



Black Dog Watershed Management Organization

2010 WATERSHED ANNUAL REPORT

Published March 2011

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 BDWMO 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:

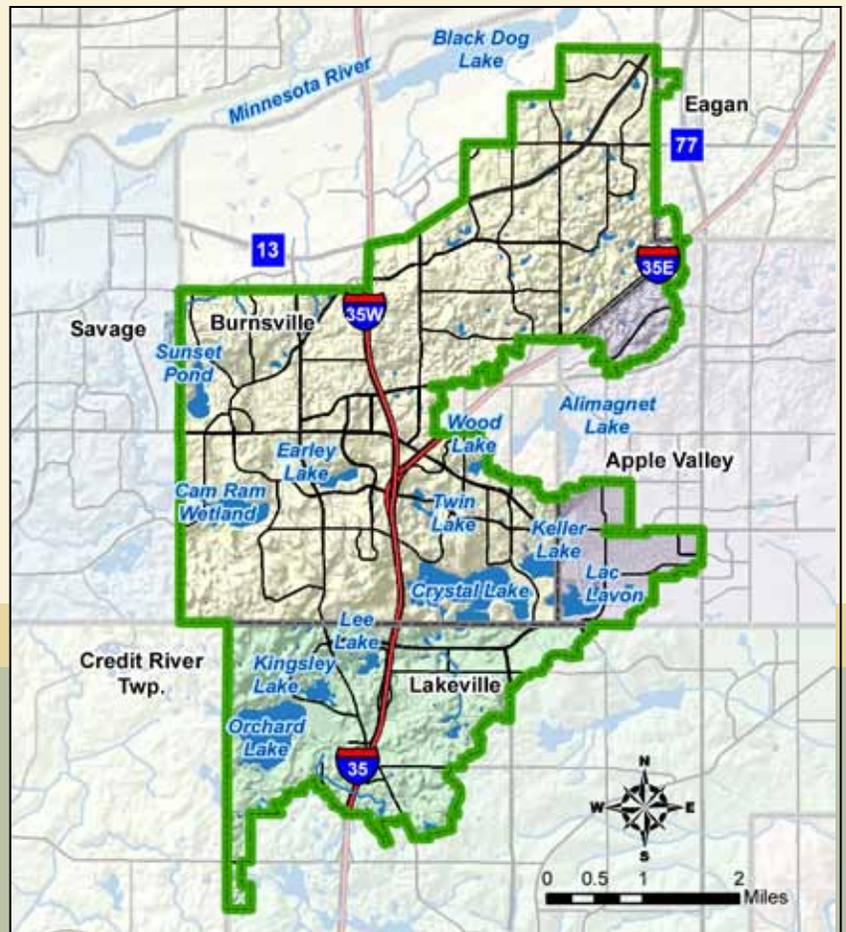
- **Trend Analysis**—The BDWMO collects water quality information to track water quality trends.
- **Performance Analysis**—The BDWMO works with the member cities to implement improvement projects, such as water quality treatment, and to measure the success of these projects.
- **Habitat Quality Analysis**—The 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 2010, and plans for 2011 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.



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Update on Three-Lake TMDL

The Black Dog WMO, together with the Cities of Lakeville, Burnsville and Apple Valley have been monitoring and working to improve water quality in Crystal, Keller, and Lee lakes for many years. In 2002, these lakes were listed on the MPCA's Impaired Waters List for excess nutrients. As a result, the MPCA required that a TMDL analysis be conducted to quantify the amount of phosphorus entering these lakes from their watersheds (runoff from driveways, streets, parking lots, and roofs) and other sources, and the reduction in that phosphorus loading required for them to meet applicable MPCA water quality standards. The Minnesota Pollution Control Agency (MPCA) uses 10 years of summer-average Secchi disc transparency, and total phosphorus and chlorophyll-a concentration data to determine if a lake is impaired. Over the past nine years, with active management, Lee Lake has not exceeded its standards, and it may soon be possible to have Lee Lake removed from the MPCA's Impaired Waters List.

