Black Dog Watershed Management Organization

2020 WATERSHED ANNUAL REPORT

Published April 2021

Our mission is . . .

To provide leadership in the management and stewardship of the water resources in northwestern Dakota County, Minnesota, through the cooperation of four cities and the involvement of local stakeholders.

Evaluating our Success

The BDWMO watershed management plan calls for the organization and its member cities to identify outcome-based goals for specific water bodies found within the watershed, and to meet annually to discuss progress toward these goals. The BDWMO uses the following tools to track progress toward goals:

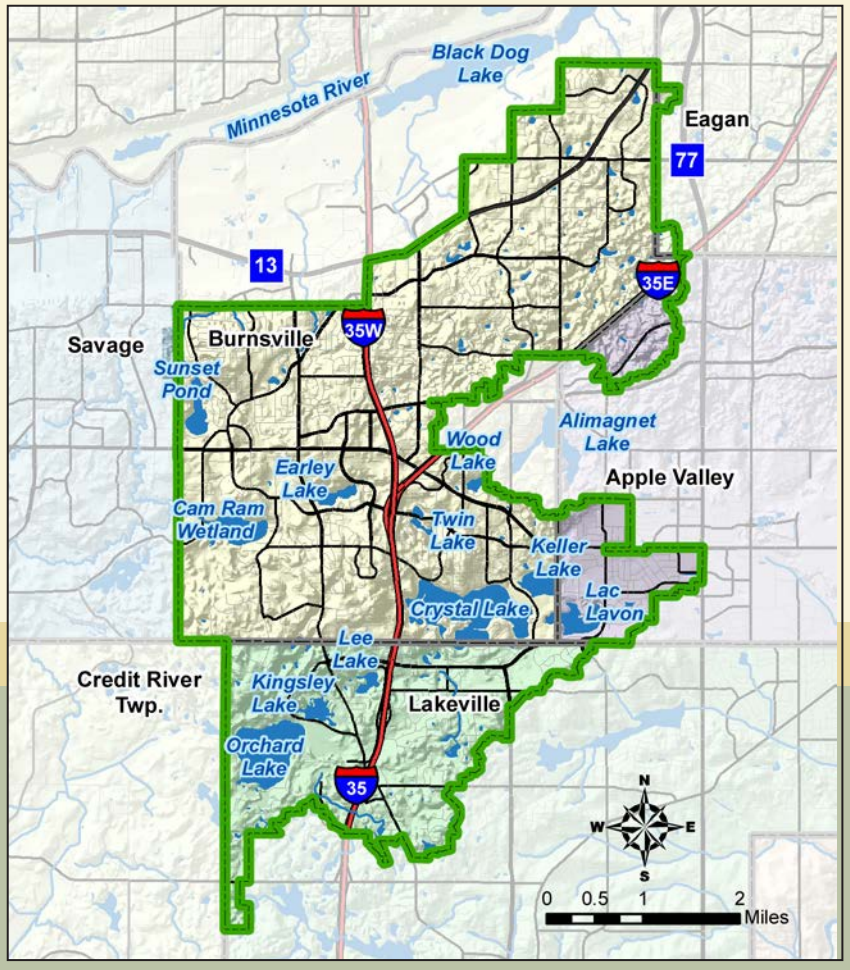
- **Trend Analysis**—The BDWMO collects water quality information to track water quality trends.
- **Performance Analysis**—The BDWMO will evaluate the member cities' implementation of maintenance plans, captial improvement projects, programs, and other items.
- **Habitat Quality Analysis**—The BDWMO collects habitat quality data to detect conditions that would trigger a need for management actions.

This annual report outlines the BDWMO's goals, progress toward those goals in 2020, and plans for 2021 and beyond.

What is the Black Dog Watershed Management Organization?

The Black Dog Watershed Management Organization (BDWMO) actively manages surface water, such as that found in lakes, streams, and wetlands, located in the Black Dog and Credit River watersheds within Dakota County. To effectively manage surface water, the BDWMO develops and implements plans that address water quality, responds to drainage issues that cross multiple municipal boundaries, and assists cities within the watershed to manage surface water runoff. The BDWMO is represented by commissioners who are appointed by the cities within the watershed, which include Burnsville, Lakeville, Apple Valley, and Eagan.

The total area of the Black Dog watershed is 17,500 acres; 70 percent of the watershed lies within the city of Burnsville, 21 percent of the area is within the city of Lakeville, 8 percent is within the city of Apple Valley, and 1 percent is within the city of Eagan.



In this Issue

Watershed Management Plan Update

The BDWMO is in the process of updating its Watershed Management Plan. The Plan will establish the goals, policies, and activities for managing and protecting the lakes, ponds, creeks, streams, wetlands, drainages, and groundwater in the BDWMO from 2022 through 2032.

State law and rules govern the watershed planning process and require that watershed management plans be updated every 10 years. The BDWMO adopted its current Plan in 2012 and anticipates completing the updated Plan in 2022. To promote a transparent and inclusive plan development process, the BDWMO is collecting input from cities and other local stakeholders in developing the 2022 Plan. Representatives from the member cities and state, regional, and county agencies have been asked to participate in a technical advisory committee (TAC). The TAC will meet periodically during the project to discuss issues, priorities, and implementation activities.

