

LCI Lake Water Quality Summary

General Information

Lake Name:

Hound Dog Pond

Location:

Town of Ripley, Chautauqua County, NY

Basin:

Allegheny River Basin

Size:

17 hectares (41 acres)

Lake Origins:

unknown

Major Tributaries:

None

Watershed Area:

appx. 1 mi²

Lake Tributary to:

West Branch French Creek via minor tributaries

Water Quality Classification:

C (best intended use: secondary contact recreation)

Sounding Depth:

< 2 meters (6 feet)

Sampling Coordinates:

42.17538, -79.72377

Sampling Access Point:

Private land (Hound Dog Rod and Gun Club)

Monitoring Program:

Lake Classification and Inventory (LCI) Survey

Sampling Date:

July 6, 2011

Samplers:

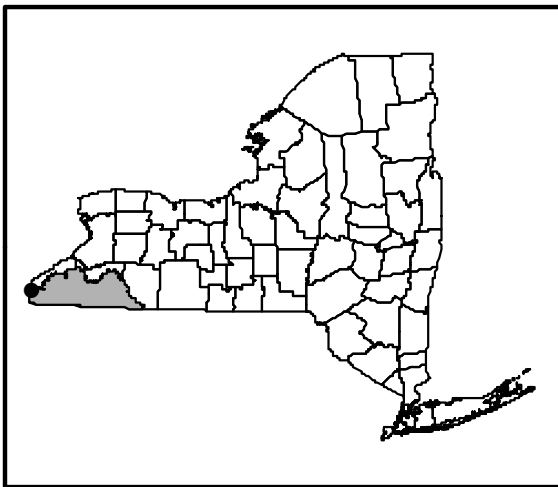
David Newman, NYSDEC Division of Water, Albany
Brian Hourigan, NYSDEC Division of Water Buffalo

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

Hound Dog Pond is a ponded section of a larger regulated wetland complex that is located north of Findley Lake in extreme southwestern portion of New York State. The majority of the land around the pond is owned and managed by the Hound Dog Rod and Gun Club for hunting and fishing in and around the pond. The area around the pond is predominantly forested. The greater watershed is a mix of wetland, forest and agricultural land. The NYSDEC Division of Water lake water quality database had no previous data for the pond, and thus the pond was included in the 2011 Lake Classification and Inventory (LCI) screening program. At this time there are no perceived water quality issues that would make this pond a candidate for additional monitoring in 2012.

The trophic state index (TSI) parameters that were analyzed indicate that the pond is *eutrophic* or highly productive. The total phosphorus reading was very high and in a range that is not typically seen in fresh surface waters in New York State. With the shallowness of the pond there is a potential that the water sample may have been contaminated by bottom sediments which may explain the elevated phosphorus levels. However, it is not atypical for wetlands to have total phosphorus levels above 100 µg/l. The water clarity of the pond at the time of monitoring was greater than 1.8 meters as the Secchi disk was able to be seen resting on the bottom at the deepest point of the pond. The chlorophyll *a* level was slightly elevated and in the typical range for *eutrophic* or highly productive waterbodies.

Like most shallow waterbodies, Hound Dog Pond does not exhibit thermal stratification, in which depth zones (warm water on top, cold water on the bottom during the summer) are established. Temperature, dissolved oxygen and conductivity were comparable throughout the water column, with pH and oxygen reduction potential (ORP) showing a fluctuation near the bottom. pH readings indicate slightly alkaline conditions, typically seen in *eutrophic* waterbodies, and the conductivity reading indicated soft water, common to many of the other small waterbodies in this part of the state.

A brief assessment of the aquatic plants in the pond found no non-native/invasive species with both *Brasenia schreberi* (watershield) and *Elodea canadensis* (common waterweed) being identified. Watershield is a floating leaf plant that is commonly seen in soft waters throughout the state. Common waterweed is a submergent plant and is also common throughout the state. The field crew indicated that aquatic plants grew to the surface of most of the pond, except for the deeper center portion of the pond.