The draft *Crystal, Keller, and Lee Lakes Nutrient Impairment Total Maximum Daily Load (TMDL) Report and the Earley Lake Water Quality Assessment (TMDL report)* was worked on for much of 2010. Several meetings were held during the first half of 2010, to inform the various stakeholders and the public about the results of the TMDL study and provide an opportunity to discuss these results. The draft TMDL report was submitted to the MPCA for review and approval and was then submitted to the United States Environmental Protection Agency (EPA) for preliminary review. In early 2011, the EPA will complete its preliminary review and the draft TMDL report will be posted by the MPCA for a 30-day public review and comment period. Once comments have been addressed, the TMDL report will be resubmitted to the EPA for their final review and approval.

In conjunction with the TMDL report, a draft *Crystal, Keller, and Lee Lakes Nutrient Impairment Total Maximum Daily Load Implementation Plan and Earley Lake Protection Plan* was also developed. This plan outlines watershed projects and other management activities that could be implemented by the stakeholders to help achieve the required phosphorus load reductions to meet the MPCA water quality standards outlined in the TMDL report. The implementation plan will be submitted for review and approval by the MPCA.

Process Underway to Update Watershed Management Plan

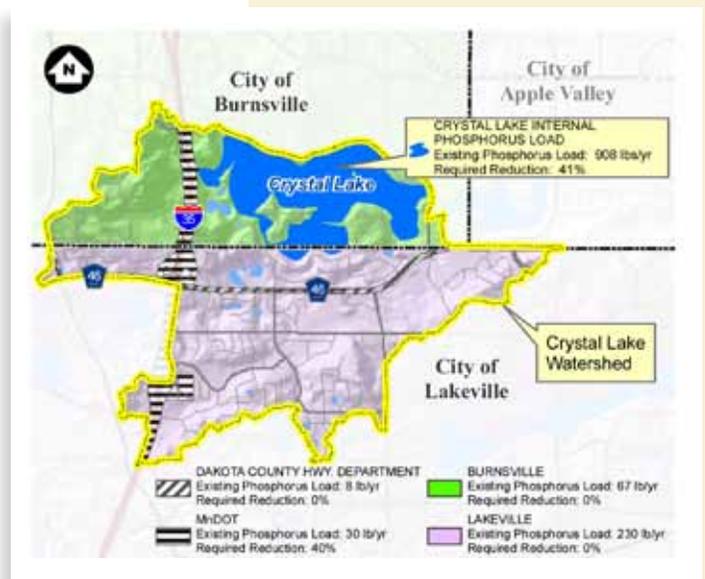
In late 2010, the Black Dog WMO began the process of updating its 2002 Watershed Management Plan. The Plan provides the vision and guidelines for managing surface water within the boundaries of the WMO. The Board of Water and Soil Resources (BWSR) requires WMOs to update their plans every 10 years. The new plan will be the BDWMO's third. The plan development phase will take approximately one year, and plan review and BWSR approval another year. A Planning Advisory Group (PAG), comprised of member city staff, citizens from the member cities and other stakeholders, was formed to advise the BDWMO commissioners throughout the planning process.

The planning process kicked off in October 2010 with a survey of the four member cities: Apple Valley, Burnsville, Eagan, and Lakeville. The survey documented the water management activities of the members and identified issues

What is a TMDL?

A total maximum daily load (TMDL) analysis is an assessment of how much of a specific pollutant a water body (lake, stream, or river) can receive and still meet established water-quality standards.

For more information regarding the three-lake TMDL, see the BDWMO website at www.blackdogwmo.org.



Phosphorus load reduction requirements for Crystal Lake, per draft TMDL.

Water Quality Improvement Projects in Crystal and Keller Lakes Implementation Program

Based on the recommendations in the Crystal and Keller lakes use attainability analysis (UAA), the BDWMO developed an implementation program to improve the water quality of Crystal and Keller lakes. The table below summarizes the implementation program, the year of implementation, and funding source for each element of the program (www.blackdogwmo.org/attainability.html).

