

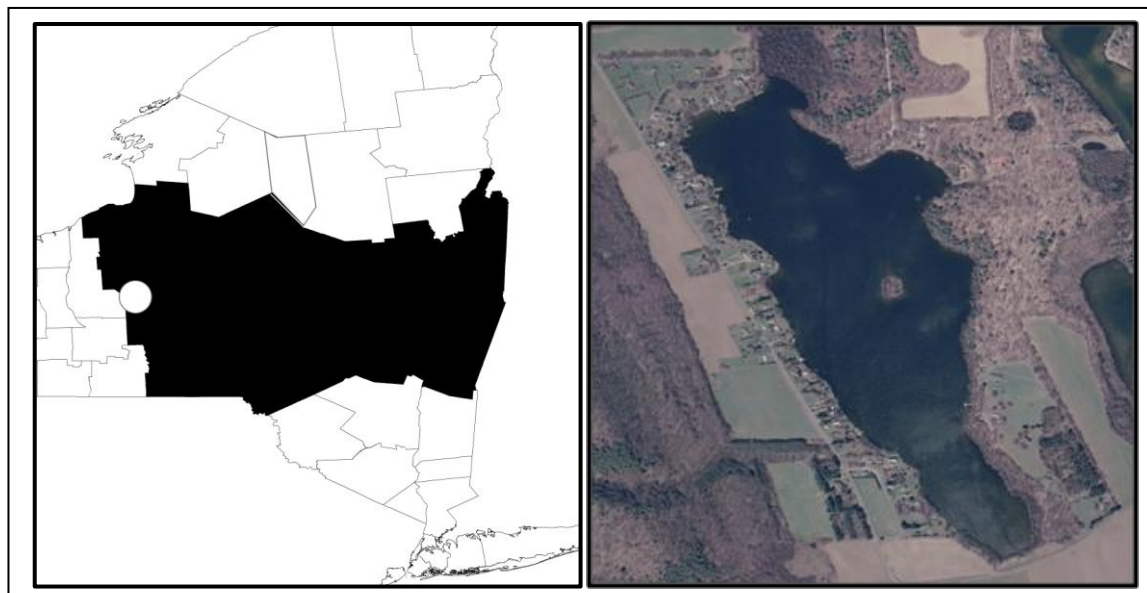
Appendix A: CSLAP 2009 Lake Water Quality Summary: Song Lake

General Lake Information

Location	town of Tully
County	Cortland
Basin	Susquehanna River
Size	44 hectares (108.7 acres)
Lake Origins	Natural
Watershed Area	255.4 hectares (630.8 acres)
Retention Time	1.1 years
Mean Depth	4.0 meters
Sounding Depth	8.6 meters
Public Access?	no
Major Tributaries	no named tribs
Lake Tributary To...	groundwater feed to West Branch Tioughnioga River to East Branch Tioughnioga River to Tioughnioga River to Chenango River to Susquehanna River
WQ Classification	B (contact recreation = swimming)
Lake Outlet Latitude	42.762
Lake Outlet Longitude	-76.143
Sampling Years	2007-2009
2009 Samplers	Tony George and Carl Grillo
Main Contact	Tony George

Lake Map

(sampling location marked with a circle)



Background

Song Lake is a 109 acre, class B lake found in the Town of Tully in Cortland County, in the central region of New York State. Song Lake was first sampled as part of CSLAP in 1988, and again in 2007.

It is one of 2 CSLAP lakes among the >15 lakes found in Cortland County, and one of 24 CSLAP lakes among the >120 lakes and ponds in the Susquehanna River drainage basin.

Lake Uses

Song Lake is a Class B lake; this means that the best intended use for the lake is for contact recreation—swimming and bathing, non-contact recreation—boating and fishing, aquatic life, and aesthetics. The lake is used by lake residents and invited guests for boating and swimming. There is no public access to the lake.

Song Lake is not stocked by the state. It is not known by the report authors if private fish stocking occurs in Song Lake. Fish species in the lake include black crappie, brown bullhead, chain pickerel, largemouth bass, pumpkinseed sunfish, rock bass, white sucker, and yellow perch.

