



Bluegill Sunfish from Gleason Lake, October, 2011

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## Fish Survey of Gleason Lake (ID #27-0095), Plymouth, Minnesota in 2011

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Survey Dates: October 5 - 6, 2011

**MnDNR Permit Number: 17693**

Prepared for:  
City of Plymouth and  
MnDNR



Prepared by:  
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## Introduction

Gleason Lake (ID: 27-0095) is a 142-acre shallow lake, located in Plymouth, Minnesota. In October 2011, the City of Plymouth sponsored a fish survey conducted by Blue Water Science under permit number 17693 granted from the MnDNR. The objectives were to characterize the fish community in Gleason Lake.

## Methods

Six standard trapnets were sampled for two days for a total of twelve lifts to survey fish in Gleason Lake. The trapnet was a MnDNR-style with a 4 x 6 feet square frame with two funnel mouth openings and 50-foot lead. Net mesh size was 3/8 inch. Six standard trap nets were set on Tuesday morning October 4, 2011. Six nets were fished for the following 2 days (October 5, 6). Trapnet locations are shown in Figure 1 and pictures of a typical trapnet operation are shown in Figure 2.

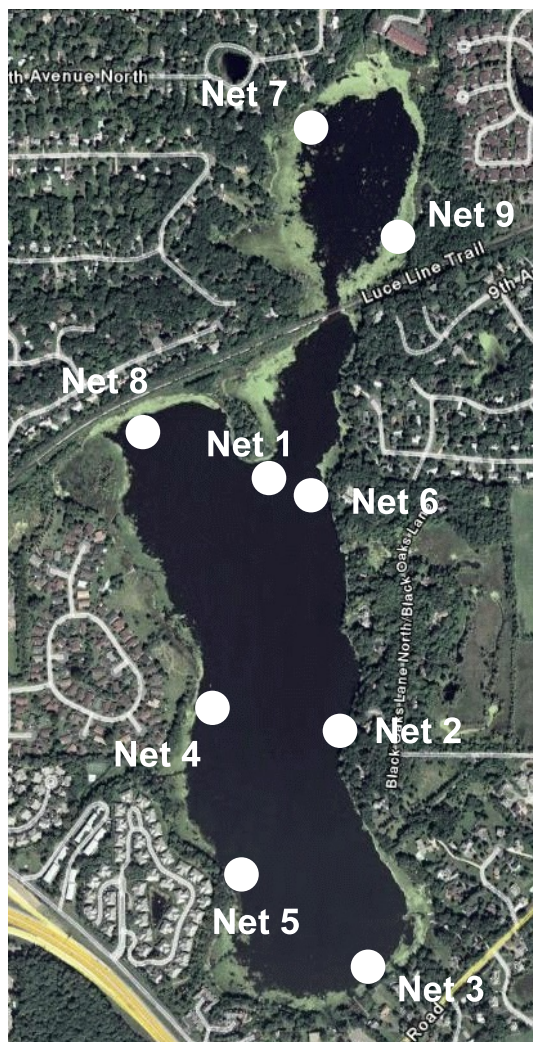


Figure 1. Map of trapnet sets in Gleason Lake.



**A trapnet is a live fish trap. Fish run into the 50-foot lead net and follow it back through a series of hoops with funnel mouths. Fish end up in the back hoop. The flag marks the end of the back hoop**



**A dip net is used to remove the fish from the back of the trapnet.**



**Fish are transferred to tubs, then they are counted and measured and released.**

**Figure 2. Trapnet set and fish sampling in the Gleason Lake fish survey.**

# Results

**Fish Results:** A total of eight fish species were sampled in Gleason Lake on October 5 and 6, 2011. Bluegill sunfish were the most abundant species followed by yellow bullhead. Nets 3 and 5 were the most productive (Table 1). The average number of bluegills caught per net was high with an average haul of 65 fish per net (Table 1). Carp and largemouth bass abundance was low based on standard ranges compiled by the MnDNR. Pumpkinseed sunfish and black crappies had moderate populations with an average of 2.3 fish per net and 3.5 fish per net respectfully. In addition to the sampling adults, a number of bluegill sunfish and black crappies that were less than three inches were caught, but not included in the statistics (referred to as young-of-the-year (YOY) in Table 1).