Implementation Program Elements		Implementation Date	Funding Source
1	Phosphorus fertilizer limitation	2003 & ongoing	N/A
2	Excavate and enhance Redwood Pond	2005	City of Apple Valley
3	Add two regional infiltration basins 3a Regional infiltration basin (north of Valley Middle School)	To be determined ¹	City of Apple Valley
	3b Regional infiltration basin (west of Buck Hill Park)	2005	City of Burnsville, BDWMO, and \$32,000 Metropolitan Council MetroEnvironment Partnership Grant
4	Upgrade select existing ponds to NURP design criteria	2012	City of Apple Valley
	4a Enlarge and excavate 153rd St. Pond	2007	City of Burnsville
	4b Excavate north of Southcross Drive & Keller Lake Drive	2007	City of Burnsville
	4c Excavate Keller Lake Pond	2007	City of Burnsville
	4d Excavate pond at northeast edge of Keller Lake	2007	City of Burnsville
4e Excavate Bluebill Pond	2005	City of Lakeville	
5	Add regional water quality treatment pond—Whitney Pond (southeast edge Keller Lake)	2011	City of Apple Valley and \$60,000 Clean Water Legacy Nonpoint Source Restoration & Protection Fund Grant
6	Resume operation of ferric chloride (FeCl ₃) treatment system in near-surface withdrawal mode	2003–2009 ²	Black Dog WMO
7	Mechanical harvesting of curlyleaf pondweed in Crystal Lake	2003 & ongoing	Lakeshore homeowners and City of Burnsville
8	Mechanical harvesting of curlyleaf pondweed in Keller Lake	2004 & ongoing ³	Lakeshore homeowners, City of Apple Valley, and City of Burnsville

¹ The upcoming TMDL implementation plan (see story on page 2) will determine the schedule for implementing this project or a different project.

² System permanently shut down at the end of 2009 (see story on page 4).

³ Harvesting not completed in 2009 because of low water levels.

	Completed Projects
	Ongoing Projects
	Planned Projects

In addition to the implementation programs listed above, a total maximum daily load (TMDL) study is underway for Crystal, Keller, and Lee lakes (see story on page 2).

If all of the recommended program elements are implemented, the Crystal and Keller lakes UAA predicts Crystal Lake water clarity would improve to a summer-average Secchi disc transparency of 2.1 m (6.9 ft), and Keller Lake would improve to a summer-average Secchi disc transparency of 1.8 m (6.0 ft).

Lac Lavon Continues to Get Good Marks

The BDWMO is happy to announce that Lac Lavon—a 60-acre flooded former gravel pit on the Burnsville/Apple Valley border—continues to make good grades.

Because Lac Lavon is a former gravel pit with a small watershed, it has relatively low algal productivity compared to other BDWMO lakes. As the lake ages, Lac Lavon's sediment is expected to become more enriched with phosphorus that could potentially be released back into the water column during summer months. Because of the lake's unique characteristics and the fact that 2008 saw the lowest summer average Secchi disc transparency (SDT) on record, additional water quality monitoring activities were conducted in 2010.

In addition to measuring water clarity with a Secchi disc, several other measurements of water quality were collected, including concentrations of phosphorus and chlorophyll *a*. Sediment cores were collected from three locations in Lac Lavon and analyzed for various forms of phosphorus. Data collected in 2010 indicate the rate at which phosphorus is released from sediment and contributes to the growth of algae in Lac Lavon is not problematic.



Happily, the summer averages of SDT in 2009 and 2010 were improved relative to the 2008 levels and were better than the BDWMO's action level for Lac Lavon. However, there does appear to be a degrading trend in the summer-average SDT of Lac Lavon, and SDT has fluctuated above and below the BDWMO's action level of 3.6 meters (11.8 feet) for the past nine years.

The BDWMO will continue its annual monitoring of Lac Lavon to detect further changes in water quality.