General statewide fishing regulations are applicable in Song Lake. In addition, open season for trout lasts from April 1st through October 15th, with no size limits and a daily take limit of 5, with no more than 2 greater than 12" and 5 brook trout under 8" in length.

There are no lake-specific fish consumption advisories on Song Lake.

Historical Water Quality Data

CSLAP sampling was conducted on Song Lake from 1998 and 2007-2009. The CSLAP reports for Song Lake for several years are posted on the NYSFOLA website at www.nysfola.org, under NYS Lake Association Lake List.

Song Lake has not been sampled through any of the statewide water quality monitoring programs prior to CSLAP. It is not known if local monitoring has been conducted as a fisheries management tool, or to evaluate swimming conditions in the lake.

The major Song Lake tributaries are not officially named, and have not been monitored through the NYSDEC Rotating Intensive Basins (RIBS) program. No sites have been sampled through the state stream macroinvertebrate monitoring program. The lake has also not been sampled through any of the state fisheries monitoring programs.

Lake Association and Management History

Song Lake is served by the Song Lake Property Owners Association. It is not known to what extent the lake association is involved in lake management activities or if it maintains a web site.

Summary of 2009 CSLAP Sampling Results

Evaluation of Eutrophication Indicators

Chlorophyll *a* readings in Song Lake were lower than normal in 2009, despite Secchi disk transparency and total phosphorus readings that were close to normal in 2009. This suggests that the lower algae levels in the lake in 2009 were within the normal range of variability for the lake. None of these indicators has exhibited any clear long-term trends. The lake can be characterized as *mesotrophic*, or moderately unproductive, based on water clarity, total phosphorus and chlorophyll *a* readings (all typical of *mesotrophic* lakes). The TSI evaluation suggests that each of these trophic indicators is “internally consistent”—each of these indicators is in the expected range given the readings of the other indicators. Overall trophic conditions are summarized on the Lake Scorecard.

Evaluation of Potable Water Indicators

Algae levels may at times be high enough to render the lake susceptible to taste and odor compounds or elevated DBP (disinfection by product) compounds that could affect the potability of the water, but the lake is not used for drinking water. Although deepwater phosphorus readings are higher than those measured at the lake surface, deepwater ammonia readings are not elevated, so deepwater intakes may support “unofficial” potable water use.

Evaluation of Limnological Indicators

Most of the limnological indicators measured in CSLAP in 2009 deviated from normal conditions. NO_x, true color and calcium readings were higher than normal, and total nitrogen and pH readings were lower than normal. The higher color readings were also measured in many other CSLAP lakes, and may have been in response to wetter weather. With only a few years of CSLAP data, it is premature to determine if any of the other limnological indicators has exhibited any clear long-term trends. It is likely that the small changes in each of these indicators have been within the normal range of variability in the lake, but trends will continue to be evaluated. Overall limnological conditions are summarized in the Lake Scorecard.

Evaluation of Biological Condition

Phytoplankton, macrophyte, zooplankton, and macroinvertebrate surveys have not been conducted through CSLAP at Song Lake. Although Eurasian watermilfoil has been found in many nearby lakes, it is not known if this exotic plant (or any other exotic plants) have been found in the lake.

The fish community is comprised of at least five warmwater fish species, and at least three coolwater fish species. This suggests that the lake can most likely be characterized as a coolwater fishery, although the inventory of fish species in the lake may be incomplete.

Evaluation of Lake Perception

Water quality, aquatic plant and recreational assessments were close to normal in 2009, and none of these measures of lake perception has exhibited any clear long-term trends. Overall lake perception is summarized on the Lake Scorecard.

Evaluation of Local Climate Change

Air and water temperature readings in the summer index period were close to normal in 2009, and neither air nor water temperature readings has exhibited any long-term trends. It is not known if this is an indication of the lack of local climate change or if these changes cannot be well evaluated through CSLAP.