**Turtle Results:** Snapping turtles and painted turtles were also sampled in the trapnets and were common in Gleason Lake. Painted turtles and snapping turtles likely do well because there is a fair percentage of a natural shoreline area. Average weight of painted turtles was 0.6 lbs/turtle (n=20).

**Table 1. Gleason Lake trapnet results for the number of fish sampled for the fish survey conducted in October 2011.**

	October 5 - 6, 2011												Total Catch	Fish per Net (n=12)	Normal Range (MnDNR)
	Net 1	Net 2		Net 3		Net 4	Net 5	Net 6	Net 7	Net 8		Net 9			
	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 1	Day 1	Day 2	Day 2			
Bluegills ( <i>Lepomis macrochirus</i> )	73 (18 yoy)	76	33	76	185	28	79	61	12	52	104 (2 yoy)	2	781 (20 yoy)	65 (1.7 yoy)	1.9 - 29.5
Black crappies ( <i>Pomoxis nigromaculatus</i> )	2 (5 yoy)	9	1	6	9	0	0	0	4 (2 yoy)	3 (8 yoy)	8 (3 yoy)	0	42 (18 yoy)	3.5 (1.5 yoy)	2.4 - 15.1
Carp ( <i>Cyprinus carpio</i> )	2	0	0	0	0	0	0	0	0	0	0	0	2	0.2	1.0 - 3.6
Largemouth bass ( <i>Micropterus salmoides</i> )	0	0	0	1	0	1	0	0	1	0	0	0	3	0.3	0.3 - 1.2
Northern pike ( <i>Esox lucius</i> )	0	2	0	0	0	0	2	1	0	0	0	0	5	0.4	NA
Pumpkinseed ( <i>Lepomis gibbosus</i> )	5	0	1	1	9	1	3	2	2	2	0	2	28	2.3	0.8 - 8.4
Yellow bullhead ( <i>Ameiurus natalis</i> )	4	8	4	2	3	0	14	7	0	12	7	0	61	5.1	0.8 - 6.2
Yellow perch ( <i>Perca flavescens</i> )	1	0	0	0	0	0	0	0	0	0	0	0	1	0.1	NA
TOTAL FISH	87 (23 yoy)	95	39	86	206	30	98	71	19 (2 yoy)	69 (8 yoy)	119 (5 yoy)	4	920 (38yoy)	77	--
Turtles - painted	5	1	1	18	13	9	20	1	19	3	8	5	103	8.6	NA
Turtles - snapping	0	0	0	0	0	2	0	0	2	1	0	6	11	0.9	NA

**Table 2. Gleason Lake trapnet results for the pounds of fish sampled per net for the fish survey conducted in October 2011.**

	October 5 - 6, 2011												Total Pounds	Pounds per Net (n=12)	Normal Range (MnDNR)
	Net 1	Net 2		Net 3		Net 4	Net 5	Net 6	Net 7	Net 8*		Net 9			
	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 1	Day 1	Day 2	Day 2			
Bluegills	6.3	17.3	8.0	14.3	37.5	6.2	17.8	12.6	1.9	10.3	18.0	0.3	151.4	12.6	0.2-0.3
Black crappies	0.6	2.6	0.1	0.5	1.6	0	0	0	1.2	0.7	2.9	0	9.5	0.8	0.2-0.4
Carp	11.1	0	0	0	0	0	0	0	0	0	0	0	11.1	0.9	2.1-5.3
Largemouth bass	0	0	0	1.8	0	0.8	0	0	0.7	0	0	0	3.3	0.3	0.4-1.2
Northern pike	0	1.7	0	0	0	0	5.8	1.9	0	0	0	0	9.4	0.8	NA
Pumpkinseed	0.8	0	0.2	0.2	2.6	0.4	1.0	0.4	0.3	2.6	0	0.3	8.2	0.7	0.1-0.2
Yellow bullhead	2.8	7.5	5.0	0.8	2.1	0	14.1	6.5	0	7.0	3.5	0	49.3	4.1	0.4-0.7
Yellow perch	0.2	0	0	0	0	0	0	0	0	0	0	0	0.2	Trace	NA
TOTAL POUNDS OF FISH	21.8	29.1	13.3	17.6	44.7	7.4	38.7	21.4	4.1	20.6	24.4	0.6	242	20.2	--

