BLACK DOG
Watershed Management Organization

2022 WATERSHED ANNUAL REPORT

Published April 2023

Our Vision:

To manage water resources and related ecosystems to sustain their long-term health and public value to contribute to the well-being of the communities within the watershed.

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:

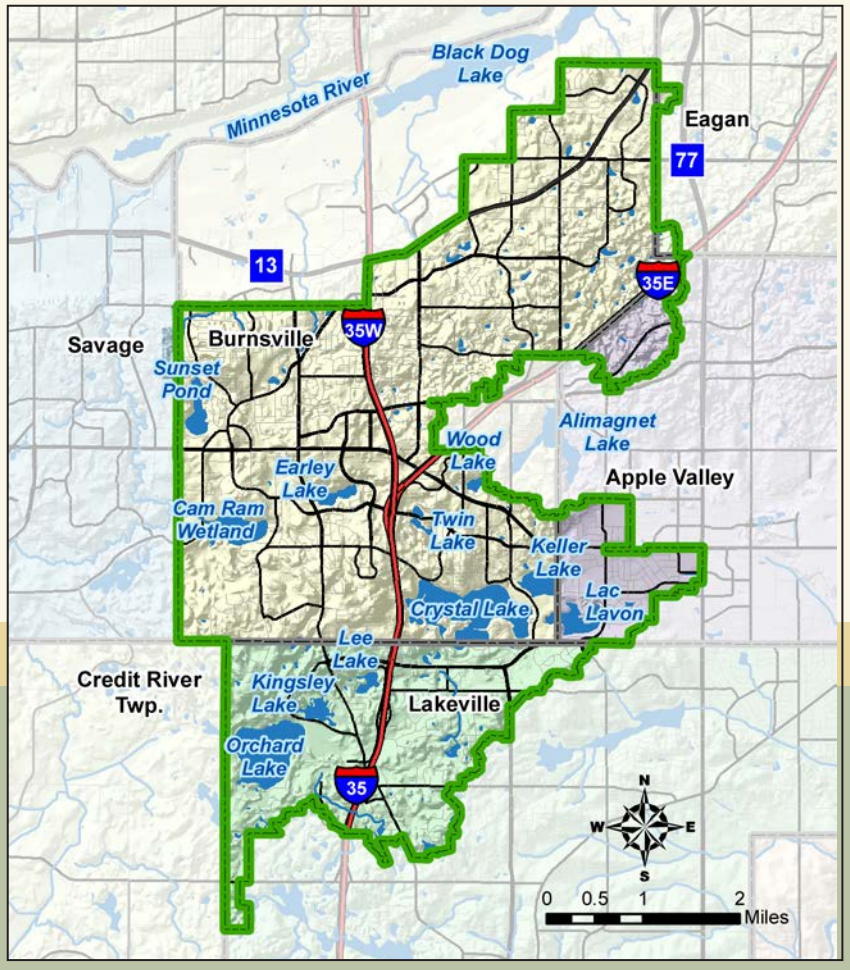
- **Trend Analysis**—The BDWMO collects water quality information to track water quality trends.
- **Performance Analysis**—The BDWMO will evaluate the member cities' implementation of maintenance plans, capital improvement projects, programs, and other items.
- **Habitat Quality Analysis**—The BDWMO 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 2022, and plans for 2023 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

BDWMO Approves and Adopts Updated Watershed Management Plan

At the end of 2022, the BDWMO completed the lengthy process of updating its Watershed Management Plan—a plan that establishes the vision, policies, and activities for protecting, restoring, and managing the surface water resources within the boundaries of the BDWMO for the next decade (2022–2032).

The plan provides resource data and background information, identifies and prioritizes watershed-wide and resource-specific issues, establishes measurable goals, sets policies and performance standards for the BDWMO and its cities, and lays out a 10-year implementation schedule including projects and programs.

Land and Water Resources Inventory

The plan includes a land and water resources inventory, covering climate and precipitation; topography and drainage; population, demographics, and land use; soils; geology; groundwater; surface water resources (lakes, ponds, and wetlands); water monitoring and studies; water quality and BDWMO management classifications; water quantity and flooding; natural communities and rare species; fish and wildlife habitat; open space and recreational areas; and pollutant sources.

