

# LCI Lake Water Quality Summary

## General Information

**Lake Name:** Stearns Pond #1

**Location:** Town of Floyd, Oneida County, NY

**Basin:** Mohawk River Basin

**Size:** 4 hectares (10 acres)

**Lake Origins:** unknown

**Major Tributaries:** none

**Lake Tributary to?:** Tributary to Sixmile Creek

**Water Quality Classification:** C (T) (best intended use: secondary contact recreation)  
(T) waters should be suitable for trout survival

**Sounding Depth:** 1.7 meters (5.6 feet)

**Sampling Coordinates:** 43.20898,-75.3578

**Sampling Access Point:** Private land Off Birch Drive

**Monitoring Program:** Lake Classification and Inventory (LCI) Survey

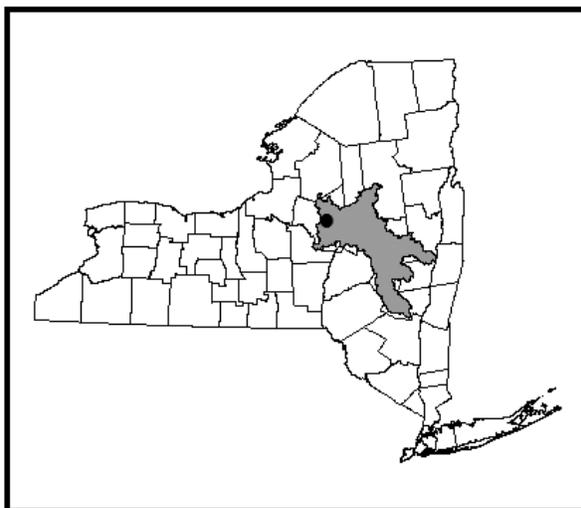
**Sampling Date:** July 27, 2010

**Samplers:** Scott Kishbaugh, NYSDEC Division of Water, Albany  
Chris Norton, NYSDEC Division of Water, Albany

**Contact Information:** David Newman, NYSDEC Division of Water  
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## Lake Map

(sampling location marked with a circle)



## Background and Lake Assessment

Stearns Pond #1 (not officially named) is the larger of two ponds located between Stearns Road and New Floyd Road and just north of Twin Ponds Trailer/Mobile Home Park (Birch Drive) outside of the city of Rome, Oneida County. Twin Ponds Mobile Home Park is an approximately 40 unit development on the south western shoreline of the pond. The majority of the remaining shoreline is forested. The greater watershed is a mix of land covers that includes forested, residential developments, agricultural lands, and a gravel mine. There is no public access to the pond, and pond use is limited to non-power boating and aesthetics by shoreline residents.

The pond was included in the Lake Classification and Inventory screening (single sampling event) of the Mohawk River Basin due to a request from NYS DEC staff from the Region 6 office in Utica and nearby pond residents. This request was made due to suspected failures of the leach field associated with the mobile home park, and complaints about algal blooms. Regional staff were concerned about high nutrient levels associated with the leach field impacting the overall water quality of the pond(s). Due to elevated phosphorus and chlorophyll *a* (algae) levels and low water clarity, the pond may be a candidate for more intensive (monthly monitoring) in the summer of 2011, although additional monitoring will likely be initiated only in the event of a bloom.

Stearns Pond #1 can generally be characterized as *eutrophic*, or highly productive. The water clarity reading (TSI= 52, typical of *eutrophic* waterbodies) was expected given the total phosphorus reading (TSI = 51, typical of *eutrophic* waterbodies) and the chlorophyll *a* reading (TSI = 57, typical of *eutrophic* waterbodies). These data indicate that an algal bloom may have been occurring at the time of the sample, although this wasn't apparent from the visual observations by sampling staff, and that baseline nutrient levels may support persistent algal blooms in the pond.

In late July the pond had a brown color, although the bottom of the pond was visible in all locations. Some shoreline accumulation of algal scums was observed, although this did not provide evidence to the reported significant bloom in the pond prior to the sampling. Two submergent aquatic pondweeds (largeleaf pondweed and flatstem pondweed) were observed in the pond. In addition common duckweed, a floating leaf aquatic plant was also observed. None of these native plant species were found in abundance. A more thorough plant specific survey may find additional native and or invasive aquatic plant species.

