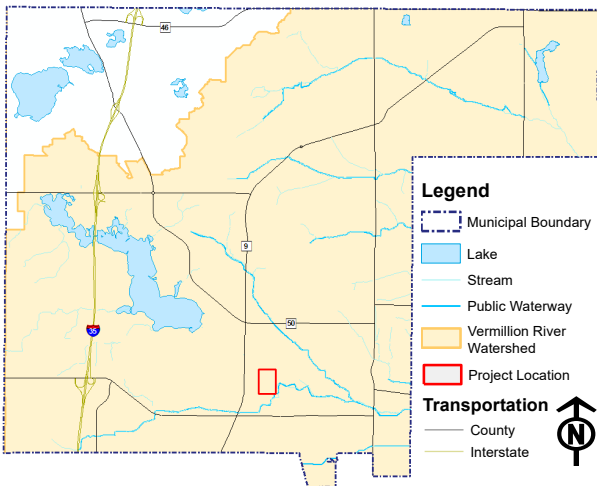
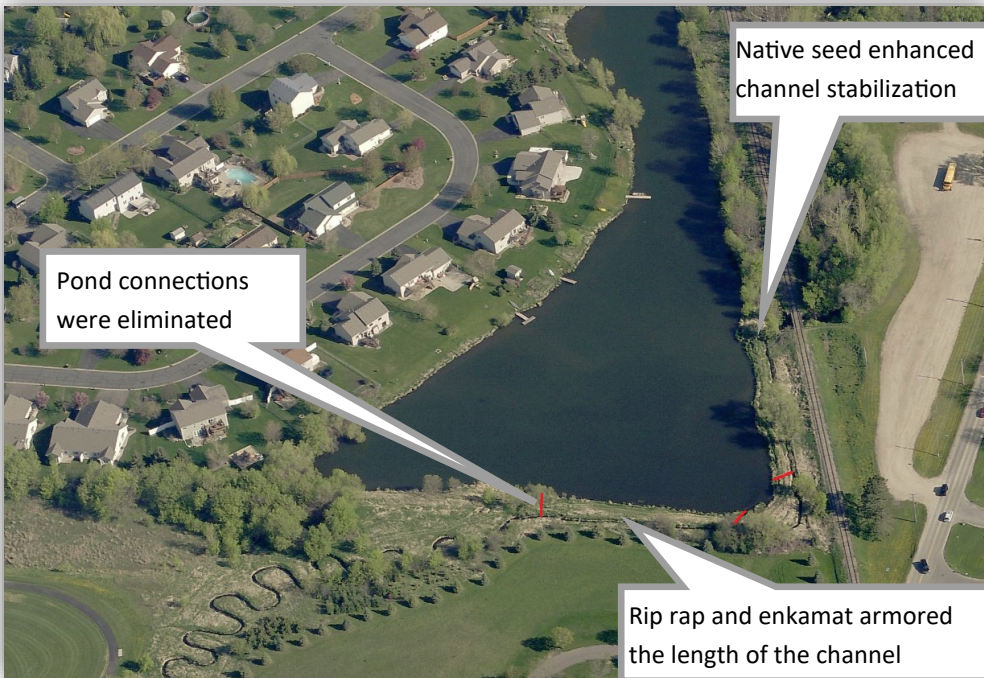
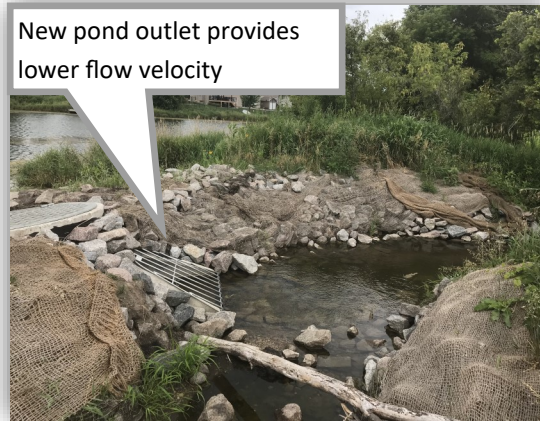
(Right) Nature trails and fort building pods post construction.



2018 South Creek Restoration at Golden Pond

Overview

The project restored an tributary of South Creek (DNR-designated trout stream), separating it from a City stormwater pond. The restored pond outlet included the addition of a stabilized emergency overflow and outlet structure. The project will result in cooler water temperatures, increased water dissolved oxygen concentrations and a reduction in sediment runoff into the trout stream and connecting Vermillion River.



Funding

Clean Water Fund Award: \$145,695

City of Lakeville: \$35,804

Vermillion River Watershed: \$35,804

Project Cost: \$217,303

Practices

- ◆ Stormwater retrofit
- ◆ Streambank Stabilization

Project Benefits

- ◆ Improved water quality
- ◆ Habitat enhancement
- ◆ Fisheries protection

Partners

- ◆ Vermillion River Watershed Joint Powers Organization
- ◆ MN Board of Water and Soil Resources

Contractors

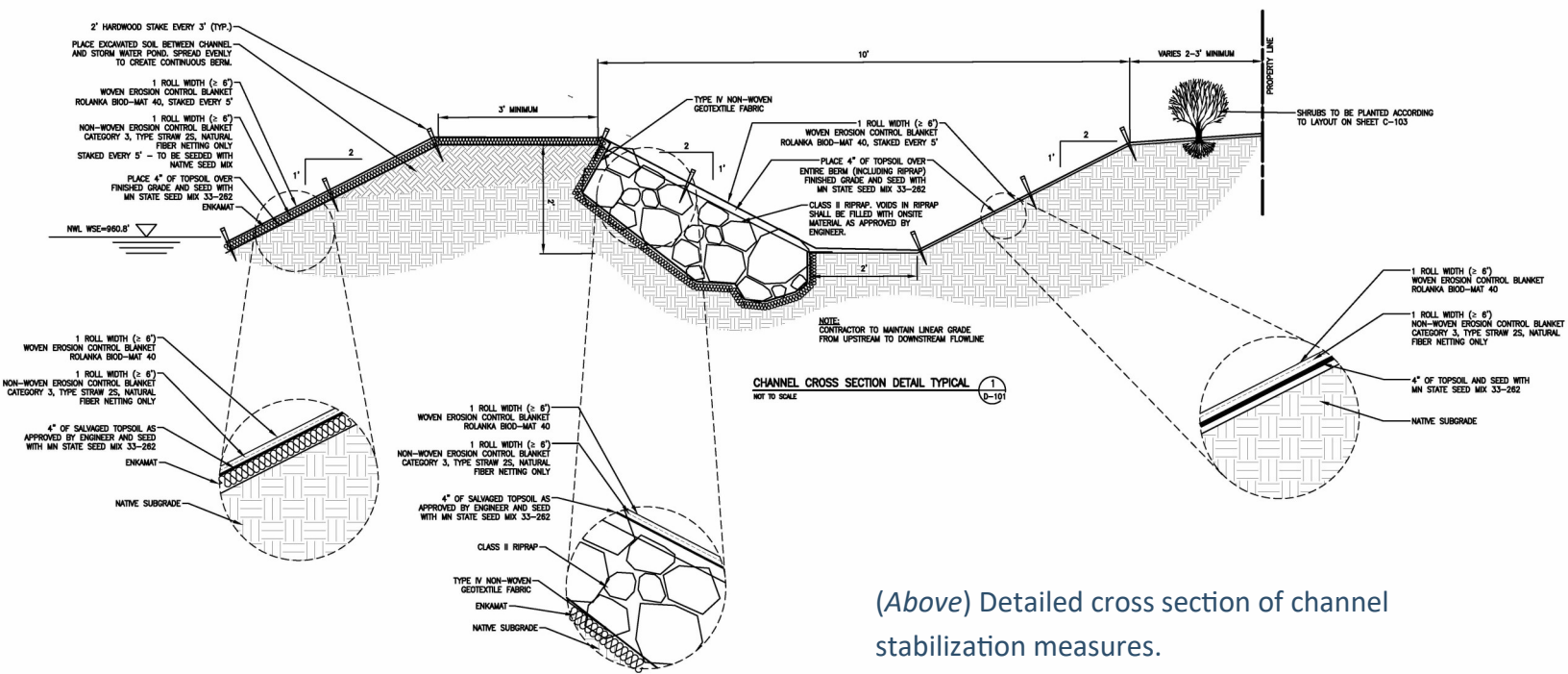
- ◆ Wenck Engineering
- ◆ Sunram Construction

Timeline

- ◆ Construction initiation—March
- ◆ Final stabilization—October

Project made possible with funding assistance from Minnesota's Clean Water Fund





(Above) Detailed cross section of channel stabilization measures.