In 2020, the BDWMO began the preliminary planning process and will continue with the numerous tasks required throughout 2021 and into 2022. The planning process is divided into three phases and includes the following tasks:

Phase I — Stakeholder Engagement

- Notifying Plan review authorities and summarizing responses
- Interviewing BDWMO city and partner staff
- Developing a stakeholder engagement plan for BWSR review and approval
- Providing updates for the BDWMO website
- Hosting an online survey
- Establishing and meeting with a Technical Advisory Committee
- Initial planning (public kickoff) meeting
- Hosting a Commissioner issue identification workshop
- Attending partner and community events (as public health guidance permits)

Phase II — Plan Development

- Updating the Land and Water Resources Inventory
- Defining issues and measurable goals
- Revising BDWMO policies
- Creating a targeted implementation program
- Compiling the complete draft Plan

Phase III — Plan Review, Approval and Adoption

- Completing formal 60-day review and responding to comments
- Distributing responses to comments and hosting public hearing
- Obtaining Plan approval by BWSR
- Adopting and distributing the final Plan

The BDWMO's current plan was approved by the Minnesota Board of Water and Soil Resources (BWSR) on September 26, 2012 and adopted by the BDWMO Board of Commissioners on October 17, 2012.

The 2012 Plan includes a summary of the BDWMO's history, inventory of water and other natural resources, discussion of issues facing the BDWMO, goals and policies defining the organization's and member cities' responsibilities, and an implementation plan outlining the BDWMO's activities over the next 10 years. An important aspect of the project was the incorporation of total maximum daily load (TMDL) studies into the implementation plan.

The 2012 Plan strengthened existing policies, but also addressed emerging and evolving topics, including cost allocation for internal load reduction projects. Based on new policies included in the 2012 Plan, the BDWMO began annual contributions to a Project Reserve Fund. This fund has served as a savings account for internal load reduction projects stemming from TMDLs. The establishment of this fund has allowed for a significant head start in financing internal load reduction projects.

The 2012 Plan is publicly available from the BDWMO's website at: www.blackdogwmo.org/pdfs/2012_Watershed_Mgmt_Plan.pdf

Landscaping for Clean Water—Clean Water Starts at Home

Since most land is privately owned, it is up to each individual landowner to do the right thing on their property to help keep water clean. The Landscaping for Clean Water program makes it easy for residents to turn their yards into a lush and lovely force for clean water rather than a contributor to water pollution.

Are you doing everything possible on your patch of lawn? Attend a Landscaping for Clean Water workshop to find out. Participants in the program attend design workshops to develop landscape plans for their own yards. These plans include creating native gardens, raingardens, or native shorelines that stabilize soil. These planting practices provide habitat for pollinators and birds, reduce watering and require no chemical inputs. On top of that, these practices help water soak into the ground rather than running off and delivering polluted stormwater into lakes, rivers and wetlands.

Who can get a grant?

Participants in the workshops can submit an application, project plan, and cost estimates to the Dakota County SWCD for grant funds of up to $250.

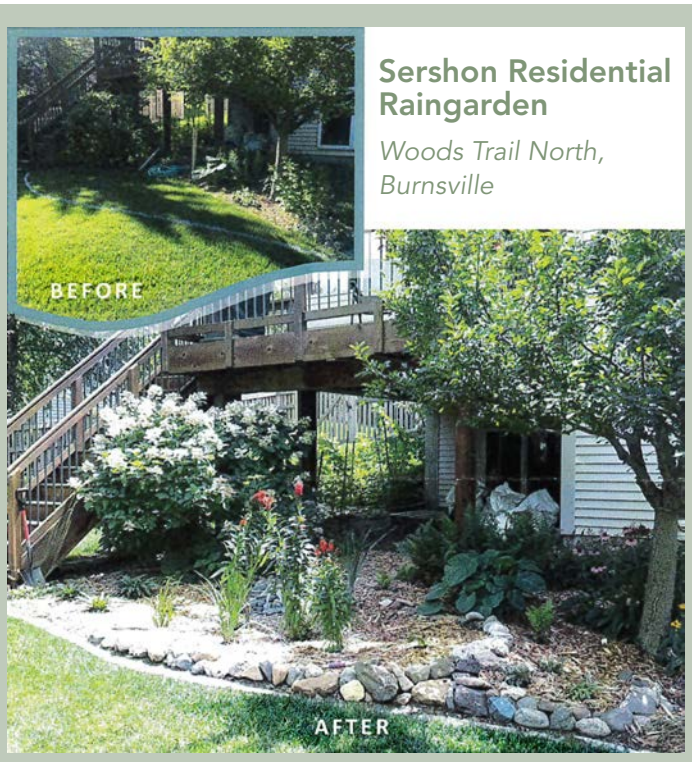
The Landscaping for Clean Water program moved online in the spring of 2020 in response to the Covid-19 pandemic. All three programs—Introduction to Clean Water Class, Design Course, and Maintenance Workshop —became available to participants beginning in mid-April. Over 600 people participated in the Introduction to Clean Water class, either in-person or online.

Three Introduction Classes were held in-person before the shutdown; one hosted by the BDWMO. 31 people attended the class hosted by the BDWMO, 26 of whom reside in Burnsville. 6 Burnsville residents attended the other two presentations.

