

**BLACKHAWK LAKE AQUATIC INVASIVE SPECIES EDUCATION,
PREVENTION & PLANNING GRANT (AEPP-410-14) 2018 REPORT
January, 2019**

Water Quality Monitoring 2018

Blackhawk Lake was monitored by DFS Conservation Consulting for Secchi disk transparency on 11 dates in 2018 (5/13, 5/22, 6/4, 6/18, 6/25, 7/6, 7/25, 8/13, 8/17, 9/10, 9/24), for phosphorus on 5/13 and for phosphorus and chlorophyll on 6/25, 7/24, and 8/17. Photos were taken of water quality and aquatic plants during each monitoring period. Data was entered into DNR's Surface Water Integrated Monitoring System (SWIMS). The 2018 water quality data and report, as well as Secchi disk transparency and Trophic State Index comparisons from 1997 – 2018 are found in Appendix A.

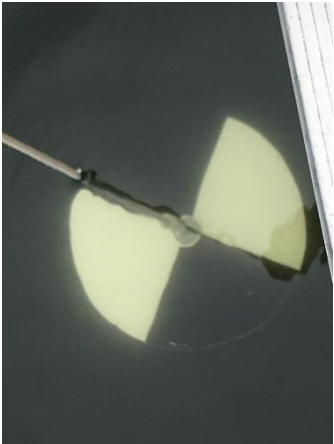
The Secchi disk clarity of Blackhawk Lake ranged from 7 to 20 feet during spring (May-June), with an average of 11.9 feet in 2018. Lower clarity at that time was generally associated with wind and rain. The May-June 2018 precipitation was 18.96 inches, as compared to a normal of 9.26 inches. Only 2008 and 2012 had lower spring average clarity. In summer (July – August), the clarity was much lower, ranging from 2 – 8.5 feet and averaging 5.4 feet. Only 2011, 2012, and 2017 had lower summer average clarity. The July-August 2018 precipitation was 9.43 inches, close to the normal of 9.57 inches. The average summer Secchi clarity at Blackhawk Lake was still more than the average for the Southwest Wisconsin Georegion in 2018 (3.9 feet).

The spring total phosphorus was 33.9 ug/l as compared to an average of 26 ug/l for 2006-2017. Spring total phosphorus (a nutrient to feed algae growth) is often used as an indicator of the potential for summer algae blooms. Impoundments that have more than 30 ug/L total phosphorus may experience noticeable algae blooms. Summer 2018 total phosphorus was 44.9 ug/l as compared to an average of 41.7 ug/l from 2006 - 2017.

The average summer chlorophyll (indicating the concentration of algae suspended in the water) was 96.4 ug/L as compared to a Southwest Georegion average of 34.9 ug/L and an average of 41.7 ug/l for 2006-2017. Heavy spring rains washed in phosphorus, which help promote the growth of algae. Nutrients were also made readily available for algae growth as the aquatic plants died back and release the phosphorus contained in them as the summer progressed. In August, following a period of hot, dry, calm weather, the water turned a cloudy, pea-soup blue-green color indicative of a blue-green algae bloom. The Blackhawk Lake Recreation Area posted Water Quality Advisory signs because of the potentially toxic effects of the blue-green algae. These were posted for most of the rest of the summer.

The summer Trophic State Index (TSI) based on chlorophyll during July and August was 69, indicating Blackhawk Lake was eutrophic. This TSI usually suggests blue-green algae can become dominant and algal scums are possible, as well as extensive aquatic plant overgrowth.

5-13-18 Blackhawk Lake Water Quality and Aquatic Plants



Secchi disk clarity = 7.5'



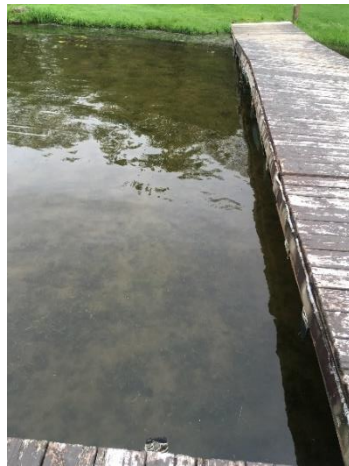
Handicapped Fishing pier



Concession Dock



Concession Dock N side



Concession Dock S side



Fishing Pier



Beach looking north



Beach looking south

5-22-18 Blackhawk Lake Water Quality and Aquatic Plants



Secchi disk clarity = 16'



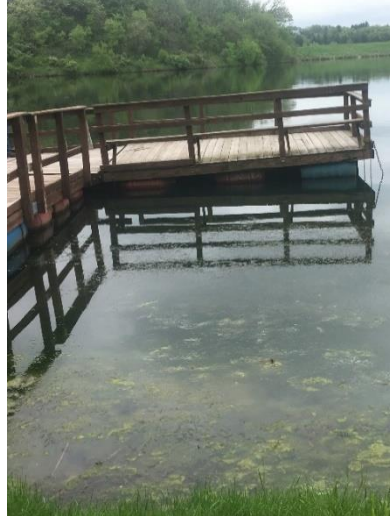
Concession Dock



Concession Dock S side



Plants at Concession Dock



Handicapped Pier



Fishing Pier



Btwn Fishing Pier & Beach



From lake looking toward Beach



Beach looking S

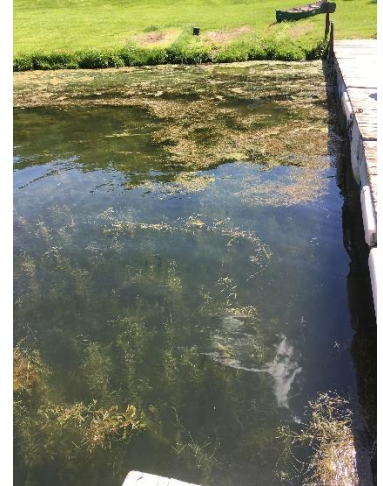
6-4-18 Blackhawk Lake Water Quality and Aquatic Plants



Secchi disk clarity = 9'



Concession Dock



Concession Dock S side



Btwn Concession & Handicapped Pier Chara Concession dock Fishing Pier



Fishing Pier S side



Looking from Concession Dock toward Beach



Btwn Fishing Pier & Beach

6-18-18 Blackhawk Lake Water Quality and Aquatic Plants



Concession Dock



Concession Dock N side



Chara Concession Dock



Concession Dock



Handicapped Pier



Btwn Fishing Pier & Concession



Fishing Pier



Looking N from Beach



Enjoying the Beach

6-25-18 Blackhawk Lake Water Quality and Aquatic Plants



Secchi = 7'



Handicapped Pier



Handicapped Pier



Concession Dock S



Concession Dock N



Chara at Concession



Fishing Pier



Fishing Pier N



Fishing pier N



Beach looking S



Plants in S 1/3 of Beach



Beach looking N



Boat Landing

7-6-18 Blackhawk Lake Water Quality and Aquatic Plants



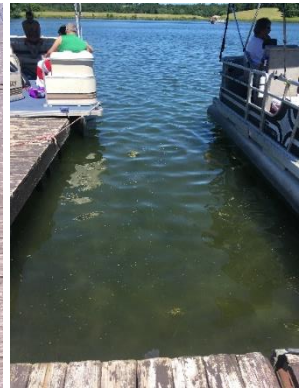
Secchi = 8.5'