(Above) Pond outlet prior to restoration.



(Above) Stabilized channel post construction.



(Above) Native seed post construction.



(Above) Pond outlet post construction.



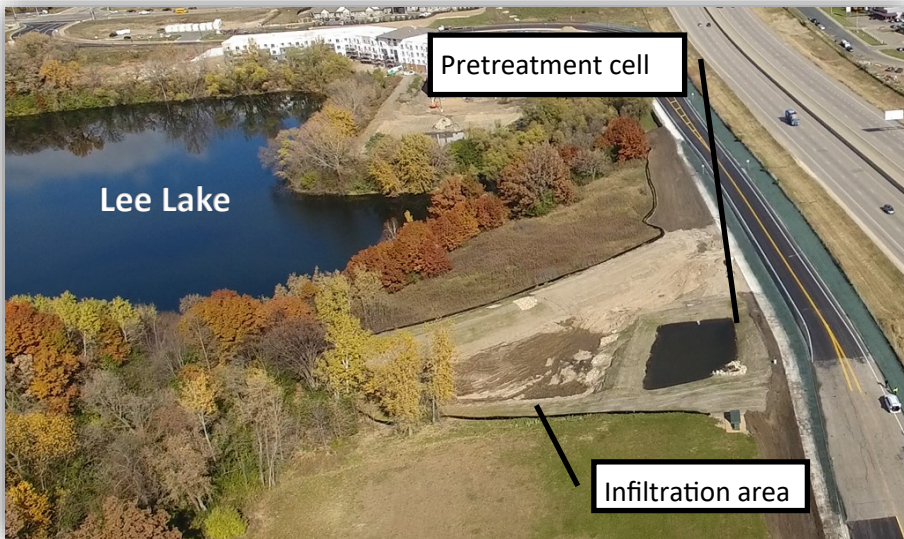
(Above) Emergency overflow structure.



2018 Lee Lake Pond Retrofit

Overview

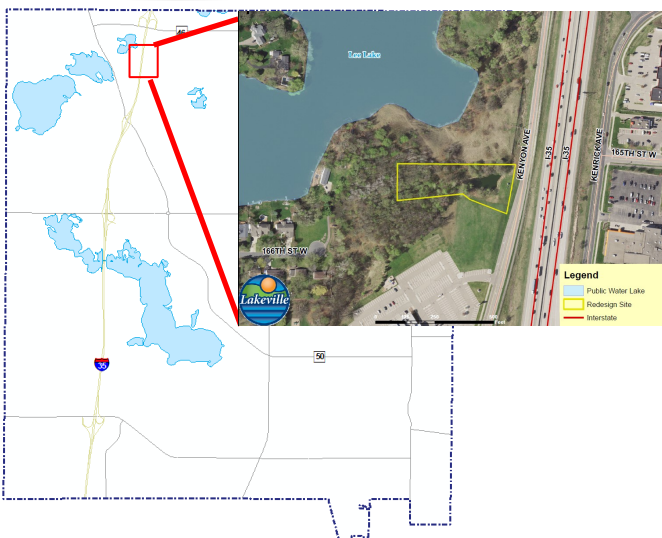
In 2018 the City was awarded funding to redesign a storm water pond that discharges treated water to Lee Lake. In 2002, Lee Lake was listed as impaired for excess nutrients; however, with the help of several water quality enhancement projects implemented by the City, the lake was delisted in 2014. The project was sought to offer protection of the previously impaired water body. The basin redesign increased stormwater infiltration capacity through addition of a pretreatment cell that discharges to a newly constructed infiltration forebay. An additional 6 acres of previously untreated runoff from MNDOT I35 right-of-way will also be directed to the basin.



Annual Particulate Phosphorus Reduction
5.33 lbs

Annual Dissolved Phosphorus Reduction
8.94 lbs

Annual Total Suspended Solids Reduction
1,820 lbs



Funding

Clean Water Fund Award (Dakota SWCD): \$39,000
City of Lakeville: \$151,282

Project Cost: \$190,282

Practices

- ◆ Stormwater retrofit
- ◆ Protection of previously impaired water

Benefits

- ◆ Suspended solid concentration reduction
- ◆ Nutrient loading Reduction
- ◆ Water quality enhancement

Partners

- ◆ Dakota County Soil and Water Conservation District (SWCD)
- ◆ Minnesota Board of Water and Soil Resources

Contractor

- ◆ Northwest Asphalt

Timeline

- ◆ Construction initiation– June, 2018
- ◆ Final stabilization– spring, 2019

Project made possible with funding assistance from Minnesota's Clean Water Fund





(Left) Prior to the retrofit, the stormwater pond was often over capacity, unable to keep up with the volume of water flowing into it.

(Right) Soil borings in the initial phase of construction informed infiltration ability and pond sizing.



(Above) The pretreatment cell was sized for increased capacity and native soils were replaced with an engineered mix meant to enhance infiltration.



(Above) A temporary bypass was installed during construction to allow for pond vegetative growth.



Water is discharged into Lee Lake

Sediment is allowed to settle out in the pretreatment cell

Water enters the infiltration area for additional treatment (enhanced phosphorus removal)



2018 Conservation Corps

Crew Labor

Overview

In 2018, the Vermillion River Watershed, partnering with the City of Lakeville, was awarded Clean Water Funds for Conservation Corps (CCM) crew labor. Crews completed work within the following projects:

- Middle Creek Restoration Planting Supplement (Avonlea Development)—50 trees and 50 shrubs were planted along a previously restored stream;
- 205th Channel Restoration Planting Supplement—40 trees and 30 shrubs were planted to further enhance the previously restored channel. In addition, buckthorn removal took place and bioengineering was used to provide further channel stabilization;
- Lake Marion—40 tons of rock were placed along the shoreline at Casperson Park to reduce erosion caused by wave action.



