

Hello Hess Lake Residents,

Does Wheeler Drain and Alger Drain/Creek impact Hess Lake?

Let's take a look at what all the experts have stated in the various Hess Lake Engineering Studies from 2020 back to 1982.

If you would like to view videos of Wheeler Drain during high flow and see what is flowing into our lake, go to the website I created. Under the Tributaries Tab you will see a number of pictures and videos taken by lake residents that were sent to me.

[www.hesslake.org](http://www.hesslake.org)

**Summary:**

It is apparent based on comments by the experts from the Hess Lake Engineering Studies and the data listed below, that Wheeler & Alger Drain/Creek are an issue for Hess Lake by contributing a significant amount of nutrients (phosphorus or nitrates) that could fuel Harmful Algal Blooms, HAB. Water quality data collected from 1980 to 2018 on Wheeler and Alger Drains indicates a high level of Total Phosphorus.

**Wheeler Drain Total Phosphorus mean, 104.69 ug/L, with Alger Drain/Creek mean 159.7 ug/L.** These are very high numbers. In general, anything over 20 ug/L is considered high.

Until significant solutions are found by Progressive AE our lake management company to significantly reduce the amount of nutrients (external nutrient loading) from coming into Hess Lake, we will either continue to have Harmful Algal Blooms or too many weeds. The history of Hess Lake demonstrates these facts.

Please see general comments, and comments from each of the engineering studies listed below from 1982 to 2020.

Note: Harmful Algal Blooms were detected on Hess Lake in 2021 and 2022 by the United States Geological Survey, ( USGS ), a federal agency, along with Environment Great Lakes Energy, ( EGLE ), a state agency. High levels of Phosphorus is generally what fuels Harmful Algal Blooms, HAB.

## General Comments

Wheeler Drain is approximately 6 miles long and is south of Hess Lake. A number of other drains flow into Wheeler Drain, including, Cox, Wren, Van Horn, Downing and others.

Wheeler Drain contributes approximately 3 billion gallons of water to Hess Lake every year per figure 6 of the 1982 Edmands Study. Certainly this can change based on rain events.

Hess Lake holds about 1.6 billion gallons of water per page 4 of the 2020 Progressive AE Study.

The Watershed south of Hess Lake is approximately 15 square miles and is about **39% Agriculture** per page 3 of the 2020 Progressive AE Study.

## Comments listed below from each Hess Lake Study

### 1982 Edmands Study

- A. 57% of the water and **55% of the phosphorus** comes into Hess Lake from Wheeler Drain and is considered a major contributor, per Figure 6 of the study
- B. “Based on samples taken following a September 30, 1981 storm, about 185 cubic yards of sediment entered the Lake during the 24-period following the rain”, per page 9 of the study
- C. 13% of the water and **26% of the phosphorus** comes into Hess Lake from Alger Drain/Creek, per Figure 6 of the study
- D. “The Alger Drain also contributes a substantial amount of **phosphorus** to Hess Lake”, page 11 of the study
- E. 12% of the phosphorus may come from Septic Systems via shallow shallow groundwater, per Figure 6 of the study
- F. The phosphorus input from septic systems is relatively small compared to other sources, per page 11 of the study

### **1993 Study by Fishbeck, Thompson, Carr & Huber**

A. "The primary source of the excess phosphorus entering Hess Lake is from the Wheeler and Alger Drains as stated in previous reports", per page 1 of the study

### **1995 Report by Fishbeck, Thompson, Carr & Huber**

A. "It is clear from the nutrient budget that the Wheeler Drain is the single most significant input of water and phosphorus", per page 6 of the study

### **2019 Hess Lake Study by Dr. David Jude, Freshwater Physicians**

A. "Wheeler Creek has been identified as a major contributor of sediment and nutrients (phosphorus and nitrates) to the lake, especially in spring. Wheeler drain used to drain the lake to the south, but developers redirected the drain north into the lake to drain marsh and other wetlands. Now it drains extensive agricultural lands, which are fertilized and often accumulate water saturated with fertilizer, which is then drained into Wheeler Creek and then into Hess Lake. This source has been identified as a substantial component of nutrients entering Hess Lake", per page 5 of the study

B. "In Hess Lake too much phosphorus has fueled algae growth, which die and sink to the bottom decomposing as sediment", per page 9 of the study

