

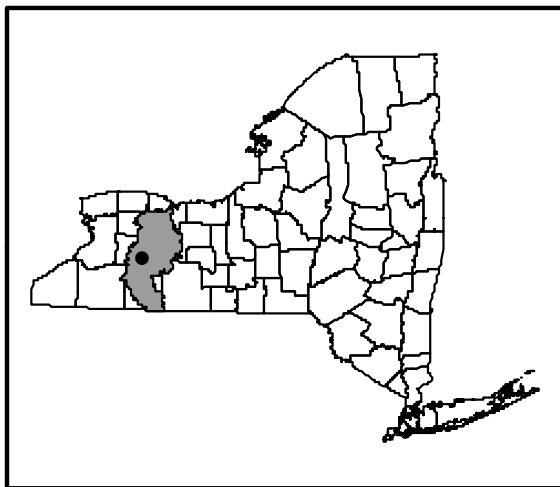
LCI Lake Water Quality Summary

General Information

Lake Name:	Trout Pond
Location:	Letchworth State Park, Town of Genesee Falls, Wyoming County, New York
Basin:	Genesee River Basin
Size:	0.8 hectares (< 2 acres)
Lake Origins:	man-made
Major Tributaries:	no known inlet
Lake Tributary to:	Genesee River
Water Quality Classification:	B(T) (best intended use: primary contact recreation) (T) designation refers to support for trout survival
Sounding Depth:	3.2 meters (10.5 feet)
Sampling Coordinates:	Latitude: 42.59177, Longitude: -78.04057
Sampling Access Point:	Fishing dock (Letchworth State Park)
Monitoring Program:	Lake Classification and Inventory (LCI) Survey
Sampling Date:	August 4, 2009
Samplers:	David Newman, NYSDEC Division of Water, Albany Steven Finnemore, NYSDEC Division of Water, Albany
Contact Information:	Scott Kishbaugh, NYSDEC Division of Water sakishba@gw.dec.state.ny.us ; 518-402-8282

Lake Map

(sampling location marked with a circle)



Background and Lake Assessment

Trout Pond is a small man-made pond at the southern end of Letchworth State Park. The pond's primary use is to offer a place for park goers to engage in fishing in a pond stocked with trout. Fishing clinics are offered at the pond, allowing the public to learn fishing techniques from certified instructors. The pond has a small fishing pier on the south end, with mowed grass surrounding most of the perimeter. The pond's watershed is primarily forested but also includes some agricultural land just outside the park's boundary. Trout pond was included in the 2009 Lake Classification and Inventory (LCI) screening survey of the Genesee River Basin at the request of the State Office of Parks Recreation and Historic Preservation (OPRHP). This request was made to give OPRHP additional water quality information for the pond. Due to a lack of perceived water quality impairments the pond is not a candidate for more intensive monitoring (monthly) by DEC during the summer of 2010.

Trout Pond can generally be characterized as *mesotrophic*, or moderately productive. The water clarity reading (TSI = 44, typical of *mesotrophic* lakes) was expected given the phosphorus reading (TSI = 40, typical of *mesotrophic* lakes) and the chlorophyll *a* reading (TSI = 47, typical of *mesoeutrophic* lakes). These data suggest that baseline nutrient levels do not support persistent algae blooms.

The pond water was observed to have a brownish yellow tint, but not enough to substantially reduce water clarity. The pond's bottom was visible from the surface in all areas except for the deepest point of the pond. Several native species of rooted submergent plants were observed growing throughout the pond and included: *Nitella sp.* (stonewort), *Najas flexilis* (slender naiad), *Utricularia minor* (lesser bladderwort), and *Potamogeton gramineus* (variable pondweed). No exotic macrophytes were observed to be growing in the pond.

Water samples were collected to evaluate the potential presence of harmful algal blooms—cyanobacteria that might trigger the release of algal toxins or taste and odor compounds. The samples from Trout Pond were run through a phycocyanin detector and recorded readings of 146 phycocyanin units. Any sampling results above 100 units may be associated with the presence of more than 1.0 µg/l of microcystis-LR, corresponding to the World Health Organization (WHO) guidance to protect drinking water supplies (it is not yet known what phycocyanin readings might result in microcystis-LR readings above 5-10 µg/l, the guidance to protect contact recreation). The results from these detectors can be highly variable, and should only be used as an indication of a potential problem.

Like most shallow water bodies, Trout Pond was not thermally stratified. Temperature and dissolved oxygen readings were comparable throughout the water column. pH readings indicate slightly alkaline water, and conductivity readings indicate moderately hard water (high ionic strength). The conductivity and pH readings were similar to those seen in another small pond in the park and probably represent typical conditions for small waterbodies in this area of New York State.