CCM provides hands-on environmental stewardship and service-learning for youth and young adults

CCM's roots trace back to the 1930's when it provided natural-resource jobs to unemployed young men during the Great Depression

Funding

Clean Water Fund Grant: \$1,600
 Vermillion River Watershed JPO: \$1,200
 City of Lakeville: \$4,609

Project Cost: \$7,409

Practices

- ◆ Stream restoration
- ◆ Urban forestry
- ◆ Native species enhancement

Project Benefits

- ◆ Stream temperature reduction
- ◆ Bank stabilization
- ◆ Increased wildlife habitat
- ◆ Reduced sediment loading

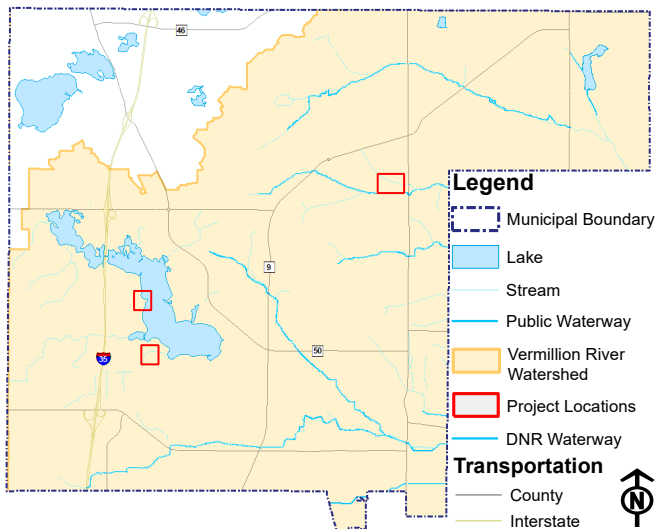
Partners

- ◆ Vermillion River Watershed JPO
- ◆ Board of Water and Soil Resources
- ◆ Conservation Corps MN and IA

Timeline

- ◆ June—Middle Creek and 205th Restoration
- ◆ October—205th Restoration and Lake Marion

Project made possible with funding assistance from Minnesota's Clean Water Fund





(Above) Rocks were hand placed on the Lake Marion shoreline in areas where wave action causes high erosion.



(Above) Chainsaws were used for buckthorn removal. Stumps were then chemically treated.



(Left) Tree guards were placed around newly planted trees to protect them from animal disturbance.



(Above) Rocks and tree stumps created additional stabilization in high channel flow areas using bioengineering.



(Left) Trees that were planted were of varying size. Species included ironwood, hackberry, river birch, red maple, swamp white oak, bur oak and sugar maple.

II. Lake Management



2018 Citizen Assisted Monitoring Program

Overview

Each year, the City of Lakeville participates within the Metropolitan Council’s Citizen Assisted Monitoring Program (CAMP). CAMP’s purpose is to empower local residents and staff to track local water quality trends. Surface water monitoring was conducted bi-weekly on Marion, Orchard, Kingsley, Lee, Valley and East lakes. Samples were analyzed for various indicators of algae growth potential (nitrogen, phosphorus and chlorophyll-a). At each sampling event, surface water temperature and water transparency were also observed.



For each monitoring parameter, the MetCouncil assigns a unique Lake grade based on the lake’s ability to meet state water quality standards. The table below reflects the grades assigned for the past three years of monitoring.

Historic Transparency Averages

Lake	Year	Transparency Avg (m)	Grade
Kingsley	2016	2.9	A
	2017	2.9	A
	2018	3.1	A
East	2016	0.5	F
	2017	0.8	D
	2018	0.7	D
Lee	2016	2.2	B
	2017	2	C
	2018	1.7	C
Orchard	2016	2.7	B
	2017	3	A
	2018	2.5	B
Marion	2016	2.2	B
	2017	2.5	B
	2018	2.5	B
Valley	2016	1.5	C
	2017	1.3	C
	2018	0.7	D

Practices

- ◆ Water quality monitoring
- ◆ Public education and engagement

Benefits

- ◆ Directs City water quality improvement initiatives
- ◆ Fisheries protection

Partners

- ◆ Metropolitan Council
- ◆ Local lake residents
- ◆ Black Dog Watershed Management Organization

Timeline

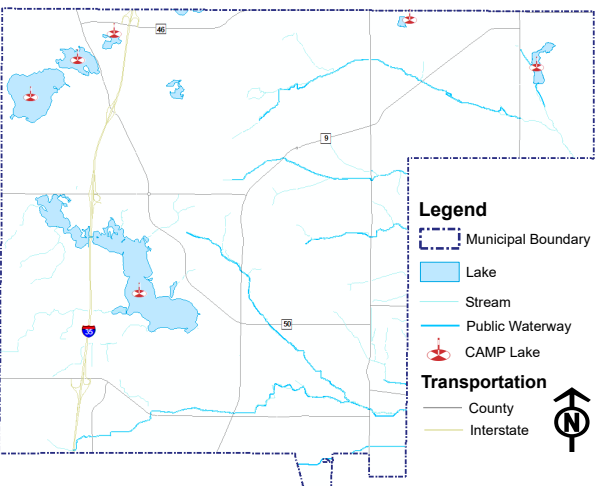
- ◆ Bi-weekly April—October

Funding

City of Lakeville: \$2,200

Black Dog Watershed Management Organization: \$1,100

Project Cost: \$3,300





(Above) A view of Lee Lake.



(Above) Lily pads seen next to the Orchard Lake Beach.



(Left) A view of Valley Lake Community Park from the canoe.



(Right) A bridge on East Lake offers the public a chance to walk on water.

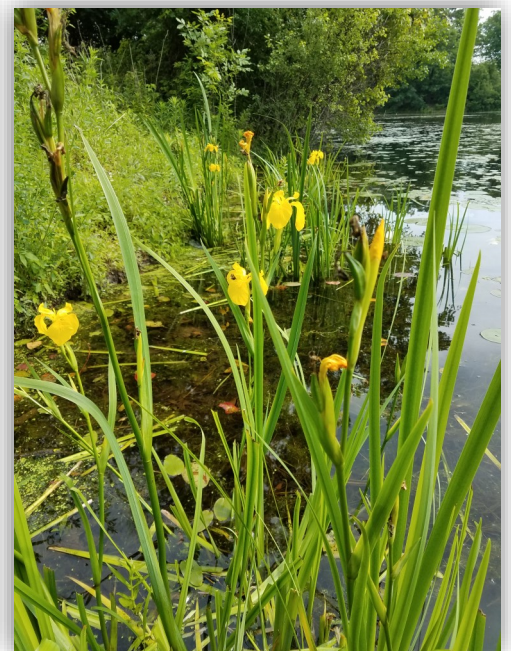
(Below) A rare carnivorous plant (sun dew) on Kingsley Lake.



(Below) City staff beach the canoe on one of the Kingsley islands during sample



(Below) Isolated pockets of invasive species (yellow iris) found on Kingsley Lake.





2018 Prevention and Control of Aquatic Invasive Species

Overview

In 2018 the City of Lakeville was awarded funds from the Dakota County Aquatic Invasive Grant (AIS) Program for various AIS activities. Funded activities included:

- 1) Watercraft inspections on Lake Marion and Orchard Lake;
- 2) Monthly targeted AIS searches; and
- 3) Treatment of curlyleaf pondweed (CLP) and Eurasian watermilfoil (EWM) on Lake Marion



EWM treatment on Lake Marion compared two methods: one said to have treatment effects lasting 2-3 years and the standard method that has been used in past years. In addition, the City monitored areas on Kingsley Lake that had been treated for yellow iris in 2017 to ensure treatment success. Limited populations were found.

Eurasian

Watermilfoil Treated

Marion: 11.09 acres

Orchard: 2.11 acres

Watercraft Inspection Data

Total Inspections: 2,691

Drain plugs not removed

upon arrival: 13

AIS found upon arrival: 50

No zebra mussels found!

