



Bluegill Sunfish from Birch Lake, August, 2011

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## Fish Survey of Birch Lake (ID #62-0024), Ramsey County, Minnesota in 2011

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Survey Dates: August 23 - 24, 2011

**MnDNR Permit Number: 17693**

Prepared for:

**VLAWMO and MnDNR**

Prepared by:

**Steve McComas  
Blue Water Science**



December 2011

## Introduction

Birch Lake (ID: 62-0024) is a 145-acre shallow lake, located in Ramsey County, Minnesota. In August 2011, VLAWMO contracted for a fish survey with Blue Water Science with a permit number 17693 granted from the MnDNR. The objectives were to characterize the fish community in Birch Lake.

## Methods

Six standard trapnets were sampled for two days for a total of twelve lifts to survey fish in Birch 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 either 3/8 inch or 1/2 inch. Six standard trap nets were set on Monday morning August 22, 2011. Six nets were fished for the following 2 days (August 23, 24). Trapnet locations are shown in Figure 1 and pictures of a typical trapnet operation are shown in Figure 2.

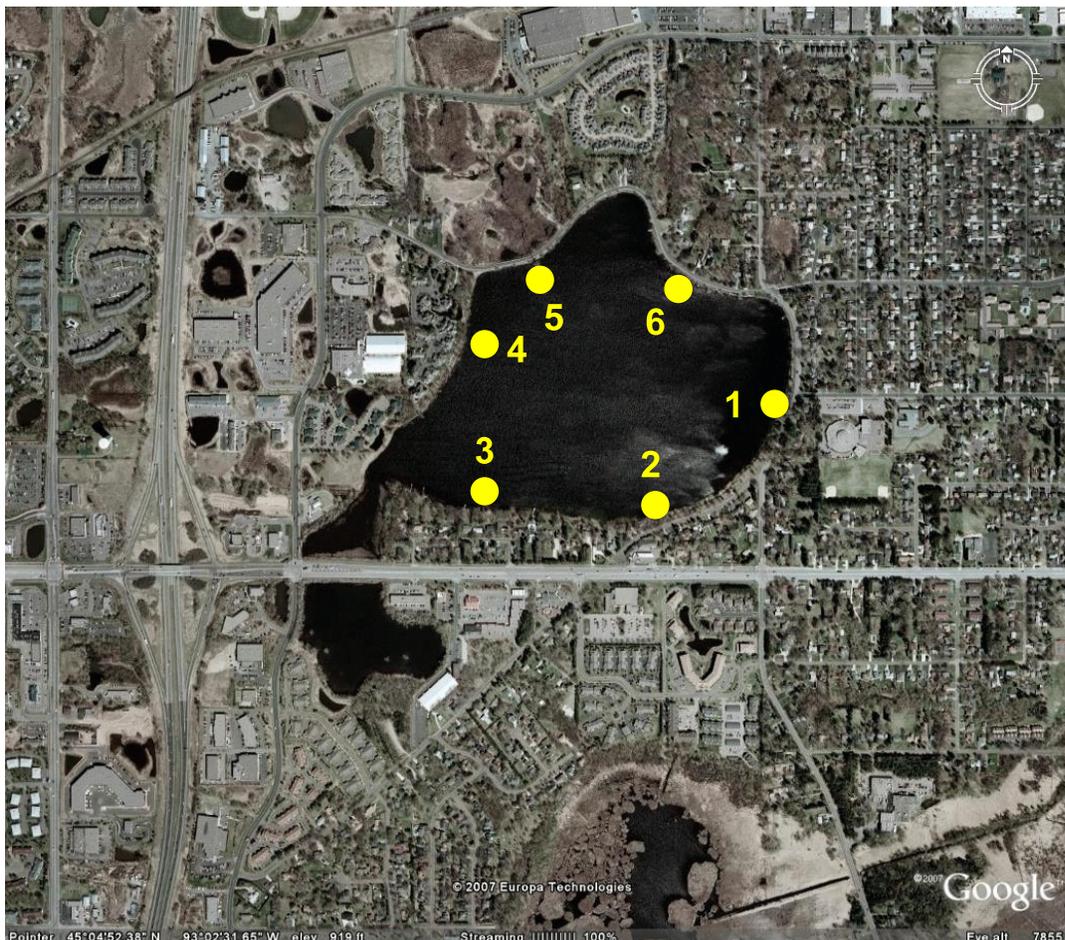


Figure 1. Map of trapnet sets.