In 2020, the BDWMO provided funding for 9 construction funding grants (2 native gardens, 1 shoreline restoration, and 6 raingardens) through the Landscaping for Clean Water program. In 2021, the BDWMO will provide 18 grants to residents interested in refreshing their landscaping with plants that support both pollinators and local water quality. Homeowners must attend workshops to apply for grants.

2020 Project Examples

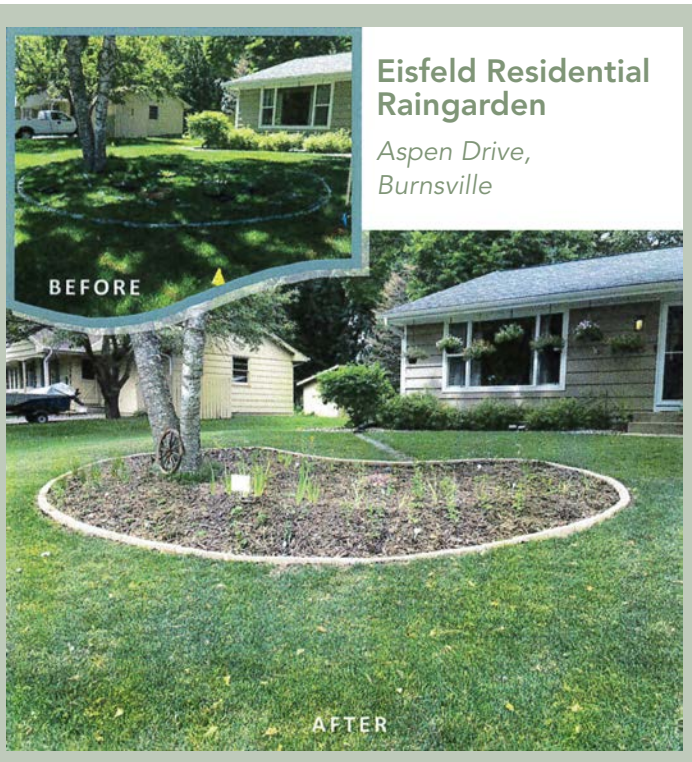
Benefits include: runoff volume reduction, improved water quality, improved wildlife habitat, opportunity for public education and outreach, and improved aesthetics.



Sershon Residential Raingarden

Woods Trail North, Burnsville

PROJECT: Installation of a 104 square foot raingarden. Project materials cost estimated at $497. Landowners received a $250 Landscaping for Clean Water grant as well as technical assistance provided by the Dakota County SWCD.



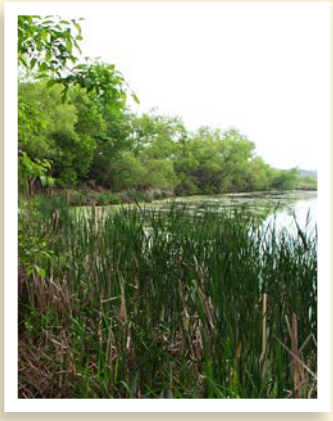
Eisfeld Residential Raingarden

Aspen Drive, Burnsville

PROJECT: Installation of a 210 square foot raingarden. Project materials cost estimated at $996. Landowners received a $250 Landscaping for Clean Water grant as well as technical assistance provided by the Dakota County SWCD.

Landscaping for Clean Water is one type of cost-sharing program offered by the Dakota County SWCD. For more information, call 651-480-7777 or go to https://dakotaswcd.org/services/landscaping-for-clean-water/.

Observing Orchard Lake



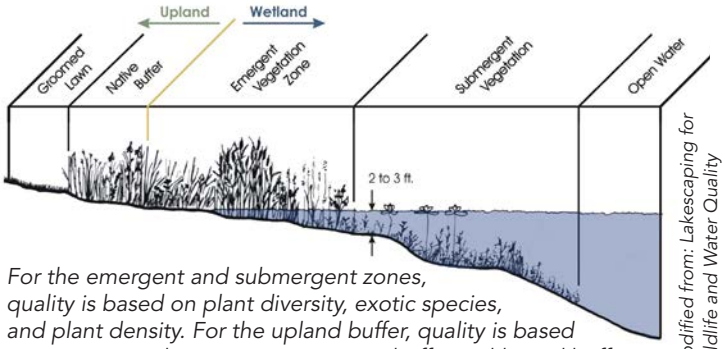
The BDWMO is pleased to report that Orchard Lake continues to have good water quality. The summer-average Secchi disc transparency (a measure of water clarity) in 2020 was 2.1 meters (6.9 feet), which is better than the MPCA deep-lake water quality standard of 1.4 meters. Concentrations of chlorophyll-*a* (a measure of algal abundance) and total phosphorus (the nutrient that drives algal growth) were also monitored in Orchard Lake. The summer-average concentrations of chlorophyll-*a* (5.2 µg/L) and total phosphorus (24 µg/L) were both better than the MPCA deep-lake water quality standards of 14 µg/L and 40 µg/L, respectively. There was a statistically significant trend of degrading water quality for the most recent 10-year period (2011-2020), as indicated by summer averages of Secchi disc transparency. However, summer averages of total phosphorus and chlorophyll-*a* do not show a statistically significant trend for the same period. The lake's water clarity is primarily influenced by changes in the amount of algae in the lake, but suspended sediments, and dissolved organic compounds from the decomposition of plants in the watershed may also contribute to reduced water clarity. Changes in the amount of annual precipitation can result in changes in the concentrations of sediments and dissolved organic compounds in the lake, as well as concentrations of phosphorus that spur algae growth.

