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# Truesdale Lake

## *2015 Year End Summary*

Truesdale Lake POA  
South Salem, NY



December 9, 2015

TRUESDALE LAKE POA  
 35 Hoyt Street  
 South Salem, New York 10590

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**YEAR END SUMMARY  
 2015 LAKE MANAGEMENT PLAN  
 TRUESDALE LAKE**

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The following summary includes highlights of the lake management strategy, water quality data, aquatic pesticide treatments, and observations noted during surveys and treatments of Truesdale Lake in 2015. The following table details the aquatic plants that were present during the surveys performed in 2015, with invasive species highlighted in red.

<b>Common Name</b>	<b>Scientific Name</b>
<b>Curly-leaf pondweed</b>	<i>Potamogeton crispus</i>
White water lilies	<i>Nymphaea odorata</i>
American waterweed	<i>Elodea canadensis</i>
Duckweed	<i>Lemna minor</i>
Southern naiad	<i>Najas guadalupensis</i>

**TABLE 1. AQUATIC PLANTS OBSERVED AT TRUESDALE LAKE IN 2015.**

Allied biological was on site at Truesdale Lake every two to three weeks to survey the lake for aquatic plants and algae, as well as perform basic water quality testing. The chart below briefly highlights each survey and treatment date, with more in depth descriptions of each visit are summarized at the bottom of the next page.

<b>2015 Truesdale Lake Herbicide and Algaecide Treatments</b>			
<b>Date</b>	<b>Product Applied</b>	<b>Acres Treated</b>	<b>Observed/Targeted Species</b>
4/27/2015	Survey Only	N/A	<i>P.crispus</i>
5/14/2015	<b>Aquathol - K</b>	40	<i>P.crispus</i>
5/28/2015	Survey Only	N/A	<i>Nymphaea odorata</i>
6/16/2015	<b>Copper Sulfate</b>	41.5	Planktonic Algae
6/30/2015	<b>Copper Sulfate</b>	41.5	Planktonic/filamentous algae
7/14/2015	<b>Copper Sulfate</b>	41.5	Planktonic/filamentous algae
7/28/2015	Survey Only	N/A	Planktonic/filamentous algae
7/30/2015	Survey Only	N/A	Planktonic/filamentous algae



8/4/2015	Survey Only	N/A	Planktonic algae
8/12/2015	<b>Copper Sulfate</b>	41.5	Planktonic algae
8/26/2015	Survey Only	N/A	Planktonic algae/ <i>Lemna minor</i>
9/3/2015	Survey Only	N/A	Planktonic/filamentous algae

**TABLE 2. SUMMARY OF LAKE SURVEYS AND TREATMENTS.**

### **APRIL 27 – LAKE SURVEY**

Dissolved Oxygen – 10 ppm      Secchi (ft) – 6’      pH – 8      Water Temperature (°F) – 53

At the time of this survey the lake supported varied growth of curly-leaf pondweed (*Potamogeton crispus*) in approximately 50% of the lake. There were sparse densities in the southern end of the lake, while only trace amounts were seen in the northern end of the lake. Most of the plants were between 8” -18” tall, but were at least 18”-24” below the surface and at that time, did not warrant a treatment.

### **MAY 14 – LAKE SURVEY & TREATMENT**

Dissolved Oxygen – 9 ppm      Secchi (ft) – 8’      Ph – 7.75      Water Temperature (°F) – 67

The water temperature had gone up 14°F since the previous survey. Curly-leaf pondweed was found in sparse to moderate densities in the entire southern end of the lake and extended up the western shore and into many of the coves including the spill way. It was also found in sparse densities near the launch and in the northeastern cove. An herbicide application was performed using **Aquathol – K** covering an area of 40 acres.

### **MAY 28 – LAKE SURVEY**

Dissolved Oxygen – 7 ppm      Secchi (ft) – 7’      Ph – 7.75      Water Temperature (°F) – 71

Conditions on the lake at this time were good. All of the beaches were free of plant and algae growth. The previous treatment was successful as no plants were observed in the treated area. The lake had a good overall appearance as well as excellent clarity and no treatment was needed at the time.