Water Quality Monitoring Program

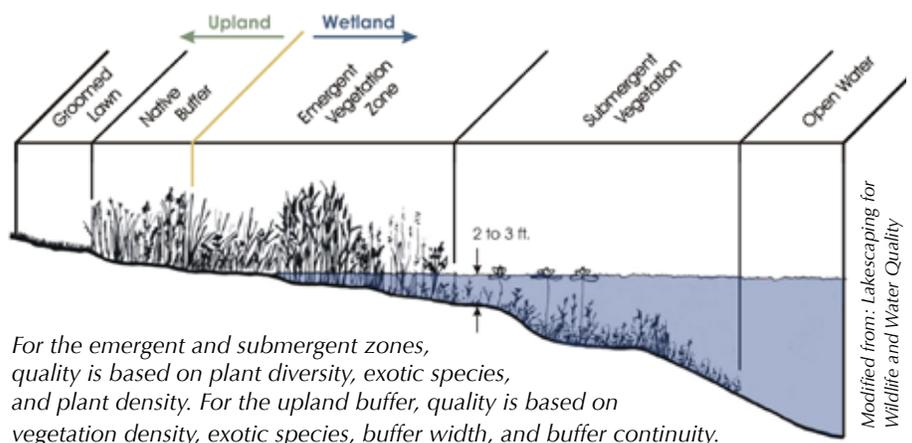
The Black Dog WMO and member cities continued to monitor several of its lakes during 2010 through the Metropolitan Council's Citizen-Assisted Monitoring Program (CAMP) to detect any water quality changes, either improving or degrading, that would require management action by the WMO. Additional water quality monitoring was also performed for the WMO for Lac Lavon (see sidebar). Both monitoring programs focused on three water quality indicators—total phosphorus and chlorophyll *a* concentrations, plus Secchi disc transparency. These three measurements correlate strongly to the open-water nuisance conditions of lakes (i.e., algal blooms). Phosphorus concentration is directly related to the abundance of algae in lakes, chlorophyll *a* (a photosynthetic pigment in algae) concentration is used to estimate the abundance of algae in a lake, and Secchi disc transparency relates to the clarity of lake water (generally the fewer the algae, the greater the transparency of a lake). Urban stormwater runoff generated within the WMO is rich in phosphorus, and has the potential to degrade lake water quality if not properly treated.

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

Habitat Monitoring Program

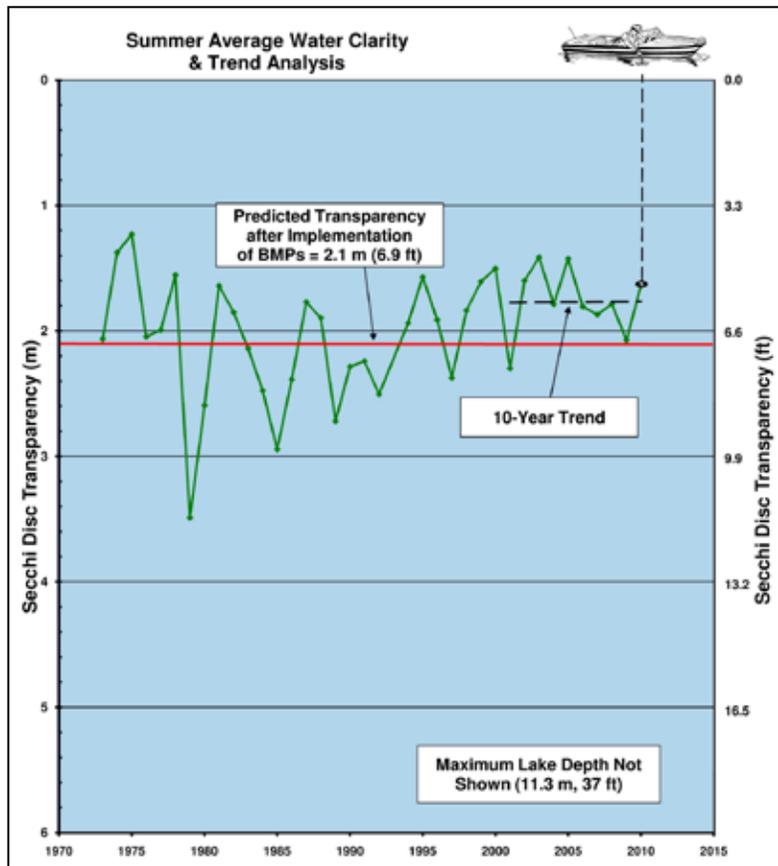
In 2002, the BDWMO created a program for monitoring the habitat quality of strategic water resources in the watershed. Implementation of the program began in 2003 and continued in 2004–2009. The program includes monitoring of biological and physical indicators, such as upland and aquatic vegetation, buffer zones, erosion, sedimentation, and the presence of non-native exotic species. The program also recommends management actions based upon monitoring results.

In 2010, the BDWMO redesigned the habitat monitoring program and did not conduct monitoring. Beginning in 2011, the program will include monitoring of each strategic water body on a cycle of once every five years, rather than monitoring every water body every year. Kingsley Lake will be monitored in 2011. Monitoring will include a meandering survey of the entire lake (in the submergent, emergent, and upland buffer zones—see figure below), rather than only at sample plots, as done in the past.



