

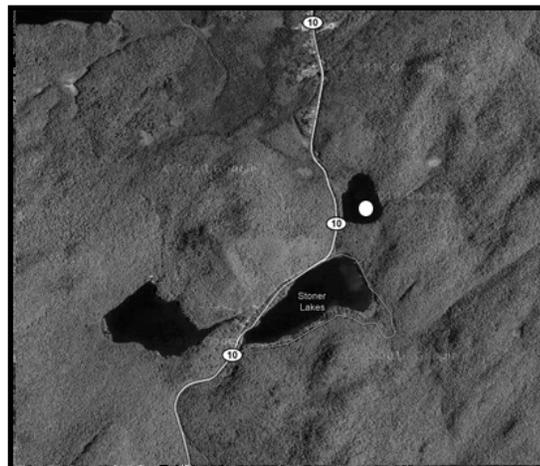
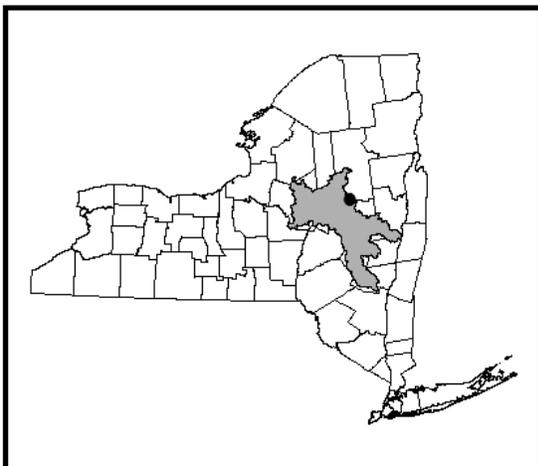
LCI Lake Water Quality Summary

General Information

Lake Name:	East Stoner Lake
Location:	Town of Arietta, Hamilton County, NY
Basin:	Mohawk River Basin
Size:	10.4 hectares (25.69 acres)
Lake Origins:	natural
Major Tributaries:	Unnamed tributaries
Lake Tributary to?:	Canada Lake via Stoner (Middle Lake)
Water Quality Classification:	Not classified (Wholly within the NYS Forest Preserve)
Sounding Depth:	9 meters (29 feet)
Sampling Coordinates:	43.23355, -74.51172
Sampling Access Point:	Informal parking area east side of lake
Monitoring Program:	Lake Classification and Inventory (LCI) Survey
Sampling Date:	July 28, 2010
Samplers:	David Newman, NYSDEC Division of Water, Albany Dan Hayes, NYSDEC Division of Water, Albany
Contact Information:	David Newman, NYSDEC Division of Water djnewman@gw.dec.state.ny.us ; 518-402-8201

Lake Map

(sampling location marked with a circle)



Background and Lake Assessment

East Stoner Lake (also referred to as North Stoner Lake, Little Stoner Lake, and East Stink Lake) is the smallest of three lakes that make up the Stoner Lake system. The lake is also the only one of the three in the Silver Lake Wilderness Area—the other two Stoner Lakes are in the Shaker Mountain Wild Forest. East Stoner Lake is the least developed of the three lakes, with Route 10 on the western side of the lake being the only non-forested land around shoreline of the lake. The greater watershed for the lake is almost completely forested with only a few buildings along Route 10 north of the Stoner Lakes. The lake is used for swimming, non-power boating and fishing, and primitive campsites are found around the lake's shoreline. Due to a lack of water quality data in the Division of Water's database and the lake appearing on The Mohawk River Basin Waterbody Inventory and Priority Waterbodies List (WI/PWL) (NYS DEC 2010) as an "impaired segment", East Stoner Lake was included in the 2010 Lake Inventory and Classification (LCI) screening program. The WI/PWL "impaired segment" listing is due to fish consumption being impaired by elevated mercury levels from atmospheric deposition. There is currently a fish consumption advisory for smallmouth bass over 15" in Middle Stoner Lake (also referred to as East Stoner Lake or Stoner Lake) (NYS DOH 2010).

East Stoner Lake can be characterized as *mesotrophic*, or moderately productive. The water clarity reading taken in late July (TSI =46, typical mesotrophic lakes) was expected given the chlorophyll *a* reading (TSI = 45, typical of *mesotrophic* lakes), and in the expected range given the total phosphorus reading (TSI = 40, typical of at the high end of *oligotrophic* waterbodies). These data indicate that baseline nutrients do not support persistent algal blooms in the lake.

