

**BLACKHAWK LAKE AQUATIC INVASIVES SPECIES EDUCATION,
PREVENTION & PLANNING GRANT (AEPP-410-14) REPORT FOR 2014
January, 2015**

Water Quality Monitoring

Blackhawk Lake was monitored by DFS Conservation Consulting (DFS CC) for Secchi disk transparency on 5/8, 5/18, 5/31, 6/6, 6/13, 6/24, 6/27, 7/18, 8/8, 8/22, 9/9 and 9/16/14, for phosphorus on 5/18/14 and for phosphorus and chlorophyll on 6/24, 7/18, and 8/22/14. Data was entered into DNR’s Surface Water Integrated Monitoring System (SWIMS). The 2014 water quality data and report, as well as Secchi disk transparency and Trophic State Index comparisons between 1997 and 2014 are found in Appendix A.

There was a very cold winter that lingered into spring 2014. The season was about 2 weeks behind normal. Curly-leaf pondweed growth is usually abundant in May, but there was less and later growth than usual. The Secchi ranged from 10 to 20 feet in May to mid-June. The water was clear at this time – beautiful or with very minor aesthetic problems. Water clarity declined to 5 feet in August and remained below that for the rest of the monitoring season. As the curly-leaf pondweed senesced in later July, nutrients became readily available to fuel blue-algae blooms, especially along the shoreline, from mid-July through September. It is unusual to have blue-green algae blooms in the lake, and especially for that long time period. It was recommended that Water Quality Advisory signs be posted at the beach and boat landing since blue-green algae toxins can be harmful to people and pets.

Aquatic Plant Monitoring

Visual and rake boat surveys for Eurasian Water Milfoil (EWM) were conducted on 5/8, 5/18, 5/31, 6/6, 6/13, 6/24, 7/18, 8/8, 8/22, 9/9 and 9/16/14. A point-intercept Aquatic Plant Survey was conducted on 78 sites in the northern 1/5 of the lake on 6/27 with assistance from Jeanne Sherer and Katrina Punzel of the Dept of Natural Resources. Eleven species of plants were found, with curly-leaf pondweed, slender pondweed, and coontail by far the most abundant. No EWM was found in any of the surveys. Since the point-intercept survey was not completed for the entire lake, the complete survey was postponed to 2015.

5/18/14 Water Quality and Aquatic Plants



S side-concession dock



End of concession dock



Shoreline near fishing pier



Fishing pier-concession dock



Beach



Cattails emerging-S beach

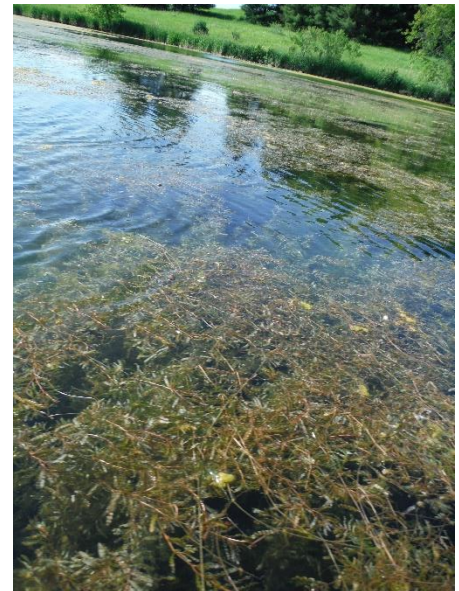
6/14/14 Water Quality and Aquatic Plants



Curly leaf pondweed-sand ridge



Curly-leaf/slender pw-sand ridge



Curly-leaf pondweed-sand ridge



Pontoon Bay



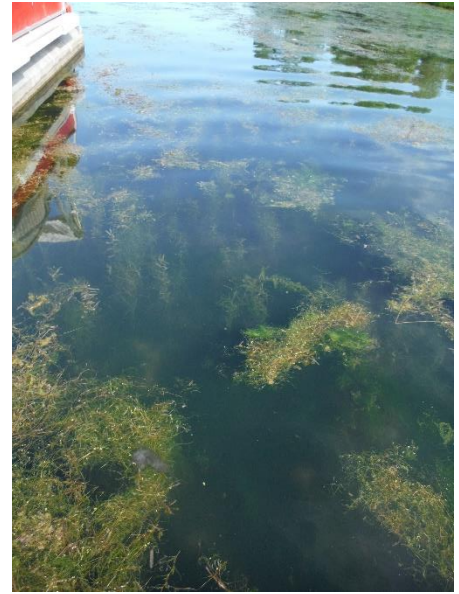
Beach with cattails on left in area to be reclaimed



Curly-leaf in deeper water-beach



Concession dock – N side CLP



Concession dock–S side slender pw



Boat landing



Deeper water-boat landing



Shallow water-boat landing

7/18/14 Water Quality and Aquatic Plants



Pontoon Bay looking N. Filamentous algae over plants



Beach area



Slender pondweed on sand ridge. Little curly-leaf left.