### **JUNE 16 – LAKE SURVEY & TREATMENT**

Dissolved Oxygen – 7 ppm      Secchi (ft) – 4.5’      Ph – 8      Water Temperature (°F) – 74

The lake continued to look good at this time. There were a few stems of floating American water weed (*Elodea canadensis*) observed, but no stems were rooted. In the north end of the lake by the dam, there were trace amounts of white water lilies. The clarity of the water had dropped 2.5’ since the last visit and sparse planktonic algae were seen in the water column. A treatment was performed using **Copper Sulfate** in an effort to reduce the amount of algae and restore the water clarity.

### **JUNE 30 – LAKE SURVEY & TREATMENT**

Dissolved Oxygen – 9 ppm      Secchi (ft) – 3’ 4”      Ph – 8      Water Temperature (°F) – 74

This end of June survey showed a continued loss of water clarity as more planktonic algae were observed in the water column. Also, there was trace to sparse amounts of filamentous algae present along the shoreline at the southern end of the lake. Near the launch and adjacent beach, trace amounts of American water weed were observed. Small floating fragments of curly-leaf pondweed were seen in areas all throughout the lake, but no rooted stems were observed. A treatment was completed using **Copper Sulfate** for planktonic algae.

### **JULY 14 – LAKE SURVEY & TREATMENT**

Dissolved Oxygen – 9 ppm      Secchi (ft) – 3’ 4”      Ph – 8.5      Water Temperature (°F) – 80

At this time, the lake was supporting moderate growth of filamentous algae along the shorelines. Sparse amounts of American waterweed were found in the southern end of the lake and by the boat launch. Trace amounts of southern naiad (*Najas guadalupensis*) were spotted sporadically throughout the lake, as well as trace floating stems of curly-leafed pondweed. Water clarity remained the same as the previous visit with a moderate amount of planktonic algae in the water column. A supplemental **Copper Sulfate** application was conducted.

### **JULY 28 – LAKE SURVEY**

Dissolved Oxygen – 9.5 ppm      Secchi (ft) – **9”**      Ph – 8.5      Water Temperature (°F) – 77

This end of July survey showed a major increase in the growth of planktonic algae. At this point, water clarity was reduced to less than one foot. There were also moderate amounts of filamentous algae observed in the northern end. Because of unsatisfactory water quality conditions, lake management strategies could not be employed at the time of this visit.



### **JULY 30 – LAKE SURVEY**

Dissolved Oxygen – **16** ppm      Secchi (ft) – **13”**      Ph – 8.5      Water Temperature (°F) – 82

Lake conditions remained nearly the same as the survey from two days earlier. The clarity improved slightly, but the dissolved oxygen content had jumped 6.5 ppm higher than in the previous survey. At this time, planktonic algae is collecting on the surface. Once again, a treatment could not be performed due to poor lake conditions.

### **AUGUST 4 – LAKE SURVEY**

Dissolved Oxygen – 10 ppm      Secchi (ft) – **1’ 14”**      Ph – 9      Water Temperature (°F) – 82

Water quality conditions of the lake showed a slight improvement; however, they still remained undesirable. Although the dissolved oxygen readings had improved, clarity was still reduced and once again a treatment could not be performed.

### **AUGUST 12 – LAKE SURVEY & TREATMENT**

Dissolved Oxygen – 5.5 ppm      Secchi (in) – 25”      Ph – 8      Water Temperature (°F) – 72

At this time, water conditions have naturally improved, but the lake still supported dense growth of planktonic algae. It was observed at high density in the water column and was also collecting on the surface and along the shorelines. Lake conditions were acceptable to perform an algacide treatment. **Copper Sulfate** was employed in an effort to improve lake conditions.

### **AUGUST 26 – LAKE SURVEY**

Dissolved Oxygen – **5** ppm      Secchi (ft) – **1.5’**      Ph – 9      Water Temperature (°F) – 76

The conditions of the lake remained nearly the same and actually showed some signs of decline following the previous treatment. The water column was still supporting planktonic growth, but appeared to be turbid as well. Trace amounts of duckweed (*Lemna minor*) were observed along the shoreline. Four dead fish were also observed during the survey. Lake conditions were not conducive for a treatment to be performed.



### SEPTEMBER 3 – LAKE SURVEY

Dissolved Oxygen – 5 ppm      Secchi (in) – 14”      Ph – 9      Water Temperature (°F) – 77

Lake conditions remained unfavorable as water quality was further reduced. Moderate amounts of planktonic algae were observed throughout the entire lake. Trace amounts of filamentous algae were found in small localized patches throughout the lake. Two more dead fish were observed during the survey. This was the final site visit for 2015 and an algaecide application could not be conducted.