Aquatic plant surveys were conducted in Orchard Lake in 2020, and two invasive, non-native aquatic plant species were identified—curly-leaf pondweed and Eurasian watermilfoil. Both plants can form dense nuisance growth in Minnesota lakes. Curly-leaf pondweed dies off in mid-summer, earlier than native plants, releasing nutrients that can contribute to summer algae blooms. An herbicide treatment was conducted in select areas of the lake in spring 2020 to reduce the growth of curly-leaf pondweed where spring surveys showed potential for heavy growth. Orchard Lake is also monitored for the non-native zebra mussel. No zebra mussels have been found in Orchard Lake to date, but zebra mussels continue to spread to Minnesota lakes, and zebra mussels have been identified in nearby Lake Marion. Invasive, non-native aquatic plants and animals can be spread to other lakes by transport of seeds and/or plant fragments. Zebra mussels can also be attached to plant fragments, and their microscopic larvae can be transported in live wells, wakeboard boat ballast tanks, or other watercraft areas that retain lake water. In order to prevent the spread of invasive plants and animals, lake users should take care in removing all plant fragments from boats and trailers; and remove boat plugs and thoroughly drain all water from live wells when leaving the lake.

The BDWMO will continue to monitor the water quality of Orchard Lake in 2021. Habitat monitoring is scheduled again for Orchard Lake in 2022.

Habitat Monitoring Program

Since 2003, the BDWMO has implemented a program for monitoring the wildlife and fish habitat quality of strategic water resources in the watershed, including biological and physical indicators, such as upland and aquatic vegetation, buffer zones, erosion, sedimentation, and the presence of non-native exotic species. The program also recommends management actions based upon monitoring results.



For the emergent and submergent zones, quality is based on plant diversity, exotic species, and plant density. For the upland buffer, quality is based on vegetation density, exotic species, buffer width, and buffer continuity.

Modified from: Lakescaping for Wildlife and Water Quality

In 2020, the BDWMO monitored the habitat quality of Keller Lake. Monitoring included transect, plot, and meandering surveys. Photographs were taken to document conditions. Analysis and reporting of the monitoring data includes a floristic quality assessment and a four-tiered rating system (poor, moderate, high, and excellent). Private versus public ownership was identified along the entire shoreline. The survey results, along with parcel data, were used to identify possible locations for restoration and preservation.

Also in 2020, the University of Minnesota conducted a seedbank assessment, which germinated nine aquatic plant species, eight of which are native species, from sediment cores within Keller Lake. In addition, a reintroduction program began in 2020, which included transplanting four species of native aquatic plants harvested from a nearby lake. The plants were transplanted into ten fenced plots and monitored from June-October 2020.

See page 7 for additional Keller Lake habitat monitoring results. See www.blackdogwmo.org for the full report.

The member cities have provided lakeshore owners with shoreline restoration information since 2004 and continually promote and encourage lakeshore property owners each year to take advantage of the Dakota County SWCD Landscaping for Clean Water shoreline restoration program. (See page 3 for more about this program.)

Water Quality Monitoring Program

The BDWMO and member cities continued to monitor several of its lakes during 2020 through the Metropolitan Council's Citizen-Assisted Monitoring Program (CAMP) to detect any water quality changes that would require management action by the WMO. In addition, the BDWMO conducted more detailed monitoring on Orchard Lake (see page 4). The monitoring focused on three water quality indicators—total phosphorus and chlorophyll-*a* concentrations, plus Secchi disc transparency. All three variables correlate strongly to the open-water nuisance conditions of lakes (i.e., algal blooms).

Long-term monitoring is important because lakes can change from year to year. Only when several years of data are compiled do trends become apparent. Because the MPCA periodically evaluates water quality data from the most recent ten-year period to determine if a lake violates applicable water quality standards, the WMO has adopted the same time convention for conducting its annual trend analyses. Graphs on this page and subsequent pages show historic trends in water quality.

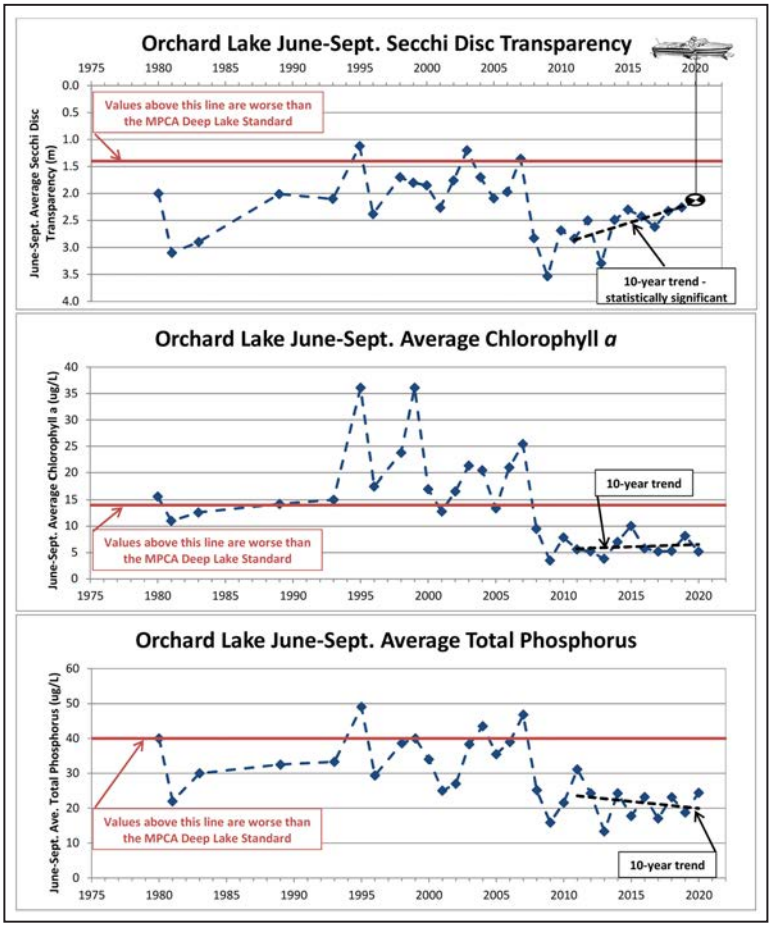
Orchard Lake (Lakeville)