Hound Dog Pond appears typical of shallow, soft water, slightly alkaline waterbodies. Other water bodies with similar water quality characteristics support warmwater fish species; however, fisheries habitat cannot be fully evaluated by the LCI. The pond is unlikely to support coldwater fish species; similarly, shallow lakes are usually not able to maintain a cold layer of water near the bottom. A fisheries survey would need to be conducted to further evaluate the fisheries of the pond.

Both the total phosphorus and iron levels were above the state's water quality standards and/or guidance value. Iron readings are usually higher in wetlands than in ponded waters (lakes and

ponds). The high iron levels could also have been influenced by bottom sediment in the water sample.

Evaluation of Lake Condition Impacts to Lake Uses

Potable Water (Drinking Water)

Hound Dog Pond is not classified for use as a potable water supply. Although the LCI data are not sufficient to evaluate potable water use, these data suggest water from the pond would require substantial treatment to serve as a potable water supply due to the elevated algae and iron levels.

Contact Recreation (Swimming)

Hound Dog Pond is not classified for primary contact recreation- swimming and bathing being the best intended use. Bacteria data are needed to evaluate the safety of waterbodies for swimming—these are not collected through the LCI. The data collected through the LCI showed the water clarity was above the State Department of Health’s guidance value of 1.2 meters to protect swimmers.

Non-Contact Recreation (Boating and Fishing)

Hound Dog Pond is classified for boating and fishing. The shallow nature of the pond, the high densities of aquatic plants and the lack of open water areas make both boating and fishing difficult in the pond.

Aquatic Life

Organisms susceptible to high summer temperature may be stressed due to a lack of cold oxygen rich water in the pond during the summer. Additional biological studies would need to be conducted to further evaluate impacts to aquatic life.

Aesthetics

These data indicate that aesthetics should be fully supported; however the moderate to high phosphorus levels in the pond may occasionally produce algal blooms that would detract from the aesthetics of the pond.

Additional Comments

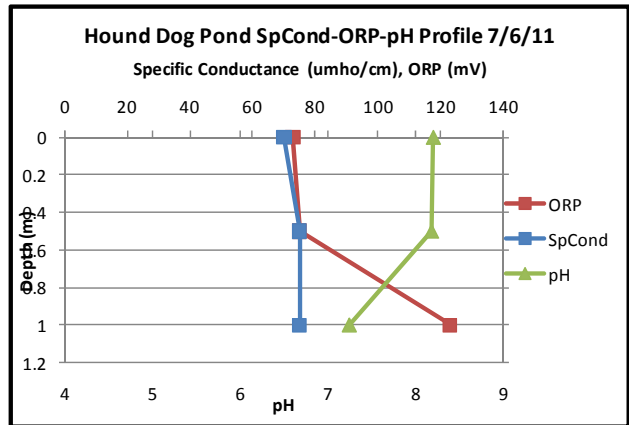
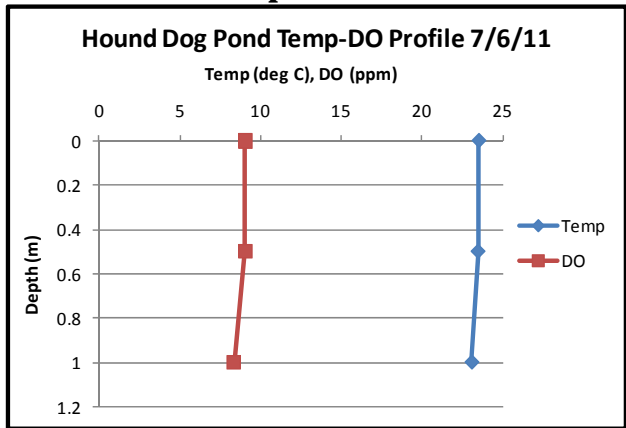
- Periodic surveillance for invasive exotic plant species may help to prevent the establishment and spread of any new invaders, given the escalating problems with exotic aquatic weeds.