C. Nitrates - "Wheeler Drain concentration was 0.93 mg/L, a high value, showing the high inputs of nutrients coming in from that drain", per page 36 of the study

### **2020 Progressive AE Hess Lake Study**

A. "The watershed is drained by Alger Creek and the Wheeler Drain, as well as several small, unnamed tributaries", per page 5 of the study

B. "Currently, the Wheeler Drain drains approximately 6,270 acres or about two-thirds of the watershed", per page 5 of the study

C. "Wheeler Drain is the largest single source of water to Hess Lake (Edmunds Engineering, Inc . 1982)", per page 8 of the study

D. "Tributary data indicate discharge and pollution loadings (i.e., total phosphorus and total suspended solids are greatest from Wheeler Drain (Table 6)." per page 14 of the study



E. "In the mid-1990s, additional sediment basins were constructed, check dams were installed, streambanks were stabilized, and a number of conservation practices were implemented all designed to reduce the impact of Wheeler Drain on Hess Lake (FTC&H 1996) . Maintenance of existing structural controls on Wheeler Drain is essential to optimizing their effectiveness", per page 29 of the study. This was a \$250,000 Project

F. "Wheeler Drain: To reduce nutrient and sediment loading from Wheeler Drain, the upstream sediment basin should be inspected and cleaned annually to optimize removal of sediments and nutrients. In addition, Wheeler Drain should be assessed to identify causes of stream instability and possible corrective actions", per page 31 of the study

G. \$6,000 per year has been budgeted for Watershed Management, per page 32 of the study

H. "In general, lakes with a phosphorus concentration greater than 20 µg/L (micrograms per liter, or parts per billion) are able to support abundant plant growth and are classified as nutrient- enriched or eutrophic", per page 11 of the study

#### **Streamside Ecological Services, August 22, 2022 Study**

A. "The croplands likely contribute a supply of sediment and nutrients to the drain, since little buffer exists along the field edges; the bottom of the drain is covered in fine sediments and dense aquatic vegetation grows along this entire reach", per page 3 of the study

## **Hess Lake & Tributaries Water Quality Data:**

**1980 - 2018 Total Phosphorus Data collected by all groups listed below**

### **In Lake Data**

**Mean 32.31 ug/L**

Low <5 ug/L,

High 90 ug/L

19 separate years of data with 61 data points

### **Wheeler Drain Data**

**Mean, 104.69 ug/L**

Low, 20 ug/L,

High, 420 ug/L

6 separate years of data with 16 data points

### **Alger Drain/Creek Data**

**Mean, 159.7 ug/L**

Low 20 ug/L,

High 510 ug/L

6 separate years of data with 14 data points

**Note: The above data indicates high level of phosphorus for both Wheeler & Alger Drains**

### **Sources of Phosphorus Data:**

2018 Progressive April & August Data & Drain Commissioner August 14, Wheeler Drain Data, Lake, Wheeler & Alger

2014 Savin Lake Data, three locations lake only, excludes aeration data

2009 Spicer Data, Wheeler Drain & Alger Only

2006 U.S.G.S Data, Lake only

2001 - 2010 Mi Corps Data, Lake only

1993 FTC&H Engineering Study, Tables 4 & 5, 1980 - 1992, Lake, Wheeler Drain & Alger

If you have an interest, consider reading the 1982 Edmands Hess Lake Study for a good baseline on what is happening to our lake. Followed by the 2020 Progressive AE and 2019 Dr. Jude Studies. These studies are located under the Engineering Tab of the website listed below.

[www.hesslake.org](http://www.hesslake.org)

If you have any questions, please give me a call or send me an email.

Take Care & Stay Safe,  
Bob Ripstra, Hess Lake Summer Resident  
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Note: I do not represent the Hess Lake Improvement Board or the Hess Lake Improvement Association



NOTE ALL FAS DRAINS THAT EMPTY INTO HESS LAKE  
SAWN IN YELLOW

### RESULTS AND DISCUSSION

A lake watershed is the land area that drains to a lake. The Hess Lake watershed is 9,336 acres, a land area about 12 times larger than the lake (Figure 5). The watershed is drained by Alger Creek and the Wheeler Drain, as well as several small, unnamed tributaries. Wheeler Drain and part of the upper portion of Alger Creek are designated county drains and are regulated under Michigan's Drain Code (PA 40 of 1956). Historical Michigan Department of Conservation records indicate that, at one time, drainage from what is now the upper portion of the Wheeler Drain flowed east and south away from the lake to the headwaters of the Rogue River. In the early 1900s, the drain was diverted to its present course substantially increasing the size of the Hess Lake watershed. Currently, the Wheeler Drain drains approximately 6,270 acres or about two-thirds of the watershed.