Lake Scorecard

Category	Indicator	Classification	2009 Change?	Long Term Change?
Eutrophication Indicators	Water Clarity	Mesotrophic	No	Too early to tell
	Chlorophyll <i>a</i>	Mesotrophic	Lower than normal	Too early to tell
	Total Phosphorus	Mesotrophic	No	Too early to tell
Potable Water Indicators	Hypolimnetic Ammonia	Similar to Surface NH4		
	Hypolimnetic Arsenic			
	Hypolimnetic Iron			
	Hypolimnetic Manganese			
Limnological Indicators	Hypolimnetic Phosphorus	Higher Than Surface TP		Too early to tell
	Nitrate + Nitrite	Low NOx		
	Ammonia	Low Ammonia		
	Total Nitrogen	Low Total Nitrogen		
	pH	Alkaline		
	Specific Conductance	Intermediate		
	True Color	Intermediate Color		
	Calcium	Highly Susceptible to Zebra Mussels		
Lake Perception	WQ Assessment	Not Quite Crystal Clear	No	Too early to tell
	Aquatic Plant Coverage	Subsurface Plant Growth	No	Too early to tell
	Recreational Assessment	Excellent	No	Too early to tell
Biological Condition	Phytoplankton	Not evaluated through CSLAP	Not known	Not known
	Macrophytes	Not evaluated through CSLAP	Not known	Not known
	Zooplankton	Not evaluated through CSLAP	Not known	Not known
	Macroinvertebrates	Not evaluated through CSLAP	Not known	Not known
	Fish	Coolwater fishery?	Not known	Not known
	Invasive Species	Not reported through CSLAP	Not known	Not known
Local Climate Change	Air Temperature		No	Too early to tell
	Water Temperature		No	Too early to tell

Evaluation of Lake Condition Impacts to Lake Uses

Song Lake is presently among the lakes listed on the Susquehanna River drainage basin PWL (2009), with public bathing and recreation listed as stressed due to excessive weeds. The PWL listing for Song Lake is listed in Appendix C.

Potable Water (Drinking Water)

The CSLAP dataset at Song Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, and the lake is not used for this purpose. The occasionally elevated algae levels indicate that water intakes may be threatened by taste and odor problems, but low deepwater ammonia readings do not indicate any threats to any "unofficial" potable water use from deeper intakes.

Contact Recreation (Swimming)

The CSLAP dataset at Song Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that swimming and contact recreation should be fully supported, although additional information about bacterial levels is needed to evaluate the safety of the water for swimming.

Non-Contact Recreation (Boating and Fishing)

The CSLAP dataset on Song Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that non-contact recreation should be fully supported.

Aquatic Life

The CSLAP dataset on Song Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life should be fully supported, although additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics

The CSLAP dataset on Song Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics should be fully supported.

Fish Consumption

There are no fish consumption advisories posted for Song Lake.