### DISCUSSION

The 2015 lake management season saw a relatively typical treatment pattern for Truesdale Lake, with early season aquatic plant control followed by periodic algaecide applications. Unfortunately, after the initial aquatic plant control, the rapid, dense growth of planktonic algae reduced water clarity of the lake to less than two feet by mid July. This trend continued for the rest of the 2015 season and limited the lake management strategies that could be employed. It is evident that the lake continues to suffer from elevated nutrient levels that contribute to the undesirable growth of planktonic algae, which gives the lake as a whole an unappealing appearance and limits water quality.

Other notable occurrences this season were the appearance of aquatic species that have not been present in the lake as far back as records show. In the 2015 season, there were areas of the lake observed to have duckweed (*Lemna minor*) and southern naiad (*Najas guadalupensis*). These species were noted at the end of the lake management season and were observed in small amounts. However, leafy pondweed (*Potamogeton foliosus*) was present in the lake in 2014, but was not observed in the 2015 season. This can be attributed to one of two things. One: the **Aquathol - K** treatment for curly-leaf pondweed was effective in gaining control before the plants were tall enough to be observed, two: the dense growth of planktonic algae during this summer season did not allow sufficient sunlight to enter the water column to enable growth. It should be noted, however, that leafy pondweed is an aquatic plant that is native to southern New York. Limited control of this plant would allow for fish habitat and would also help to reduce that amount of planktonic algae that is present in the water column.



According to the CSLAP report for Truesdale Lake, the 2012 & 2013 summer seasons saw an increase in planktonic algae and a reduction in clarity. This trend can be supported by the treatment logs for the 2014-2015 seasons. At certain times in the 2015 season the water clarity was less than one foot, which is undesirable in maintaining a healthy, functional lake. With algae density that great, sunlight cannot reach beneficial plants. This also causes the dissolved oxygen content to maintain a higher concentration in the water, which can be harmful to fish if levels change too rapidly. CSLAP also suggests that elevated pH levels could potentially threaten the aquatic life in Truesdale Lake. High pH levels are often associated with high levels of planktonic algae, which have dominated the water column. Moving forward into the 2016 season, different management approaches might need to be employed in order to gain better control during the mid summer months.

The CSLAP report also states that both phosphorus and nitrogen levels are higher than normal. Both elements are essential for plant growth, however, in all plants, the limiting factor in growth is the amount of phosphorus available. If the amount of phosphorus continues to increase, the current methods of control will likely become ineffective. Currently, **Copper Sulfate** is applied for algae control, but NYSDEC only allows for a low dosage to be applied (.8 pound/acre foot), which is less than half of the recommended dosage rate. During the 2015 season there were five instances in which a treatment could not be performed due to water quality readings that fell outside of these parameters (dissolved oxygen content & water clarity).

A recommended management strategy would be the installation of a large scale aeration system. Aeration reduces the recycling of nutrients from lake bottom sediments when designed properly. The prevention of nutrient recycling occurs when the lake supports oxygen at the sediment-water interface, aiding decomposition of organic sediments and prohibiting disassociation of phosphorus from the sediment in anoxic conditions.

Looking ahead to the 2016 lake management season, both aquatic plant and algae control will be necessary. Treatment of curly-leaf pondweed will be justified as most plants will reach the surface across a significant portion of the lake. This past year has shown **Aquathol – K** to be effective in the control of curly-leafed pondweed as there were no reports of new plant growth after the initial treatment. This option should be considered for the initial treatment in 2016 because the plants can be controlled in less than 2 weeks time.



Abundant algal blooms can be expected in the coming year. If no alternative measures are taken to remove nutrients from the water column, a season of algaecide treatments will be performed as water quality parameters permit. Other algaecides may be a benefit to the lake in terms of better control of the planktonic algae. **Green Clean Pro** & **Citrine Plus** are two additional algaecides that are permitted for use in Truesdale Lake. Each algaecide has benefits that differ from **Copper Sulfate** and can positively contribute to algae control.

It has been a pleasure to continue providing quality lake management services for Truesdale Lake in the 2015. We look forward to working with the TLPOA towards continued water quality improvements in 2016.

Sincerely,

*Carl Cummins*

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