In late July the water appeared brownish. Visual observation and rake tosses yielded a wide variety of native emergent, floating leaf, and submergent plant species. The emergent species observed were *Pontederia cordata* (pickerelweed) and *Sparganium sp.* (bur-reed); both were seen in the near-shore shallow portion of the lake. The floating leaf species consisted of *Brasenia schreberi* (watershield), *Nymphaea sp.* (white waterlily), and *Nymphoides cordata* (little floating heart). These were also found in the shallow near-shore areas of the lake. The submergent plant species were *Eriocaulon septangulare* (pipewort), *Potamogeton epihydrus* (ribbonleaf pondweed), *Utricularia purpurea* (purple bladderwort), and *Utricularia vulgaris* (common bladderwort). No exotic invasive species were observed in the lake. A more thorough plant specific survey may yield additional aquatic plants.

East Stoner Lake exhibited thermal stratification, in which depth zones (warm water on top, cold water on the bottom during the summer) are established, as in most NYS lakes greater than 6 meters deep. The thermocline in the lake was at four meters in late July. The bottom three meters of the hypolimnion (bottom waters) were anoxic (devoid of oxygen) with the waters below 5 meters characterized as hypoxic (low oxygen). These dissolved oxygen readings in the hypolimnion are below the state standard to protect trout survival. The pH readings were just above 6.0 and fell below the state's guidance value of 6.5. Some aquatic life may become stressed below 6.5. Acidic waters are common in Adirondack lakes due to natural low alkalinity levels coupled with acidic deposition. Conductivity readings indicate soft water, as is typical for Adirondack lakes due to the granitic nature of the watershed.

East Stoner Lake appears to be typical of moderately shallow, slightly acidic Adirondack lakes. Other Adirondack lakes with similar water quality characteristics often support warmwater fisheries; however, the data collected through the LCI is not sufficient to evaluate fish habitat. It is unlikely the lake supports cold water fish species due to a lack of cold oxygen-rich water. A fishery survey in 1975 showed that yellow perch, fallfish, golden shiner, brown bullhead, chain pickerel, black crappie, and pumpkinseed sunfish were found in the lake (NYS DEC 2006). There has not been a more recent fish survey of the lake, at least conducted by NYSDEC.

The surface water sample showed no indications of water quality problems, with all parameters falling below the state standards and guidance values. The deep water sampled showed iron levels above the state water quality standard, and was at a level that are likely to cause taste or odor problems. Deep water ammonia levels were also elevated, although they were below the state water quality standard. Elevated deep water iron and ammonia are typically seen in waterbodies experiencing oxygen deficits in the bottom waters. All of the other parameters analyzed were below established guidance values.

Evaluation of Lake Condition Impacts to Lake Uses

Potable Water (Drinking Water)

LCI data are not sufficient to evaluate potable water use; these data suggest that deepwater withdrawals may require substantial treatment to serve as a water supply, due to elevated iron levels. It is likely that people camping around the lake may use treated surface water for drinking and may cook or clean with untreated surface water.

Contact Recreation (Swimming)

Bacteria data are needed to evaluate the safety of East Stoner Lake for swimming; however, these data are not collected through the LCI. The water clarity reading was above the state guidance value to protect swimmers, and algae levels are relatively low. People are known to swim in the lake during the summer months indicating this use is supported.

Non-Contact Recreation (Boating and Fishing)

The LCI data did not indicate any threats to non-contact recreation. It is unlikely that cold water fish species are able to survive in the lake. People are known to fish and use non powerboats on the lake, indicating that these uses are currently supported.

Aquatic Life

The anoxic conditions observed in the bottom waters may stress some aquatic life susceptible to high summer temperatures. The Silver Lake Wilderness Unit Management Plan (NYS DEC 2006) indicates that the lake has a dominant non-native, warm-water fishery community that may be impacting the native aquatic life in the lake. Additional biological studies would be needed to fully evaluate stressors to aquatic life.

Aesthetics

Data collected through the LCI did not indicate any impacts to the aesthetics of the lake.