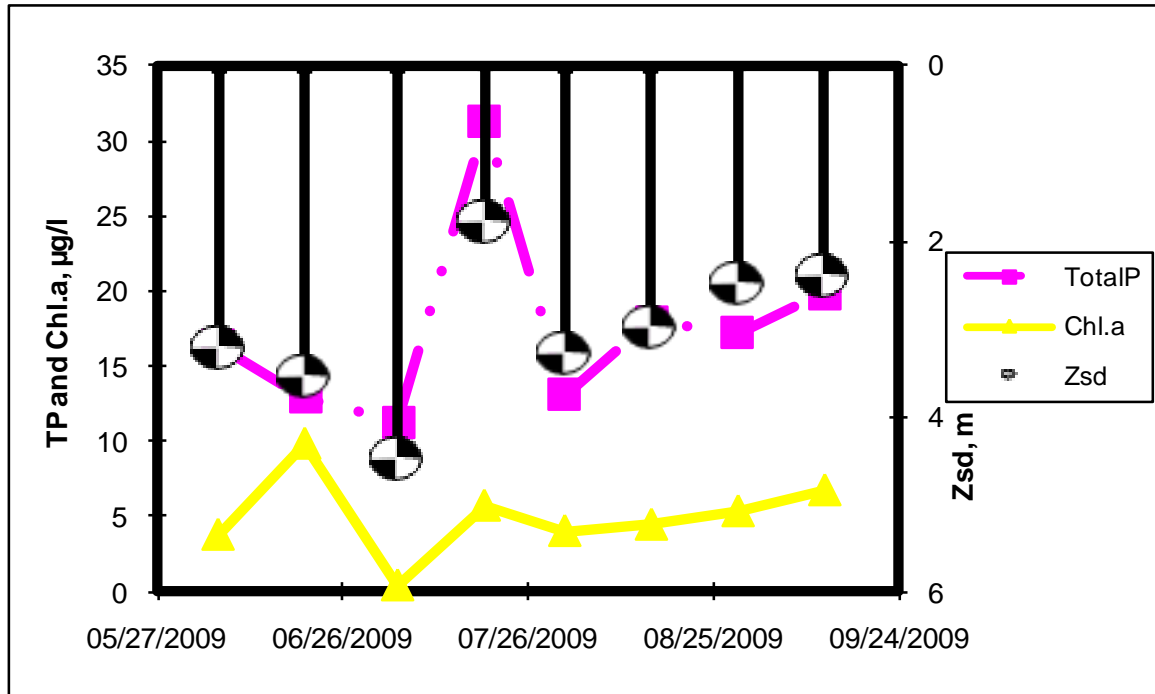
Additional Comments and Recommendations

Aquatic plant survey data will help to determine if the lake is threatened (or presently impacted) by invasive species, such as Eurasian watermilfoil, common to other lakes in the area. Additional water quality monitoring data will help to determine if the existing PWL listings for the lake are warranted.

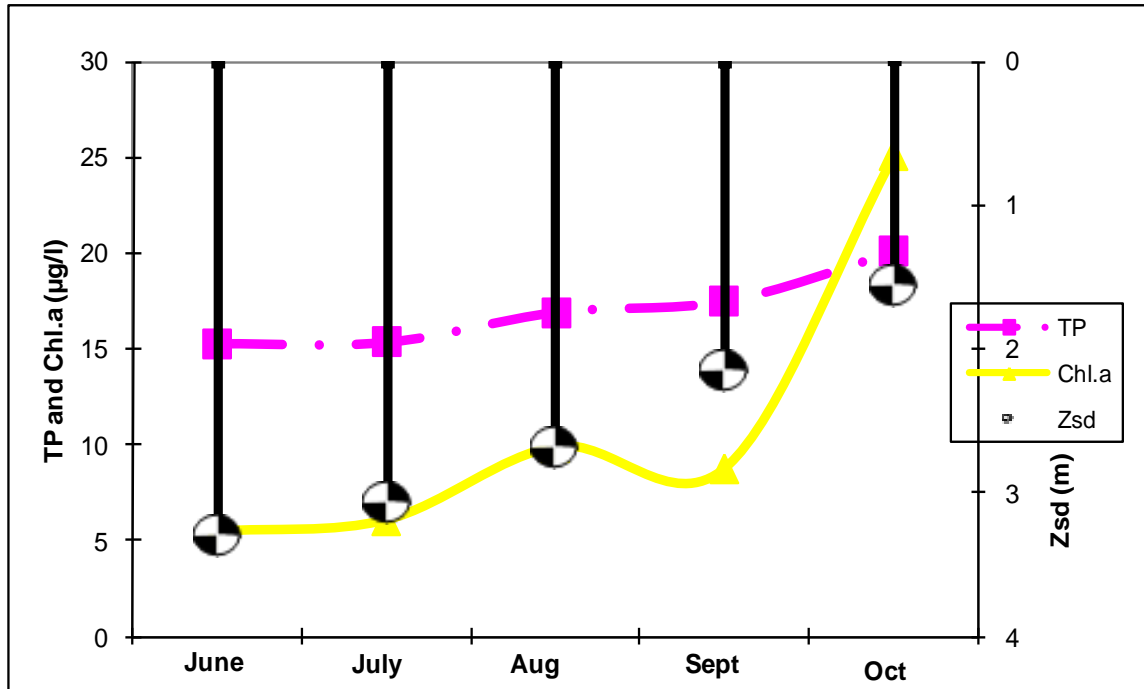
Aquatic Plant IDs-2009

None collected in 2009.