**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**



**The back hoop of the trapnet is propped up on the bow (front end) of the survey boat. 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 Birch Lake fish survey.**

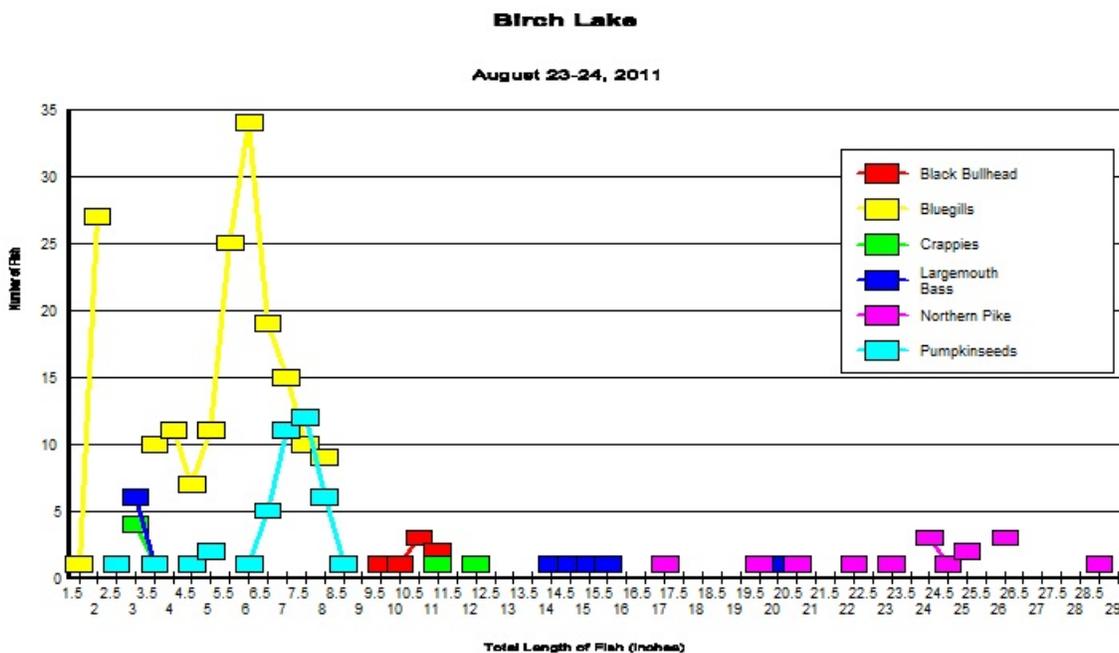
# Results

A total of six fish species were sampled in Birch Lake on August 23 and 24, 2011. Bluegill sunfish were the most abundant species followed by pumpkinseed sunfish. Nets 3 and 4, on the east end of the lake, were the most productive (Table 1).

The average number of bluegills caught per net was moderate with the average haul of 15 fish per net (Table 1). Pumpkinseed sunfish were found at moderate numbers and within a typical range for a lake like Birch, as defined by the MnDNR. Black crappie and black bullhead abundance was low based on standard ranges compiled by the MnDNR. Northern pike had a moderate population with an average of 1.3 fish per net.

**Table 1. Birch Lake trapnet results for the fish survey conducted in August 2011.**

	August 23-24, 2011												Total Catch	Fish per Net (n=12)	MnDNR Normal Range
	Net 1		Net 2		Net 3		Net 4		Net 5		Net 6				
	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2			
Black bullheads					3	2		1			1		7	0.6	2 - 61
Bluegills	3	2	10	1	35	13	54	28	13	9	2	9	179	15	6 - 60
Black crappies			1		1						4	1	7	0.6	2 - 18
Largemouth bass		1				2	4	3				2	12	1.0	0.3 - 1
Northern pike	2	2	1		1	1	1	1		1	4	1	15	1.3	NA
Pumpkinseeds	5	2	4	1	4	3	4	7	2	1		8	41	3.4	1 - 8
TOTAL FISH	10	7	16	2	44	21	63	40	15	11	11	21	261	22	--



**Figure 3. Length distribution of fish from the August 2011 survey in Birch Lake.**

Fish lengths are shown in Figure 3 and Table 2. Bluegill lengths ranged were from 1.5 inches up to 8 inches with the majority of the population 6 inches or greater. Northern pike were present with lengths measured up to 28.5 inches and largemouth bass were measured up to 20 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.