Concession Dock



Concession Dock N



Concession Dock S



Handicapped Pier



Handicapped Pier S



Fishing Pier S



Fishing Pier looking S



Beach looking S



Beach looking N



Plants in S 1/3 of Beach



Clean Boats, Clean Waters Landing



Landing Arrowhead

7-24-18 Blackhawk Lake Water Quality and Aquatic Plants



Secchi = 7.5'



Concession Dock



Concession Dock S



Concession Dock S



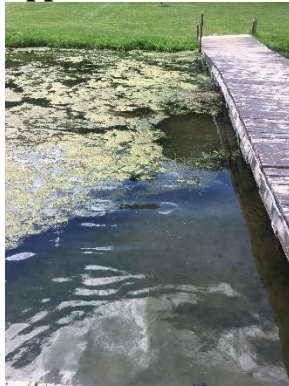
Handicapped Pier



Fishing Pier



Fishing Pier N



Fishing Pier S



Beach looking S



Beach looking N



Beach looking N



Boat Landing



Boat Landing from Dock to Shore



Boat Landing Arrowhead



Boat Landing N

8-13-18 Blackhawk Lake Water Quality and Aquatic Plants



Secchi = 2'



Concession Dock



Concession Dock from lake



Concession dock side



Handicapped Pier



Fishing pier



Beach from lake



Beach



Beach looking N

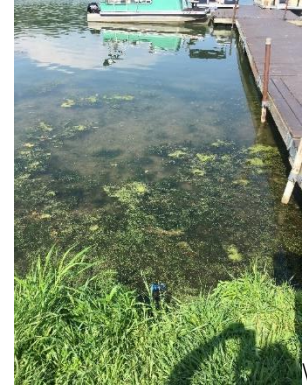
8-17-18 Blackhawk Lake Water Quality and Aquatic Plants



Secchi = 3.5



Concession Dock



Concession Dock N



Concession Dock S



Concession Dock from lake



Fishing Pier



Fishing Pier N



Beach N to Fishing Pier



Beach from lake



Beach



Beach looking N

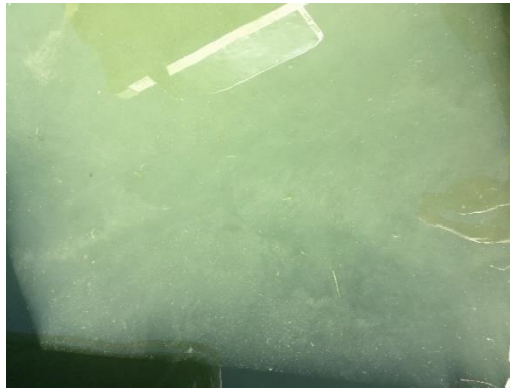


Boat Landing

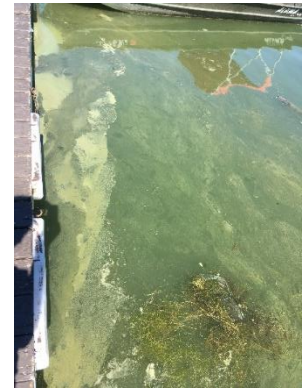
9-10-18 Blackhawk Lake Water Quality and Aquatic Plants



Secchi = 3.5'



Concession Dock



Concession Dock S



Handicapped Pier



Fishing Pier



Fishing pier



Beach – fish trails in blue-green algae



Beach looking N



Boat landing

9-24-18 Blackhawk Lake Water Quality and Aquatic Plants



Secchi = 5'



Concession Dock



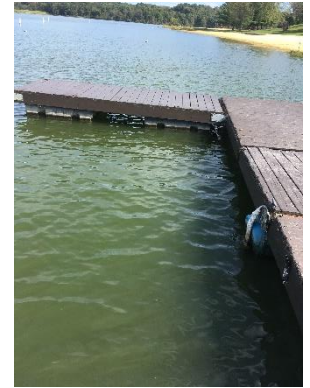
Concession Dock



Handicapped Pier



Fishing Pier



Fishing Pier



Beach from lake



Beach looking N



Beach looking S



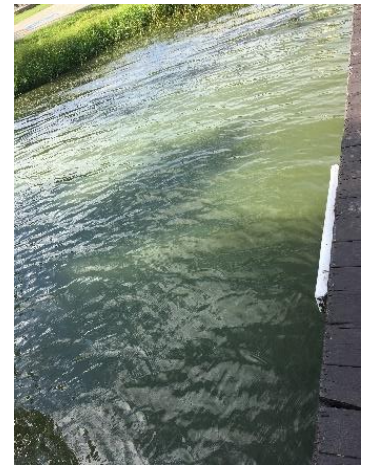
Chinese Mystery Snails



Blue-green pigment Beach



Boat landing



Boat landing

Aquatic Plant Monitoring and Management 2018

Visual and rake boat surveys for *Myriophyllum spicatum* (Eurasian watermilfoil or EWM) and other aquatic plants were conducted on 5/13, 5/22, 6/4, 6/18, 6/25, 7/6, 7/25, 8/13, 8/17, 9/10, 9/24/18. Photos were taken and the aquatic plants were noted during each sampling date (Appendix B). No Eurasian watermilfoil was found. The predominant plants in the deeper water and sand ridge in the spring were *Potamogeton crispus* (curly-leaf pondweed), *P. puscillus* (slender pondweed), *Ceratophyllum demersum* (coontail), and filamentous algae. *Ranunculus aquatilis* (white water crowfoot), *Heteranthera dubia* (water stargrass), *P. foliosus* (sago pondweed), *Elodea canadensis* (common waterweed), coontail, *Stuckenia pectinata* (sago pondweed), and *Chara* (muskgrass) were common in the shallower water in spring. Most of these plants had senesced by August. Water stargrass became more abundant in the shallower water as the summer progressed.

The visual survey done on 5/13/18 found little aquatic plant growth, except for some curly-leaf pondweed. The Secchi clarity was 7.5 feet and the water color was greenish brown. There had been above normal precipitation in early May.

By 5/22/18, curly-leaf pondweed and slender pondweed were abundant around the concession dock, fishing pier, and handicapped fishing pier, impairing navigation and fishing, as well as in the beach area, impairing swimming. Filamentous algae, white water crowfoot, coontail, elodea, Chara, and water stargrass were also present in these areas. Curly-leaf pondweed and slender pondweed were also abundant on the sand ridge and in Pontoon Bay. Despite above normal rainfall the previous two weeks, the Secchi clarity was 16 feet.

The aquatic plant survey on 6/4/18 found navigation, fishing, and swimming impaired at the handicapped pier, fishing pier, concession dock, and beach by curly-leaf pondweed and slender leaf pondweed. Filamentous algae, Chara, coontail, and water stargrass were also present. Curly-leaf pondweed and slender pondweed were abundant on the sand ridge and in Pontoon Bay. Sago pondweed and white water crowfoot were also present in Pontoon Bay. The Secchi clarity was 9 feet.

In mid-May, the Blackhawk Lake Recreation Area applied for and obtained a permit for chemical treatment around the handicapped pier, concession dock, fishing pier, and beach. The permit was issued on 6/13/18 (Appendix B). The chemicals approved were Diquat for the submersed aquatic plants and Habitat for cattails. Because an endangered frog has been documented in the vicinity, the amount of Diquat was limited to 1 ppm in areas less than 2 feet in depth.