Boat concession area



Slender pondweed on sand ridge

Slender pondweed-boat concession

Slender pondweed-boat concession



Btwn boat concess & beach

Slender pw, stargrass fishing pier

Floating-leaf pondweed (*P. natans*) near beach



Boat landing -Elodea &filam algae



Boat landing-slender/sago pondweed



Boat landing blue-green algae bloom

8/22/14 Water Quality and Aquatic Plants



Water stargrass, boat concession



Blue-green algae bloom forming



Beach area from a distance



Beach area blue-green algae



Boat launch plants



Boat launch blue-green algae bloom

9/16/14 Water Quality and Aquatic Plants



Blue-green algae, boat launch



Blue-green algae, boat launch



Blue-green algae, boat launch



Blue-green algae at beach



Blue-green algae, boat concession



Blue-green algae at fishing pier

Recommendations for Aquatic Plant Management

Blackhawk Lake Recreation Area applied for a permit to chemically treat the areas around the beach, concession dock and fishing pier in July 2014. By the time they received the permit and could arrange for treatment, the plants were no longer a severe nuisance and beneficial native plants, such as water stargrass and Potamogeton natans (floating leaf pondweed) were present, so no treatment was done.

The following recommendations are made regarding aquatic plant management in 2015. The Blackhawk Lake Recreational Area should apply for a permit to chemically treat within 50 feet of the concession dock and the fishing pier to maintain navigational and fishing access in these areas and the entire beach area to maintain swimming access. The treatment should be done between mid-May and mid-June as needed before nuisance curly leaf pondweed, slender pondweed, sago pondweed, and coontail become abundant and impair recreational use. Treatment should not be done after 7/15, as beneficial plants such as water stargrass and floating-leaf pondweed are present at that time.

If the Blackhawk Lake Recreation Area wants to reclaim the beach area lost over time, they will need to obtain permits from DNR Water Regulations and Zoning and/or the Lakes Coordinator. The plants in this area during spring and early summer are primarily curly-leaf pondweed, sago pondweed, and coontail, the same ones that that impair navigation and fishing around the concession boat dock and fishing pier and swimming around the beach. Cattails in this area will also likely need to be treated to provide access to the shoreline.

Clean Boats, Clean Waters

Blackhawk Lake Recreation Area and DFS Conservation Consulting staff attended Clean Boats, Clean Waters training at the DNR Service Center in Dodgeville on 5/19/14. The Cobb-Highland Recreation Commission received a Clean Boats, Clean Waters grant to do watercraft inspections and education at Blackhawk and the Blackhawk Recreation Area staff implemented the grant in 2014. Brochures on Eurasian water milfoil and aquatic invasive species were placed in a prominent place at the front desk in the office.

Educational Workshops

Workshops on Water Quality and Aquatic Invasive Species were conducted for the Highland Middle School students on 9/9/14 and for the High School Environmental Club on 9/16/14. The teachers and students found them to be interesting and beneficial.

9/9/14 Aquatic Invasive Species and Water Quality Workshop for Highland Middle School



AIS wksp for Highland Middle Sch



AIS workshop by Laura Spears



Water Quality Monitoring workshop



Water quality workshop for Highland Middle School



Students using the water quality monitoring equipment

9/16 Aquatic Invasive Species and Water Quality Workshop for Highland High School



Highland Environmental Club canoeing basics



Highland Environmental Club canoeing basics



Getting into canoes (note blue-green algae bloom)