**Table 2. Length frequency of fish species (as total length) for the Birch Lake fish survey.**

	Black Bullhead	Bluegills	Crappies	Largemouth Bass	Northern Pike	Pumpkinseeds
1.5		1 (0.6%)				
2		27 (15%)				
2.5						1 (2%)
3			4 (58%)	6 (50%)		
3.5		10 (6%)	1 (14%)	1 (8%)		1 (2%)
4		11 (6%)				
4.5		7 (4%)				1 (2%)
5		11 (6%)				2 (5%)
5.5		25 (14%)				
6		34 (19%)				1 (2%)
6.5		19 (11%)				5 (12%)
7		15 (8%)				11 (27%)
7.5		10 (6%)				12 (29%)
8		9 (5%)				6 (15%)
8.5						1 (2%)
9						
9.5	1 (14%)					
10	1 (14%)					
10.5	3 (43%)					
11	2 (29%)		1 (14%)			
11.5						
12			1 (14%)			
12.5						
13						
13.5						
14				1 (8%)		
14.5				1 (8%)		
15				1 (8%)		
15.5				1 (8%)		
16						
16.5						
17					1 (7%)	
17.5						
18						
18.5						
19						
19.5					1 (7%)	
20				1 (8%)		
20.5					1 (7%)	
21						
21.5						
22					1 (7%)	
22.5						
23					1 (7%)	
23.5						
24					3 (20%)	
24.5					1 (7%)	
25					2 (13%)	
25.5						
26					3 (20%)	
26.5						
27						
27.5						
28						
28.5					1 (7%)	
29						
<b>Total</b>	<b>7</b>	<b>179</b>	<b>7</b>	<b>12</b>	<b>15</b>	<b>41</b>