Priority Issues and Resources

Understanding the condition of water and natural resources present in the BDWMO is key to identifying priority issues, establishing goals, and targeting the actions of the BDWMO, its member cities, and other partners. As part of the plan development, the BDWMO commissioners solicited input on priority issues and concerns from residents, state agencies, member cities, and regional partners through multiple stakeholder engagement activities, including:

- Plan notification letter
- City and Partner staff interviews
- Online survey
- Technical Advisory Committee (TAC) workshop
- Public kickoff meeting (virtual)

Higher Priority Issues	Lower Priority Issues
• **Water quality**, including: - Stormwater runoff quality - In-lake water quality - Impairments (Keller Lake) • **Lake ecology and habitat**, including: - Habitat quality - Invasive species management • **Groundwater management**, including: - Pollution prevention - Conservation and sustainability • **Education and Engagement**	• **Flooding and water levels** • **Wetland management** • **Upland and natural area management**

The BDWMO also classified Crystal Lake, Keller Lake, Kingsley Lake, Lac Lavon, and Orchard Lake as strategic waterbodies to be the focus of BDWMO activities.

Goals and Policies

The plan presents the goals and policies established by the BDWMO to address the priority resources or operational issues. Where possible, BDWMO goals contain measurable targets to evaluate progress.

Key goals include:

- Maintain or improve water quality in BDWMO strategic waterbodies to meet applicable state standards or existing 10-year (2012–2021) summer average water quality, if better than state standards.
- Work with member cities to reduce chloride loading relative to current conditions through practices consistent with the Twin Cities Metropolitan Area Chloride Management Plan and Minnesota Statewide Chloride Management Plan.
- Maintain or improve the ecological and habitat quality of BDWMO strategic waterbodies to achieve applicable standards for floristic quality index (FQI ≥ 17.8) and native species diversity of submerged vegetation (at least 11 species).
- Support member city and partner actions to prevent the increase or reduce the occurrence of aquatic invasive species within BDWMO strategic waterbodies.
- Increase awareness and knowledge of residents, local officials, and city staff regarding water resources and stormwater management through actions coordinated with member cities, Dakota SWCD, and other partners.
- Increase community capacity to implement water and natural resource stewardship action through increased participation in volunteer activities; increased participation in small-scale BMP cost share projects; and providing data through accessible media.

Implementation Program

The plan also presents a 10-year implementation program, including a continuation of ongoing activities as well as new activities to address emerging issues and changing priorities. Notable new or expanded activities include:

- Expanded water chemistry monitoring of Keller Lake and Kingsley Lake
- Algal community monitoring of strategic waterbodies
- Chloride monitoring of strategic waterbodies
- Development of K-12 education outreach
- Targeted outreach to address chloride loading
- Opportunities to use watershed-based implementation funding (WBIF) to support member city projects for stormwater treatment, shoreline improvement, and aquatic plant management for strategic waterbodies.

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.

2022 Classes and Participants

In 2022, all Landscaping for Clean Water programming was held virtually. Three live virtual Introduction classes were held in the spring (March through May) and then recorded so others could participate in the classes at their leisure. A total of 58 residents of the BDWMO participated in the Introduction classes through either a live virtual class or through the recordings.

A total of 41 participants took part in the virtual Design classes which consisted of a series of pre-recorded videos. Project materials for participants were made available online and an "Office Hours" program was used to provide virtual consultations to Design class participants. A total of 15 participants took advantage of these virtual consultations with staff in 2022. Participants were thankful for the additional one-on-one design assistance.

Nine projects were installed in the BDWMO in 2022—five raingardens and four native gardens (see two below).

In 2022, two Maintenance classes were taught in the spring. Each workshop focused on garden maintenance across all seasons. Providing participants with seasonal information on how to maintain and promote the health, performance, and beauty of their garden. A total of 21 people registered for the Maintenance classes.

The 2023 Landscaping for Clean Water program will be held both in-person and virtually for the first time since 2019! For more information and to get signed up, visit https://dakotaswcd.org/services/landscaping-for-clean-water/.

Before and after: Installation of a 250 sq. ft. residential native garden

Before and after: Installation of a 250 sq. ft. residential raingarden

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/.

"School" of Goldfish

There are two new teachers in the Black Dog WMO, and they are here to remind you not to release unwanted pets into local water bodies. Two new educational goldfish mounts, "Betty" and "Bubbles" are available for use by local public entities to help educate the public on harms of exotic invasive species. Goldfish can wreak havoc in lakes and ponds—these two examples were found in Keller Lake. Their feeding behavior disrupts shallow rooted plants, muddying the water, and also releasing phosphorous bound in the sediment. Less clear water and additional phosphorous can prevent sunlight from reaching plants and can lead to additional algal blooms. Aquatic plants provide important habitat for native fish and help sustain water clarity by holding sediments in place.