Areas around the handicapped pier, concession dock, fishing pier, and beach were treated with Diquat and copper by Wisconsin Lake and Pond Resources on 6/21/18. They injected the chemicals under the water surface using hoses in the deeper water (5-12 feet) near the sides and ends of the docks/piers and at the beach. Wisconsin DNR Lakes Coordinator, Susan Graham, supervised the chemical treatment and approved the use of a copper compound in conjunction with the Diquat to kill the filamentous algae and thus increase the efficacy of Diquat on the aquatic macrophytes. The cattails on the southern edge of the beach had not increased to become a nuisance, so Habitat was not used to control them.

On 6/16, the Secchi clarity had increased to 20 feet. There was abundant curly-leaf and slender pondweed around the concession dock and fishing pier.

By 6/25, the Secchi clarity had been reduced to 7 feet and the water color was green. Curly-leaf and slender pondweed were senescing around the concession dock. The plants around the fishing pier and beach weren't affected much from the treatment yet.

The curly-leaf pondweed and slender pondweed were gone from around the concession dock and fishing pier and were senescing elsewhere in the lake by 7/6. There was decaying filamentous algae and vegetation near the shore. The southern 1/3 of the beach had abundant water stargrass. Senescing slender pondweed and white water crowfoot covered by filamentous algae was abundant in Pontoon Bay. The Secchi clarity was 8.5 feet and the water color was green.

By 7/24, much of the vegetation had senesced throughout most of the lake except in the nearshore areas. Water stargrass was still abundant on the southern 1/3 of the beach and boat launch. Coontail, elodea, and filamentous algae were also found in the shallows around the boat launch. Arrowhead, bulrush, and cattail lined the shoreline at the boat launch. The Secchi clarity was 7.5 feet.

On 8/13, following hot and calm weather, the Secchi clarity was 2 feet and there was an obvious blue-green algae bloom as evidenced by the cloudy blue-green water color. There was little other vegetation. The Blackhawk Lake Recreation Area posted Water Quality Advisory signs because of the potentially toxic effects of the blue-green algae on humans and dogs. These signs remained up most of the rest of the summer.

The lake was sampled again on 8/17 and wind and rain had dissipated some of the algae. The Secchi was 3.5 feet and the water color was green. By 9/10, the water at the beach looked like pea soup, with trails where fish swam through. On 9/24, the Secchi clarity was 5 feet and there was blue-green pigment in the sand on the beach, evidencing decayed blue-green algae.

Clean Boats, Clean Waters

Abundant plants were found on motors, boats, and trailers, from May – July. The Southwest Badger Resource and Development Council put a priority on Clean Lakes, Clean Waters watercraft inspections and education at the Blackhawk Lake boat landing in 2018. DFS Conservation Consulting also did watercraft inspections and educational activities at the lake as the opportunity arose when they were sampling. Eurasian watermilfoil has not been found in the lake since 2011 and the inspections and educational activities are important to protecting the lake from EWM and other aquatic invasive species.

Brochures on Eurasian water milfoil and aquatic invasive species were available in a prominent place at the front desk in the office.

Education and Outreach

Donna Sefton of DFS Conservation Consulting gave a PowerPoint presentation “Water Quality and Blue-Green Algae” to 60 Middle School students and staff at Highland Schools on 11/7/18. The students learned about: 1) Blackhawk Lake water quality, aquatic plants, and algae; 2) Blue-green algae characteristics; 3) Why they are of concern; 4) How people and pets can be protected from blue-green algae toxins; and 5) What causes algae blooms and what can be done to prevent them. A copy of the presentation is found in Appendix C. Copies were also sent to the Iowa and Lafayette County, WI, Health Departments, managers of parks with lakes in the area (e.g. Blackhawk Lake Recreation Area, Governor Dodge State Park, and Yellowstone Lake State Park), and Wisconsin DNR.

Appendix A
Blackhawk Lake Water Quality, 2018

Wisconsin Department of Natural Resources

Lake Water Quality 2018 Annual Report

Blackhawk Lake

Iowa County

Waterbody Number: 1239400

Lake Type: DRAINAGE

DNR Region: SC

GEO Region:SW

Site Name	Storet #
Black Hawk Lake - Deep Hole	253124

Date	SD	SD	Hit	CHL	TP	TSI	TSI	TSI	Lake	Clarity	Color	Perception
	(ft)	(m)	Bottom			(SD)	(CHL)	(TP)	Level			
05/13/2018	7.5	2.3	NO		35.9	48		56	NORMAL	MURKY	BROWN	3-Enjoyment somewhat impaired (algae)
05/22/2018	16	4.9	NO			37			HIGH	CLEAR	BLUE	1-Beautiful, could not be nicer
06/04/2018	9	2.7	NO			45			HIGH	MURKY	GREEN	3-Enjoyment somewhat impaired (algae)
06/18/2018	20	6.1				34			NORMAL	CLEAR	BLUE	1-Beautiful, could not be nicer
06/25/2018	7	2.1		17.4	25.7	49	56	53	HIGH	MURKY	GREEN	3-Enjoyment somewhat impaired (algae)
07/06/2018	8.5	2.6	NO			46			HIGH	MURKY	GREEN	3-Enjoyment somewhat impaired (algae)
07/24/2018	7.5	2.3	NO	14.7	23.8	48	55	53	HIGH	MURKY	GREEN	3-Enjoyment somewhat impaired (algae)
08/13/2018	2	0.6	NO			67			NORMAL	MURKY	GREEN	5-Enjoyment substantially impaired (algae)
08/17/2018	3.5	1.1		178	66	59	74	61	NORMAL	MURKY	GREEN	4-Would not swim but boating OK (algae)
09/10/2018	3.5	1.1	NO			59			HIGH	MURKY	GREEN	5-Enjoyment substantially impaired (algae)
09/24/2018	5	1.5	NO			54			HIGH	MURKY	GREEN	4-Would not swim but boating OK (algae)

Date	Collector Comments
05/13/2018	water temp 59- air temp 66- cloudy- breeze 5 mph. Some small curly-leaf pondweed- no other plants visible. No Eurasian watermilfoil.
05/22/2018	65- cloudy- calm to 5 mph breeze. 5" rain previous 2 weeks. No Eurasian watermilfoil. Curly-leaf pondweed abundant on sand ridge- with P. puscillus and sago pondweed in Pontoon Bay- Curly-leaf and P. puscillus abundant at concession dock + fishing pier- along with some filamentous algae- water buttercup- water stargrass- coontail- and elodea- impairing navigation and fishing.
06/04/2018	70- cloudy- breezy 5-10 mph- 1.5" rain 6/2-6/3. Curly-leaf pondweed- P. puscillus impairing navigation- fishing + swimming at concession dock- fishing pier- and beach. Chara- filamentous algae- water stargrass- coontail also present. Curly-leaf + P. puscillus on sand ridge. Curly-leaf with P. puscillus- sago- water buttercup in Pontoon Bay.
06/18/2018	70s- clear- calm to slight breeze. No Eurasian watermilfoil. P. puscillus abundant around concession dock- fishing pier- sand ridge- beach. Some curly-leaf pondweed.
06/25/2018	70s- wind 10-15 mph- moderate waves- 4" rain week before. Diquat + copper sulfate applied to concession dock- fishing pier- beach on 6/21. Curly-leaf + P. puscillus senescing around concession dock- not much effect of treatment from fishing pier to beach.