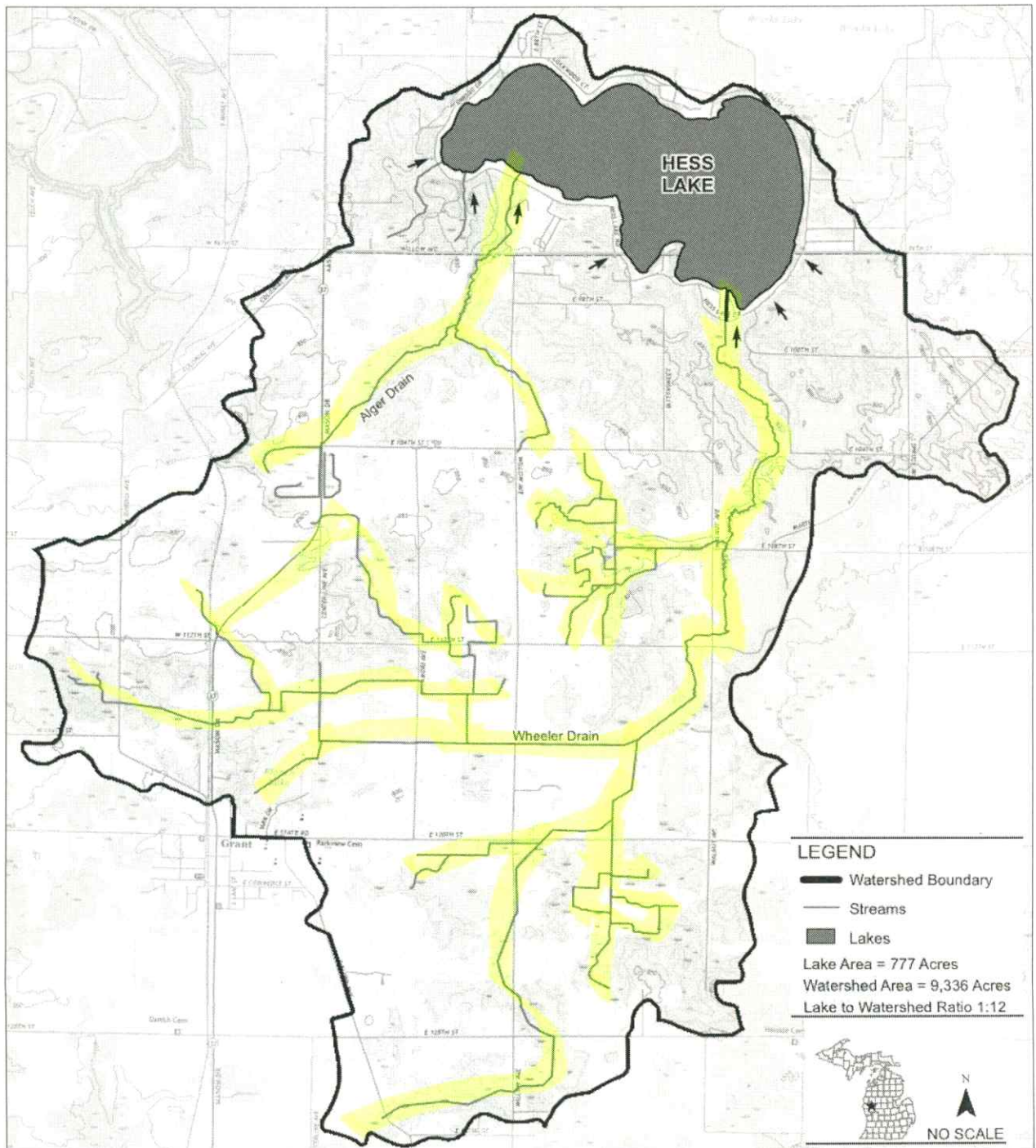


Figure 5. Hess Lake watershed map. Topographic map source: USGS TopoView. Watershed boundary source: USGS and USDA-NRCS.

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