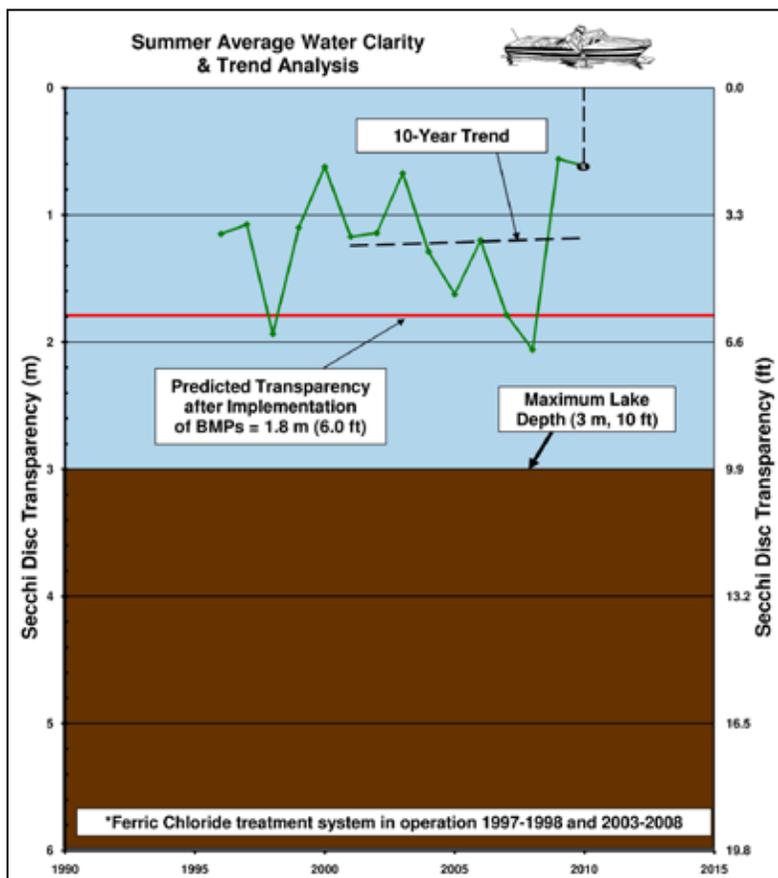
For the emergent and submergent zones, quality is based on plant diversity, exotic species, and plant density. For the upland buffer, quality is based on vegetation density, exotic species, buffer width, and buffer continuity.

Crystal Lake



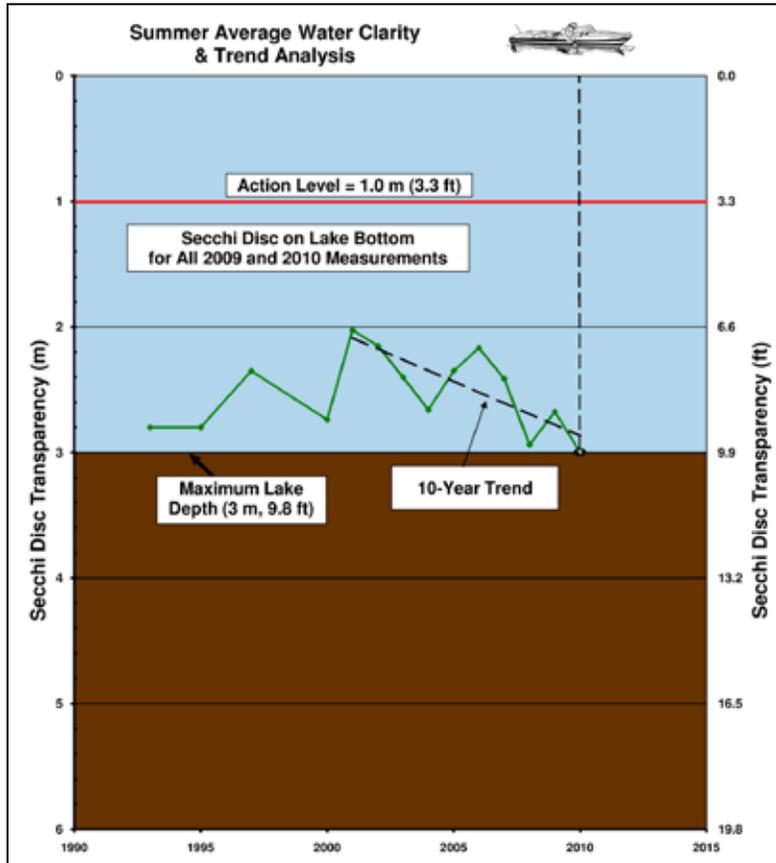
Water Quality Monitoring—Water quality monitoring data show a degradation in water quality in 2010 when compared to 2009 as indicated by the transparency readings in 2010. Chlorophyll-a concentrations increased in 2010 from 2009, also showing a degradation in water quality. However, total phosphorus concentrations in 2009 and 2010 were about equal, which indicates little change in water quality. The ferric chloride treatment system did not operate in 2010, as it was permanently shut down at the end of 2009. The draft three-lake TMDL study and implementation plan identifies the water quality improvement measures needed to achieve the BDWMO and MPCA goals for Crystal Lake. Habitat monitoring was not completed in 2010; the program will resume in 2011 (see story, page 4).