07/06/2018	80s- clear- calm to slight breeze. Curly-leaf pondweed- P. puscillus gone around concession dock + fishing pier- senescing elsewhere in lake- decaying filamentous algae + vegetation near shore. Water stargrass in S. 1/3 of beach. Pontoon Bay senescing P. puscillus covered by filamentous algae.
07/24/2018	80- humid- breeze 5 mph. algae bloom forming. Concession dock + fishing pier: little vegetation in area treated- some filamentous algae- coontail. Beach: S. 1/3 water stargrass + coontail. Most plants in lake senesced- nothing visible on sand ridge. Boat launch: water stargrass- some coontail- elodea- filamentous algae- arrowhead- bulrush- cattail.
08/13/2018	80s- clear- slight breeze- previous week hot- calm- no rain. Little vegetation. Blue-green algae bloom. Blackhawk L Recreation Area posted Water Quality Advisory signs.
08/17/2018	75- calm to 5 mph breeze- humid- 2.5" rain in past 2 days. Still blue-green algae bloom- but not as abundant. Concession dock + S 1/3 of beach: water stargrass impairs navigation.
09/10/2018	70s- sunny- slight breeze- ripple waves. 10" rain between 8/20 - 8/30. Blue-green algae bloom like pea soup. Blackhawk L Recreation Area posted Water Quality Advisory signs.
09/24/2018	Mostly sunny- slight breeze 0-5 mph. Still algae visible in water- but not as much as on 9/10/18. Most plants have senesced. Some residual blue-green algae pigment on beach.

Date	Data Collectors	Project
05/13/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
05/22/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
06/04/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
06/18/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
06/25/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
07/06/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
07/24/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
08/13/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
08/17/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
09/10/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
09/24/2018	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet.

Wisconsin Department of Natural Resources

Wisconsin Lakes Partnership

Report Generated: 12/11/2018

Blackhawk Lake

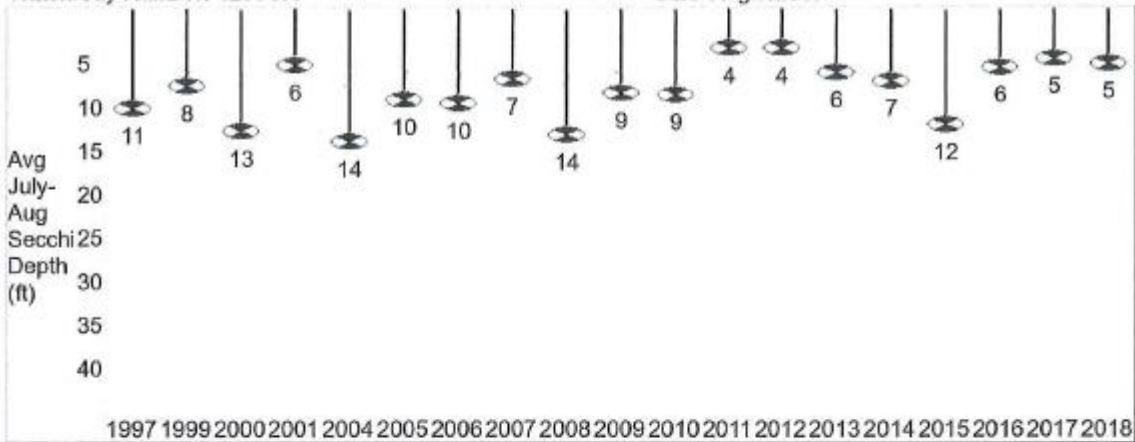
Iowa County

Waterbody Number: 1239400

Lake Type: DRAINAGE

DNR Region: SC

GEO Region: SW

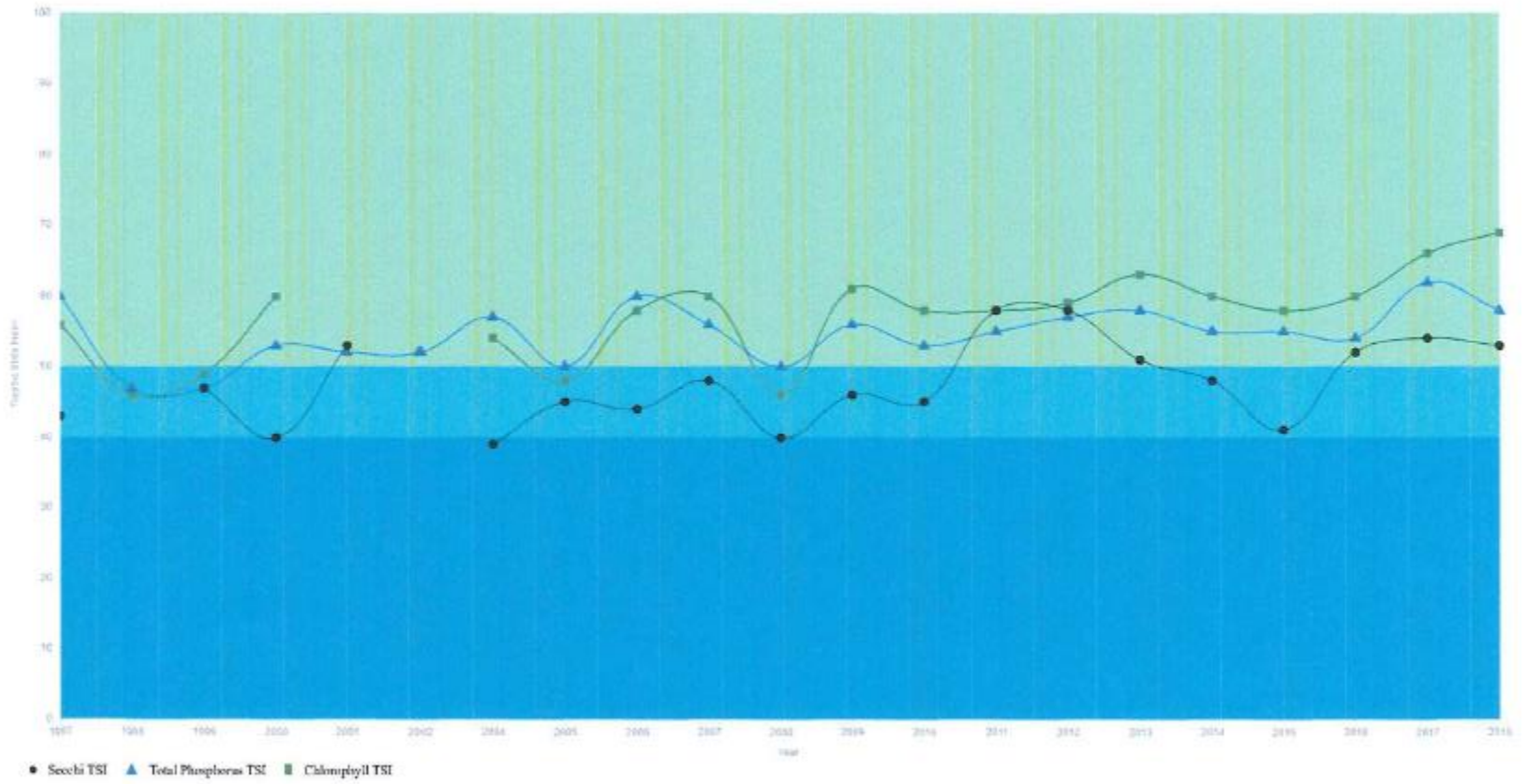


Past secchi averages in feet (July and August only).