## Representative Fish Species of Birch Lake

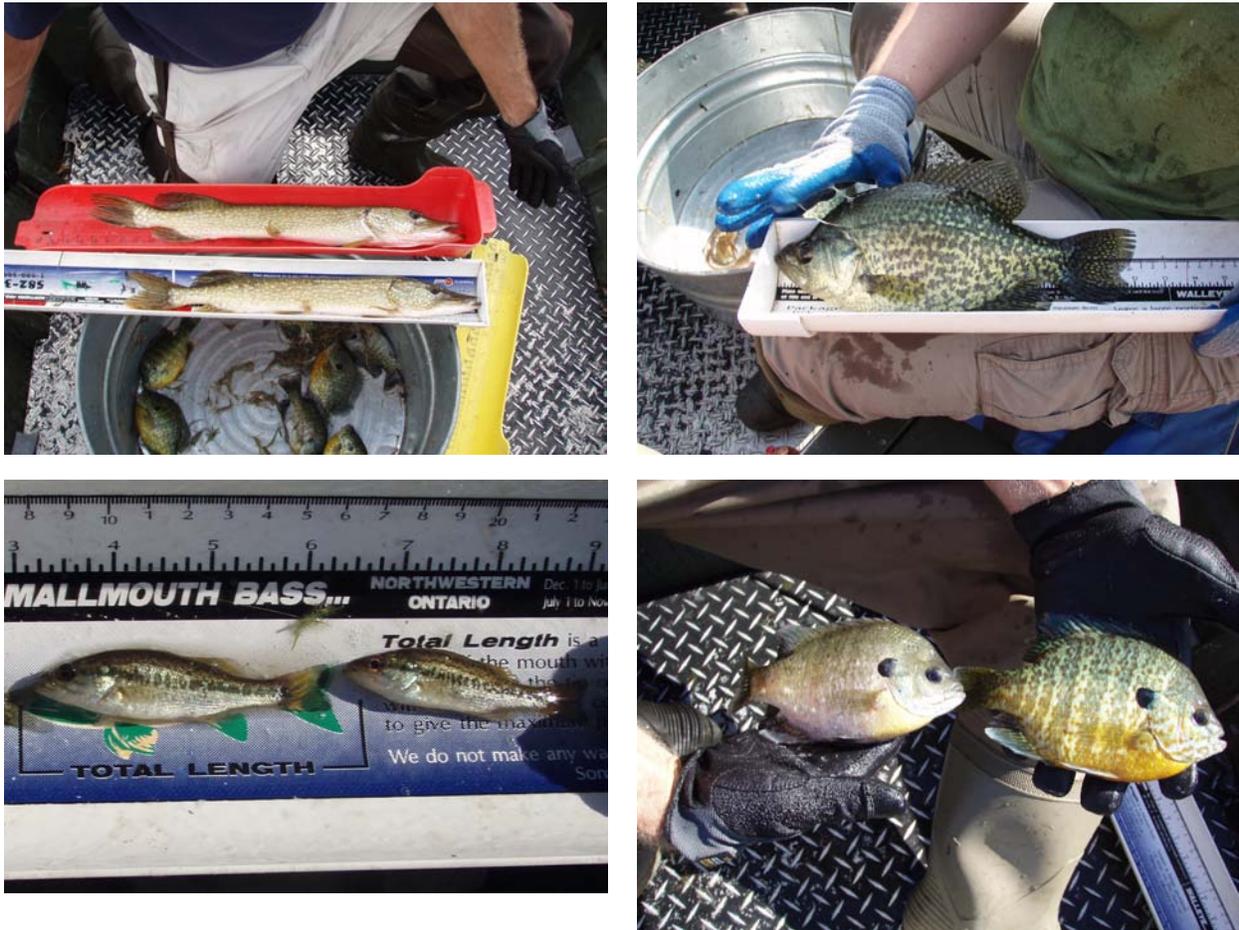


Figure 4. Top left: Northern pike (in poor condition).  
 Top right: Black crappie (large crappies are present but in low abundance).  
 Bottom left: Largemouth bass (probably stocked in 2011).  
 Bottom right: Bluegill sunfish (they are doing very well in Birch Lake).

## Recent Stocking Records

Table 3. Recent fish stocking records.

	Largemouth Bass	Walleye	Yellow Perch	Crappie	Bluegill
April 2007	700 (4-7")	300 (3")			
April 2010	500 (4-7")	500 (4-7")	75 (2-3")		
July 2011	1,000 (3-5")		800 (3-4")	300 (4-7")	800 (3-5")
Fish Survey Results (Fish/trapnet) (August 2011)	1.0	0	0	0.6	15

**Turtle Results:** Snapping turtles and painted turtles were also sampled in the trapnets and were common in Birch Lake. Painted turtles and snapping turtles likely do well because there is a fair percentage of a natural shoreline area.

**Table 4. Painted turtle and snapping turtle catch per net for the two netting days.**

Net	Painted Turtles	Snapping Turtles
<b>(Aug 23, 2011)</b>		
1		
2		
3	7	
4		
5		1
6	3	3
<b>subtotal</b>	10	4
<b>(Aug 24, 2011)</b>		
1		1
2		2
3	3	1
4		
5	1	1
6		
<b>subtotal</b>	4	5
Total Turtle (12 nets)	14	9
<b>Turtle/Trapnet (12 lifts)</b>	<b>1.2</b>	<b>0.8</b>



**Birch Lake snapping turtles.**

## Discussion

**General Findings In This Survey:** Birch 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. Fish stocking may have helped increase the number of largemouth bass but walleyes and perch were not sampled in this survey and they have been stocked in the past.

Stocking small torpedo-shaped fish like perch and walleyes into a lake with a well established bass population generally is not successful. The size and shape of young perch and walleye are a preferred forage choice for bass and pike. If yellow perch and walleyes are present in Birch Lake, their abundance is low.

In terms of gamefish, largemouth bass apparently are performing better than northern pike and walleyes. Largemouth bass should spawn in Birch Lake and sustain a population. It would be difficult to establish a walleye population even if large walleyes were stocked. They would not likely reproduce and forage availability would be lower compared to what the bass could handle, based on the gape of gamefish mouth as a function of their length (Figure 6).

## Discussion - concluded

**Gamefish Control to Prevent Bluegill Stunting:** The existing fish community in Birch Lake has good piscivore pressure (piscivores in Birch Lake are bass and pike) that may prevent the development of stunted sunfish and bullhead populations. Based on theoretical piscivore lengths and converting fish length to gape width (Figure 6) it is apparent that the piscivore lengths in Birch Lake, when converted to gape widths, should exert predation pressure and 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 5. 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.