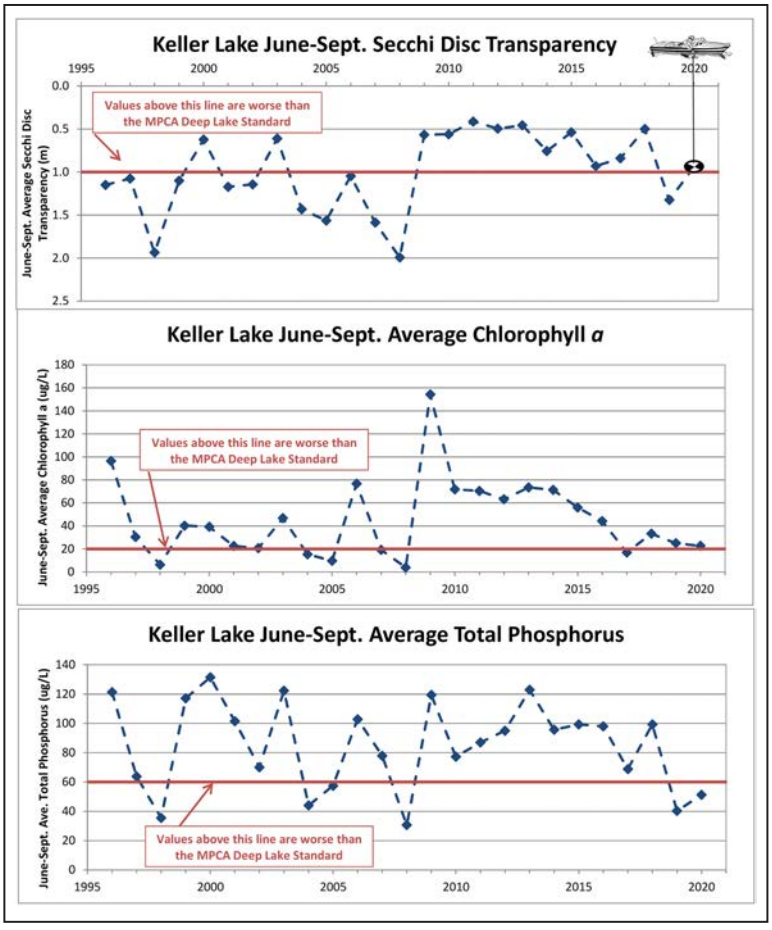
Water Quality Monitoring—In 2020, the BDWMO performed more detailed management level monitoring on the lake (see story on page 4). Habitat monitoring is scheduled for the lake in 2022.

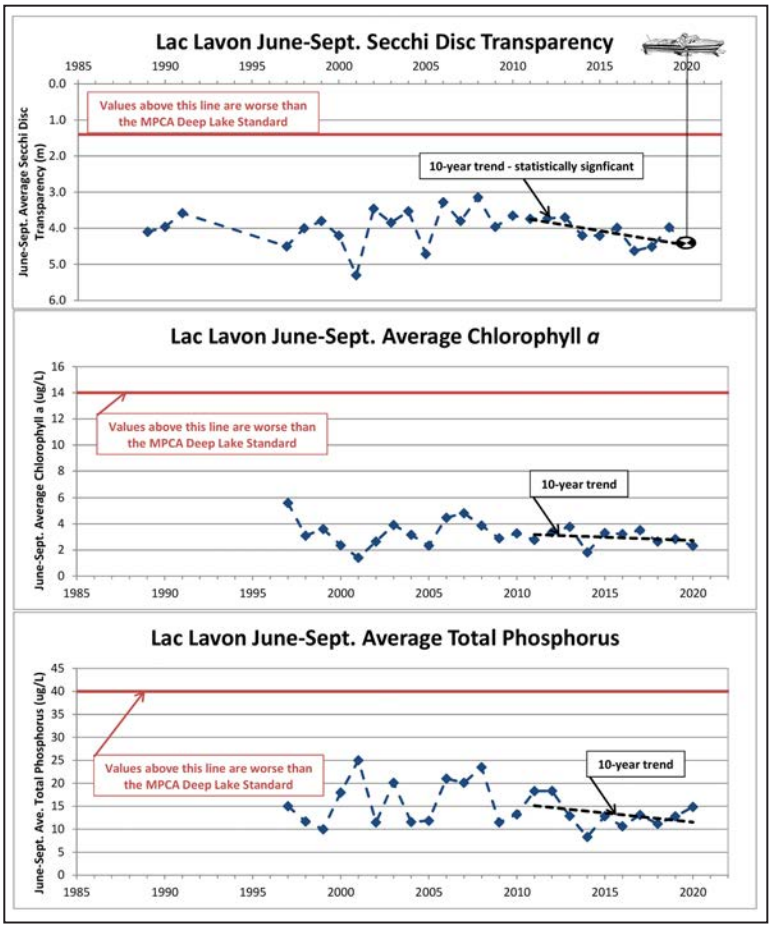
Keller Lake (Burnsville & Apple Valley)