Curlyleaf

Pondweed Treated

Marion: 1.01 acres

Orchard: 2.98 acres

Funding

Dakota County

AIS Grant Award: \$17,721

City of Lakeville: \$19,921

Project Cost: \$37,642

Practices

- ◆ Watercraft inspections
- ◆ Vegetation and habitat monitoring
- ◆ AIS treatment

Benefits

- ◆ Watercraft decontamination
- ◆ Education and outreach
- ◆ AIS rapid response
- ◆ Promotion of native species through invasive removal

Partners

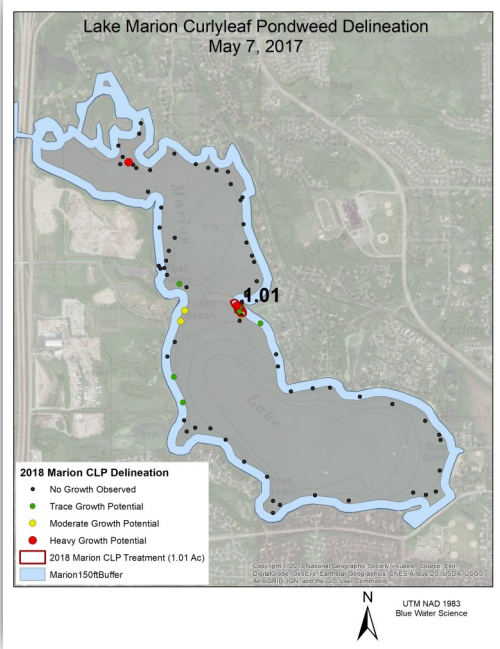
- ◆ Dakota County
- ◆ Department of Natural Resources

Contractors

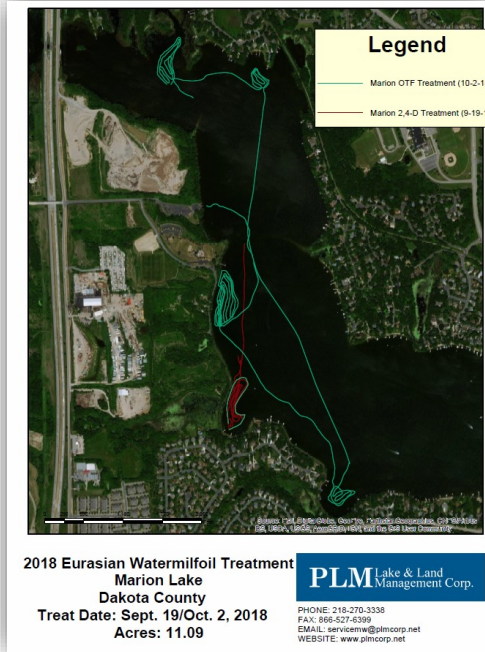
- ◆ Blue Water Science
- ◆ PLM Lake and Land Management Corp
- ◆ WaterGuards, LLC

Timeline

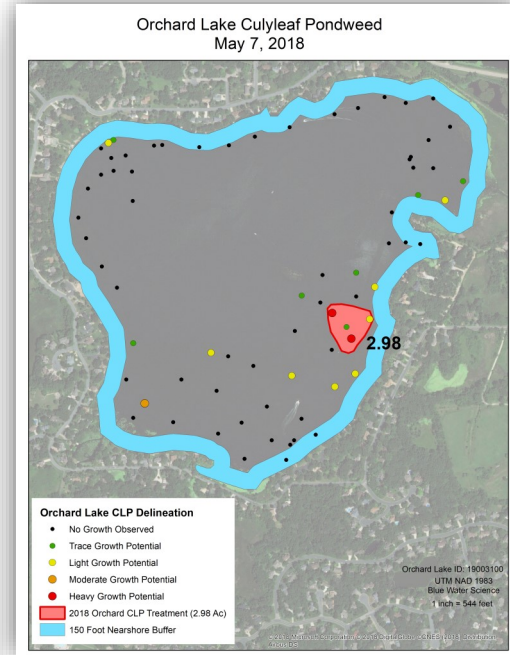
- ◆ Watercraft inspections: May 12—Sept. 3 (Fri-Sun and holidays)
- ◆ Curlyleaf treatments: May 21
- ◆ Eurasian watermilfoil treatments: July 18, Sept 19, and Oct 2



(Above) CLP delineation results on Lake Marion. Treatment area shown outlined in red.



(Above) Lake Marion EWM treatment areas. Use of 2 chemicals will allow for cost effectiveness comparison.



(Above) CLP delineation results for Orchard Lake. Treated areas shown outlined in red.



(Left) A settling plate at the Lake Marion public access revealed only native mussels.



(Right) Orchard Lake EWM treatment areas.



(Above) Scuba diving gear allows surveyors to get a close up look at lake substrate.



(Left) An aquatic plant survey taking place on Orchard Lake.



2018 East Lake Carp Assessment

Overview

Common carp, an aquatic invasive species (AIS), are often associated with poor water quality and vegetation degradation in lakes (when biomass is >100 kg/ha). In 2018, the City and Vermillion River Watershed Joint Powers Organization began tracking carp abundance and movement within East Lake. The purpose of the study was to define future management activities to improve East Lake water quality. The study included:

- 1) Boat electrofishing—captured fish were counted (abundance determination) and measured for length (age determination); and
- 2) Radiotelemetry— Radiotransmitters

Were implanted and fish movement patterns were studied to determine potential spawning locations.

Management recommendations were provided for consideration including: conducting further carp tracking, strategic carp removal and implementing a semi-permanent fish barrier between East Lake and the Vermillion River.



Practices

- ◆ AIS tracking and population analysis

Project Benefits

- ◆ Informed water quality initiatives

Partners

- ◆ Vermillion River Watershed JPO
- ◆ Dakota County

Contractor

- ◆ Carp Solutions, LLC

Timeline

- ◆ Radiotagging and telemetry surveys— May-July
- ◆ Electrofishing— July-August

A common carp can live for 60 years and grow up to 3 feet in length!

Funding

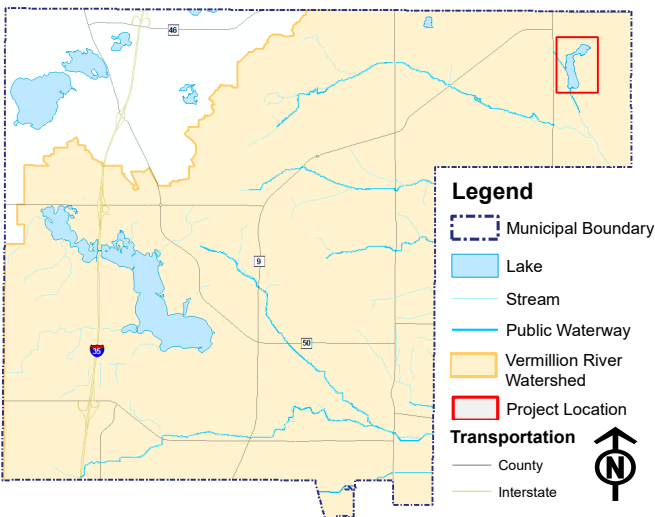
Dakota County AIS Grant:
\$10,285

Vermillion River Watershed
JPO: \$5,142

City of Lakeville: \$5,142

Project Cost: \$20,570

Tracking results showed carp may be able to freely move in and out of East Lake





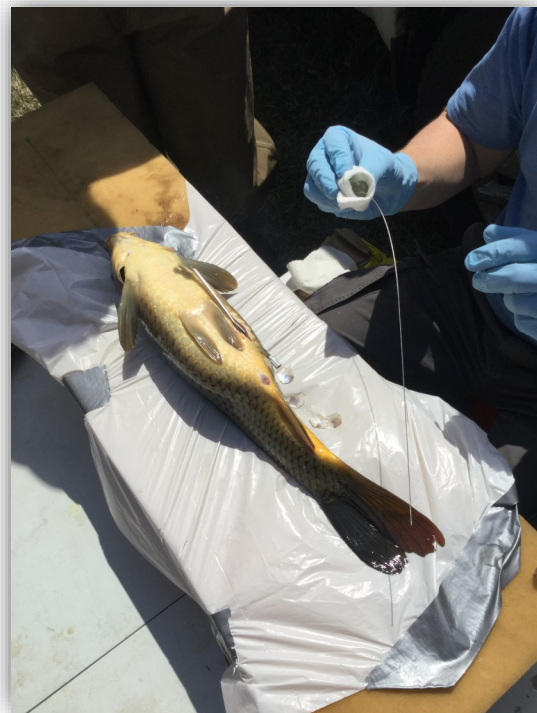
(Above) The electrofishing boat temporarily stuns fish, allowing them to be collected for analysis.