Additional Comments

- Periodic surveillance for invasive exotic plant species may help to prevent the establishment and spread of any new invaders, given the escalating problems with exotic aquatic weeds. Educational signs regarding aquatic invasive species may help prevent unintended introductions into the lake.
- An effort should be made to complete the recommendations in the Silver Lake Wilderness Unit Management Plan (NYS DEC 2006). These recommendations include: managing the lake as a warm water fishery and to preserve the native aquatic community in the presence of nonnative fish.
- Signs educating visitors to the lake about *Leave No Trace* principles may help protect the lake from impacts caused by recreational hikers and campers.

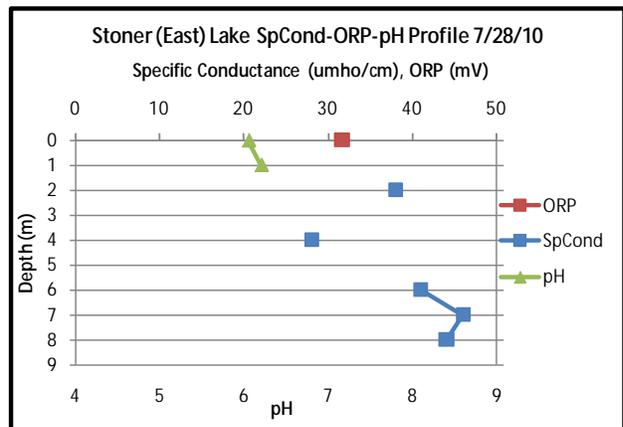
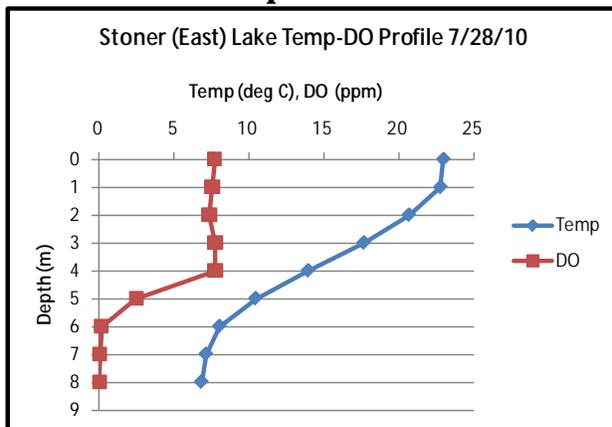
Aquatic Plant IDs

Exotic Plants: none observed

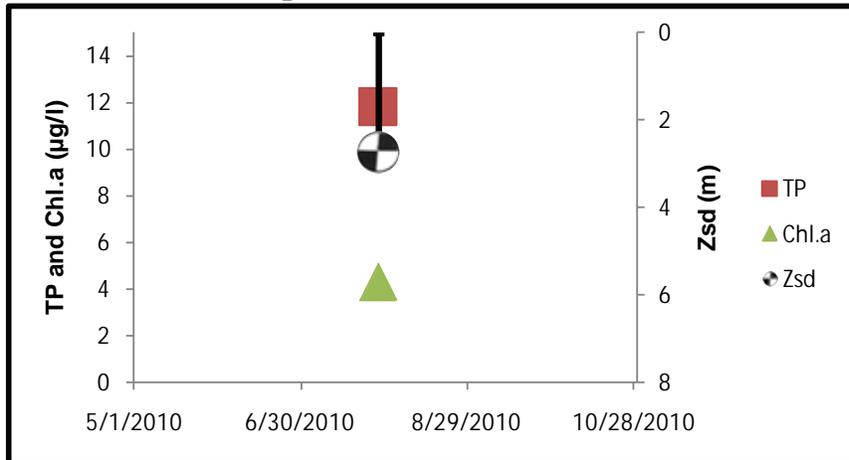
Native Plants:

- Brasenia schreberi* (watershield)
- Eriocaulon septangulare* (pipewort)
- Nymphaea sp.* (white waterlily)
- Nymphoides cordata* (little floating heart)
- Pontederia cordata* (pickerelweed)
- Potamogeton epihydrus* (ribbonleaf pondweed)
- Sparganium sp.* (bur-reed)
- Utricularia purpurea* (purple bladderwort)
- Utricularia vulgaris* (common bladderwort)