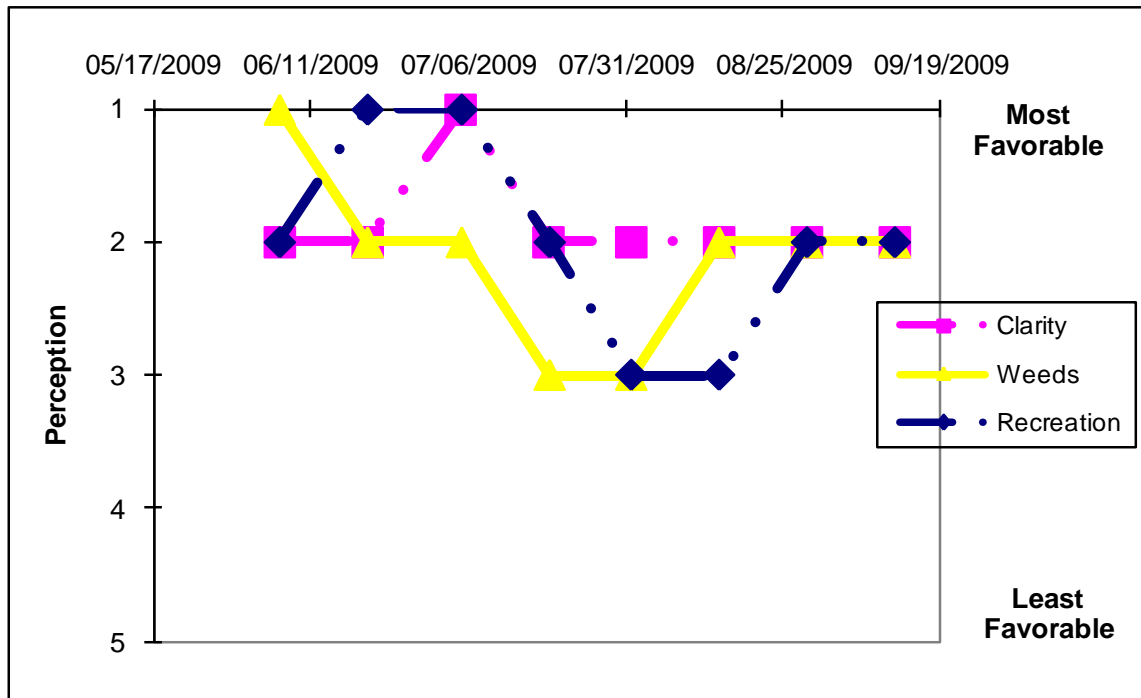
Time Series: Trophic Indicators, 2009



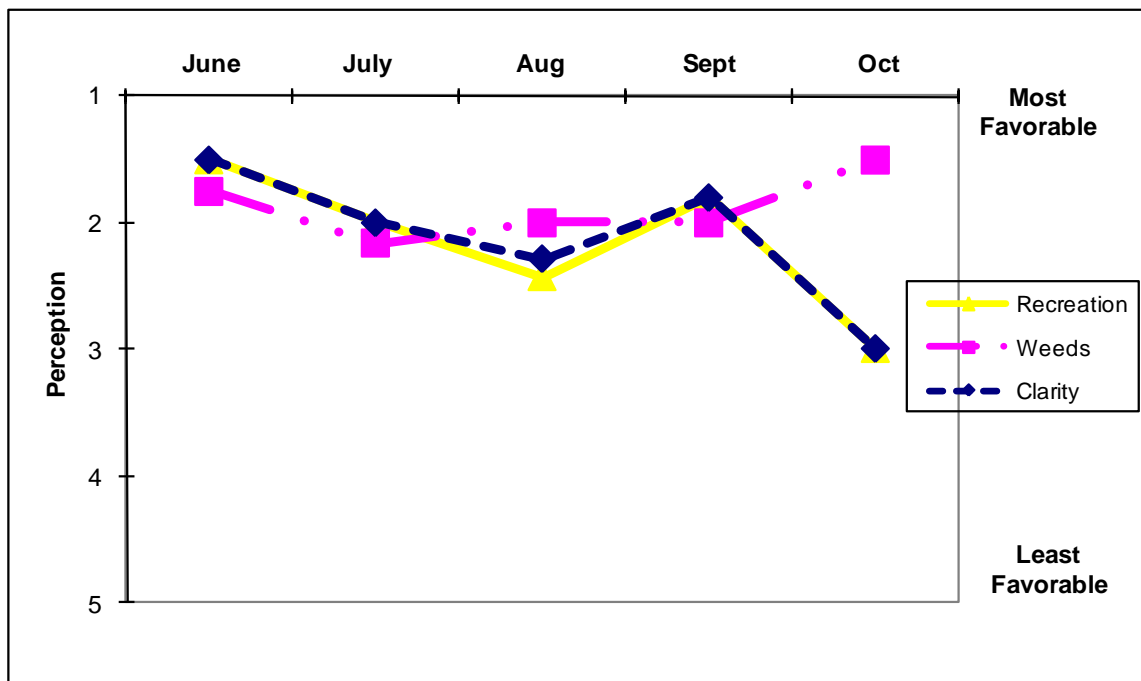
Time Series: Trophic Indicators, Typical Year (1988-2009)