Year	Secchi Mean	Secchi Min	Secchi Max	Secchi Count
1997	10.63	6.75	14.5	2
1999	8	8	8	1
2000	13.2	2	19	5
2001	5.5	5.5	5.5	3
2004	14.3	14.3	14.3	2
2005	9.5	8.5	10.5	2
2006	10	8	13	5
2007	7.29	3	18	12
2008	13.56	12.25	15	4
2009	8.75	4	15.75	6
2010	9	4.5	17	5
2011	3.67	3	5	3
2012	3.67	3	4	3
2013	6.33	3	10	3
2014	7.33	3	14	3
2015	12.38	7	17	4
2016	5.83	3	10.5	3
2017	4.88	2.5	8	4
2018	5.38	2	8.5	4

Report Generated: 12/11/2018

Trophic State Index Graph: Black Hawk Lake - Deep Hole - Iowa County



Black Hawk Lake - Deep Hole 2018 Results



Black Hawk Lake - Deep Hole was sampled **11** different days during the 2018 season. Parameters sampled included:

- water clarity
- total phosphorus
- chlorophyll

The average summer (July-Aug) secchi disk reading for Black Hawk Lake - Deep Hole (Iowa County, WBIC: 1239400) was 5.38 feet. The average for the Southwest Georegion was 3.9 feet. Typically the summer (July-Aug) water was reported as **MURKY** and **GREEN**. This suggests that the secchi depth may be mostly impacted by algae. Algal blooms are generally considered to decrease the aesthetic appeal of a lake because people prefer clearer water to swim in and look at. Algae are always present in a balanced lake ecosystem. They are the photosynthetic basis of the food web. Algae are eaten by zooplankton, which are in turn eaten by fish. You will know algae are causing reduced Secchi depth if the water generally appears green when you assess the color against the white background of the secchi disc.

Chemistry data was collected on Black Hawk Lake - Deep Hole. The average summer Chlorophyll was 96.4 µg/l (compared to a Southwest Georegion summer average of 34.9 µg/l). The summer Total Phosphorus average was 44.9 µg/l. Lakes that have more than 20 µg/l and impoundments that have more than 30 µg/l of total phosphorus may experience noticeable algae blooms.

The overall Trophic State Index (based on chlorophyll) for Black Hawk Lake - Deep Hole was 69. The TSI suggests that Black Hawk Lake - Deep Hole was **eutrophic**. This TSI usually suggests blue-green algae become dominant and algal scums are possible, extensive plant overgrowth problems possible.

Appendix B
Blackhawk Lake Aquatic Plant Management Permit, 2018



June 13, 2018

Cobb-Highland Recreation Commission
2025 County Rd BH
Highland, WI 53543

PERMIT# SC-2018-25-1157

Subject: Aquatic Plant Management Permit for Blackhawk Lake, Iowa County

Dear Applicant:

Enclosed is your permit for chemical control of dense aquatic plants in 1.1 acres of Blackhawk Lake, Iowa County, Wisconsin. Your permit application has been reviewed and meets the minimum requirements by law and a permit is being issued. Issuance of the permit is not an endorsement or approval for the action authorized.

Permit Conditions:

1. Treatments are limited in area to protect native plants and shoreline habitat for animals that have been documented in the area. Treatment areas are intended to allow shorefishing for anglers, and reduce difficulties with navigation from the pier. Cattail control is allowed to help reclaim the beach area.
2. An endangered frog has been documented in the vicinity, so there are some limits on application rates of diquat. The following herbicides are permitted for use in this pond: diquat (at a dose of 1.0 ppm) and Habitat. Diquat is approved for use at 1.0 ppm for the treatment area where the average depth is 2 feet. (1 gallon per surface acre). A permit amendment must be issued by the department if any herbicide or applicator not already listed on the application form will be added.

Diquat is inactivated when it comes in contact with sediment, so care must be taken to avoid propeller stirring of the sediment in an area to be treated. The applicator should operate the boat in at least 3' of water, and spray toward shore. This will put the diquat where it's needed without stirring up the bottom.

Habitat is to control the cattails which are encroaching on the beach area.

3. The herbicide applicator must follow the disinfection protocol following the signature to reduce the possible spread of fish diseases or other invasive species.
4. Pesticide treatment area signs must identify the areas that are treated with chemicals, and remain posted for the duration of any use restrictions according to the chemicals used.
5. **Supervision of this treatment by DNR staff is required.** Supervision is explained in Section NR107.07(1)(2), Wisconsin Administrative Code. The applicator must schedule supervision by calling me at 608-275-3329 in advance of proposed treatment. (4 day prior is not necessary for this permit).

6. The permit holder must submit form 3200-111 (available online), "Aquatic Plant Management Herbicide Treatment Record", for each treatment as follows:
 1. **Immediately, if any unusual circumstances occur during the treatment.**
 2. **Within 30 days, if treatment occurred.**
 3. **By October 1 of this year, if no treatment occurred.**

Thank-you for complying with Chapter NR 107, Wisconsin Administrative Code concerning aquatic plant management.

Sincerely,



Susan Graham
Lake Management Coordinator
608-275-3329

e-copy. Bradd Sims, DNR Fisheries Manager
Donna Sefton, DFS Conservation Consulting

DISINFECTION PROTOCOLS

Conditions related to invasive species movement. The applicant and operator agree to the following methods required under s. NR 109.05(2), Wis. Adm. Code for controlling, transporting and disposing of aquatic plants and animals, and moving water:

- Aquatic plants and animals shall be removed and water drained from all equipment as required by s. 30.07, Wis. Stats., and ss. NR 19.055 and 40.07, Wis. Adm. Code.
- Operator shall comply with the most recent Department-approved 'Boat, Gear, and Equipment Decontamination and Disinfection Protocol', Manual Code # 9183.1, available at <http://dnr.wi.gov/topic/invasives/disinfection.html>

Chemical Aquatic Plant Control Application and Permit
 Wisconsin Pollutant Discharge Elimination System (WPDES)
 Pesticide Pollutant Permit Application

Form 3200-004 (R 02/17)

Page 1 of 4

Notice: Use of this form is required by the Department for any application filed pursuant to s. 281.17(2), Wis. Stats., and Chapters NR 107, 200 and 205, Wis. Adm. Code. This permit application is required to request coverage for pollutant discharge into waters of the state. Personally identifiable information on this form may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

DNR Use Only	
ID Number SC-2018-25-1157	Permit Expiration Date
Waterbody # 1239400	Fee Received \$70

Section I – Applicant Information – Name of Permit Applicant. Also indicate names and addresses of all individuals, associations, communities or town sanitary districts sponsoring treatment. Attach additional sheets if necessary.