(Above) Locations of trap nets set in East Lake subwatershed. Trap nets were set to determine potential carp nurseries.



(Above) A captured carp awaiting transmitter implantation within the “anesthesia tank.”



(Left) A captured carp being implanted with a radiotracer. A total of 20 carp were implanted. During this process, inner ear bones were to assist with the aging determination.



(Above) Carp lengths were measured for aging estimates.

Parameter	Quantity	Notes
Electrofishing Surveys	3	
Telemetry Surveys	5	
Biomass (kg/ha)	137.4	Significant water quality impacts seen at 100 kg/ha
Avg. Length (mm)	438	YOY carp are those <200mm
Avg. Weight (lbs)	2.4	
Percent YOY Carp	10%	
Recruitment Period	Annual	
Catch Rate (carp/hour)	27	
Tagged Fish Unable to be Located	30%	Suggests movement in and out of East Lake

(Above) Summary of assessment results.



2018 Annual Lake Studies

Overview

The City conducts annual lake studies on Marion, Lee, Orchard and Valley.

Lake monitoring parameters include:

- Water quality (including analyzing changes following historic alum and iron treatments);
- Aquatic plants (native and invasive); and
- Fish communities.

In addition, the King Park reuse ponds are monitored for chlorides, phosphorus and bacteria to ensure field recreability.

This year, results included:

- ⇒ Lee Lake: Eight submerged species were observed, with coontail being the dominant plant.
- ⇒ Valley Lake: Aquatic plant distribution was limited; however, native plant species included coontail and elodea.
- ⇒ Lake Marion: The most common plant observed was coontail, followed by EWM. Sixteen submerged species were seen.
- ⇒ Orchard Lake: Curlyleaf pondweed (CLP), coontail and northern (native) watermilfoil were the dominant plants observed.

Lee Lake Native Plant Coverage
May 31, 2018



Figure S1. Early season native plant coverage on May 31, 2018.

Practices

- ◆ Water quality monitoring
- ◆ Vegetation and habitat monitoring

Benefits

- ◆ Innovative water quality enhancement
- ◆ Long term monitoring database
- ◆ Initiates aquatic invasive species rapid response

Contractor

- ◆ Blue Water Science

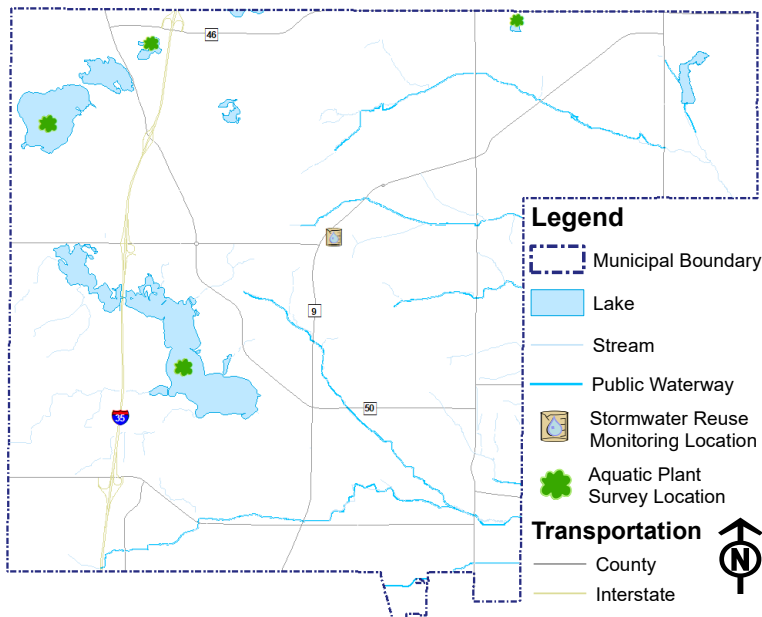
Timeline

- ◆ Aquatic plant surveys: early and late summer
- ◆ Reuse ponds: once monthly May—August

American lotus is an uncommon native species found in Lee Lake

E. coli concentrations in the King reuse ponds were consistently below state stormwater standards

Native plant species have been increasing in Lake Marion!



Funding

City of Lakeville: \$13,200

Project Cost: \$13,200



(Left) Native species blue flag iris seen at Valley Lake.



(Above) EWM (present within Valley lake since 2005) was only observed at one location.



(Above) Lily pads seen on Lake Marion.

	Harvesting (ac)	Herbicide Treatment (ac)
2002	--	--
2003	--	--
2004	63	--
2005	68	--
2006	70	--
2007	70	--
2008	70	--
2009	50*	20
2010	--	24.5
2011	--	26.1
2012	--	23
2013	--	--
2014	--	--
2015	--	7.34
2016	--	2.9
2017	--	14.5
2018	--	2.98

(Left) Orchard lake CLP treatment from 2002-2018. Fifty acres were proposed to be harvested in 2009 but less than 10 acres actually required harvesting.



(Above) King Park reuse ponds.



(Above) Orchard Lake.

III. Education and Volunteer Activities



Education Activities 2018

Overview

Environmental Resources staff mainly uses Watershed Cleanup Day and Earth Day Celebration as the main education event yearly, but we also conduct several other education activities at various scales. These outreach efforts are a great way to connect with residents, businesses, and students to help foster the environmental connection to the natural resources of Lakeville. These activities also meet the City’s Storm Water Pollution Prevention Plan (SWPPP) requirements. Highlighted below is what was completed in 2018.

First Lego League Presentations February 15



In 2018, the FIRST Lego League had the theme of ‘water’. There were 11 teams in Lakeville in the local competition. Environmental Resources, Utilities, Streets, Communications, and Administration staff worked with various teams to provide information and direction on projects that focused on water protection, conservation, or improving water quality. After sectionals, there were 5 teams that moved on to the state level competition. Lakeville staff members were requested to watch the presentations, ask technical questions, and critique the presentations. Teams used this experience to better prepare them for the state competition.

Practices

- ◆ Education for students
- ◆ Education for adults

Project Benefits

- ◆ Baseline knowledge to promote better environmental stewardship in the Lakeville community such as:
 - protect water quality
 - conserve water
 - support of local plants and wildlife
 - promote waste reduction and increase recycling
- ◆ Community Connectivity

Timeline

- ◆ Year Round

Partnerships

- ◆ Dakota County Soil & Water Conservation District
- ◆ Area School Districts



Landscaping for Clean Water

Introduction: April 9 Design: April 23 & 25

The City of Lakeville has been involved with Dakota County Soil and Water Conservation District’s Landscaping for Clean Water program, formerly Blue Thumb, since it’s debut in 2007. Environmental Resources staff sets up workshop logistics, assists in project design, as well as attends some site visits. The program consists of introduction and design workshops that help residents understand the impacts of storm water runoff from their property to water quality and promotes the installation of private raingardens, native gardens & shoreline restorations to reduce that impact.