Time Series: Lake Perception Indicators, 2009



Time Series: Lake Perception Indicators, Typical Year (1988-2009)



LNum	LName	Date	Zbot	Zsd	Zsamp	TAir	TH2O	QA	QB	QC	QD
212	Song L	7/3/1988	7.3	4.04	1.5	20	18				
212	Song L	7/10/1988	7.2	4.05	1.5	26	25				
212	Song L	7/17/1988	7.3	3.20	1.5	24	23				
212	Song L	7/25/1988	8.2	2.71	1.5	20	23				
212	Song L	8/1/1988	7.5	2.96	1.5	22	24				
212	Song L	8/8/1988	7.8	2.64	1.5	22	23				
212	Song L	8/15/1988	7.2	3.14	1.5	24	26				
212	Song L	8/23/1988	7.6	2.56	1.5	16	20				
212	Song L	8/28/1988	7.8	2.29	1.5	25	21				
212	Song L	9/6/1988	7.9	2.82	1.5	9	16				
212	Song L	9/11/1988	7.6	2.96	1.5	14	18				
212	Song L	9/18/1988	8.0	3.77	1.5	24	17				
212	Song L	9/25/1988			1.5						
212	Song L	9/26/1988			1.5						
212	Song L	7/17/2007	8.3	3.30	1.5	24	23	1	2	1	8
212	Song L	7/31/2007	8.4	3.38	1.0	23	25	1	2	1	0
212	Song L	8/11/2007	8.3	2.90	1.0	33	27	3	2	2	6
212	Song L	8/25/2007	8.3	3.40	1.0	31	24	1	1	1	0
212	Song L	9/8/2007	8.2	2.80	1.0	27	25	1	2	1	8
212	Song L	9/22/2007	7.6	2.58	1.0	22	21	1	2	1	8
212	Song L	10/6/2007	7.7	1.55	1.0		20	3	2	4	368
212	Song L	10/20/2007	8.0	1.57	1.0	16	15	3	1	2	5
212	Song L	6/14/2008	7.5	3.70	1.0	29	27	1	2	2	8
212	Song L	6/28/2008	8.6	2.70		31	26	1	2	1	0
212	Song L	7/12/2008	8.5	2.30	1.0	32	27	3	2	3	38
212	Song L	7/26/2008	8.3	1.45	1.0	23	26	4	2	4	1234
212	Song L	8/9/2008	8.4	1.40	1.0	22	25	4	2	4	134
212	Song L	8/23/2008	8.4	2.25	1.0	20	23	2	2	2	8
212	Song L	9/6/2008	8.2	1.85	1.0	22	22	3	2	3	5
212	Song L	9/20/2008	8.2	2.40	1.0	16	21	2	2	2	6
212	Song L	06/06/2009	8.7	3.23	1.0	19	20	2	1	2	0
212	Song L	06/20/2009	8.8	3.55	1.0	20	22	2	2	1	0
212	Song L	07/05/2009	8.7	4.50	1.0	24	23	1	2	1	0
212	Song L	07/19/2009		1.79	1.0	23	24	2	3	2	0
212	Song L	08/01/2009	8.5	3.30	1.0	22	24	2	3	3	8
212	Song L	08/15/2009	8.6	3.00	1.0	25	26	2	2	3	3
212	Song L	08/29/2009	8.6	2.50	1.0	20	22	2	2	2	0
212	Song L	09/12/2009		2.40	1.0	17	22	2	2	2	5
212	Song L	7/17/2007	8.3		7.0		16				
212	Song L	7/31/2007	8.4		7.0		25				
212	Song L	8/11/2007	8.3		7.0		19				
212	Song L	8/25/2007	8.3		7.0		21				
212	Song L	9/8/2007	8.2		7.2		21				
212	Song L	9/22/2007	7.6		6.6		20				
212	Song L	10/6/2007	7.7		6.7		19				
212	Song L	10/20/2007	8.0		7.0		17				
212	Song L	6/14/2008			6.5		19				
212	Song L	6/28/2008					18				
212	Song L	7/12/2008			7.5		18				
212	Song L	7/26/2008			7.3		18				
212	Song L	8/9/2008			7.3		20				
212	Song L	8/23/2008			7.4		29				
212	Song L	9/6/2008			7.3		20				
212	Song L	9/20/2008			7.2		20				
212	Song L	06/06/2009	8.7		7.7		18				
212	Song L	06/20/2009	8.8		7.8		18				
212	Song L	07/05/2009	8.7		7.7		18				
212	Song L	07/19/2009			7.6		22				
212	Song L	08/01/2009	8.5		7.5		21				
212	Song L	08/15/2009	8.6		7.6		22				
212	Song L	08/29/2009	8.6		7.6		21				
212	Song L	09/12/2009	0.4		7.4		21				