The goldfish mounts were funded through an Aquatic Invasive Species grant offered by Dakota County Environmental Services as learning tools for education and outreach opportunities. Other entities or local government units can borrow the fish for educational events. Contact 952-953-2462 for more information on borrowing one of the mounts.

Lac Lavon Looking Lovely

The BDWMO is pleased to report that Lac Lavon continues to have excellent water quality. The 2022 summer-average Secchi disc transparency in Lac Lavon was 3.5 meters (11.5 feet), and considerably better than the MPCA deep-lake water quality standard of 1.4 meters. The 2022 summer average of total phosphorus (the nutrient that drives algal growth) was 13 µg/L, considerably better than the MPCA's deep lake standard (40 µg/L). The summer-average chlorophyll-*a* (a measure of algal abundance) was 3 µg/L, also considerably better than the MPCA's deep lake standard (14 µg/L).

Aquatic plant surveys were performed in June and August of 2022— the survey found twelve aquatic plant species present in Lac Lavon, nine of which are native to Minnesota. The three non-native aquatic plants identified in 2022 were curly-leaf pondweed, Eurasian watermilfoil, and brittle naiad. Eurasian watermilfoil, and the native plant coontail, were the two most abundant aquatic plants in June and August. The non-native emergent plant purple loosestrife was also identified on shorelines. Brittle naiad was first identified on Lac Lavon in 2003. As of 2022, the Minnesota Department of Natural Resources reports that only six lakes in Minnesota are known to have brittle naiad. Brittle naiad does not grow very tall, and does not appear to be growing at nuisance levels in Lac Lavon—it was not even identified in aquatic plant surveys conducted in 2019.

Non-native brittle naiad in Lac Lavon, August 10, 2022

The BDWMO will continue to monitor the water quality of Lac Lavon in 2023.

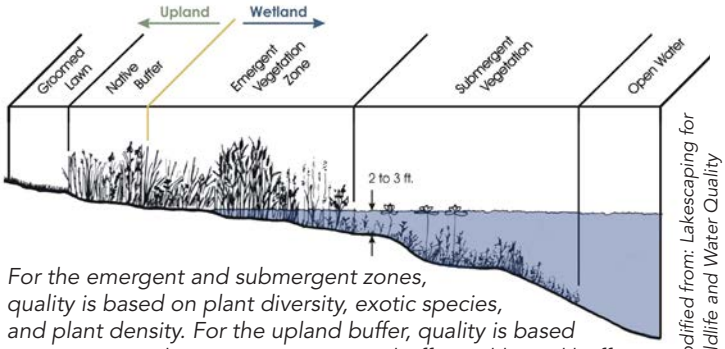
Lac Lavon Raingarden Coming in 2023

The City of Apple Valley leveraged $40,000 in local grant dollars to design and construct a raingarden at the parking lot located on the north end of Lac Lavon. Currently, stormwater runoff flows off the parking lot, down a slope, ultimately reaching Lac Lavon. The raingarden, featuring native plants, will serve as a demonstration project for the improvement of water quality within the watershed.

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.

2022 was the final year of the habitat monitoring program.



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 2022, the BDWMO monitored the habitat quality of Orchard 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.

Habitat monitoring results showed that Orchard Lake's submergent zone was rated high, but both the emergent and upland buffer zones were rated moderate. Curly-leaf pondweed and Eurasian watermilfoil are treated each year in Orchard Lake.

See page 7 for additional Orchard 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 2022 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 Lac Lavon (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.

