



Rabbit Lake

DNR ID: 18-0093

Vitals

MN Lake ID:	18-0093-02
Zoning Authority:	Crow Wing County, City of Cuyuna
Lake Classification:	General Development (GD)
Major Drainage Basin:	Upper Mississippi River
Latitude/Longitude:	46.528895 / -93.906219
Water Body Type:	Public
Invasive Species	None

Physical Characteristics

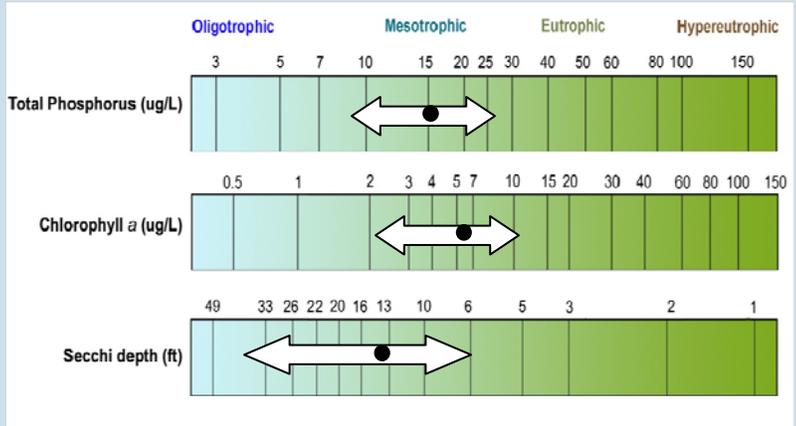
Surface area (acres):	667 (East), 535 (West)
Littoral area (acres):	242 (East), 165 (West)
% Littoral area:	36% (East), 31% (West)
Max depth (ft):	337 ft (East), 50 ft (West)
Mean depth (ft):	N/A
Inlets / Outlets / Accesses:	3 / 1 / 1
Lakeshed to lake area ratio:	3:1

Total Phosphorus

Rabbit Lake is phosphorus limited, which means that algae and aquatic plant growth is dependent upon available phosphorus. Total phosphorus was evaluated in the west bay of Rabbit Lake in 1993, 2007-2008. The phosphorus has not been tested in the east bay. The majority of the data points fall into the mesotrophic range.

Chlorophyll a

Chlorophyll a is the pigment that makes plants and algae green. Chlorophyll a is tested in lakes to determine the algae concentration or how "green" the water is. Chlorophyll a was evaluated in the west bay of Rabbit Lake in 1993, 2007-2008. Chlorophyll a concentrations remained below 10 ug/L for all but two sample dates, indicating clear water most of the summer. There was not much variation over the years monitored, and chlorophyll a concentrations remained relatively steady over the summer.



Rabbit Lake total phosphorus, chlorophyll a and transparency historical ranges. The arrow represents the range and the black dot represents the historical mean (Primary Site 201-West Bay). Figure adapted after Moore and Thornton, [Ed.]. 1988. Lake and Reservoir Restoration Guidance Manual. (Doc. No. EPA 440/5-88-002)

Transparency (Secchi Depth)

Transparency is how easily light can pass through a substance. In lakes, it is how deep sunlight penetrates through the water. Plants and algae need sunlight to grow, so they are only able to grow in areas of lakes where the sun penetrates. Water transparency depends on the amount of particles in the water. An increase in particulates results in a decrease in transparency. The annual mean transparency for Rabbit Lake ranges from 8.5 to 18.2 feet. The transparency throughout the lake appears to be relatively uniform, with the best transparency occurring at the deepest spot in the west bay (sampling site 201). The transparency between both basins appears to be relatively similar as well. The transparency has improved an average of approximately 1-2 feet in both bays.

Trophic State Index (TSI)

Phosphorus (nutrients), chlorophyll a (algae concentration) and Secchi depth (transparency) are related. As phosphorus increases, there is more food available for algae, resulting in increased algal concentrations. When algal concentrations increase, the water becomes less transparent and the Secchi depth decreases. The results from these three measurements cover different units and ranges and thus cannot be directly compared to each other or averaged. In order to standardize these three measurements, we convert them to a trophic state index (TSI). The mean TSI for the two bays of Rabbit Lake fall in the Mesotrophic range. Mesotrophic lakes (TSI 40-50) are characterized by moderately clear water most of the summer. "Meso" means middle or mid; therefore, mesotrophic means a medium amount of productivity. Mesotrophic lakes have clear water with algal blooms in late summer.