Home Address	Name Cobb-Highland Recreation Commission			Waterbody Address	Name Daniel Welsh		
	Street Address 2025 County Rd BH				Street Address 2025 County Rd BH		
	City Highland	State WI	Zip 53543		City Highland	State WI	Zip 53543
Phone Number (include area code) Primary 608-623-2707 x. Secondary 608-574-5573				Email Address bhlake@mhtc.net			

Section II – Aquatic Plant Control Location

Water body to be Treated (water body where treatment area is located) Blackhawk Lake				Lake Surface Area 220.00 acres	Estimated Surface Area that is 10 Feet or Less in Depth acres
County Iowa	Section 6	Township 07 N	Range 2	Name of Applicator or Firm Wisconsin Lake and Pond Resource	
Latitude: 43.025654		Longitude: -90.288626		Street or Route	
Is there more than one property owner? <input type="radio"/> Yes <input checked="" type="radio"/> No Is there surface water discharge? <input checked="" type="radio"/> Yes <input type="radio"/> No Does the water body have public access? <input checked="" type="radio"/> Yes <input type="radio"/> No If all are no the it is considered to be a private pond				City Eldorado	State WI
Adjacent Riparian Owner Names 1. Type Name Here				County	Phone Number (include area code)
				Email Address Mark@WisconsinLPR.com	
				Applicator Certification Number for Category 5 Aquatic Pesticide Application JS77803 & MK82178 OK	
				Business Location License Number (if applicable) 93-015182-012226	
Name of Lake Property Owners' Association Representative or Lake District Representative (if none, please indicate)				Restricted Use Pesticide License Number (if applicable)	

Area(s) Proposed for Control: (Note details in permit cover letter for final permitted sizes of treatment areas.)

Treatment Length	Treatment Width	Estimated Acreage	Average Depth	Calculated Volume
2,400 ft	x 20 ft	÷ 43,560 ft ² = 1.10 ac	3 ft = 3.31 ac-ft	
Estimated Acreage Grand Total		1.10 ac	Calculated Volume Grand Total	3.31 ac-ft

If the estimated acreage is greater than 10 acres, or is greater than 10 percent of the estimated area 10 feet or less in depth in Section II, complete and attach Form 3200-004A, Large-Scale Treatment Worksheet. Private pond treatments are exempted from this requirement.

Is the area with in or adjacent to a sensitive area designated by the Department of Natural Resources. <input type="radio"/> Yes <input checked="" type="radio"/> No	DNR Use: NHI Review? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Describe: <i>See cover letter</i>
---	--

Section III - Fees

1. s. NR 107.11(1), Wis. Adm. Code, lists the conditions under which the permit fee is limited to the \$20 minimum charge.
2. s. NR 107.11(4), Wis. Adm. Code, lists the uses that are exempt from permit requirements.
3. s. NR 107.04(2), Wis. Adm. Code, provides for a refund of acreage fees if the permit is denied or if no treatment occurs.
4. Fee calculations: If Proposed treatment is over 0.25, calculate acreage fee:
(round up to nearest whole acre, to maximum of 50 acres)

$$\underline{1.10} \text{ acres} \times \$25 \text{ per acre} = \$ \underline{50.00}$$
 If proposed treatment is less than 0.25 acre, acreage fee is \$0

Acreage Fee (from above) \$	50.00
Basic Permit Fee (non-refundable) \$	20.00
Total Fee Enclosed \$	70.00

Site Map: Attach a sketch or a printed map of lake indicating area and dimensions of each individual area where plant control is desired and flow of surface water outside treatment area. Also show location of property owners riparian to and adjacent to the treatment area. Attach a separate list of owners and corresponding treatment dimension coded to the lake map, if necessary.

Section IV - Reasons for Aquatic Plant Control

Is this permit being requested in accordance with an approved Aquatic Plant Management Plan? Yes No

Treatment Type
 Lake Pond Wetland Marina Other

Goal of Aquatic Plant Control:

- Maintain navigation channel
- Maintain boat landing and carry in access
- Improve fish habitat
- Maintain swimming area
- Control of invasive exotics
- Other

Nuisance Caused By:

- Algae
- Emergent water plants (majority of leaves & stems growing above water surface, e.g. cattail, bulrushes)
- Floating water plants (majority of leaves floating on water surface, e.g., water lilies, duckweed)
- Submerged water plants (leaves & stems below surface, flowering parts may be exposed: milfoil, coontail)
- Other

Note: Different plants require different chemicals for effective treatment. Do not purchase chemical before identifying plants.

List Target Plants

Increased amount of re-invading cattails and mixed submersed native plants

Section V - Chemical Control

Alternatives to Chemical Control:	Feasible?	If No, Why Not?
1. Mechanical harvesting	<input type="radio"/> Yes <input checked="" type="radio"/> No	Insufficient labor force/resources
2. Manual removal	<input type="radio"/> Yes <input checked="" type="radio"/> No	Insufficient labor force/resources
5. Sediment screens/covers	<input type="radio"/> Yes <input checked="" type="radio"/> No	
6. Dredging	<input checked="" type="radio"/> Yes <input type="radio"/> No	Dollar resources not available at the time
7. Lake drawdown	<input type="radio"/> Yes <input checked="" type="radio"/> No	
8. Nutrient controls in watershed	<input type="radio"/> Yes <input checked="" type="radio"/> No	
9. Other:	<input type="radio"/> Yes <input checked="" type="radio"/> No	

Note: If proposed treatment involves multiple properties, consider feasibility of EACH alternative for EACH property owner.

If you checked yes to any of the alternatives listed above, please explain your decision to use chemical controls:

referral by DNR water plant specialist

Chemical Aquatic Plant Control Application and Permit
Wisconsin Pollutant Discharge Elimination System (WPDES)
Pesticide Pollutant Permit Application

Form 3200-004 (R 02/17)

Page 3 of 4

Trade Name of Proposed Chemical(s)

Diquat and Habitat and/or recommendations from WLPR and WDNR

Method of Application: Spot

Will surface water outflow and/or overflow be controlled to prevent chemical loss? Yes No

Have the proposed chemicals been permitted in a prior year on the proposed site? All Some None

What were the results of the treatment?

Moderate control - needed retreatment

For private ponds and wetlands please ignore the next question

Is the treatment area greater than 5% of surface area? Yes No

If yes, calculate whole lake concentration (in ppm). Refer to DNR Lake pages <http://dnr.wi.gov/lakes> to answer the following:

Does the lake stratify? Yes No
If yes, calculate whole lake concentration using volume above thermocline.

No
If no, calculate whole lake concentration using total lake value

Whole Lake Concentration _____ ppm

Note: Chemical fact sheets for aquatic pesticides used in Wisconsin are available from the Department of Natural Resources upon request.

