

Minnesota Lake ID: 69-0254
Area: 674 acres
Watershed Area: 2,063 acres
Ecoregion: Northern Lakes and Forests (NLF)

Trophic State: Mesotrophic
Maximum Depth: 46 feet
Mean Depth: 12 feet
Mixing Status: Dimictic



Figure 2. Lake bathymetric map

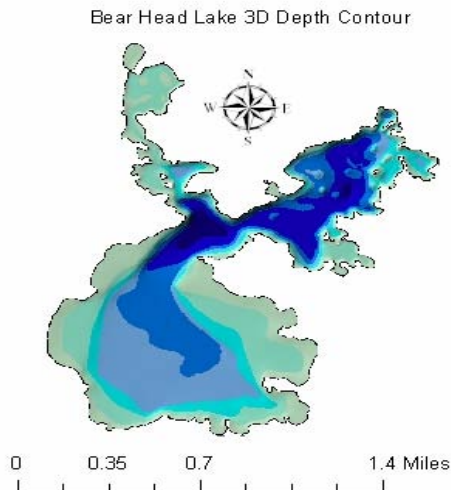


Figure 1. Bearhead Lake Watershed map

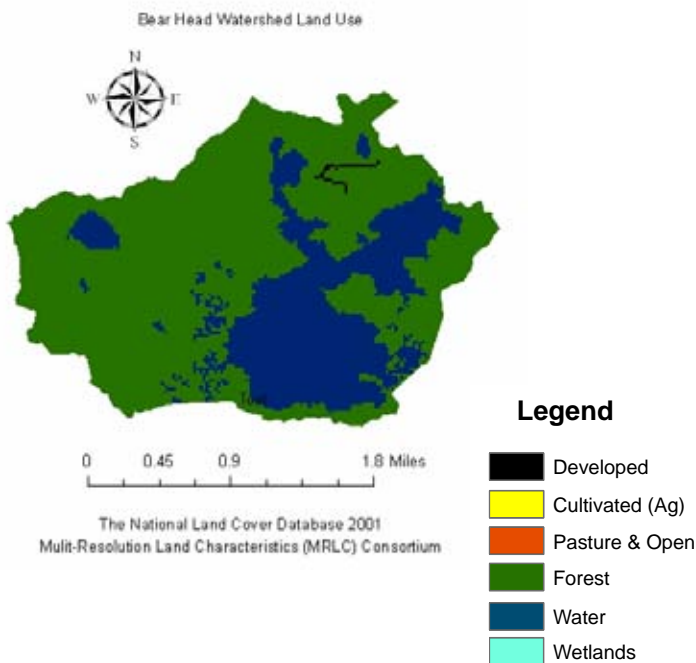


Table 1. Bearhead Lake Watershed land use as compared to NLF ecoregion reference lakes

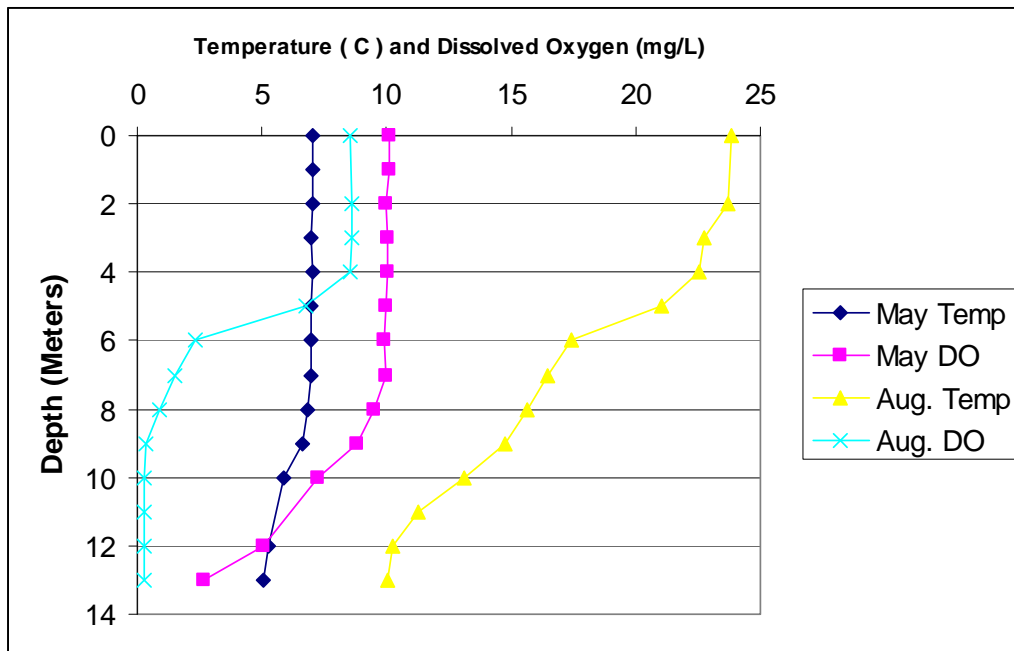
Land use	Bearhead Lake land use percentage	NLF typical land use percentage
Developed	<1	0 - 7
Cultivated (Ag)	0	<1
Pasture & Open	<1	0 - 6
Forest	71	54 - 87
Water & Wetland	29	14 - 31
Feedlots (#)	0	