Water Quality Monitoring—An alum and sodium aluminate treatment was conducted on Keller Lake in Spring 2019, resulting in improved water quality in 2019 and 2020 compared to the previous decade. A phase II alum treatment is planned for the fall of 2021. The 2020 Secchi disc transparency summer average was 0.9 meters (3.0 feet), which is worse than it was in 2019, and is slightly worse than the MPCA's shallow lake standard of 1.0 meter (3.3 feet). The summer-average total phosphorus (51 µg/L) was worse than it was in 2019, but was better than the MPCA's shallow lake standard of 60 µg/L. Summer averages of total phosphorus had been consistently worse than the MPCA standard every year for the period 2009-2018. The 2020 summer-average of chlorophyll-*a* (23 µg/L) was slightly better than it was in 2019, but is worse than the MPCA's shallow lake standard of 20 µg/L.

Trend analyses were not completed for Keller Lake because of the alum treatment that was conducted in Spring 2019. The three-lake TMDL study and implementation plan identifies the water quality improvement measures needed to achieve the BDWMO and MPCA goals for the lake. The BDWMO will continue to monitor the water quality of Keller Lake in 2021. Habitat monitoring was performed in 2020 (see page 7 for results).

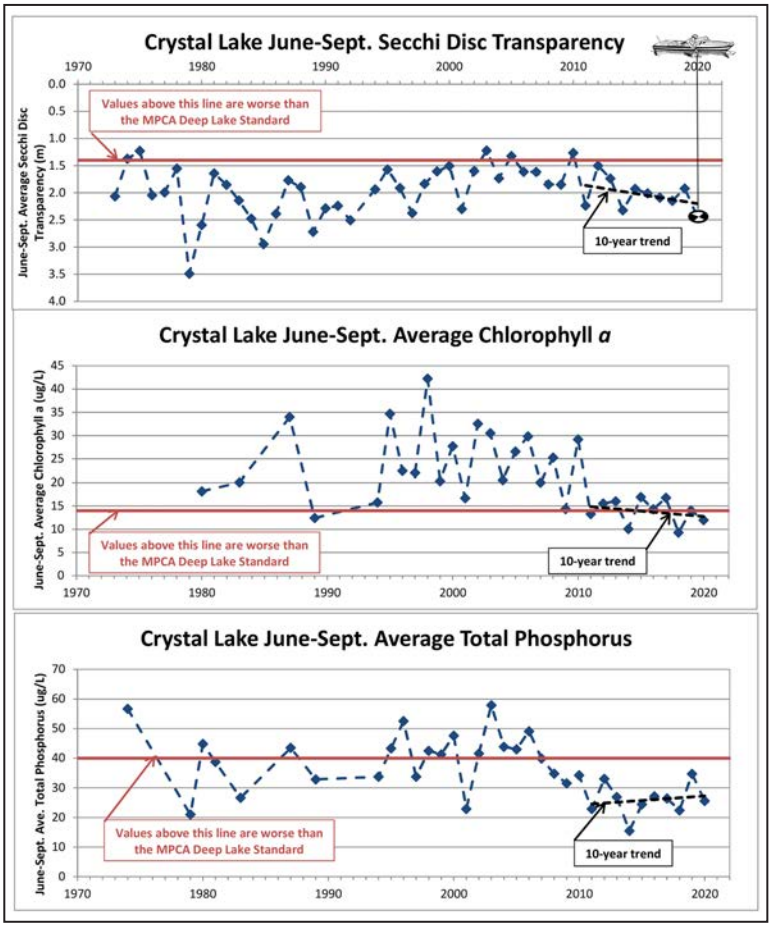






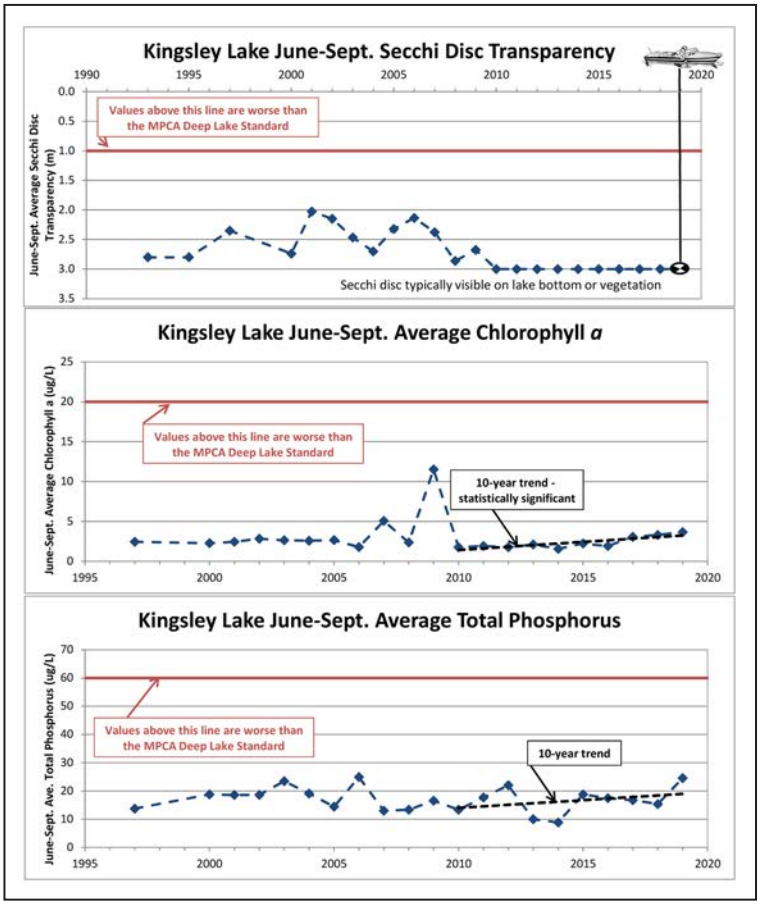
Lac Lavon (Apple Valley & Burnsville)

Water Quality Monitoring—Lac Lavon continued to experience excellent water quality in 2020. The 2020 summer-average Secchi disc transparency was 4.4 meters (14 feet), and is much better than the MPCA deep-lake water quality standard of 1.4 meters. The 2020 summer averages of total phosphorus (15 µg/L) and chlorophyll-*a* (2.3 µg/L) further indicate excellent water quality for Lac Lavon. Summer averages of Secchi disc transparency show a statistically significant improving trend for the most recent 10-year period of 2011-2020. There was no significant trend in summer averages of total phosphorus or chlorophyll-*a* for the same period. The BDWMO will continue to monitor the water quality of Lac Lavon in 2021. Habitat monitoring was performed in 2019 and is scheduled again in 2024.



Crystal Lake (Burnsville & Lakeville)

Water Quality Monitoring—The 2020 summer-average Secchi disc transparency was 2.4 meters (7.9 feet), which is better than other recent summer averages, and better than the MPCA deep-lake water quality standard of 1.4 meters. The last time the Secchi measurement was 2.4 meters or better was 1997. The 2020 summer average of total phosphorus (26 µg/L) was better than the 2019 summer average, and is better than the MPCA's deep lake standard (40 µg/L). The summer-average chlorophyll-*a* (12 µg/L) was better than the 2019 summer average, and is better than the MPCA's deep lake standard (14 µg/L). The BDWMO will continue to monitor the water quality of Crystal Lake in 2021, including management level monitoring that is conducted every 3 years. The next Crystal Lake habitat monitoring is scheduled for 2023.