\* net is set in coontail at a density of a "5"

**Fish Lengths:** Fish lengths are shown in Figure 3 and Table 2. Bluegill lengths ranged from less than 3 inches up to 8 inches with over 70% of the bluegill population 6 inches or greater. Northern pike were present with lengths measured up to 33 inches and largemouth bass were measured up to 15.5 inches. At these lengths, both northern pike and bass populations have the capacity to capture and ingest small to medium-sized fish and should keep sunfish and bullheads from becoming overpopulated and producing stunted growth conditions.

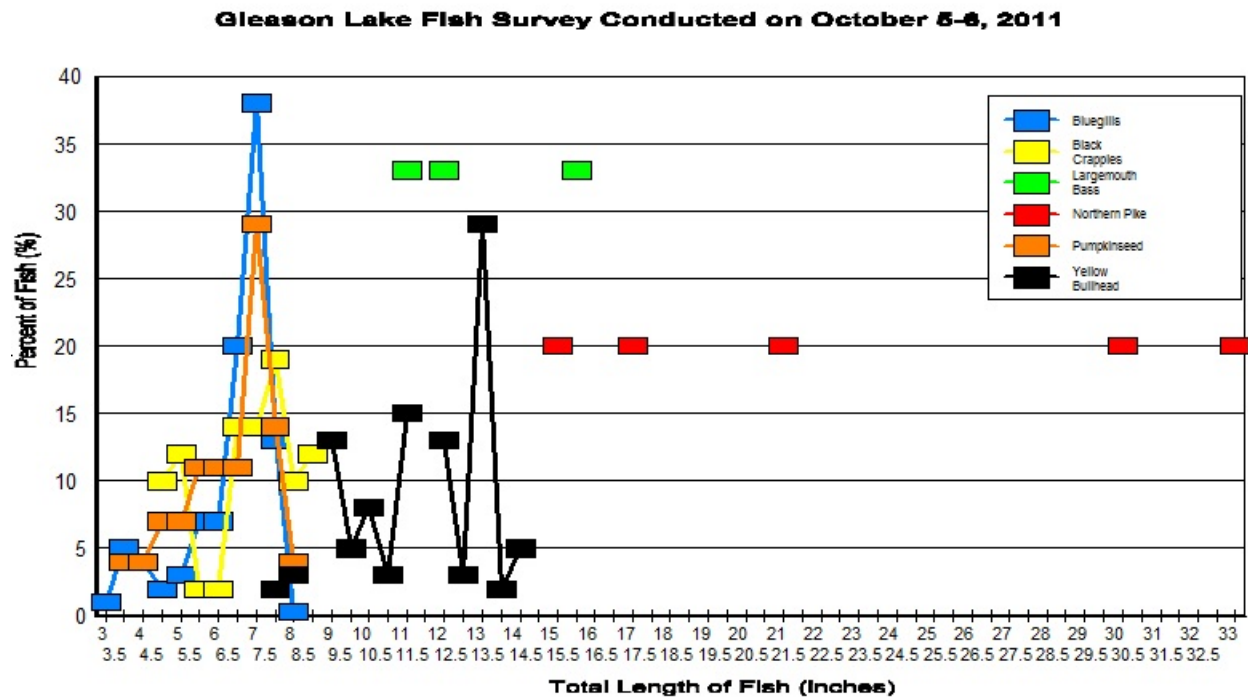


Figure 3. Length distribution of fish from the October 2011 survey in Gleason Lake.