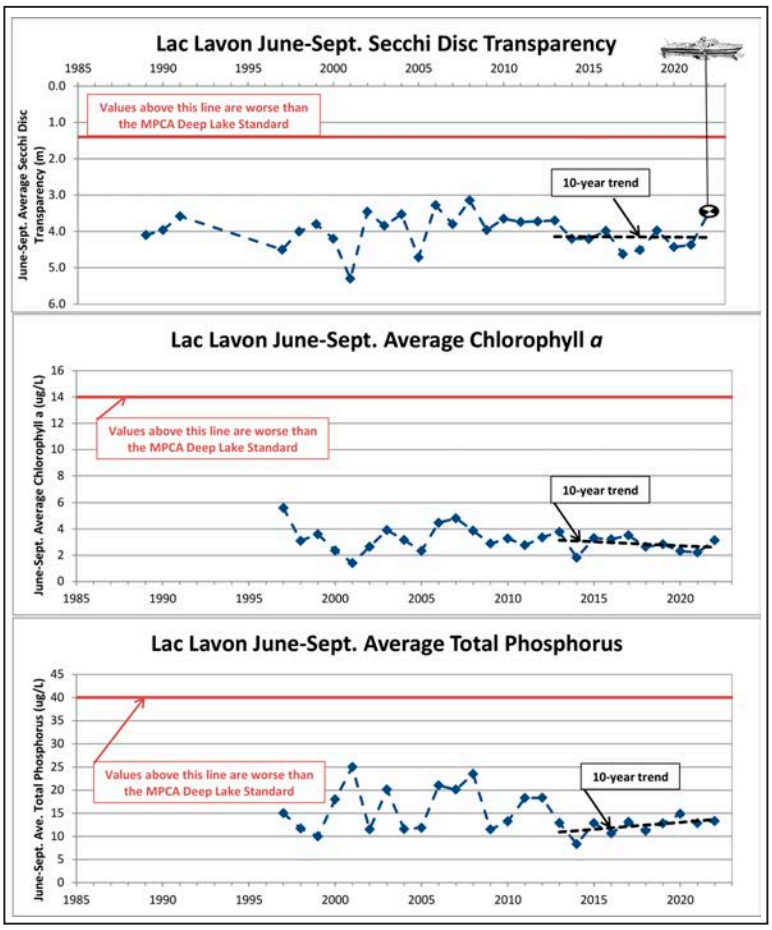
Lac Lavon (Apple Valley & Burnsville)

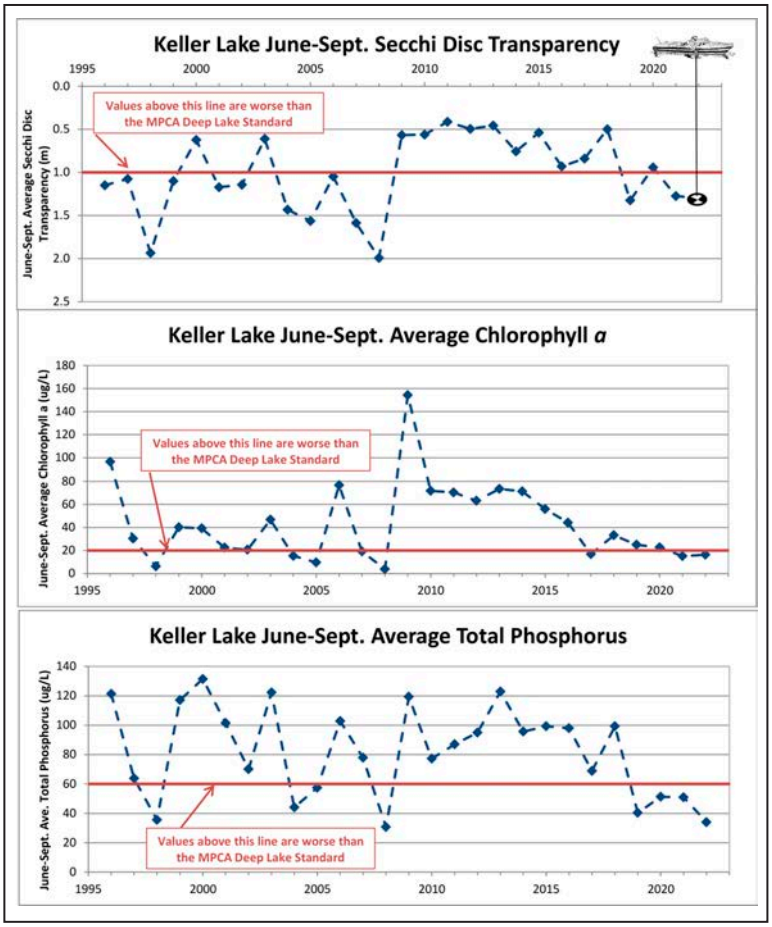
Water Quality Monitoring—In 2022, the BDWMO performed more detailed management level monitoring on the lake (see story on page 4).