Time Series: Depth Profiles



Time Series: Trophic Indicators



WQ Sampling Results

Surface Samples

	UNITS	Reading	Scientific Classification	Regulatory Comments
SECCHI	meters	2.75	Mesotrophic	Readings does not violate DOH guidance value
TSI-Secchi		45.4	Mesotrophic	No pertinent water quality standards
TP	mg/l	0.0118	Mesotrophic	Reading does not violate DEC guidance values
TSI-TP		39.7	Oligotrophic	No pertinent water quality standards
TSP	mg/l	0.0058	High % soluble Phosphorus	No pertinent water quality standards
NOx	mg/l	ND	Low nitrate	Reading does not violate guidance
NH4	mg/l	0.01	Low ammonia	Reading does not violate guidance
TKN	mg/l	0.5	Intermediate organic nitrogen	No pertinent water quality standards
TN/TP	mg/l	92.85	Phosphorus Limited	No pertinent water quality standards
CHLA	ug/l	4.3	Mesotrophic	No pertinent water quality standards
TSI-CHLA		44.9	Mesotrophic	No pertinent water quality standards
Alkalinity	mg/l	2.2	Poorly Buffered	No pertinent water quality standards
TCOLOR	ptu	50	Highly Colored	No pertinent water quality standards
TOC	mg/l	8.9		No pertinent water quality standards
Ca	mg/l	2.05	Does Not Support Zebra Mussels	No pertinent water quality standards
Fe	mg/l	0.187		Reading does not violate water quality standards
Mn	mg/l	0.0315		Reading does not violate water quality standards
Mg	mg/l	0.473		Reading does not violate water quality standards
K	mg/l	0.195		No pertinent water quality standards
Na	mg/l	6.41		Reading does not violate water quality standards
Cl	mg/l	8.8	Minor road salt runoff	Reading does not violate water quality standards
SO4	mg/l	2.9		Reading does not violate water quality standards

Bottom Samples

	UNITS	Reading	Scientific Classification	Regulatory Comments
TP-bottom	mg/l	0.0267	Elevated deepwater phosphorus	No pertinent water quality standards
TSP-bottom	mg/l	0.0116	High % soluble phosphorus	No pertinent water quality standards
NOx-bottom	mg/l	ND	No evidence of DO depletion	Reading does not violate water quality standards
NH4-bottom	mg/l	0.285	Evidence of DO depletion	Reading does not violate water quality standards
TKN-bottom	mg/l	0.7		No pertinent water quality standards
Alk-bottom	mg/l	5	Poorly Buffered	No pertinent water quality standards
TCOLOR-bottom	ptu	75	Highly Colored	No pertinent water quality standards
TOC-bottom	mg/l	7.1		No pertinent water quality standards
Ca-bottom	mg/l	3.44	Does Not Support Zebra Mussels	No pertinent water quality standards
Fe-bottom	mg/l	1.88	Taste or odor likely	Reading violates water quality standards
Mn-bottom	mg/l	0.148		Reading does not violate water quality standards
Mg-bottom	mg/l	0.989		Reading does not violate water quality standards
K-bottom	mg/l	0.265		No pertinent water quality standards
Na-bottom	mg/l	14.1		Reading does not violate water quality standards
Cl-bottom	mg/l	23.2		Reading does not violate water quality standards
SO4-bottom	mg/l	12.3		Reading does not violate water quality standards

Lake Perception

	UNITS	Reading	Scientific Classification	Regulatory Comments
WQ Assessment	1-5, 1 best	2	Not Quite Crystal Clear	No pertinent water quality standards
Weed Assessment	1-5, 1 best	3	Plants Grow to Lake Surface	No pertinent water quality standards
Recreational Assessment	1-5, 1 best	1	Could Not Be Nicer	No pertinent water quality standards

References

NYS DEC Division of Lands and Forest. 2006. Silver Lake Wilderness Area Unit Management Plan. Accessible at: http://www.dec.ny.gov/docs/lands_forests_pdf/slwaump.pdf.

NYS DEC Division of Water. 2010. The Mohawk River Basin Waterbody Inventory and Priority Waterbodies List. Accessible at: http://www.dec.ny.gov/docs/water_pdf/pwlmhkw10.pdf.

