

## 8.12.1 AN INTRODUCTION TO MUSKELLUNGE LAKE

Muskellunge Lake, Vilas County, is a 44-acre drainage lake. This eutrophic lake has a moderately sized watershed when compared to the size of the lake. Muskellunge Lake contains 30 native plant species, of which coontail is the most common plant. No exotic plant species are known to exist in the lake.

### Field Survey Notes

Large lake with brown stained water and abundant vegetation. Dark organic sediments, mucky areas and rocky areas found along the shoreline. Lake bottom primarily muck with random rocky areas too. Many fish observed (bass, muskellunge) along with eagles. Very green water (algae bloom) observed during August 12<sup>th</sup> water quality sampling, was not seen during PI survey the previous week.



### Lake at a Glance - Muskellunge Lake

Morphology	
Acreage	272
Maximum Depth (ft)	19*
Mean Depth (ft)	9
Shoreline Complexity	2.7
Vegetation	
Curly-leaf Survey Date	June 15, 2009
Comprehensive Survey Date	August 5, 2009
Number of Native Species	30
Threatened/Special Concern Species	None
Exotic Plant Species	None
Simpson's Diversity Index	0.86
Average Conservatism Value	6
Water Quality	
Trophic State	Eutrophic
Limiting Nutrient	Phosphorus
Water Acidity (pH)	9.2
Sensitivity to Acid Rain	Not Sensitive
Watershed to Lake Area Ratio	6:1

\* Maximum depth at ordinary high water level

### 8.12.2 Muskellunge Lake Watershed Assessment

Muskellunge Lake's watershed is approximately 1,818 acres in size. Dominant land cover types include forests (1,011 acres or 56%) and wetlands (417 acres or 23%), while the lake surface (15%), pasture / grass (6%), and open water not connected to the lake (<1%) comprise the remaining areas of the watershed (Figure 8.12.2-1). The watershed is only six times larger than the lake itself (a ratio of 6:1). Lakes with a smaller watershed to lake area ratio are typically influenced strongly by the land cover types within the watershed. In the case of Muskellunge Lake, however, there are other factors regulating the water quality besides the land cover.

Muskellunge Lake's phosphorus and chlorophyll-*a* content are fairly high compared to other regional lakes (this will be discussed in the water quality section). To investigate potential sources of phosphorus input to the lake, the United States Geological Survey (USGS) conducted a 2003 study in cooperation with the Muskellunge Lake Association in which a phosphorus budget was investigated for the lake. The report found Muskellunge Lake received approximately 437 lbs of phosphorus in 2001, 58% of which came from groundwater inputs, 16% from septic systems, 23% from surface water runoff, and 3% from precipitation (USGS REPORT). The budget calculated an export of 206 lbs. (47%) of phosphorus through Muskellunge Creek, while the remaining 206 lbs. (53%) was deposited to the lake bottom. Furthermore, an analysis of sediment cores from the bottom of the lake revealed that the phosphorus levels and eutrophic conditions were present in Muskellunge Lake over 100 years ago. The investigators in the study concluded that the eutrophic conditions in Muskellunge Lake are naturally induced by groundwater flowing through naturally high phosphorus soils, primarily along the north shore of the lake. Although these conditions have remained so for the past 100 years, one change has been an increase in the density of the aquatic plant community.

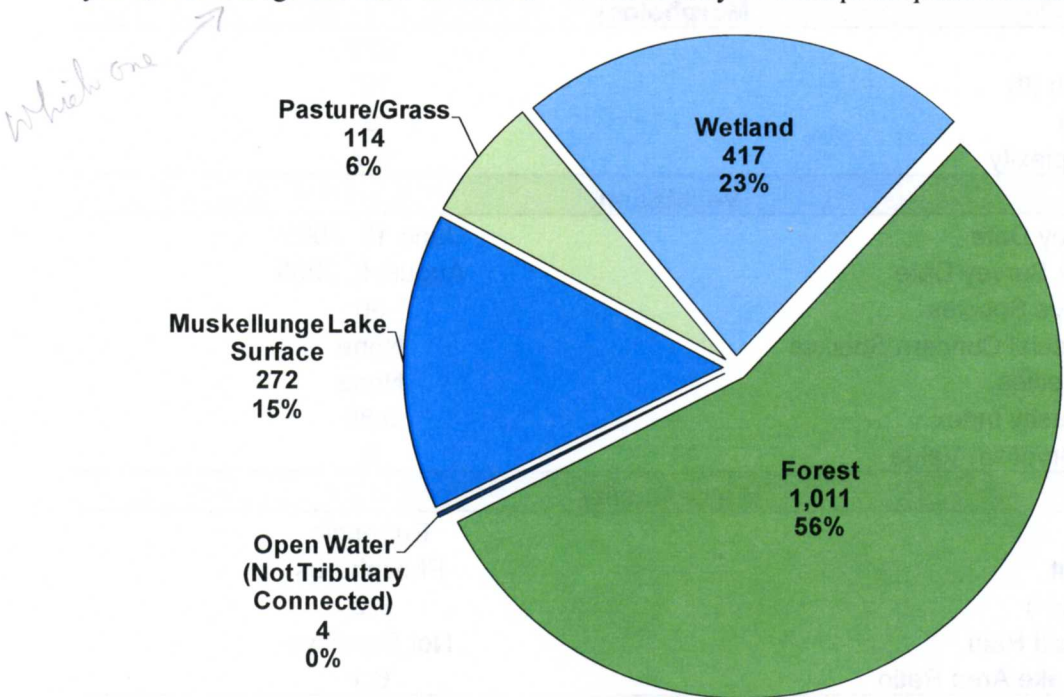


Figure 8.12.2-1. Muskellunge Lake watershed land cover types in acres. Based upon Wisconsin Initiative for Statewide Cooperation on Landscape Analysis and Data (WISCLAND) (WDNR, 1998).