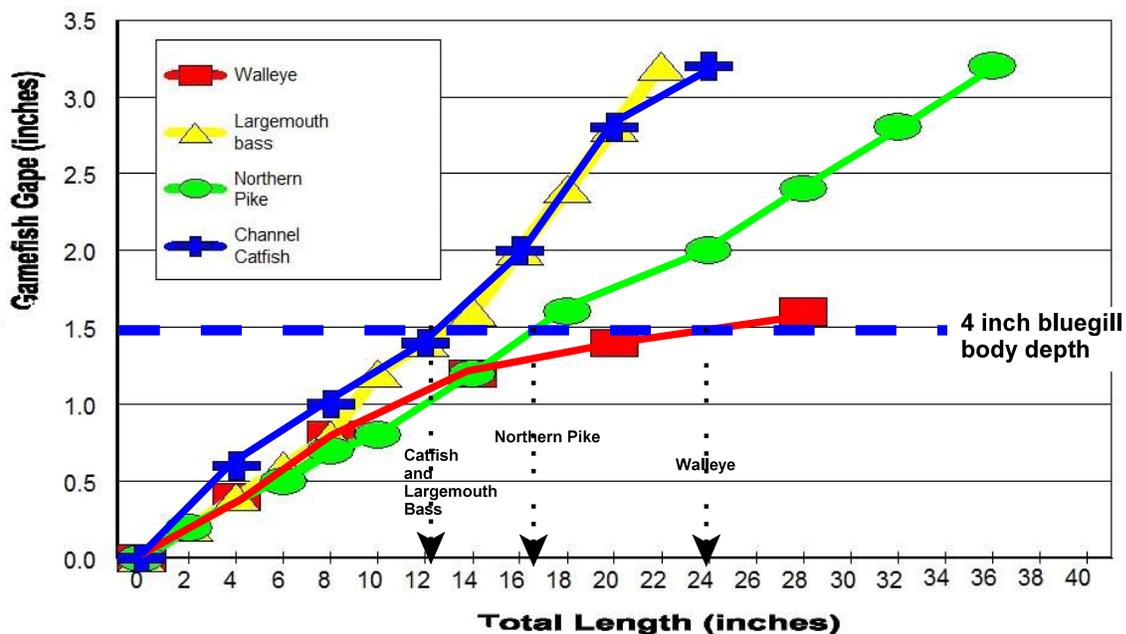


Figure 6. Gamefish gape increases as a function of its total length. The gape determines the size of the prey fish that can be swallowed. For example, a 4-inch bluegill has a body depth of 1.5 inches. To ingest a 4-inch bluegill it would take a 12-inch bass that has a gape of 1.5 inches. There are bass and northern pike in Birch Lake that should be able to ingest 4-inch bluegills or smaller.

## Conclusions and Recommendations

The trapnet survey in 2011 found the fish community was composed of six species. The bluegill and pumpkinseed sunfish abundance were average for trapnet catches. Bluegills and black bullheads are not stunted indicating there is some control from the piscivores. The largemouth bass population has a wide size range and stocking appears to supplement the population. Several year classes of the fish species indicate winter aeration is keeping fish alive over winter.

Recommendations and future considerations include the following:

- In Birch Lake, largemouth bass are the dominant gamefish and although northern pike are present, their condition is not as good as the bass. Walleyes and perch have been stocked in the past and have not become established. Future stocking of walleyes and perch are not recommended at this time.
- Because sunfish currently spawn in the lake, the young fish should produce a forage base on an annual basis. Generally, stocking forage fish is not a long term solution to sustain gamefish and stocking forage fish is not recommended at this time. The carrying capacity of Birch Lake should be established naturally which is a good long-term management strategy.
- The winter aeration system is essential to maintain the existing fish community. It is recommended that efforts continue to insure proper operation of the winter aeration system.
- Water quality remains good in Birch Lake and fishing has the potential to be very good for panfish and largemouth bass. In three to four years another fish survey should be conducted to evaluate conditions and re-evaluate recommendations.



**Brian Corcoran, VLAWMO, holding one of the adult largemouth bass that was sampled during the fish survey on Birch Lake.**



**Vanessa Strong, VLAWMO, showing one of the northern pike captured in the trapnet. Some of the northern pike appeared to be in poor condition.**

# Appendix A

## Minnesota DNR Fish Survey Notification

**From:** Steve McComas [<mailto:mccomas@pclink.com>]  
**Sent:** Thursday, August 18, 2011 10:39 AM  
**To:** Johnson, Gerald J (DNR); Salo, Gregory (DNR)  
**Cc:** Brian Corcoran  
**Subject:** Fish survey notification

Hello all,

Blue Water Science will be conducting a fish survey in Birch Lake (MN ID 62-24 ), Ramsey County, starting on Monday August 22. We will set 6 fyke nets on Monday. 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 Wednesday, August 24. The fish survey is sponsored by Vadnais Lake Area Watershed Management Organization 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

Regards,

**Steve McComas**

**BLUE WATER SCIENCE**

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