Aquatic Plant IDs

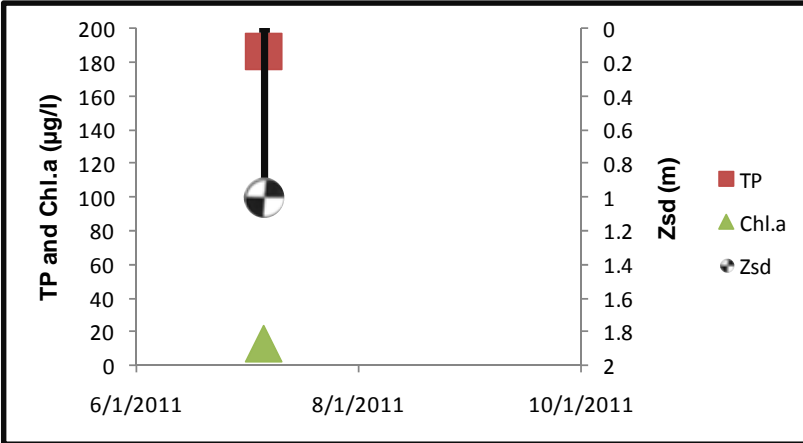
Exotic Plants: none observed

Native Plants: *Brasenia schreberi* (watershield)
Elodea canadensis (common waterweed)

Time Series: Depth Profiles



Time Series: Trophic Indicators



*An accurate water clarity reading could not be taken due to water depth, but was greater than 1 meter.

WQ Sampling Results

Surface Samples

| | UNITS | Reading | Scientific Classification | Regulatory Comments |
|------------|--------|---------|----------------------------------|--|
| SECCHI | meters | >1.8* | Eutrophic to Mesotrophic | Readings does not violate DOH guidance value |
| TSI-Secchi | | < 52* | Eutrophic to Mesotrophic | No pertinent water quality standards |
| TP | mg/l | 0.186 | Eutrophic | Sample exceeds guidance value |
| TSI-TP | | 79.5 | Eutrophic | No pertinent water quality standards |
| TSP | mg/l | 0.0173 | Little available phosphorus | No pertinent water quality standards |
| NOx | mg/l | ND | Low nitrate | Reading does not violate guidance |
| NH4 | mg/l | 0.035 | Low ammonia | Reading does not violate guidance |
| TKN | mg/l | 2.32 | Elevated organic nitrogen | No pertinent water quality standards |
| TN/TP | mg/l | 27.20 | Nutrient Limitation Unclear | No pertinent water quality standards |
| CHLA | ug/l | 12.80 | Eutrophic | No pertinent water quality standards |
| TSI-CHLA | | 55.6 | Eutrophic | No pertinent water quality standards |
| Alkalinity | mg/l | 34.6 | Poorly Buffered | No pertinent water quality standards |
| TCOLOR | ptu | 37 | Highly Colored | No pertinent water quality standards |
| TOC | mg/l | 8.6 | | No pertinent water quality standards |
| Ca | mg/l | 13.1 | Minimally Supports Zebra Mussels | No pertinent water quality standards |
| Fe | mg/l | 2.71 | Taste or odor likely | Reading violates water quality standards |
| Mn | mg/l | 0.161 | | Reading does not violate water quality standards |
| Mg | mg/l | 2.82 | | Reading does not violate water quality standards |
| K | mg/l | 0.455 | | No pertinent water quality standards |
| Na | mg/l | 4.06 | | Reading does not violate water guidance value |
| Cl | mg/l | 5.8 | Minor road salt runoff | Reading does not violate water quality standards |
| SO4 | mg/l | 2.7 | | Reading does not violate water quality standards |

*An accurate water clarity reading was unable to be taken due to the water depth

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 | 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
 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, = $14.42 \cdot \ln(\text{TP} \cdot 1000) + 4.15$ |
| 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 for class A waters |
| 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 |
| As | =arsenic, mg/l Detection limit = 3.2 mg/l; NYS standard = 10 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