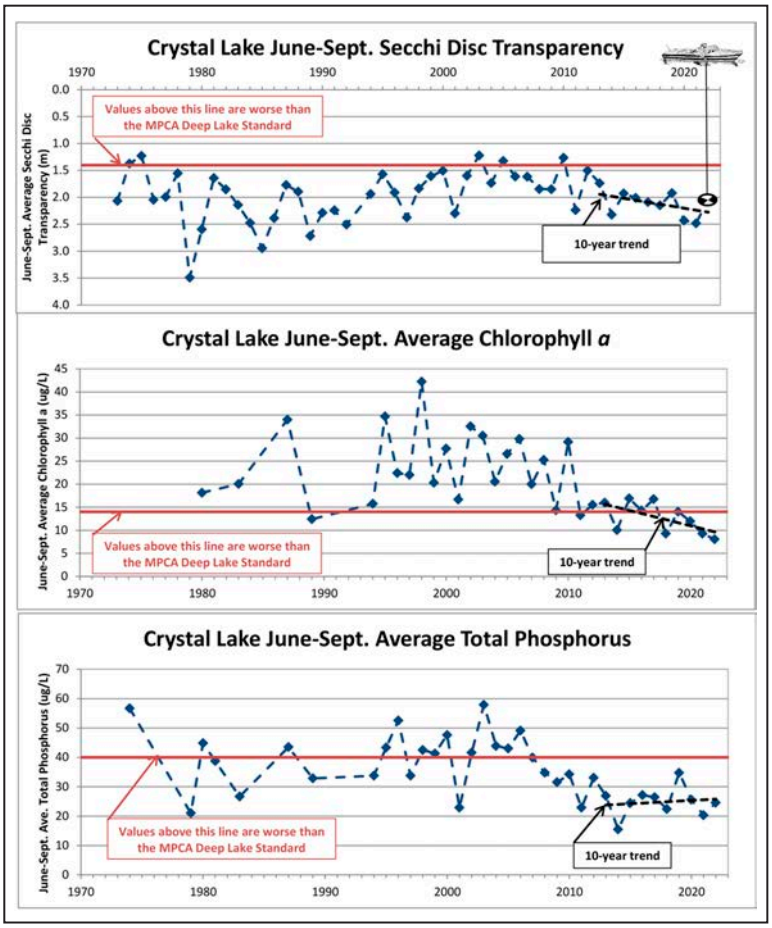
Keller Lake (Burnsville & Apple Valley)

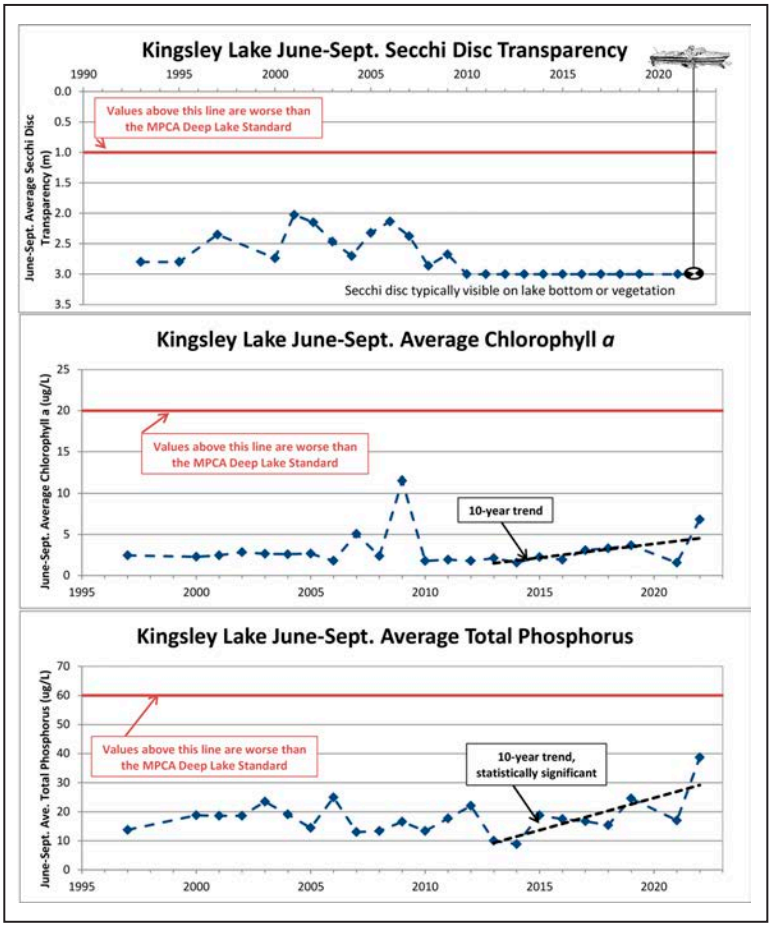
Water Quality Monitoring—An alum and sodium aluminate treatment was conducted on Keller Lake in Spring 2019 and Spring 2021, resulting in improved water quality in recent years. The 2022 Secchi disc transparency summer average was 1.3 meters (4.2 feet), which is better than the MPCA's shallow lake standard of 1.0 meter (3.3 feet). The summer-average total phosphorus (34 µg/L) was also 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, before the alum and sodium aluminate treatment of the lake. The 2022 summer-average of chlorophyll-*a* (16 µg/L) was also better than the MPCA's shallow lake standard of 20 µg/L.