Keller Lake



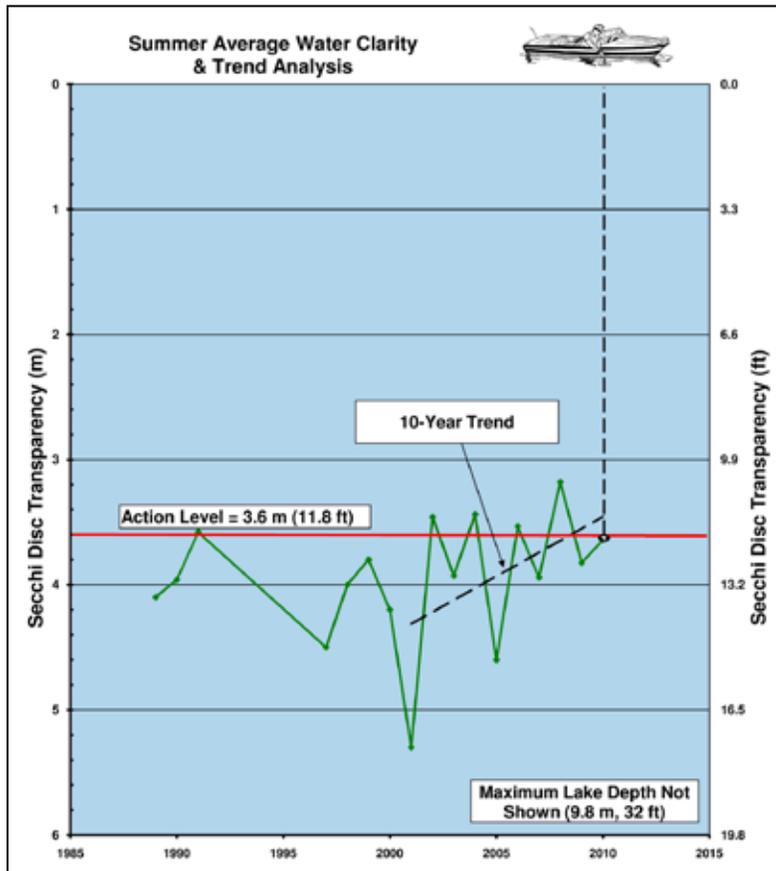
Water Quality Monitoring—Water quality monitoring data show minor improvements in water quality in 2010 when compared to 2009. Chlorophyll-a concentrations and total phosphorus concentrations were lower and transparency readings were higher, indicating water quality improvements for all parameters. In 2009, the ferric chloride treatment system did not operate and it was assumed that the water quality degradation seen in the 2009 monitoring was due to the fact that iron was not added to Keller Lake during 2009. Similarly, poor water quality was observed during the summer of 2010 when the ferric chloride dosing system was (again) not operated. The draft three-lake TMDL study and implementation plan identifies the water quality improvement measures needed to achieve the BDWMO and MPCA goals for Keller Lake. Habitat monitoring was not completed in 2010; the program will resume in 2011 (see story, page 4).