**Table 2. Length frequency of fish from the Gleason Lake fish survey.**

Size (inches)	Bluegills	Black Crappies	Carp	Largemouth Bass	Northern Pike	Pumpkinseed	Yellow Bullhead	Yellow Perch
<3	20	18						
3	5 (1%)							
3.5	37 (5%)					1 (4%)		
4	28 (4%)					1 (4%)		
4.5	13 (2%)	4 (10%)				2 (7%)		
5	25 (3%)	5 (12%)				2 (7%)		
5.5	57 (7%)	1 (2%)				3 (11%)		
6	58 (7%)	1 (2%)				3 (11%)		
6.5	152 (20%)	6 (14%)				3 (11%)		
7	299 (38%)	6 (14%)				8 (29%)		1
7.5	105 (13%)	8 (19%)				4 (14%)	1 (2%)	
8	2 (0.3%)	4 (10%)	1			1 (4%)	2 (3%)	
8.5		5 (12%)						
9							8 (13%)	
9.5		2 (5%)					3 (5%)	
10							5 (8%)	
10.5							2 (3%)	
11				1 (33%)			9 (15%)	
11.5								
12				1 (33%)			8 (13%)	
12.5							2 (3%)	
13							17 (29%)	
13.5							1 (2%)	
14							3 (5%)	
14.5								
15					1 (20%)			
15.5				1 (33%)				
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29.5								
30					1 (20%)			
30.5								
31								
31.5								
32								
32.5								
33					1 (20%)			
Number of fish caught	781 (20 yoy)	42 (18 yoy)	2	3	5	28	61	1

# Representative Fish Species of Gleason Lake



**Largemouth Bass**



**Northern Pike**



**Bluegill**



**Yellow Bullhead**



**Pumpkinseed**



**Common carp**



**Black Crappie**



**Mirror carp**

# Historical Trapnet Fish Survey Records for Gleason Lake

A summary of previous Gleason Lake trapnet surveys is shown in Table 3. The abundance of several fish species such as black bullheads and bluegill sunfish, has fluctuated over the years. Black bullheads may have peaked in 1991 and have not been caught since the 1996 survey. They are scarce in Gleason Lake now. Bluegill abundance shows variability with the highest trapnet catch in 1991. In 2011, bluegill abundance was high, with many fish over 6-inches in length. This population is in good condition. Largemouth bass and northern pike abundance appears to vary within normal fluctuations.

**Table 3. Historical fish survey records for trapnet results for Gleason Lake.**

	Trapnet Results						Normal Range (MnDNR)
	Fish per net (n=7) June 16, 1980 (MnDNR)	Fish per net (n=7) June 17, 1986 (MnDNR)	Fish per net (n=7) June 13, 1991 (MnDNR)	Fish per net June 17, 1996 (MnDNR)	Fish per net (n=8) Sept, 2007 (Wenck)	Fish per Net (n=12) Oct 5 & 6, 2011 (Blue Water Science)	
Black bullhead	18.3	58	69.9	28.3	0	0	2.2 - 60.5
Black crappies	17.4	0.4	8.9	12.9	0.6	3.5 (1.5 yoy)	2.4 - 15.1
Bluegills	0.4	1.3	157.6	63.8	9.3	65 (1.7 yoy)	1.9 - 29.5
Brown bullhead	0	0	0.9	0	0	0	NA
Common carp	0	0	0	0.1	0	0.2	1.0 - 3.6
Green sunfish	7.1	0.4	0.1	0.1	0	0	0.2 - 2.0
Golden shiner	0	0	0.1	0	0	0	0.2 - 1.1
Hybrid sunfish	1	0	4.3	0.9	0	0	NA
Largemouth bass	1.4	0	0.4	0.1	0	0.3	0.3 - 1.2
Northern pike	0	0	0.3	0.2	0.1	0.4	NA
Pumpkinseed	0	0.4	9.6	6.6	0.3	2.3	0.8 - 8.4
White crappie	0	0	0	0.1	0	0	NA
White sucker	0.1	0.3	0.3	0	0	0	NA
Yellow bullhead	0	0	0	0.1	1.3	5.1	0.8 - 6.2
Yellow perch	0	0	0	0	0	0.1	NA
TOTAL FISH	45.7	60.8	252.4	113.2	11.6	76.9	--
Number of Fish Species	7	6	11	11	5	8	--