Like most shallow waterbodies, Stearns Pond #1 does not exhibit thermal stratification, in which depth zones (warm water on top, cold water on the bottom during the summer) are established. Temperature and dissolved oxygen readings were comparable throughout the water column. The pH reading at the surface was just above the state's guidance values to protect aquatic life. At 1 meter the pH reading fell below the 6.5 guidance values indicating there may be some impacts to aquatic life. Conductivity readings indicate moderately hard water (high ionic strength), which is consistent with readings from streams in the Rome area.

Stearns Pond #1 is a shallow, soft water, weakly colored acidic pond. Other waterbodies with similar water quality characteristics often support warmwater fisheries, although fisheries habitat cannot be fully evaluated through this monitoring program. DEC Region 6 staff noted that they

observed several bass in the pond, which would confirm the pond supporting warmwater fisheries. It is unlikely that the pond would support cold water fish species due to the shallow nature of the pond preventing the formation of a cold bottom water layer, although some colder springs may be present. Nutrient (nitrogen and phosphorus) levels were in the intermediate to high range, with phosphorus being the limiting nutrient controlling primary production (algae). The total phosphorus level was above the state's guidance value. In addition, sodium and chloride levels were high and may indicate significant impacts from road salting or runoff through developed areas. The sodium level was just above the state's water quality standard associated with potable water intake.

## **Evaluation of Lake Condition Impacts to Lake Uses**

### ***Potable Water (Drinking Water)***

Stearns Pond #1 is not classified to be used for potable water. Although the LCI data are not sufficient to evaluate potable water use, these data suggest that surface water withdrawals may be impacted by slightly elevated algae and sodium levels.

### ***Contact Recreation (Swimming)***

Stearns Pond #1 is not classified for primary contact recreation, including swimming and bathing. It is unlikely people swim in the pond. Bacteria data are needed to evaluate the safety of the pond for swimming, but these are not collected through the LCI. If there are leach field failures from the mobile home park, it is likely that bacteria levels may make the pond unsafe to swim in. The water clarity was above the State Department of Health's minimum guidance value of 1.2 meters to protect swimmers.

### ***Non-Contact Recreation (Boating and Fishing)***

Stearns Pond #1 is classified for non-contact recreational use including boating and fishing, and it is likely that some residents use canoes and rowboats on the pond. The observation of bass in the pond may indicate that the pond is able to sustain warmwater fish populations. The data collected through the LCI did not indicate any impacts to fishing or boating on the pond.

### ***Aquatic Life***

The pH readings below 1 meter in depth were acidic, and if these reading are accurate, aquatic life may be *threatened* by these conditions. Due to the lack of coldwater, it is unlikely that the pond supports coldwater fish species or other organisms susceptible to high summer water temperatures. This would be inconsistent with the trout survival "(T)" water quality classification, although it is not known if the pond has colder springs.

### ***Aesthetics***

The aesthetic enjoyment of the lake may be impacted by reduced water clarity and observation of high levels of organic matter on the edge of the pond's surface.

## **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.

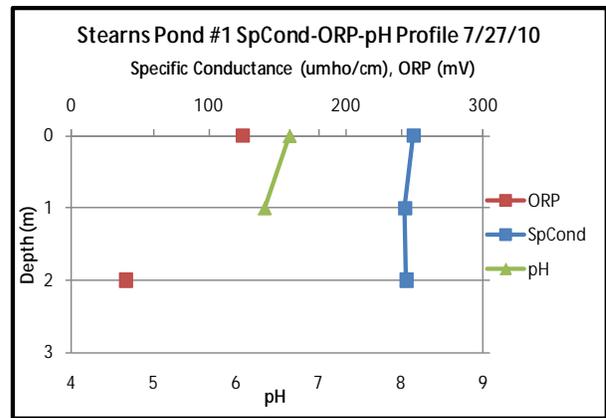
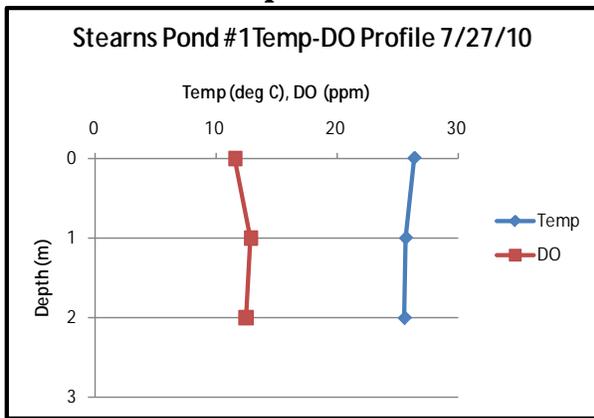
- It is possible that the failing leach field could be contributing to the high nutrient levels (total phosphorus, organic nitrogen, and ammonia). In addition the failing leach field could also be contributing to the high levels of sodium and chloride. It is likely that other activities in the watershed also play a role in these elevated parameters.