Section VI- Applicant Responsibilities and Certification

- 1 The applicant has prepared a detailed map which shows the length, width and average depth of each area proposed for the control of rooted vegetation and the surface area in acres or square feet for each proposed algae treatment.
- 2 The applicant understands that the Department of Natural Resources may require supervision of any aquatic plant management project involving chemicals. Under s.NR 107.07 Wis. Adm. Code, supervision may include inspection of the proposed treatment area, chemicals and application equipment before, during or after treatment. The applicant is required to notify the regional office 4 working days in advance of each anticipated treatment with the date, time, location and size of treatment unless the Department waives this requirement. Do you request the Department to waive the advance notification requirement?
 Yes No
- 3 The applicant agrees to comply with all terms or conditions of this permit, if issued, as well as all provisions of Chapter NR 107, Wis. Adm. Code. The required application fee is attached.
- 4 The applicant has provided a copy of the current application to any affected property owners' association inland Lake District and, in the case of chemical applications for rooted aquatic plants, to all owners of property riparian or adjacent to the treatment area. The applicant has also provided a copy of the current chemical fact sheet for the chemicals proposed for use to any affected property owner's association or inland Lake District.
- 5 Conditions related to invasive species movement. The applicant and operator agree to the following methods required under s.NR 109.05(2), Wis. Adm. Code for controlling, transporting and disposing of aquatic plants and animals, and moving water:
 - Aquatic plants and animals shall be removed and water drained from all equipment as required by s.30.07, Wis. Stats., and ss. NR 19.055 and 40.07, Wis. Adm. Code.
 - Operator shall comply with the most recent Department-approved 'Boat, Gear, and Equipment Decontamination and Disinfection Protocol', Manual Code #9183.1, available at <http://dnr.wi.gov/topic/invasives/disinfection.html>.

Check if you are signing as Agent for Applicant.

I hereby certify that the above information is true and correct and that copies of this application have been provided to the appropriate parties named in Section II and that the conditions of the permit and pesticide use will be adhered to.

All portions of this permit, map and accompanying cover letter must be in possession of the chemical applicator at the time of treatment. During treatment all provisions of Chapter NR 107 107.07 and NR 107.08, Wis. Adm. Code, must be complied with, as well as the specific conditions contained in the permit cover letter.

Section VII - WPDES Permit Request

Is WPDES coverage being requested? Refer to <http://dnr.wi.gov/topic/wastewater/aquaticpesticides.html> for more information.

- No Yes - complete section VII with signature.
 Already have WPDES
 WPDES coverage not needed

- Select which permit you are requesting: WI-0064556-1 Aquatic Plants, Algae & Bacteria
 WI-0064564-1 Aquatic Animals
 WI-0064581-1 Mosquitoes & other Flying Insects

Indicate WPDES permittee responsible for the pollutant discharge: Applicator Sponsor

Do you expect the pest control activity will result in a detectable pollutant discharge to waters of the state beyond the treatment area boundary or a pollutant residual in waters of the state after the treatment project is completed? Yes No

If yes, identify the pollutant(s):

Are you planning to incorporate integrated pest management principles, as specified in the WPDES permit, into your pest control activity to minimize any pollutant residual or pollutant discharge beyond the treatment area? Yes No

Type of WPDES coverage being requested: One Treatment Site Statewide Coverage

For informational purposes, select areas of WI for most of your aquatic treatments: NE NW SW SE

Is WPDES coverage being requested for more than 1 year? Yes No

If yes, the permittee will remain in "active" WPDES status until a Notice of Termination is submitted

Section VIII – Permit to Carry Out Chemical Treatment (Leave Blank – DNR Use Only)

The foregoing application is approved. Permission is hereby granted to the applicant to chemically treat the waters described in the application during the season of 20 18.

Application fee received?

- Yes No

State of Wisconsin
 Department of Natural Resources
 For the Secretary

Advance notification of treatment required?

- Yes No

By Susan Graham
 Regional Director or Designee

6/13/18
 Date Signed

6/13/18
 Date Mailed

Please Note:

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to ss. 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to s. 227.48(2), Wis. Stats.

To request a contested case hearing pursuant to s. 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filing of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30-day period for filing a petition for judicial review.



Blackhawk Lake Chemical Treatment Areas 2018



Legend

- Rivers and Streams
- Intermittent Streams
- Lakes and Open water
- Index to EN_Image_BaseMap_Leaf_Cnt



NAD_1983_HARN_Wisconsin_TM

1: 1,826

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notice web page <http://dnr.wi.gov/legal/>

Notes

Appendix C
“Water Quality and Blue-green Algae”
Power Point Presentation, 2018



Water Quality and Blue Green Algae

Donna Sefton
Aquatic Ecologist

Learn About

- ▶ Blackhawk L water quality, aquatic plants, and algae
- ▶ What are **blue green algae**
- ▶ Why they are of concern
- ▶ How you can protect yourself and your pets
- ▶ What can be done to prevent algae blooms



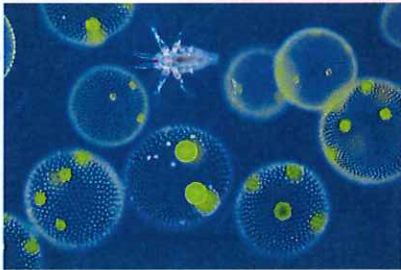
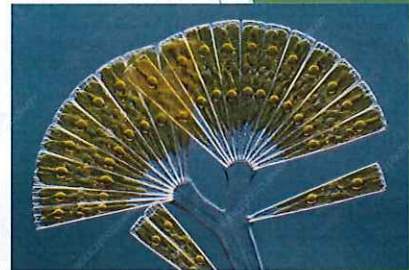
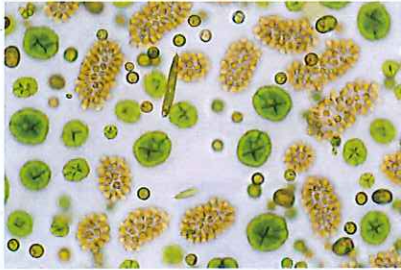
Blackhawk Lake Water Quality



Eurasian Water Milfoil

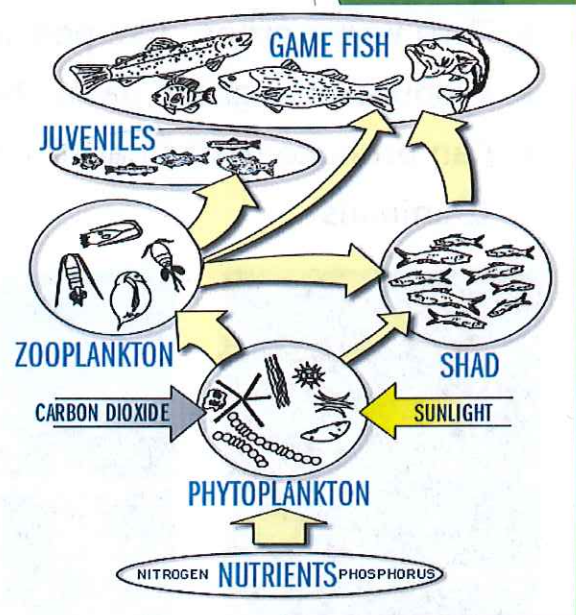


What Are Algae?



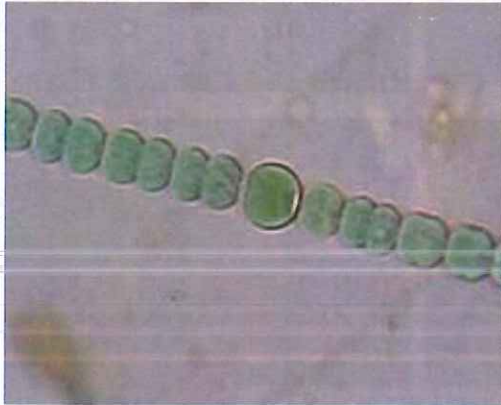
Algae

- ▶ Contain **chlorophyll** pigment
- ▶ Carry out **photosynthesis**:
 $\text{light} + \text{CO}_2 + \text{H}_2\text{O} = \text{carbohydrates} + \text{O}_2$
- ▶ Lack roots, stems, leaves
- ▶ Microscopic, multicellular, colonies
- ▶ Nutrients (**fertilizers like nitrogen & phosphorus**) make grow
- ▶ **Phytoplankton** base of food web
- ▶ Having some algae good - blooms, blue green algae not good



What Are Blue Green Algae?