In 2018, there were 42 participants at the Lakeville intro, 29 at design, with 5 raingardens and 2 native gardens installed in Lakeville. This program is for all Dakota County residents. After 12 years, there have been 4,194 participants and 498 projects installed in the county.



Nature Detectives



June 26 & 28

Nature Detectives, part of Lakeville's Parks and Recreation summer programming, has been held annually since 2009. In 2018, Environmental Resources staff lead a group of 12 kids, ages ranging from 5 to 12, through Ritter Farm Park's woodlands, prairie, and backwaters of Lake Marion. Participants use their detective senses along with bug nets, bug boxes, dip nets, sorting trays, and field guides to locate and temporarily capture insects and wildlife. Emphasis on water quality is always a major component of this class. There have been over 133 participants who've attended this program to date.



Water Treatment Facility Tours

October 19

The City participated in the national *Value Water Campaign: Imagine a Day without Water* by educating attendees about water conservation, stormwater pollution and water quality. Following the interactive educational event, a tour of the water treatment facility was offered, allowing residents to see firsthand the processes involved in drinking water:

- extraction
- storage
- treatment
- distribution

Approximately 100 residents were in attendance at the event.



Metro Area Children's Water Festival

September 26

The Metro Children's Water Festival (CWF) provides area fourth graders hands-on opportunities to learn about water's importance to people and our natural environment. This year, sixty-four students learned about the process required for water treatment at the City's *Cleaning Dirty Water: How Easy is it?* learning station. The station incorporated the CWF's theme of: 'Water Connects Everyone and Everything on Earth' through a water jug demonstration of how much drinking water is available on earth.



Lakeville Landscape Home & Garden Show

March 10

The Environmental Resources staff took shifts at this heavily attended event sharing information to attendees about the upcoming Landscaping for Clean Water workshops and signing up groups to participate in Watershed Cleanup Day. Over 3,000 people attended.

Puppet Wagon—Summer



Skip the Drip completed a third season of puppet shows with Park and Recreation's Puppet Wagon reaching a total of 7,742 attendees to date. 76 shows occurred between June to August at 13 locations. The content for the Environmental Minute segments included topics like: importance of pollinators, water conservation, wetland protection, lake water quality, recycling, & pollution prevention.





Lakeville Volunteer Projects 2018

Overview

Each year various groups contact Environmental Resources with the desire to do various volunteer projects. The groups include Girl Scouts, Boy Scouts, or high school students looking to complete capstone projects. Most volunteers know what type of project they want to do and are looking for a location, or they are looking for ideas and locations for possible projects. In 2018, there were many students who wanted to complete projects on city property. Details about each project is listed below.

Pollinator Garden at Ritter Farm Park Cistern

Emma Tessmer and Emma Niesen

Girl Scout Silver Award

After many hours of planning, on July 7, twelve volunteers spent 3 hours to plant 46 pollinator friendly plants around the cistern near the Environmental Learning Center at Ritter Farm Park. Each girl is required to put in 50 hours of work (volunteer's time included) to receive the Silver Award.



Environmental Resources and the Parks Maintenance staff worked together to provide guidance, site location and preparation needs, water source, and signage. Environmental staff reviewed and revised the planting plan as well as ordered the plants and edited the sign. The parks department donated the cost of the 46 plants and the sign (\$195.50). This project provides connectivity to other native plant areas near by and supports pollinators.

Benefits (City)

- ◆ Low cost projects
- ◆ Completion of projects that would not have been possible

Benefits (Student)

- ◆ Education
- ◆ Experience with real life project management
- ◆ Volunteering
- ◆ Guidance and coordination for project location & supplies from Env. Resources staff
- ◆ Community connections

Timeline

- Year round



Buckthorn Bust at Casperson Park between boat launch and playground

Shannon Gallagher

Girl Scout Gold Award

On October 6, 2018, approximately 25 volunteers removed a 1/2 acre of buckthorn from the shoreline and woodland area near a pedestrian trail at Casperson park. One local business, Arbor Barber Tree Experts, provided chainsaw work to cut down a portion of the buckthorn.

4 projects completed in 2018

Env. Resources Staff provided guidance, site location and coordination with Parks Maintenance staff. Park Maintenance staff chipped and hauled away 40 yards of buckthorn with 20 to 25 man hours spent to complete the task.



Raingarden Habitat Enhancement and Inlet Maintenance at Casperson Park Raingarden

Brandon Stachewicz

Eagle Scout Award

On October 13, Brandon lead nineteen volunteers to complete two main aspects of habitat improvement to the raingarden at the Casperson Park Boat Launch. The first part of the project was to plant 40 ferns under the tree canopy of the River Birch and Swamp White Oak Trees. Ostrich ferns were chosen for this location in hopes that they spread through the understory of the garden to create a fuller look to the understory and provide more habitat. The second portion of the project involved removing the old permanent turf reinforcement (PTR), sod, and accumulated sediments at the inlet. The area then needed to be re-sloped so that the water from the boat launch can freely flow into the raingarden. Brandon reported 66.3 hours for the project completion. 33 of those hours were his work toward project completion.

Environmental Resources staff created the project, ordered the ferns (\$266.50), purchased the blanket and staples (~\$200), and provided the layout for plant locations, mulch, & where to replace PTR. Eagle Scout supplied the sod.



Woodland Habitat Enhancement at East Lake Community Park Woodland

Carson Davis, Andrew Hanson, Owen Dugan, Alex Haugen, and Logan Sampson

Lakeville North Business Academy Project

On October 27, seven recruited student and parent volunteers helped 5 Lakeville North Business students plant 10 bur oak, 10 red oak, 10 hackberry, 10 white cedar, 20 hazelnut, & 10 nannyberry. Plants donated at no cost from Outback Nursery in Hastings. The 12 volunteers completed the planting in 1.5 hours (18 project hours).

Env. staff assisted with layout locations, plant pick up and placement, fabric, water pump & hose, and also installed browsing protection for the trees (~\$300).

This is the first attempt at reforestation in the East woodland. The area chosen had very low buckthorn presence. Staff plan to continue buckthorn control in the woodland and adding native trees and shrubs to the woodland over the coming years.



Juno Trail Shoreline Capstone Project

Jordan Lang

Lakeville South STEM Capstone Project

For Jordan Lang's STEM Capstone Project she participated in the review process of the Juno Trail Natural Resource Management Plan in November. In 2019, she will complete the project by planning a potential shoreline restoration that will demonstrate 3 different types of restoration methods. She will also have the opportunity to educate residents on shoreline stabilization alternatives.





Watershed Cleanup Day and Earth Day Celebration 2018

Overview

Environmental Resources staff have been running Watershed Cleanup Day and Earth Day Celebration since 2008. The event has grown from attendance of 351 attendees in 2007 to over 1,450 people (70 groups) in 2018, that volunteered to remove trash throughout Lakeville.

Due to snowy weather conditions, the actual cleanup took place when the groups could reschedule a cleanup for their designated locations. Groups consisted of church groups, Girl Scouts, Boy/Cub Scouts, school groups, environmental groups, businesses, as well as several families and individuals who signed up to participate. Lakeville Streets & Parks staff picked up the collected bags as they were located.

The Earth Day Celebration education portion of the event still took place as scheduled on April 21. There were 16 education stations at the event this year. Earth friendly prizes that promote positive environmental support were won through participation in the educational activities and by answering environmental related questions.