Trend analyses were not completed for Keller Lake because of the alum and sodium aluminate treatments that were conducted in 2019 and 2021. 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 2023, including regularly-scheduled management level monitoring.









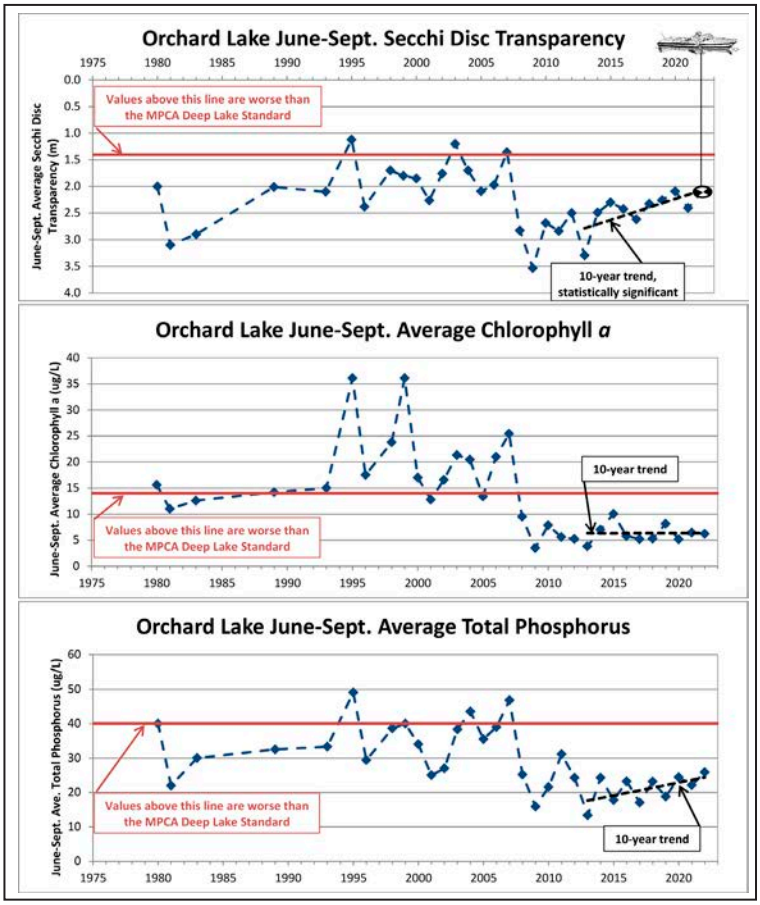
Crystal Lake (Burnsville & Lakeville)

Water Quality Monitoring—Crystal Lake continued to experience good water quality in 2022. The 2022 summer-average Secchi disc transparency was 2.0 meters (6.6 feet), which is better than the MPCA deep-lake water quality standard of 1.4 meters. The 2022 summer average of total phosphorus (25 µg/L) was better than the deep lake standard (40 µg/L). The summer average of chlorophyll-*a* (8 µg/L) was also better than the deep lake standard (14 µg/L), and was the best on record for Crystal Lake. There were no statistically significant trends in summer averages of water quality for the period 2013-2022. The BDWMO will continue to monitor the water quality of Crystal Lake in 2023.