### Aquatic Plant IDs

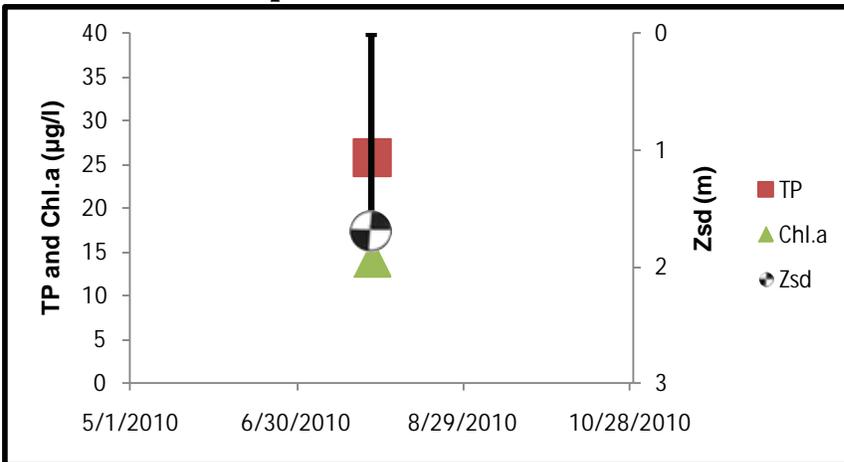
Exotic Plants: none observed

Native Plants: *Potamogeton amplifolius* (largeleaf pondweed)  
*Potamogeton zosteriformis* (flatstem pondweed)  
*Lemna minor* (common duckweed)

### Time Series: Depth Profiles



### Time Series: Trophic Indicators



## WQ Sampling Results

### Surface Samples

	UNITS	Reading	Scientific Classification	Regulatory Comments
SECCHI	meters	1.7	Eutrophic	Readings does not violate DOH guidance value
TSI-Secchi		52.4	Eutrophic	No pertinent water quality standards
TP	mg/l	0.0257	Eutrophic	Sample exceeds guidance value
TSI-TP		50.9	Eutrophic	No pertinent water quality standards
TSP	mg/l	0.0127	High % soluble Phosphorus	No pertinent water quality standards
NOx	mg/l	0.0968	Low nitrate	Reading does not violate guidance
NH4	mg/l	0.121	Potentially high ammonia	Reading does not violate guidance
TKN	mg/l	0.54	Intermediate organic nitrogen	No pertinent water quality standards
TN/TP	mg/l	54.51	Phosphorus Limited	No pertinent water quality standards
CHLA	ug/l	14.4	Eutrophic	No pertinent water quality standards
TSI-CHLA		56.8	Eutrophic	No pertinent water quality standards
Alkalinity	mg/l	112	Moderately Buffered	No pertinent water quality standards
TCOLOR	ptu	15	Weakly Colored	No pertinent water quality standards
TOC	mg/l	4.3		No pertinent water quality standards
Ca	mg/l	34.7	Strongly Supports Zebra Mussels	No pertinent water quality standards
Fe	mg/l	0.0373		Reading does not violate water quality standards
Mn	mg/l	0.0359		Reading does not violate water quality standards
Mg	mg/l	10.5		Reading does not violate water quality standards
K	mg/l	1.04		No pertinent water quality standards
Na	mg/l	20.4		Reading violates water quality standards
Cl	mg/l	33.5	Significant road salt runoff	Reading does not violate water quality standards
SO4	mg/l	8.4		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	2	Excellent for Most Uses	No pertinent water quality standards

## 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 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)

pH NYS standard = 4 mg/l; 5 mg/l for salmonids  
= 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