Cub Scout Pack 121



Zoomobile



Police reserves lunch serving crew



Shiffelly Earth Day Puppet Show

Funding

Total Cost
(Environmental Resources Fund):
\$20,000
Cost per volunteer:
~\$4.44/hr

Over 650 people attended the Earth Day Celebration

Practices

- ◆ Volunteer event for all ages
- Removal of pollutants from watershed
- Education event

Project Benefits

- ◆ Promote community stewardship
- ◆ Waste removal along roadsides, parks, neighborhoods, trails, ponds, wetlands and waterways
- ◆ Education on a wide variety of environmental topics

Timeline

- ◆ Event held annually, typically on the Saturday closest to Earth Day (April 22)
- ◆ Cleanup from 8-11 am
- ◆ Celebration 11 am-1 pm

Partners

- Volunteers are recruited from many agencies and specialties to provide education stations at the Earth Day Celebration



*Dakota County SWCD
-raingardens, shoreline restoration,
and native plantings*



*Metropolitan Mosquito
Control District
-mosquito habitat reduction
and disease prevention*



*MN DNR & Dakota County
Sheriff's Office
-AIS identification & inspections*



*Hobby Bee Keepers
-importance of pollinators*



*Lakeville Forester
-tree information and
services*



*Lakeville Friends of the Environment
-water quality protection, waste reduction—specifically
plastic reduction at event (annually host a water station
with compostable cups)*



*Master Naturalists
-native plant and animal
information and identification*



*Metropolitan Council
-groundwater protection*



*Dakota Valley Recycling
-recycling/waste reduction and details
on what is recyclable*



*Vermillion River Watershed
-watershed information and water con-
servation*



*Dakota County Recycling
-food waste reduction and general
recycling information*



*(Left) Blue Water
Science
-water quality
and monitoring,
AIS identification,
fresh water
mussel
identification*



*(Above) Lakeville City Engineer
-roundabout benefits, Inflow & Infiltration
detection, street sweeping*



IV. Miscellaneous



Natural Area Maintenance 2018



Overview

Many projects are undertaken by Environmental Resources yearly. Often there is a native vegetation component associated with those projects. Once these areas are planted, maintenance is needed until the area is well established. There are also several natural areas throughout the city that are in need of maintenance to preserve the valuable habitat that it provides for local wildlife. If an area is determined as a valuable resource and funding can be established, maintenance plans are determined to keep the areas functioning. All areas are controlled to manage/eliminate noxious weeds. Grants are frequently sought after to restore natural areas, manage existing areas, and create projects that improve stormwater quality and natural resources. Sentence to Serve crews are also utilized for dead thatch removal in spring and as needed for duties like rip rap maintenance, planting, and fence repair.

TYPE	# OF SITES	SIZE OF AREAS	CONTRACTOR
Raingardens and Small Areas	6 raingardens 3 shoreline 1 pollinator garden <u>10 sites</u>	44,650 sq. ft.	MN Native Landscapes
Prairie and Large Areas	5 agriculture field 3 channel restoration 3 wetland & buffer 3 stormwater pond and buffer 4 woodland 3 prairie 2 Japanese knotweed <u>23 sites</u>	78.1 acres 3,402,036 sq. ft.	Applied Ecological Services

Over 79 acres of natural areas managed

Practices

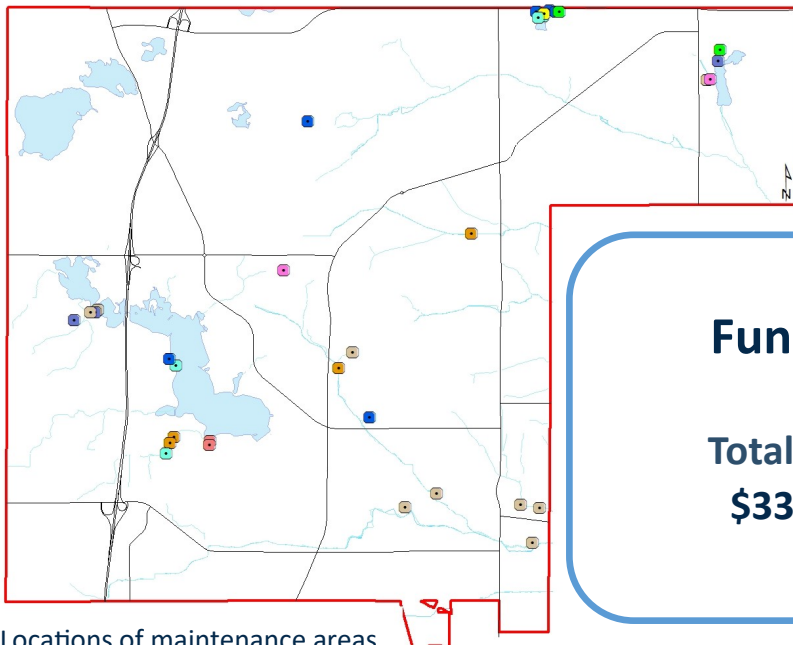
- ◆ Vegetative Stabilization
- ◆ Manage native plantings to reduce invasive species
- ◆ Mechanical or chemical methods used

Project Benefits

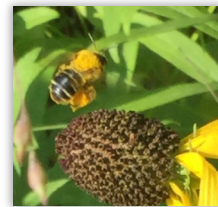
- ◆ Stabilization of soils
- ◆ Provide valuable habitat to native fauna
- ◆ Uphold aesthetics
- ◆ Control invasive species
- ◆ Maintain designed storm-water function

Timeline

- ◆ Most work completed during the growing season before invasive species put out their seed
- ◆ Buckthorn management mainly occurs at end, or after growing season, to not effect native species



Locations of maintenance areas



Funding

Total Cost:
\$33,552





Casperon Park Rain Garden



*(Above)
Buckthorn
Control
at 205th*



June

Agriculture Field Area E



August



Avonlea Creek Restoration



Ritter Farm Park Hill Slope



*Donnelly Farms Channel —Siberian Elm
Removal*



Valley Lake Pollinator Garden



*(Above) Comparison of
Japanese Knotweed at Ritter
from 2017 to 2018*



*(Left) East
Community Park
Woodland*



*Shady Oak Grove Wetland
Mitigation*



Wetland Conservation Act 2018

Overview

The Wetland Conservation Act (WCA) is a State Law from the Federal Clean Water Act that was set up to maintain and protect Minnesota’s wetlands and the benefits they provide. Lakeville’s Environmental Resources Specialist is a Certified Professional Wetland Delineator and serves as the City’s LGU (Local Governing Unit). When an application is received, it is reviewed by this process:

1. Review report and determine completeness.
2. Contact wetland contractor to revise any issues found.
3. Set up and conduct an on-site meeting.
4. Collect required fee.
5. Write and send out a Notice of Application (NOA) once everything is complete to all Technical Evaluation Panel (TEP) members:
 - Dakota County Soil and Water Conservation District
 - Board of Water and Soil Resources
 - MN Department of Natural Resources
 - Vermillion River Joint Powers Org.
 - United States Army Corps of Engineers.
6. After a comment period of at least 15 working days, and if no issues have been found, a Notice of Decision is written and sent out.

Over 75 acres of wetland reviewed

The same process is used for a wetland delineation, a wetland replacement plan, or other wetland applications. Therefore, wetlands on one property may go through this process 2 or more times before the wetland review process is complete. TEP meetings are called when there are potential issues during the review process. The LGU also responds to potential wetland violations with in the City as they arise and works with agencies to resolve violations.