Kingsley Lake

Kingsley Lake (Lakeville)

Water Quality Monitoring—Water quality monitoring data from 2022 show continued good water quality in Kingsley Lake. Water 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 2022 summer average of total phosphorus (39 µg/L) was the worst on record, and double the 2021 summer average, but still much better than the shallow lake standard (60 µg/L). However, there is a statistically significant trend of degrading total phosphorus concentration for the 10-year period of 2013–2022. Chlorophyll-*a* (7 µg/L) concentrations were the worst they have been since 2009, but also still much better than the shallow lake standard (20 µg/L). The 2022 summer averages of total phosphorus and chlorophyll-*a* were better than the MPCA's shallow lake standards, and have consistently been better than the water quality standards since 1997. Water quality was not monitored in Kingsley Lake in 2020. The BDWMO will continue to monitor the water quality of Kingsley Lake in 2024. **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 at left.*

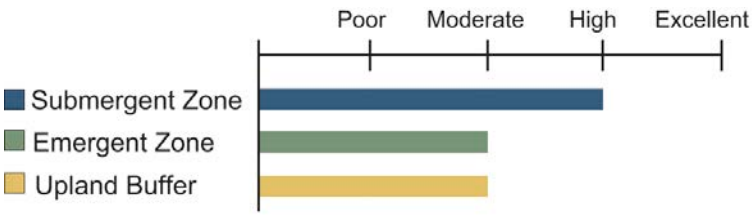


Orchard Lake (Lakeville)

Water Quality Monitoring—Orchard Lake's water quality in 2022 was similar to other recent years, but has generally experienced declining water clarity over the past 13 years. There is a statistically significant trend of degrading water clarity for the 10-year period of 2013-2022. The 2022 summer average Secchi disc transparency was 2.1 meters (6.9 feet), which is better than the MPCA deep-lake water quality standard of 1.4 meters. The 2022 summer-averages of total phosphorus (26 µg/L) and chlorophyll-*a* (6 µg/L) were better than the MPCA's deep-lake water quality standards as well. There were no statistically significant trends in summer averages of total phosphorus and chlorophyll-*a* for the most recent 10-year period. Summer averages of water quality in Orchard Lake have been consistently better than the water quality standards for the last fifteen years (2008-2022). The BDWMO will continue to monitor the water quality of Orchard Lake in 2023.

Orchard Lake Habitat Monitoring Results for 2022

As mentioned in the article on page 4, habitat monitoring was conducted in 2022 on Orchard Lake. The BDWMO made the following quality ratings, based on the monitoring results:



Submergent zone quality rating = High

Rating based on averaging four criteria:

1. excellent total number of native species (16)
2. excellent average native plant density (1.2)
3. moderate rating for average exotic species density (1.3)
4. moderate coefficient of conservatism value (mean C-value) (5.3)

Curly-leaf pondweed and Eurasian watermilfoil are treated each year in Orchard Lake. Curly-leaf pondweed has been documented within Orchard Lake since 2004. Eurasian watermilfoil was first observed in 2017 and has since increased in distribution. Coontail is the dominant native submergent plant species. Moderate and light densities of native plants were well distributed on Orchard Lake in 2022, including flatstem pondweed, muskgrass, and largeleaf pondweed. Filamentous algae was also present on the lake in 2022.

The BDWMO recommends continued monitoring and control of non-native invasive plant species.

Emergent vegetation zone quality rating = Moderate

Rating based on averaging four criteria:

1. excellent number of native wetland plant species (64)
2. moderate rating for % coverage of exotic species (51-75%)
3. a poor mean C-value rating (2.9)
4. high rating for total vegetative cover (51-75%)

Non-native species, including narrowleaf and hybrid cattail, and purple loosestrife are found in the vegetated emergent zone. The deep marsh habitat in the northeastern portion of Orchard Lake contains dense cattails and purple loosestrife along with native vegetation, including sedges, rushes, bulrushes, bur-reeds, ferns, iris, and bluejoint, which provide habitat for frogs, turtles, green herons, wood ducks, and great blue herons. One shoreline restoration is well maintained by the residentail landowner, providing aesthetically pleasing shoreline pollinator habitat and erosion protection with dense coverage of native emergent species.

The BDWMO recommends continued control and management of purple loosestrife and encouragement of additional residential shoreline restoration projects to control erosion and improve habitat.