2019 water quality monitoring data

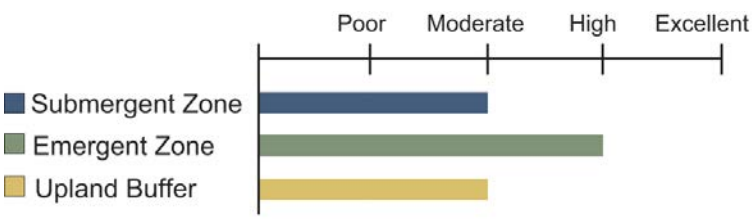
Kingsley Lake (Lakeville)

Water Quality Monitoring—Kingsley Lake was not monitored in 2020, but water quality monitoring data from 2019 (see above) show continued excellent water quality in Kingsley Lake. The lake is often clear enough that the Secchi disc used to measure transparency can still be seen when resting on the bottom of the lake.* The 2019 summer averages of total phosphorus (25 µg/L) was the highest it's been since 2006, but still considerably better than the MPCA shallow lake standard (60 µg/L). The 2019 summer average chlorophyll-*a* (3.7 µg/L) was similar to years 2015-2018, and is considerably better than the MPCA's shallow lake standard (20 µg/L). The BDWMO will continue to monitor the water quality of Kingsley Lake in 2021. Habitat monitoring is also scheduled for the lake in 2021.

** Secchi disc readings in Kingsley Lake are difficult because lake vegetation obscures the Secchi disc, giving false measurements; therefore, there is no trend line in the graph above.*

Keller Lake Habitat Monitoring Results for 2020

As mentioned in the article on page 4, Keller Lake habitat monitoring was conducted in 2020. The BDWMO made the following quality ratings, based on the monitoring results:



Submergent zone quality rating = Moderate

Rating based on averaging four criteria:

1. low total number of native species (2)
2. excellent average native plant density (1.2)
3. moderate rating for average exotic species density (1.8)
4. poor coefficient of conservatism value (mean C-value) (1.5)

Curly-leaf pondweed, a dominant species found every year in Keller Lake, was present at 43 percent of sample points in April. In July, (after treatment) no plants were observed. This die-off creates a sudden loss of habitat and releases nutrients into the water that can produce algal blooms and create turbid water conditions. A curly-leaf pondweed turion survey was conducted in mid-October, indicating the potential for continued growth of this species and the need for its long term control. Eurasian watermilfoil was also found in Keller Lake in 2020 and in previous years. It has fast growing stems that will branch out and cover the water surface—impeding boating, complicating water recreation, and shading out slower-growing native plants.