**Figure 5. [left] Bullheads that have distinctive yellowish barbels indicate this is a yellow bullhead. [right] Young of the year (YOY) black crappies were sampled and counted, but not included in the fish per net statistics.**

## Discussion

Gleason Lake offers good fishing opportunities based on the sizes of bluegills, largemouth bass, and northern pike found in this survey. Winter aeration likely has sustained the fish community.

The existing fish community in Gleason Lake may have enough piscivore pressure to prevent the development of stunted sunfish and bullhead populations. Based on theoretical piscivore lengths and converting their length to mouth gape width (Figure 7) it is apparent that the piscivore lengths in Gleason Lake, when converted to gape widths, should exert predation pressure and possibly prevent stunted bluegill (typical around 4-inches) or black bullhead populations. This type of fish community structure is a benefit for fishing and for water quality.



Figure 6. Gamefish (piscivores) usually select prey that can be swallowed, which is a function of the piscivore gape versus the prey body depth. This 24-inch northern pike from White Bear Lake made a mistake. It attempted to ingest a seven inch bluegill. The 24-inch pike has a 2.0 inch gape, but a 7-inch bluegill has a body depth of 2.3 inches. This pike was found floating and basically choked on the bluegill.

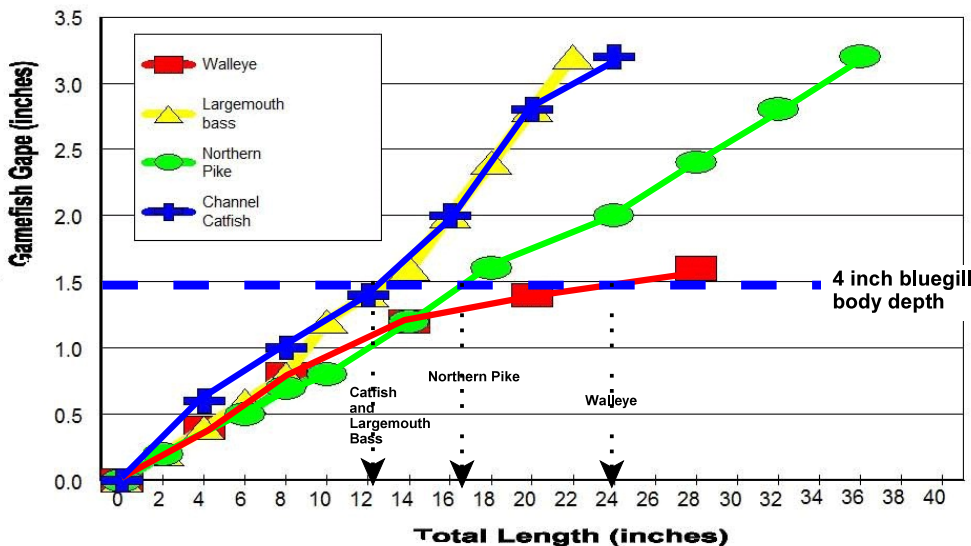


Figure 7. Gamefish gape increases as a function of its total length. The gape determines the size of the prey fish that can be swallowed. For example, a 4-inch bluegill has a body depth of 1.5 inches. To ingest a 4-inch bluegill it would take a 12-inch bass that has a gape of 1.5 inches. There are bass and northern pike in Gleason Lake that should be able to ingest 4-inch bluegills or smaller.