Kingsley Lake



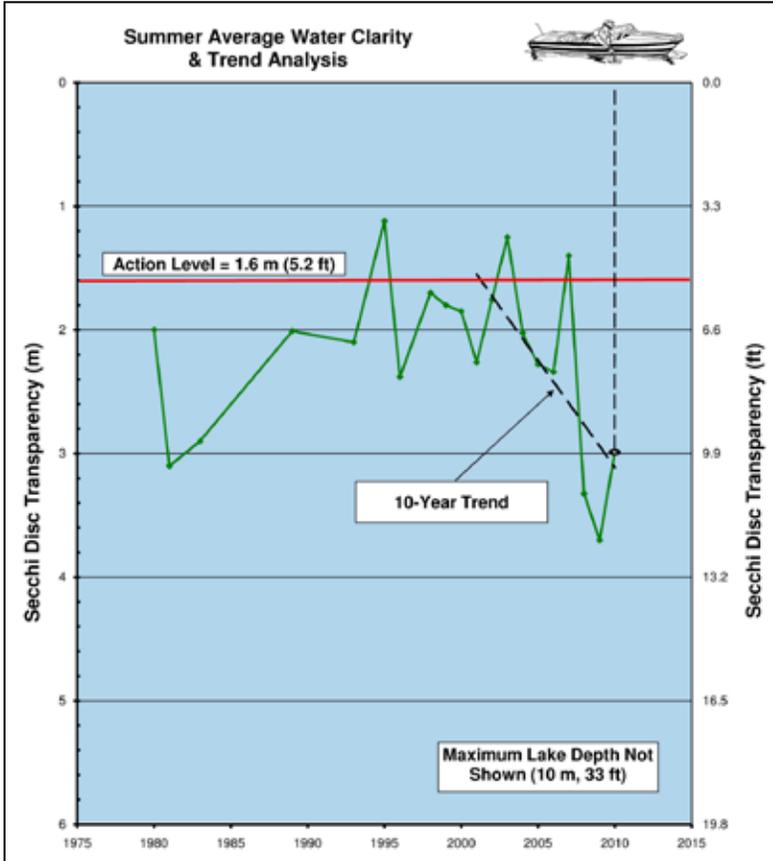
Water Quality Monitoring—Water quality monitoring data from 2010 show continued very good water quality in Kingsley Lake, with transparency readings at the bottom of the lake and continued low chlorophyll-a concentrations. Total phosphorus concentrations decreased in 2010 from 2009, showing minor improvements in water quality. The BDWMO will continue to monitor the water quality of Kingsley Lake. Habitat monitoring was not completed in 2010; the program will resume in 2011 (see story, page 4).

Lac Lavon



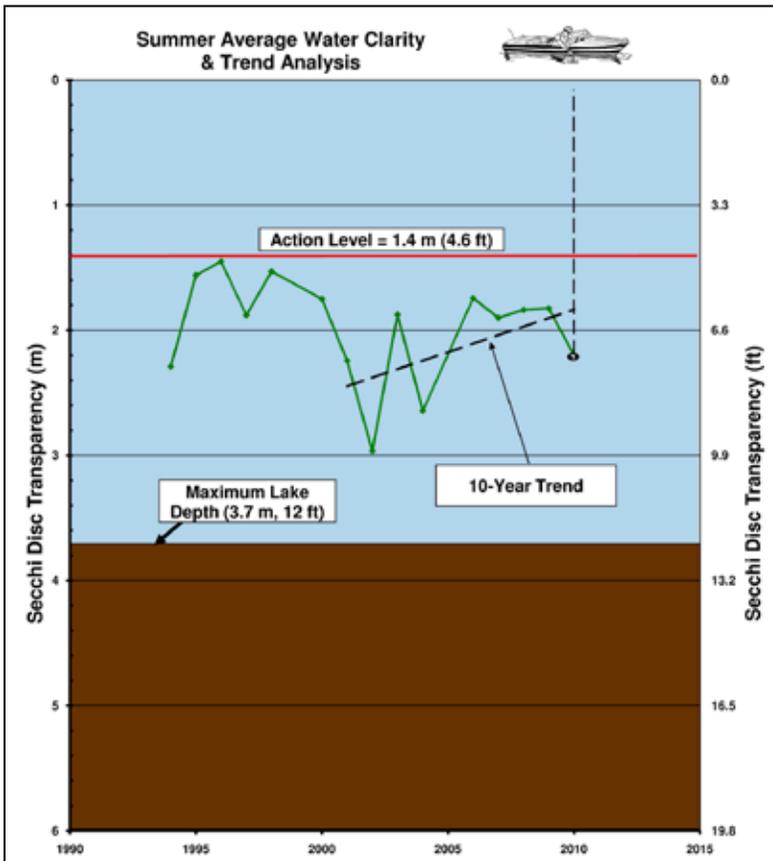
Water Quality Monitoring—Lac Lavon has excellent water quality, although it has recently experienced water clarity that is worse than the action level. Transparency readings show a degradation in water quality in 2010 when compared to 2009. Total phosphorus concentrations increased slightly in 2010 from 2009, also showing water quality degradation. However, chlorophyll-a concentrations decreased slightly in 2010 from 2009, showing some water quality improvement. In 2010, the BDWMO performed additional monitoring to better understand the reasons for reduced transparency readings on the lake (see story, page 4). Habitat monitoring was not completed in 2010; the program will resume in 2011 (see story, page 4).