NYS DOH. 2010. Chemicals in Sportfish and Game 2010-2011 Health Advisories. Accessible at: <http://www.health.ny.gov/environmental/outdoors/fish/docs/fish.pdf>.

Legend Information

General Legend Information

Surface Samples	= integrated sample collected in the first 2 meters of surface water
Bottom Samples	= grab sample collected from a depth of approximately 1 meter from the lake bottom
SECCHI	= Secchi disk water transparency or clarity - measured in meters (m)
TSI-SECCHI	= Trophic State Index calculated from Secchi, = $60 - 14.41 * \ln(\text{Secchi})$

Laboratory Parameters

ND	= Non-Detect, the level of the analyte in question is at or below the laboratory's detection limit
TP	= total phosphorus- milligrams per liter (mg/l) Detection limit = 0.003 mg/l; NYS Guidance Value = 0.020 mg/l
TSI-TP	= Trophic State Index calculated from TP, = $14.42 * \ln(\text{TP} * 1000) + 4.15$
TSP	= total soluble phosphorus, mg/l Detection limit = 0.003 mg/l; no NYS standard or guidance value
NOx	= nitrate + nitrite nitrogen, mg/l Detection limit = 0.01 mg/l; NYS WQ standard = 10 mg/l
NH4	= total ammonia, mg/l Detection limit = 0.01 mg/l; NYS WQ standard = 2 mg/l
TKN	= total Kjeldahl nitrogen (= organic nitrogen + ammonia), mg/l Detection limit = 0.01 mg/l; no NYS standard or guidance value
TN/TP	= Nitrogen to Phosphorus ratio (molar ratio), = $(\text{TKN} + \text{NOx}) * 2.2 / \text{TP}$ > 30 suggests phosphorus limitation, < 10 suggests nitrogen limitation
CHLA	= chlorophyll <i>a</i> , micrograms per liter ($\mu\text{g/l}$) or parts per billion (ppb) Detection limit = 2 $\mu\text{g/l}$; no NYS standard or guidance value
TSI-CHLA	= Trophic State Index calculated from CHLA, = $9.81 * \ln(\text{CHLA}) + 30.6$
ALKALINITY	= total alkalinity in mg/l as calcium carbonate Detection limit = 10 mg/l; no NYS standard or guidance value
TCOLOR	= true (filtered or centrifuged) color, platinum color units (ptu) Detection limit = 5 ptu; no NYS standard or guidance value
TOC	= total organic carbon, mg/l Detection limit = 1 mg/l; no NYS standard or guidance value
Ca	= calcium, mg/l Detection limit = 1 mg/l; no NYS standard or guidance value
Fe	= iron, mg/l Detection limit = 0.1 mg/l; NYS standard = 0.3 mg/l
Mn	= manganese, mg/l Detection limit = 0.01 mg/l; NYS standard = 0.3 mg/l
Mg	= magnesium, mg/l

K	Detection limit = 2 mg/l; NYS standard = 35 mg/l = potassium, mg/l
Na	Detection limit = 2 mg/l; no NYS standard or guidance value = sodium, mg/l
Cl	Detection limit = 2 mg/l; NYS standard = 20 mg/l = chloride, mg/l
SO4	Detection limit = 2 mg/l; NYS standard = 250 mg/l = sulfate, mg/l

Field Parameters

Depth	= water depth, meters
Temp	= water temperature, degrees Celsius
D.O.	= dissolved oxygen, in milligrams per liter (mg/l) or parts per million (ppm) NYS standard = 4 mg/l; 5 mg/l for salmonids
pH	= powers of hydrogen, standard pH units (S.U.) Detection limit = 1 S.U.; NYS standard = 6.5 and 8.5
SpCond	= specific conductance, corrected to 25°C, micromho per centimeter (μ mho/cm) Detection limit = 1 μ mho/cm; no NYS standard or guidance value
ORP	= Oxygen Reduction Potential, millivolts (MV) Detection limit = -250 mV; no NYS standard or guidance value

Lake Assessment

WQ Assessment	= 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
Weed Assessment	= weed coverage/density assessment , 5 point scale, 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = plants cover surface
Recreational Assessment	= swimming/aesthetic assessment , 5 point scale; 1 = could not be nicer, 2 = excellent, 3= slightly impaired, 4 = substantially impaired, 5 = lake not usable