The BDWMO recommends continued monitoring, control, and management of invasive species and continued efforts to increase native aquatic plant diversity.

Emergent vegetation zone quality rating = High

Rating based on averaging four criteria:

1. excellent number of native wetland plant species (36)
2. high rating for % coverage of exotic species (26-50%)
3. a poor mean C-value rating (2.4)
4. high rating for total vegetative cover (51-75%)

Narrowleaf and hybrid cattail are dominant non-native invasive species found in the vegetated emergent zone. Purple loosestrife, another non-native invasive plant species, is present in shallow open water and along the shoreline and has been managed for years through the release of beetles, which eat the plants. A floodplain forest wetland community is present along the southern shoreline of Keller Lake.

The BDWMO recommends continued control and management of purple loosestrife.

Upland buffer zone quality rating = Moderate

- 42 native species and 29 exotic species observed
- Exotic plant species > 40% of upland vegetative cover. The mean C-value rating is 1.8 (poor).
- Upland buffer within portions of the publicly owned shoreline is wide, providing wildlife habitat and shoreline protection.
- The majority of residential properties have a narrow width of naturalized vegetation along the shoreline, which helps provide some water quality protection and erosion prevention, but the buffer width is too narrow to provide significant wildlife habitat protection. The majority of the residential shoreline properties on Keller Lake have the potential to provide a 50-foot naturalized buffer without altering any structures. One residential property has a naturalized buffer width adequate for wildlife protection (≥100 feet).
- Lakeshore property owners are encouraged to apply for funds (see page 3) to assist with implementation of the BDWMO recommendations.

Black Dog Watershed Management Organization

Board of Commissioners

Representing Burnsville:

Curtis Enestvedt, Chair
(serving since 2014)
Mike Hughes, Vice Chair
(serving since 2008)
Tom Harmening, Commissioner
(serving since 2002)
Frank Boyce, Alternate
(serving since 2021)

Representing Apple Valley and Eagan:

Rollie Greeno, Commissioner
(serving since 2018)
Greg Helms, Alternate
(serving since 2011)

Representing Lakeville:

Scott Thureen, Secretary/Treasurer
(serving since 2008)
Natalie Walker, Alternate
(serving since 2020)

Engineering Consultant:

Karen Chandler, P.E., Barr Engineering Co.

Legal Consultant:

Joel Jamnik, Campbell Knutson, P.A.

Regular board meetings...

are held at 5:00 p.m. on the third Wednesday of the month at the Burnsville Maintenance Facility at 13713 Frontier Court.

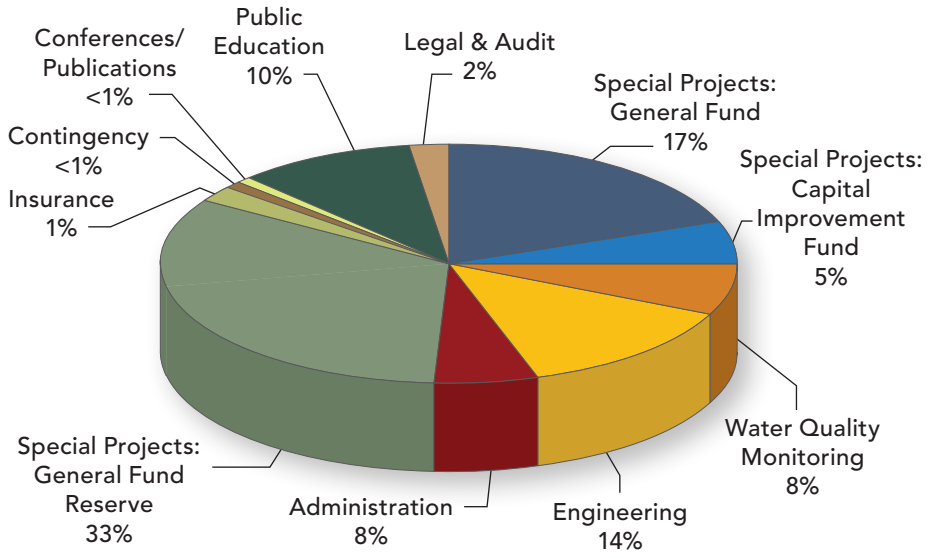
For more information, please contact:

Daryl Jacobson, Administrator
Black Dog WMO
City of Burnsville
13713 Frontier Court
Burnsville, MN 55337
Telephone: 952-895-4574
Fax: 952-895-4531

Website: www.blackdogwmo.org

2021 Budget

Engineering	$31,000
Legal and Audit	$5,000
Administrative Services	$18,000
Public Education	$22,100
Insurance	$3,000
Special Projects – General Fund	$36,800
Special Projects – Capital Improvement Fund	$10,000
Special Projects – General Fund Reserve	$70,000
Conference/Publications	$500
Water Quality Monitoring	$17,100
Contingency	$1,000
Total Expenditures	**$214,500**



2021 Income

Member Contributions	$153,000
Interest	$40
Total Income	**$153,040**