

Leech (Shingobee) 11-0203-04

MN Lake ID: 11-0203-04
 County: Cass
 Ecoregion: Northern Lakes and Forests
 Major Drainage Basin: Upper Mississippi River
 Latitude/Longitude: 47.05111111 / -94.56694444
 Water Body Type: Public Waters
 Monitored Sites (Primary): 203
 Monitored Sites (Secondary): 201, 202

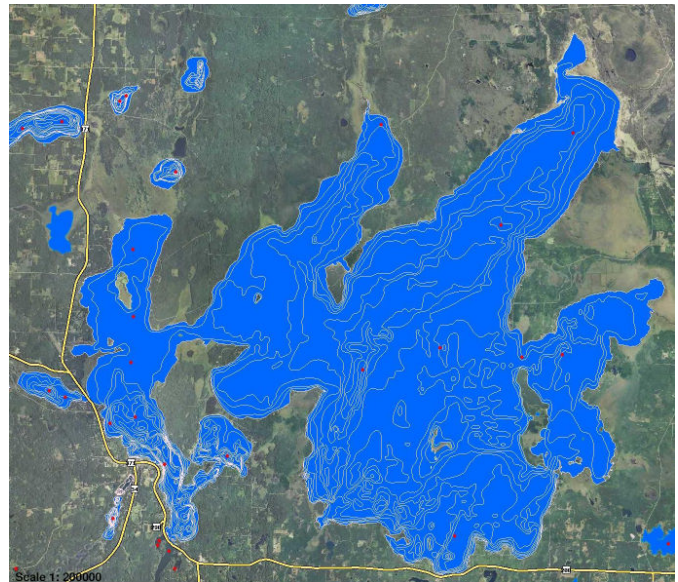
Physical Characteristics

Surface area (acres): 319
 Littoral area (acres): N/A
 % Littoral area: N/A
 Max depth (ft): 35 (m): 10.7
 Mean depth (ft): N/A (m): N/A
 Watershed size (acres): N/A

Water Quality Characteristics - Historical Means

Years monitored: 1986-1990, 2006, 2008-2009

Parameters	Primary Site 203
Total Phosphorus Mean:	18.1
Total Phosphorus Min:	12
Total Phosphorus Max:	22
Number of Observations:	10
Chlorophyll-a Mean:	5.3
Chlorophyll-a Min:	3
Chlorophyll-a Max:	8
Number of Observations:	10
Secchi Depth Mean:	9.9
Secchi Depth Min:	6
Secchi Depth Max:	14
Number of Observations:	11
Trophic State Index Mean (Primary Site):	45
Trophic State:	Mesotrophic



Ecoregion Comparisons

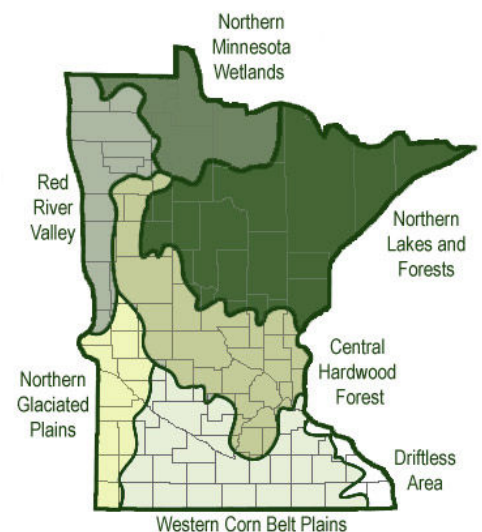
Minnesota is divided into 7 ecoregions based on land use, vegetation, precipitation and geology. The MPCA has developed a way to determine the "average range" of water quality expected for lakes in each ecoregion.

From 1985-1988, the MPCA evaluated the lake water quality for chosen reference lakes. These reference lakes are not considered pristine, but are considered to have little human impact and therefore are representative of the typical lakes within the ecoregion. The "average range" refers to the 25th - 75th percentile range for data within each ecoregion.

Cass County is in the Northern Lakes and Forests Ecoregion.

Leech Lake – Shingobee (Site 203) compares to the ecoregion average ranges as indicated below:

Total Phosphorus:	Within expected range, which indicates expected water quality for the area
Chlorophyll-a:	Within expected range, which indicates expected water quality for the area
Secchi Depth:	Within expected range, which indicates expected water quality for the area



Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0203-04	Leech (Shingobee)	203 (Primary)	06-01-2006 - 09-30-2009	All Historical

Historical Mean						18.1	5.3	9.9	45	46	44	45
Date	Time	Site	Sampler	Lab Code	Data Source	TP ug/L	ChlA ug/L	Secchi Ft.	TSI Phos.	TSI ChlAL	TSI Secchi Ft.	TSI Avg.
6/25/2006	11:30 AM	203	N/A	N/A	2nd Source*	N/A	N/A	14	N/A	N/A	39	39
7/11/2006	2:00 PM	203	N/A	N/A	2nd Source*	N/A	N/A	9.5	N/A	N/A	45	45
8/19/2006	1:00 PM	203	N/A	N/A	2nd Source*	N/A	N/A	9	N/A	N/A	45	45
Annual Mean						N/A	N/A	10.8	N/A	N/A	43	43
Date	Time	Site	Sampler	Lab Code	Data Source	TP ug/L	ChlA ug/L	Secchi Ft.	TSI Phos.	TSI ChlAL	TSI Secchi Ft.	TSI Avg.
6/9/2008	2:50 PM	203	Don Flyckt	78406	RMB Lab	22	6	9	49	48	45	47
6/29/2008	6:10 PM	203	Don Flyckt	80695	RMB Lab	21	4	11	48	44	43	45
7/27/2008	5:00 PM	203	Don Flyckt	83544	RMB Lab	12	3	8	40	41	47	43
8/17/2008	3:30 PM	203	Don Flyckt	85390	RMB Lab	14	6	11	42	48	43	44
9/7/2008	4:00 PM	203	Don Flyckt	87156	RMB Lab	21	8	N/A	48	51	N/A	50
Annual Mean						18	5.4	9.8	45	46	44	45
Date	Time	Site	Sampler	Lab Code	Data Source	TP ug/L	ChlA ug/L	Secchi Ft.	TSI Phos.	TSI ChlAL	TSI Secchi Ft.	TSI Avg.
5/31/2009	2:30 PM	203	Don Flyckt	98189	RMB Lab	20	5	N/A	47	46	N/A	46
6/21/2009	1:30 PM	203	Flyckt	101088	RMB Lab	14	3	12	42	41	41	41
7/12/2009	2:30 PM	203	Don Flyckt	103436	RMB Lab	15	8	6	43	51	51	48
8/9/2009	2:30 PM	203	Don Flyckt	107134	RMB Lab	21	6	8.5	48	48	46	47
9/13/2009	3:00 PM	203	Don Flyckt	110783	RMB Lab	21	4	11	48	44	43	45
Annual Mean						18.2	5.2	9.4	45	46	45	45

Trend Analysis Report

For detecting trends, a minimum of 8-10 years of data with 4 or more readings per season are recommended. Minimum confidence accepted by the MPCA is 90%. This means that there is a 90% chance that the data are showing a true trend and a 10% chance that the trend is a random result of the data. Only short-term trends can be determined with just a few years of data, because there can be different wet years and dry years, water levels, weather, etc., that affect the water quality naturally.

There is not enough historical data to perform trend analysis for total phosphorus, chlorophyll *a*, or Secchi depth on Leech Lake – Shingobee (Site 203).