Legend Information

<i>Indicator</i>	<i>Description</i>	<i>Detection Limit</i>	<i>Standard (S) / Criteria (C)</i>
General Information			
Lnum	lake number (unique to CSLAP)		
Lname	name of lake (as it appears in the Gazetteer of NYS Lakes)		
Date	sampling date		
Field Parameters			
Zbot	lake depth at sampling point, meters (m)		
Zsd	Secchi disk transparency or clarity	0.1m	1.2m (C)
Zsamp	water sample depth (m)	0.1m	none
Tair	air temperature (C)	-10C	none
TH20	water temperature (C)	-10C	none
Laboratory Parameters			
Tot.P	total phosphorus (mg/l)	0.003 mg/l	0.020 mg/l (C)
NOx	nitrate + nitrite (mg/l)	0.01 mg/l	10 mg/l NO3 (S), 2 mg/l NO2 (S)
NH4	total ammonia (mg/l)	0.01 mg/l	2 mg/l NH4 (S)
TN	total nitrogen (mg/l)	0.01 mg/l	none
TN/TP	nitrogen to phosphorus (molar) ratio, = (TKN + NOx)*2.2/TP		none
TCOLOR	true (filtered) color (ptu, platinum color units)	1 ptu	none
pH	powers of hydrogen (S.U., standard pH units)	0.1 S.U.	6.5, 8.5 S.U. (S)
Cond25	specific conductance, corrected to 25C (umho/cm)	1 umho/cm	none
Ca	calcium (mg/l)	1 mg/l	none
Chl.a	chlorophyll a (ug/l)	0.01 ug/l	none
Fe	iron (mg/l)	0.1 mg/l	0.3 mg/l (S)
Mn	manganese (mg/l)	0.01 mg/l	0.3 mg/l (S)
As	arsenic (mg/l)	1 ug/l	10 ug/l (S)
Lake Assessment			
QA	water quality assessment, 5 point scale; 1 = crystal clear, 2 = not quite crystal clear, 3 = definite algae greenness, 4 = high algae levels, 5 = severely high algae levels		
QB	aquatic plant assessment, 5 point scale; 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = surface plant coverage		
QC	recreational assessment, 5 point scale; 1 = could not be nicer, 2 = excellent, 3 = slightly impaired, 4 = substantially impaired, 5 = lake not usable		
QD	reasons for recreational assessment, 8 choices; 1 = poor water clarity, 2 = excessive weeds, 3 = too much algae, 4 = lake looks bad, 5 = poor weather, 6 = litter/surface debris, 7 = too many lake users, 8 = other		