Trout Pond appears to be typical of moderately hardwater, weakly colored alkaline lakes. Other lakes with similar water quality characteristics often support warmwater fisheries, although fisheries habitat cannot be fully evaluated through this monitoring program. Stocked coldwater

fish species may not survive the summer in the pond given the lack of cold water during the summer months. A fisheries survey would be required to determine if this is the case. Chloride and other ions were found at low levels, which is typical for waterbodies in forested watersheds. None of the other water quality indicators measured through this program indicate water quality problems.

Evaluation of Lake Condition Impacts to Lake Uses

Potable Water (Drinking Water)

Trout Pond is not classified for potable water supply. LCI data not sufficient to evaluate potable water use; however, there were no indicators that would suggest stressors to this use.

Contact Recreation (Swimming)

Trout Pond is classified for primary contact recreation. It was not reported whether the park allows people to swim in the pond and whether people do partake in swimming in the pond. Bacteria data are needed to evaluate the safety of swimming in Trout Pond; however, these data are not collected through the LCI. The data collected through the LCI show that water clarity was well above the state minimum for the safety of swimmers. The amount of rooted aquatic vegetation in the pond may make swimming difficult in certain areas of the pond.

Some species of cyanobacteria can produce toxins, such as microcystis-LR, and others can be implicated in taste and odor problems. So while the presence of cyanobacteria does not necessarily indicate water quality problems or the presence of harmful algal blooms, it may warrant additional investigation.

Non-Contact Recreation (Boating and Fishing)

Due to the small size of the pond, boating does not appear to be supported. There were no indications of stressors to warmwater fisheries; however, the stocked trout may not survive high summer temperatures.

Aquatic Life

The only noted stressors to aquatic life would be the suboptimal temperatures for coldwater species. Additional biological studies would need to be conducted to fully evaluate aquatic life. Calcium levels are sufficiently high to support zebra mussels, but these exotic bivalves have not been found in the pond.

Aesthetics

These data indicate that aesthetics should be fully supported.

Additional Comments

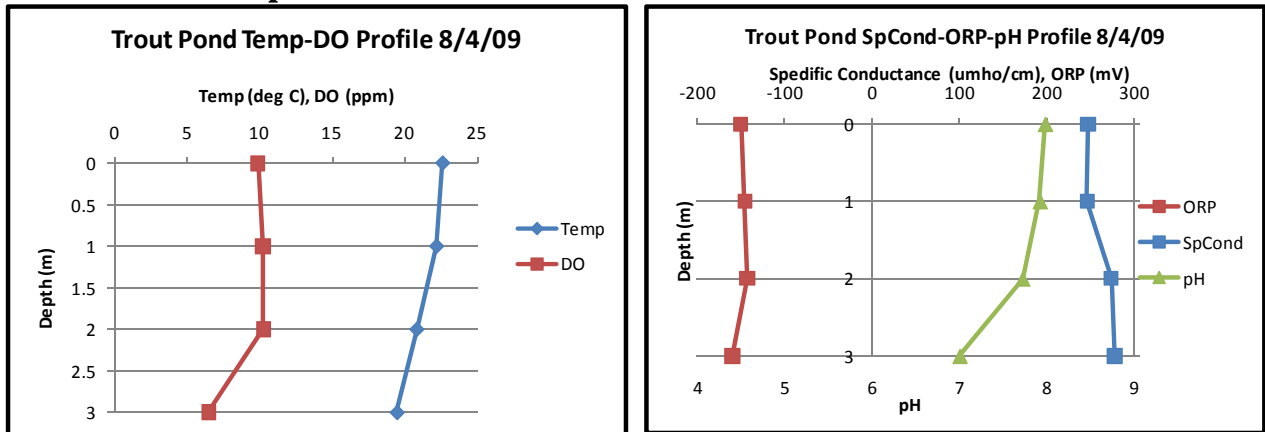
1. Periodic surveillance for invasive exotic plant species may help to prevent the establishment and spread of any new invaders, given the escalating problems with exotic aquatic weeds.
2. Algae identification would determine if the lake may suffer from harmful algal blooms (HABs) and/or the production of algal toxins. This may be conducted through future

generations of the LCI or on-going monitoring conducted by NYSOPRHP. In the interim, if any algal blooms are suspected at Trout Pond in the future, the Wyoming County Health Department should be notified to conduct additional investigations to determine if restrictions on drinking or swimming in lake water may be appropriate.