View from beach to fishing pier & concession dock



Students on pontoon for water quality & AIS training



Students on pontoon for water quality & AIS training



Going out to WQ sample site



Filtering chlorophyll on shore



Workshop leaders Donna Sefton & Laura Spears

Appendix A
2014 Water Quality Data

Lake Water Quality 2014 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 (ft)	SD (m)	Hit Bottom	CHL	TP	TSI (SD)	TSI (CHL)	TSI (TP)	Lake Level	Clarity	Color	Perception
05/08/2014	12	3.7				41			NORMAL	CLEAR	BLUE	2-Very minor aesthetic problems
05/18/2014	10	3			16.3	44		50	NORMAL	CLEAR	BLUE	2-Very minor aesthetic problems
05/31/2014	17	5.2				36			NORMAL	CLEAR	BLUE	1-Beautiful, could not be nicer
06/06/2014	20	6.1				34			NORMAL	CLEAR	BLUE	1-Beautiful, could not be nicer
06/13/2014	17	5.2				36			NORMAL	CLEAR	BLUE	1-Beautiful, could not be nicer
06/24/2014	14	4.3		4.77	10.4	39	47	46	NORMAL	CLEAR	BLUE	2-Very minor aesthetic problems
06/27/2014	13	4				40			NORMAL		BLUE	2-Very minor aesthetic problems
07/18/2014	14	4.3		10.1	20.2	39	52	51	NORMAL	MURKY	GREEN	4-Would not swim but boating OK (algae)
08/08/2014	5	1.5				54			NORMAL	MURKY	GREEN	5-Enjoyment substantially impaired (algae)
08/22/2014	3	0.9		45	47.1	61	64	58	NORMAL	MURKY	GREEN	5-Enjoyment substantially impaired (algae)
09/09/2014	4	1.2				57			NORMAL	MURKY	GREEN	4-Would not swim but boating OK (algae)
09/16/2014	3	0.9				61			HIGH	MURKY	GREEN	5-Enjoyment substantially impaired (algae)

Date	Collector Comments
05/08/2014	Partly cloudy- calm. Concession dock area: water clear with some filamentous algae + curly-leaf pondweed- lots of panfish. Boat launch area murky (brown) with no plants near shore. Pontoon bay: some floating filamentous algae- water buttercup just coming up. Boat/rake survey found no Eurasian watermilfoil.
05/18/2014	Partly cloudy- wind from W @ 8 mph. 70's. Curly leaf pondweed primary plant- but not as much growth as there usually is this time of year. Boat/rake survey found no Eurasian water milfoil.
05/31/2014	Clear- slight breeze- mostly curly-leaf pondweed. Sago pondweed- water stargrass- water buttercup just emerging. Not much coontail on bottom on sand ridge. Boat/rake survey found no Eurasian water milfoil.
06/06/2014	Partly cloudy- breeze from SW @ 7 mph- 80's. Lots of curly-leaf pondweed- some sago pondweed- little coontail. Water stargrass and water buttercup coming up. Boat/rake survey found no Eurasian water milfoil.
06/13/2014	Clear- calm. Lots of curly-leaf pondweed and narrow leaf pondweed. Some elodea- coontail- and sago pondweed in shallow areas. Boat/rake survey found no Eurasian water milfoil.
06/24/2014	Partly cloudy- slight breeze. Boat/rake survey found no Eurasian water milfoil. Shallows by boat landing has coontail- sago pondweed- elodea- water stargrass- curly-leaf pondweed- water buttercup- narrow leaved pondweed- filamentous algae + duckweed.
06/27/2014	Partly cloudy. Breezy. Point-intercept aquatic plant survey completed on northern part of lake. No Eurasian water milfoil found.
07/18/2014	Partly cloudy- slight breeze- 80's. Little curly-leaf pondweed. Mostly sago pondweed on sand ridge. No Eurasian water milfoil observed with boat/rake survey. Blue-green algae "paint slick" bloom at boat landing and concession and fishing docks- but not at beach. Recommended post water quality advisory signs.
08/08/2014	Partly cloudy- 80's- slight breeze. Sago pondweed dying off- water stargrass becoming more abundant near shore + by docks. Potamogen natans between beach and concession dock. Looks like pea soup near shore. Obvious blue-green algae bloom (probably Microcystis) throughout lake. Recommended post water quality advisory signs.
08/22/2014	Partly cloudy- 80's- humid. Obvious blue-green algae bloom. Recommended post water quality advisory signs. Aquatic plants decaying. Boat/rake survey found no Eurasian water milfoil.
09/09/2014	Partly cloudy- calm- water green- but not an obvious blue-green algae bloom.
09/16/2014	Calm- 65. Water green. Blue-green algae "paint slick" at landing and boat concession area. Boat/rake survey found no Eurasian water milfoil. Recommended post water quality advisory signs.