Upland buffer zone quality rating = Moderate

- 41 native species and 24 exotic species observed.
- Exotic plant species >40% of upland vegetative cover. The mean C-value rating is 2.2 (poor).
- Upland buffer within residential properties is dominated by maintained lawn grasses with little to no naturalized vegetation. These area could be vegetated with native grasses and wildflowers to control erosion and improve habitat. The BDWMO recommends control of non-native common buckthorn, Chinese silver grass, and Siberian elm.
- Additional recommendations are in areas of bare soil to prevent erosion.
- 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

www.blackdogwmo.org

WANTED: Lakeville Alternate Commissioner

The City of Lakeville is seeking an alternate commissioner to represent the City on the Black Dog Watershed Commission through 2025. Alternates serve as an acting member but vote only during the absence of a regular Commissioner. The Commission meets the third Wednesday of each month. The position is open to Lakeville residents ages 18 and older that live within the Black Dog Watershed. Those interested in this volunteer position should send a letter of interest to the Lakeville City Engineer Zach Johnson. The City will interview interested qualifying candidates.

Email Zach Johnson at:
zjohnson@lakevillemn.gov

Board of Commissioners

Representing Burnsville:
Curtis Enestvedt, Chair
(serving since 2014)
Mike Hughes, Vice Chair
(serving since 2008)
Lynette Dunsworth, Commissioner
(serving since 2023)
Alternate — Open position

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)
Alternate — Open position

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

Legal Consultant:
Jared Shepherd, Campbell Knutson, P.A.

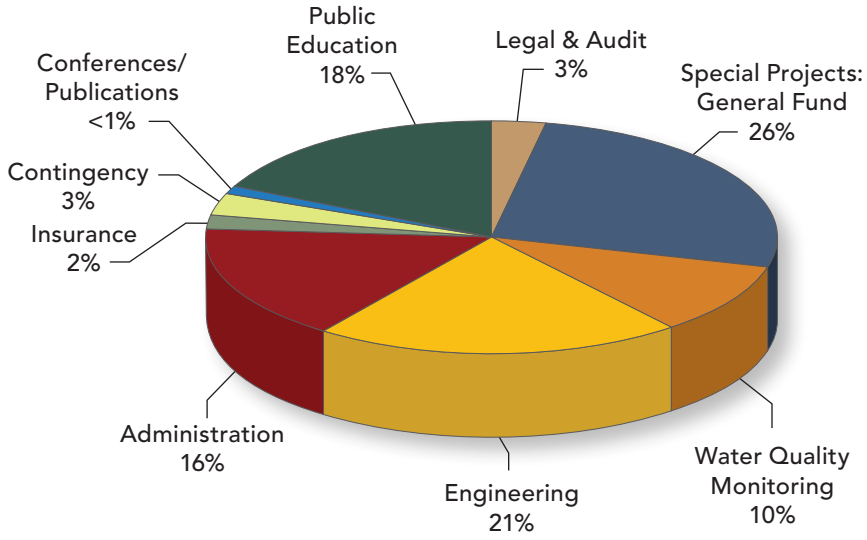
For more information, please contact:

Daryl Jacobson, Administrator
Black Dog WMO

City of Burnsville
13713 Frontier Court | Burnsville, MN 55337
Phone: 952-895-4574
Daryl.Jacobson@burnsvillemn.gov

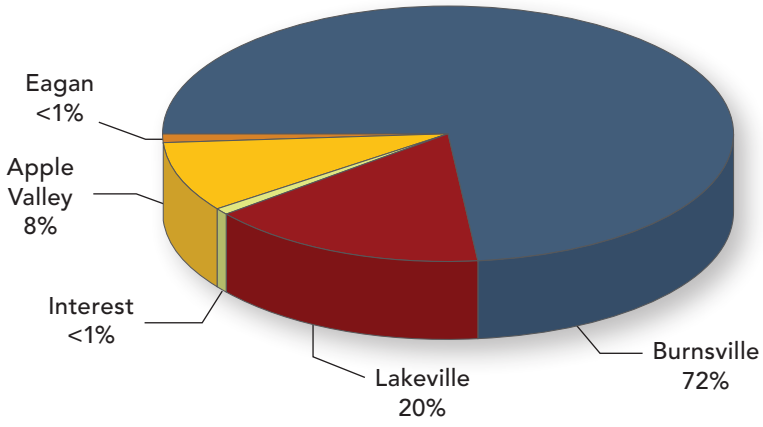
2023 Budget

Engineering	$31,000
Legal and Audit	$5,000
Administrative Services	$24,000
Public Education	$25,700
Insurance	$2,500
Special Projects – General Fund	$37,300
Conference/Publications	$500
Water Quality Monitoring	$15,200
Contingency	$5,000
Total Expenditures	**$146,200**



2023 Income

Member Contributions	$143,500
Interest	$40
Total Income	**$143,540**



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.