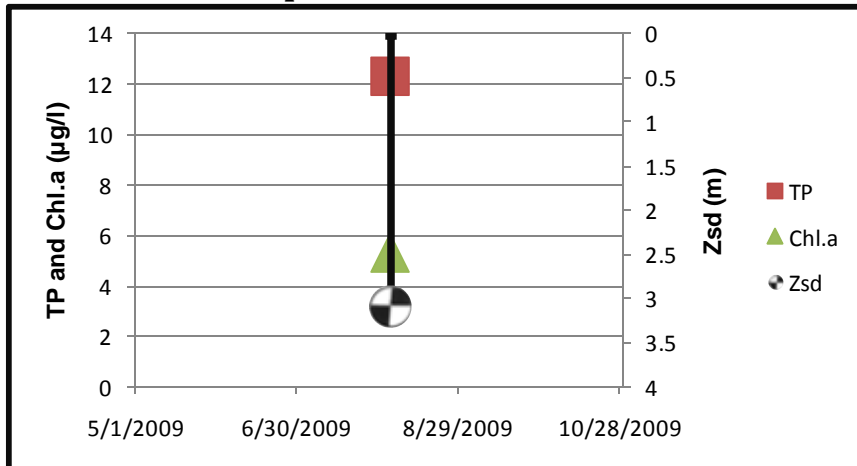
Aquatic Plant IDs

Exotic Plants: None
 Native Plants: *Nitella sp.* (stonewort)
Najas flexilis (slender naiad)
Utricularia minor (lesser bladderwort)
Potamogeton gramineus (variable pondweed)

Time Series: Depth Profiles



Time Series: Trophic Indicators



WQ Sampling Results

Surface Samples

	UNITS	Reading	Scientific Classification	Regulatory Comments
SECCHI	meters	3.1	Mesotrophic	Reading does not violate DOH guidance value
TSI-Secchi		43.7	Mesotrophic	No pertinent water quality standards
TP	mg/l	0.0123	Mesotrophic	Reading does not violate DEC guidance values
TSI-TP		40.3	Mesotrophic	No pertinent water quality standards
TSP	mg/l	0.0046	Little available phosphorus	No pertinent water quality standards
NOx	mg/l	0.0021	Low nitrate	Reading does not violate guidance
NH4	mg/l	0.044	Low ammonia	Reading does not violate guidance
TKN	mg/l	0.39	Low organic nitrogen	No pertinent water quality standards
TN/TP	mg/l	70.13	Phosphorus Limited	No pertinent water quality standards
CHLA	ug/l	5.3	Mesotrophic	No pertinent water quality standards
TSI-CHLA		47.0	Mesotrophic	No pertinent water quality standards
Alkalinity	mg/l	145	Moderately Buffered	No pertinent water quality standards
TCOLOR	ptu	15	Weakly Colored	No pertinent water quality standards
TOC	mg/l	4.4		No pertinent water quality standards
Ca	mg/l	40.1	Strongly Supports Zebra Mussels	No pertinent water quality standards
Fe	mg/l	0.113		Reading does not violate water quality standards
Mn	mg/l	0.0244		Reading does not violate water quality standards
Mg	mg/l	15.2		Reading does not violate water quality standards
K	mg/l	0.338		No pertinent water quality standards
Na	mg/l	4.23		Reading does not violate water quality standards
Cl	mg/l	5.9	Minor road salt runoff	Reading does not violate water quality standards
SO4	mg/l	13.8		Reading does not violate water quality standards

Lake Perception

	UNITS	Reading	Scientific Classification	Regulatory Comments
WQ Assessment	1-5, 1 best	3	Definite Algal Greenness	No pertinent water quality standards
Weed Assessment	1-5, 1 best	4	Dense Plant Growth at Lake Surface	No pertinent water quality standards
Recreational Assessment	1-5, 1 best	3	Slightly Impaired	No pertinent water quality standards

Legend Information

General Legend Information

Surface Samples = integrated sample collected in the first 2 meters of surface water
 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, = $14.42 \cdot \ln(\text{TP} \cdot 1000) + 4.15$
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), = $(\text{TKN} + \text{NOx}) \cdot 2.2 / \text{TP}$ > 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, = $9.81 \cdot \ln(\text{CHLA}) + 30.6$
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 Detection limit = 2 mg/l; NYS standard = 35 mg/l
K	= potassium, mg/l Detection limit = 2 mg/l; no NYS standard or guidance value
Na	= sodium, mg/l Detection limit = 2 mg/l; NYS standard = 20 mg/l
Cl	= chloride, mg/l Detection limit = 2 mg/l; NYS standard = 250 mg/l
SO4	= sulfate, mg/l Detection limit = 2 mg/l; NYS standard = 250 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 ($\mu\text{mho/cm}$) Detection limit = 1 $\mu\text{mho/cm}$; 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