- ▶ Primitive, among oldest living things (3 billion yrs)
- ▶ Cyano (blue-green) bacteria
- ▶ Microscopic, but may form filaments or colonies



Why Are Blue Green Algae of Concern?

- ▶ Turn water green, like pea soup
- ▶ Produce blue-green paint slick on decay
- ▶ Can produce toxins harmful to humans & animals



Other Concerns with Blue Green Algae

- ▶ Unsightly water
- ▶ Taste and odor, toxins
- ▶ Reduce light penetration
- ▶ Uses oxygen when decays
- ▶ Fish kills
- ▶ Not desirable food for zooplankton or fish



Anabaena (Annie)



Aphanizomenon (Fanny)



Microcystis (Mike)



Blue green algae toxins & symptoms

▶ Skin

- rash, hives, blisters



▶ Gastrointestinal system

- stomach pain, nausea, vomiting, diarrhea



Blue green algae toxins & symptoms

▶ Respiratory system

- runny eyes/nose, sneezing, cough, sore throat, allergies, asthma, difficulty breathing



▶ Liver

- weakness, tissue damage, tumors



Blue green algae toxins & symptoms

▶ **Headache, fever**

▶ **Nervous system**

- fatigue, seizures,
disorientation, paralysis



Should you let your kids or pets play in this?

BAD IDEA!

Algae are common in lakes and rivers. But at high concentrations a type called "blue-green" algae can make people and animals sick.

What to look for:

- Does the water look "pea soupy"?
- Does it smell swampy?

Blue-green algae can:

- irritate skin, eyes and nasal passages and make you sick.
- poison your pets or livestock – animals have died from it.

If you or your pets have come in contact with blue-green algae, **wash thoroughly.** Think you or animals are sick from it? Call a doctor or veterinarian immediately.

When in doubt, best keep out!

This poster prepared by the Minnesota Interagency Work Group on Blue-Green Algae.

In Wisconsin - <http://dnr.wi.gov/lakes/bluegreenalgae/>



CAUTION

WATER QUALITY ADVISORY

This water may contain blue-green algae capable of producing toxins that can be dangerous to humans and pets.



FOR YOUR SAFETY

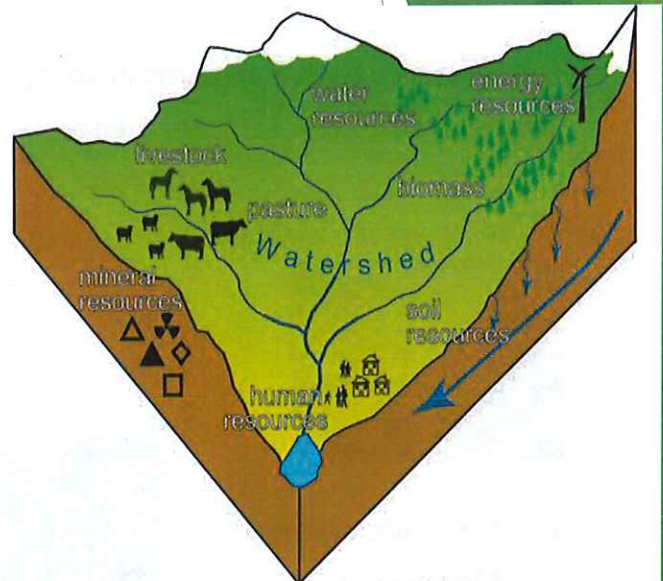
- If water is cloudy, looks like green paint or pea soup, or has a floating scum layer or floating clumps
 - Do not swim or swallow water
 - Do not allow pets to swim or drink
 - Do not allow children to play in scum layer from shoreline
- Rinse off after swimming

For more information please contact the

LOCAL HEALTH DEPARTMENT at () -

What Causes Algae Blooms?

- ▶ Fertilizers containing nutrients - nitrogen & phosphorus - make grow
- ▶ 1 lb phosphorus = 500 lbs of algae
- ▶ Activities in watershed affect WQ
- ▶ Nutrients & soil wash in
- ▶ Nutrients released when larger aquatic plants die off
- ▶ Algae multiply quickly in hot & calm weather



What Can Be Done to Prevent Algae Blooms?

- ▶ Use only amount of fertilizer needed at proper time



- ▶ Prevent soil erosion



- ▶ Manage animal waste storage and spreading



What Can Be Done to Prevent Algae Blooms?

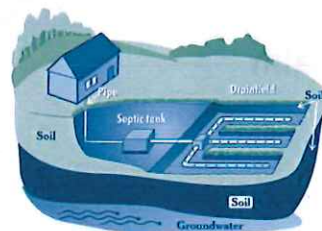
- ▶ Keep/restore native vegetation along shore - don't mow to water's edge



- ▶ Protect/restore wetlands



- ▶ Ensure septic systems working properly



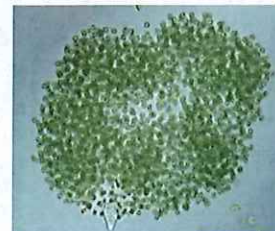
What Can Be Done to Prevent Algae Blooms?

- ▶ Reduce Stormwater Runoff
 - Basins
 - Erosion control materials
 - Keep waste, leaves out of storm drains



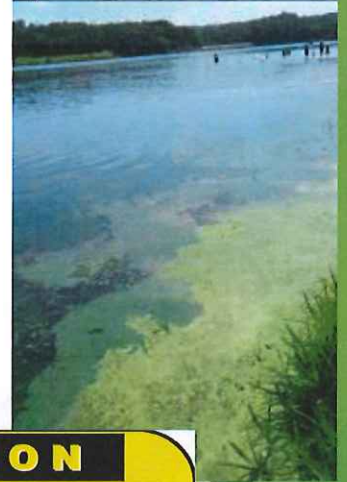
Blue Green Algae Summary

- ▶ Contain blue green chlorophyll pigment
 - ▶ Photosynthesize
 - ▶ No roots, stems, leaves
 - ▶ Primitive, more like bacteria
-
- ▶ Microscopic cells, filaments, colonies




Blue Green Algae Summary

- ▶ Make water cloudy, pea soup, blue green paint slick, scummy
- ▶ Can produce **toxins**: skin, liver, respiratory, nervous system
- ▶ **Keep people & pets out of water if present**
 - don't wade, swim, swallow
- ▶ **Wash** thoroughly if contact
- ▶ **If sick after exposure, contact doctor or vet**
- ▶ Best management practices to prevent



CAUTION
WATER QUALITY ADVISORY

This water may contain blue-green algae capable of producing toxins that can be dangerous to humans and pets.



FOR YOUR SAFETY

- If water is cloudy, looks like green paint or pea soup, or has a floating scum layer or floating clumps
- Do not swim or swallow water
- Do not allow pets to swim or drink
- Do not allow children to play in scum layer from shoreline
- Rinse off after swimming

For more information please contact the
LOCAL HEALTH DEPARTMENT at () -

Enjoy Blackhawk Lake!



Questions?