Date	Data Collectors	Project
05/08/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
05/18/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
05/31/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
06/06/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
06/13/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
06/24/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
06/27/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
07/18/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
08/08/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
08/22/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
09/09/2014	Donna Sefton	Citizen Lake Monitoring - Water Quality - Black Hawk Lake; Blackhawk Lake
09/16/2014	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: 12/23/2014

Blackhawk Lake

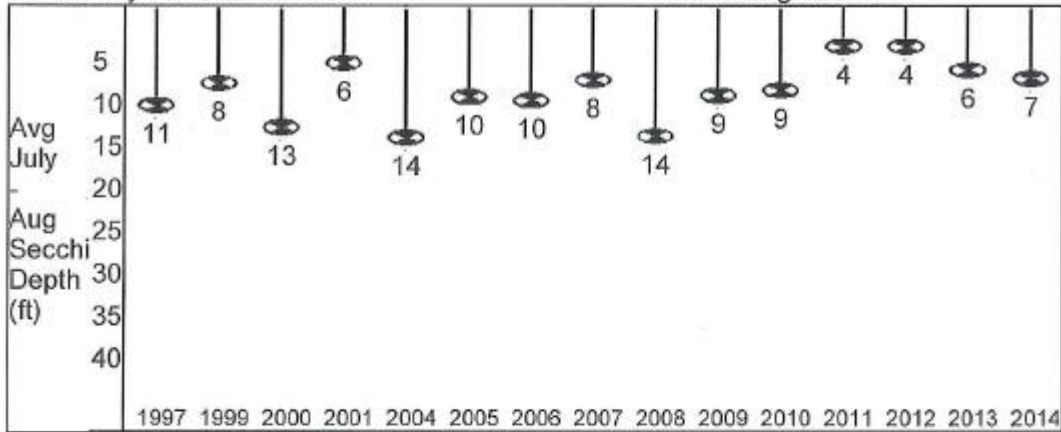
Iowa County

Waterbody Number: 1239400

Lake Type: DRAINAGE

DNR Region: SC

GEO Region: SW

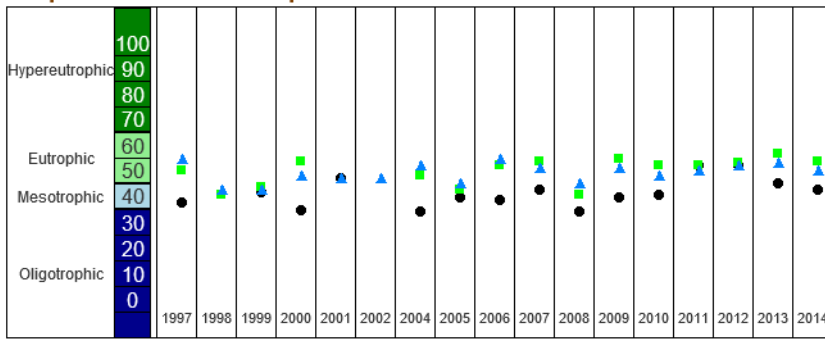


Past secchi averages in feet (July and August only).

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	7.6	4	18	6
2008	14.13	13.25	15	2
2009	9.42	4.5	15.75	3
2010	8.83	4.5	17	3
2011	3.67	3	5	3
2012	3.67	3	4	3
2013	6.33	3	10	3
2014	7.33	3	14	3

Report Generated: 12/23/2014

Trophic State Index Graph



Monitoring Station: Black Hawk Lake - Deep Hole, Iowa County

Past Summer (July-August) Trophic State Index (TSI) averages.

● = Secchi ■ = Chlorophyll ▲ = Total Phosphorus	
TSI(Chl) = TSI(TP) = TSI(Sec)	It is likely that algae dominate light attenuation.
TSI(Chl) > TSI(Sec)	Large particulates, such as Aphanizomenon flakes dominate
TSI(TP) = TSI(Sec) > TSI(Chl)	Non-algal particulate or color dominate light attenuation
TSI(Sec) = TSI(Chl) >= TSI(TP)	The algae biomass in your lake is limited by phosphorus
TSI(TP) > TSI(Chl) = TSI(Sec)	Zooplankton grazing, nitrogen, or some factor other than phosphorus is limiting algae biomass

Black Hawk Lake - Deep Hole 2014 Results



Black Hawk Lake - Deep Hole was sampled 12 different days during the 2014 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 7.33 feet. The average for the Southwest Georegion was 3.8 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 27.6 µg/l (compared to a Southwest Georegion summer average of 62 µg/l). The summer Total Phosphorus average was 33.7 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 60. The TSI suggests that Black Hawk Lake - Deep Hole was **eutrophic**. This TSI usually suggests decreased clarity, fewer algal species, oxygen-depleted bottom waters during the summer, plant overgrowth evident, warm-water fisheries (pike, perch, bass, etc.) only.