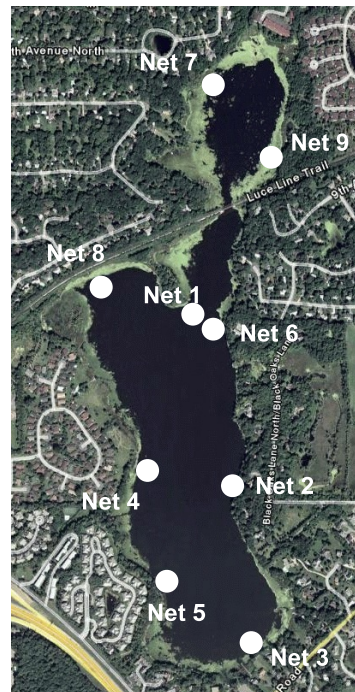
**Comparing 2007 and 2011 Trapnet Results:** The number of fish species and the fish abundance have increased from 2007 to 2011 based on trapnet surveys (Table 4). A whole-lake curlyleaf pondweed herbicide treatment was conducted in 2007, 2008, and 2009 with partial lake treatments in 2010 and in 2011. The distribution and abundance of curlyleaf has decreased over this time span and water clarity has increased. Although the number of fish and the number of pounds increased 5-fold from 2007 to 2011, it is not clear what caused the increase. Trapnet results in 1986, 1991, and 1996 have found as many if not more fish than what was sampled in 2011 and there were no whole-lake curlyleaf treatments at that time. Still, in 2011, the fish community appears to be in good condition.

**Table 4. Results of trapnetting in 2007 and 2011 using eight trapnet sites. The same trapnet sites were used in both 2007 and 2011. Nets were set for one night at each site.**

	September 2007 (Wenck)		October 5-6, 2011 (Blue Water Science)	
	Total Number	Total Pounds	Total Number	Total Pounds
Bluegill	75	12.80	457	87.6
Black crappie	5	1.56	24	4.9
Carp	0	0	2	11.1
Largemouth bass	0	0	3	3.3
Northern pike	1	2.50	5	9.4
Pumpkinseed	2	0.77	16	5.1
Yellow bullhead	10	13.09	47	38.7
Yellow perch	0	0	1	0.2
Total	93	30.72	555	160.3



**Wenck map of trapnet locations in 2007**



**Blue Water Science map of trapnet locations in 2011.**

## Conclusions and Recommendations

The trapnet survey found the fish community was composed of eight species. The bluegill sunfish abundance was above average for trapnet catches. Sunfish spawning is occurring and should provide forage for the bass and northern pike. Bluegills and yellow bullheads are not stunted indicating there may be some control from the piscivores. The largemouth bass population has a size range from 11 to 15 inches but the number collected was low. Several year classes of the fish species, based on a range of fish lengths, indicate winter aeration is keeping fish alive over winter. Carp were present, but their abundance appears to be low. Without stunted bluegills or bullheads and with a low carp population, fish should not be adversely impacting water quality. Management recommendations are minor since natural processes are helping to maintain a balanced fishery. Fish stocking is not essential at this point and it is important that the winter aeration system should be maintained on a regular basis. Another fish survey could be conducted in 3 to 4 years to check conditions.



**Bluegill sunfish are dominated by nice size 7-inch fish.**



**Carp are present in Gleason Lake, but scarce in number.**



**The longest northern pike found in this survey was 33-inches long. This pike could ingest a 7-inch bluegill found in Gleason Lake.**



**Six large snapping turtles came out of Net 9. It is recommended that the net not be set there again.**

# Appendix A

## Minnesota DNR Fish Survey Notification

**Steve McComas**

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**From:** Steve McComas <mccomas@pclink.com>  
**Sent:** Monday, October 03, 2011 12:13 PM  
**To:** Daryl Ellison; Greg Salo  
**Cc:** Lee Keeley; Kevin Springob; Yvette Christianson  
**Subject:** Fish survey notification

Hello all,

Blue Water Science will be conducting a fish survey in Gleason Lake (MN ID 27-95), Hennepin County, starting on Tuesday, October 4. We will set 6 fyke nets on Tuesday. The nets will be monitored daily and all fish will be weighed and measured and returned to the lake. The nets will be removed from the lake on Thursday, October 6. The fish survey is sponsored by the City of Plymouth with the objective to examine possible winterkill effects from last winter on the fish community structure.

This survey is being conducted under the permit number: 17693

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