Table 2. Bearhead Lake 2008 data as compared to typical range for NLF ecoregion reference lakes
Data from Minnesota Department of Health (MDH) laboratory

Parameter	Bearhead Lake	NLF
Number of reference lakes		32
Total Phosphorus (µg/L)	14.5	14 – 27
Chlorophyll mean (µg/L)	7.4	4 – 10
Secchi Disk (feet)	8.0	8 -15
(meters)	2.4	2.4 – 4.6
Total Kjeldahl Nitrogen (mg/L)	0.45	0.4 – 0.75
Alkalinity (mg/L)	14.6	40 – 140
Color (Pt-Co U)	30	10 – 35
pH (SU)	6.64	7.2 – 8.3
Chloride (mg/L)	< 1	0.6 – 1.2
Total Suspended Solids (mg/L)	2.0	<1 – 2
Total Suspended Inorganic Solids (mg/L)	1.7	<1 - 2
Conductivity (umhos/cm)	38	50 – 250
TN:TP ratio	31:1	25:1 - 35:1

µg/L = micrograms per liter	Pt-Co-U = Platinum Cobalt Units
mg/L = milligrams per liter	SU = Standard Units
umhos/cm = micromhos per centimeter	

Figure 3. Bearhead Lake May and August 2008 dissolved oxygen and temperature profile



Bearhead Lake covers an area of 674 acres and is located 10 miles east of Tower, Minnesota. The lakeshore is entirely managed by the Minnesota Department of Natural Resources, via Bearhead Lake State Park - a partner in the Sentinel Lake project. There is no distinct surface water outlet from Bearhead Lake. The lake has a very small (3:1) watershed to lake surface ratio (Figure 2). The watershed is almost entirely forest and wetland, and is located at the headwaters of the Birch Lake / Kawishiwi River watersheds. With the exception of the State Park campground, in the northwest part of the lake, the entire lakeshore is undeveloped.

Prior to the 2008 monitoring there was very limited historical data for Bearhead Lake. In mid-May a thermocline had not yet developed; however, by the end of May a thermocline was apparent. By August, a thermocline had developed at approximately five meters and the lake was anoxic from 8 m to the bottom (Figure 3). 2008 data indicates mesotrophic conditions, and generally good water quality with concentrations of total phosphorus, chlorophyll-a, and Secchi transparency well within the range of reference lakes in the Northern Lakes and Forests ecoregion (Table 2).

Table 3. Focal species captured during recent surveys and their size and abundance compared with other lakes in its lake class

Species	Stocked	Abundance	Size	Trend	Notes
Walleye*	Y	High	Average	Increasing	
Northern Pike	N	High	?	Increasing	
Black Crappie	N	?	Average	Increasing	Discovered in 1989
Largemouth bass	N	High	Average	?	
Bluegill	N	High	Small-average	Increasing	Discovered in 1969
White sucker	N	Average	Large	Decreasing	
Yellow perch	N	Low	Small	Decreasing	

*Management emphasis on this species

Table 4. Aquatic Plant Summary:

Percent cover of aquatic plants \leq 15 ft deep	61.8%
Lake depth beyond which most vegetation disappeared	10.9 ft
Number of common species (i.e., \geq 10% cover)	5
Non-native plant infestation	NA
Frequency of <i>Chara</i>	9.5%

Narrative

Bearhead maintains a high quality walleye fishery that is supplemented through fry stocking. Similar to other lakes in the border lakes ecoregion, warm-water centrarchids are becoming increasingly abundant. Catches of yellow perch, an important cool-water forage species in 2008 were much lower than normal for Bearhead and other lakes in its lake class. The aquatic plant community in Bearhead is moderately diverse with vegetation growing to modest depths.