Orchard Lake



Water Quality Monitoring—Water quality monitoring data show a degradation in water quality in 2010 when compared to 2009, although a significant improving trend was detected in Orchard Lake’s transparency readings over the past 10 years. This slight degradation is likely the result of increased watershed runoff in 2010 due to the dry summer in 2009. The generally improved water quality trend is likely the result of completed best management practices. However, chlorophyll-a and total phosphorus concentrations increased in 2010 from 2009, also showing a degradation in water quality. Habitat monitoring was not completed in 2010; the program will resume in 2011 (see story, page 4).

Sunset Pond



Water Quality Monitoring—Water quality monitoring data show improvements in the water quality of Sunset Pond in 2010, when compared to 2009, with chlorophyll-a concentrations decreasing and transparency readings increasing, but total phosphorus concentrations staying nearly the same as 2009. Habitat monitoring was not completed in 2010; the program will resume in 2011 (see story, page 4).



Black Dog Watershed Management Organization

Board of Commissioners

Representing Burnsville:

Roger Baldwin, Chair
 Loren Knott, Treasurer/Secretary
 Tom Harmening, Commissioner
 Mike Hughes, Alternate

Representing Apple Valley and Eagan:

Mary Hamann-Roland, Vice Chair
 Stephen David, Alternate

Representing Lakeville:

Scott Thureen, Commissioner
 Colleen LeBeau, Alternate

Engineering Consultant:

Karen Chandler, P.E., Barr Engineering Co.
 Henry Runke, Ph.D., Barr Engineering Co.

Legal Consultant:

Roger Knutson, 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:

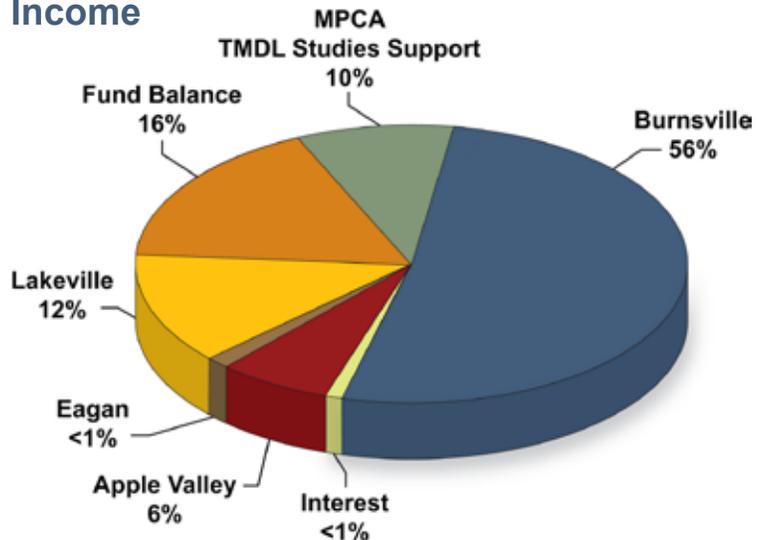
Daryl Jacobson, Administrator
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 Fax: 952-895-4531

Website: www.blackdogwmo.org

2011 Budget

Engineering Fees.....	\$33,000
Legal and Audit Fees.....	\$7,950
Administrative Services.....	\$12,000
Public Education	\$14,600
Insurance.....	\$3,000
Special Projects	\$98,737
Conference/Publications.....	\$500
Water Quality Monitoring	\$11,300
Contingency	\$1,500
Total.....	\$182,587

2011 Income



2011 Expenditures