The overall goal of WCA is no-net loss of wetlands. To achieve this goal anyone looking to impact a wetland must follow a process of:

1. AVOIDANCE, and if that is not possible
2. MINIMIZE IMPACTS
3. REPLACE any lost wetlands via wetland banking.

In 2018, staff reviewed:

- 18 wetland delineations; 17 approved
 - 1 no-loss plan at Pheasant Run North development; 0.10 acres
 - 2 wetland replacement plans were processed
- | Project | Impact | Replaced via Bank |
|------------|--------------|-------------------|
| Wild Wings | 0.1025 acres | 0.21 acres |
| Co Rd 50 | 1.57 acres | 2.73 acres |
- 3 TEP meetings were held in 2018 for 5 site locations
 - 2 Wetland violation investigations were reviewed

Practices

- Regulatory process to protect wetlands in Lakeville

Benefits

- ◆ Preserve wetlands and reduce impacts

Protection of wetland results in:

- Increase in water quality
- Decrease in flooding
- Public education and recreation &
- Wildlife habitat

Timeline

- ◆ Year round, but mainly during the growing season April 15 to October 15

In 2018, there were 1.67 acres of wetland impact

0.54 associated with unavoidable impacts for development and

1.13 acres due to Co Rd 50 road impacts (replaced via the BWSR Road Bank)



Location of delineations in 2018



(Above) Wetland review at Smith/Apple Valley Properties



(Above) Wetland Delineation at Kenwood Hills 3rd Addition



(Above) Potential Wetland Violation Investigation at 199th and Italy Ave



2018 Erosion and Sediment Control and Stormwater Management

Overview

The City, as a regulated municipal storm sewer system (MS4), oversees the implementation of local and state erosion and sediment control requirements. In addition, the City is tasked with ensuring stormwater infrastructure is properly functioning and maintained, including inspecting a minimum of 20% of City owned ponds (>450). Erosion and sediment control compliance and stormwater infrastructure are tracked through construction stormwater inspections. Inspection reports (see example below) are distributed to the entity performing the land disturbing activity and corrective actions are coordinated by City staff.

In 2018, the following corrective actions took place due to site noncompliance:

- Building inspections were withheld on 38 lots; and
- 1 Stop Work Order was issued.

In addition, City staff reviewed over 500 SWPP Verification Forms to ensure single family home builders had qualified staff to implement erosion best management practices.

Practices

- ◆ Stormwater management
- ◆ Erosion and sediment control
- ◆ Environmental compliance

Benefits

- ◆ Suspended solid concentration reduction
- ◆ Nutrient loading reduction

Partner

- ◆ Minnesota Pollution Control Agency (MPCA)

Timeline

- ◆ Erosion control inspections-year round
- ◆ Outfall inspections- fall

Number of erosion control inspections
279

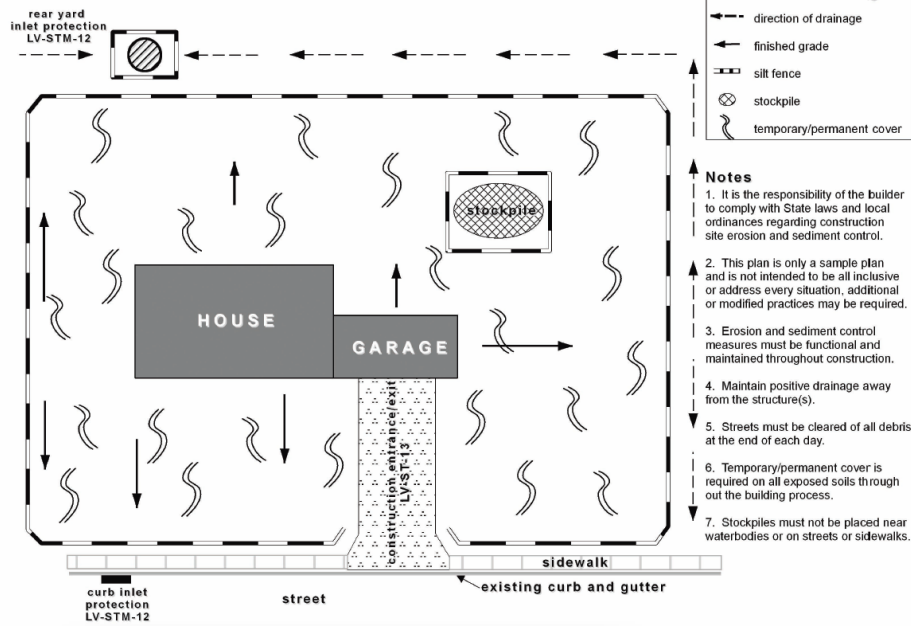
A new MPCA construction permit was issued on August 1

Number of outfall inspections
199

City of Lakeville Construction Stormwater Inspection Report		
Inspection ID# 111355	SubDivision: EXAMPLE	
Permittee		
Address:		
Inspector: Other		
Date: 5/23/2017	Next Inspection: 5/29/2017	
Type: Spot-check		
Last Rain: 5/20/2017, 0.75in		
SWPPP onsite?	NO	Must be available upon City request.
SWPPP followed?	NO	Staff could not find builder's SWPPP.
Site is Compliant?	NO	See photos. Multiple non-compliant issues
Erosion and Sediment Control	Compliant*	Notes
1. Rock Construction Entrance? (24 hours)	NO	Install 3-inch rock to entrance; 75-ft in length.
2. Streets are clean? (Immediate)	NO	Sweep streets within 24 hrs of trackout.
3. Perimeter control where appropriate? (24 hours)	NO	Add silt fence. Biologs ineffective. See photo.
4. Inlet protection in streets? (24 hours)	YES	Clean out when 1/2 full.
5. Soil stabilization where appropriate?	NO	Mulch site temporary stabilization required.
6. 90% Cover?	NO	
7. Ditches stabilized?	NI	
8. Inlet protection in rear lot(s)? (24 hours)	NO	Maintain drainage swale and install protection.
9. Stock piles contained(immediate)/stabilized? (7-14 days)	NI	
10. Pond slopes stabilized? (24 hours)	NO	Use correct seed mix & install erosion blanket.
11. Infiltration basins protected to avoid compaction? (24 hours)	NI	
12. Pipe outlets have energy dissipation? (24 hours)	NO	Install riprap at storm pipe outlets.
13. Dewatering buffer clean? (Immediate)	NI	
14. 50ft natural buffer or redundant silt fence near all surface waters? (24 hours)	NI	
15. Dust Control?	NI	
Other		
1. Pollutants protected from rain? (Immediate)	NO	
2. Hazardous materials access restricted onsite?	NI	Contain hazardous materials.
3. Fueling onsite in a contained area? (Immediate)	NI	
4. Solid wastes being properly disposed of?	YES	No blowing trash allowed. Use dumpsters.
5. Concrete washout contained?	NO	Need washout area with impermeable liner.
6. Concrete washout area marked with a sign?	NO	Add designated signage for concrete washout.
7. Receiving waters free of discharge from site? (Removal within 7 days)	NO	Dewatering discharge must be clear.



Individual Lot Erosion and Sediment Control



(Left) An example erosion control plan. Those disturbing over 1 acre are required to obtain a NPDES permit; those who disturb <1 acre must submit a plan similar to the one on the left.



(Above) Concrete washout is toxic to plants, aquatic organisms and contaminates groundwater.



(Left) Silt fence that is not maintained (cleaned once half full) becomes bypassed during heavy rains, which results in sediment deposition on neighboring lots.

(Right) All contractors must have functional rock construction entrances to limit sediment track out.



(Left) Secondary containment is required for bathroom facilities—without containment, hazardous waste can enter stormwater infrastructure.