Appendix C- PWL Listing for Song Lake

Song Lake (0602-0019)

MinorImpacts

Waterbody Location Information

Revised: 07/02/2009

Water Index No:	SR- 44-14-60-P68-P72	Drain Basin:	Susquehanna River
Hydro Unit Code:	02050102/080	Str Class:	B
Waterbody Type:	Lake (Unknown Trophic)	Reg/County:	7/Cortland Co. (12)
Waterbody Size:	105.4 Acres	Quad Map:	OTISCO VALLEY (J-16-4)
Seg Description:	entire lake		

Water Quality Problem/Issue Information (CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
Public Bathing	Stressed	Suspected
Recreation	Stressed	Suspected

Type of Pollutant(s)

Known: ---
Suspected: ALGAL/WEED GROWTH (aquatic vegetation), NUTRIENTS (phosphorus)
Possible: ---

Source(s) of Pollutant(s)

Known: ---
Suspected: AGRICULTURE
Possible: On-Site/Septic Syst

Resolution/Management Information

Issue Resolvability:	1 (Needs Verification/Study (see STATUS))	
Verification Status:	4 (Source Identified, Strategy Needed)	
Lead Agency/Office:	ext/WQCC	Resolution Potential: Medium
TMDL/303d Status:	n/a	

Further Details

Overview

Public Bathing and other recreational uses in Song Lake are thought to experience minor impacts due to elevated nutrient levels that contribute to algal and weed growth. Agricultural activities and other nonpoint sources in the watershed are the likely source of the pollutants.

Water Quality Sampling

Song Lake was sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) in 2007. Prior to that, the lake was sampling through CSLAP in 1988. An Interpretive Summary report of the findings of this sampling was published in 2008. These data indicate that the lake continues to be best characterized as mesoeutrophic, or moderately productive. Phosphorus levels in the lake occasionally exceeded the state guidance values indicating impacted/stressed recreational uses. Corresponding transparency measurements typically exceed what is the recommended minimum for swimming beaches. Measurements of pH are somewhat high but typically fall within the state water quality range of 6.5 to 8.5. The lake water is slightly colored, but color does not limit water transparency. (DEC/DOW, BWAM/CSLAP, January 2008)

Recreational Assessment

Public perception of the lake and its uses is also evaluated as part of the CSLAP program. This assessment indicates recreational suitability of the lake to be mostly favorable in 2008. The recreational suitability of the lake is described most frequently as "could not be nicer" or "excellent." The lake itself is most often described as "not quite crystal clear" or having "definite algal greenness," an assessment that is somewhat more favorable than occurs in lakes with similar water quality. Assessments have noted that aquatic plants do not grow to the lake surface. (DEC/DOW, BWAM/CSLAP, January 2008)

Lake Uses

This lake waterbody is designated class B, suitable for use as a public bathing beach, general recreation and aquatic life support, but not as a public water supply. Water quality monitoring by NYSDEC focuses primarily on support of general recreation and aquatic life. Samples to evaluate the bacteriological condition and bathing use of the lake or to evaluate contamination from organic compounds, metals or other inorganic pollutants have not been collected as part of the CSLAP monitoring program. Monitoring to assess potable water supply and public bathing use is generally the responsibility of state and/or local health departments.

Previous Assessment

Based on previous CSLAP sampling in 1988, recreational uses in Song Lake were assessed as possibly being stressed. However impacts to the lake were noted as needing verification. The more recent sampling suggests impacts to uses are present but fairly minor. (DEC/DOW, BWM/Lake Services, January 2008).

Segment Description

This segment includes the total area of the lake.