Volunteer Lake Assessment Program Individual Lake Reports

STEVENS POND, MANCHESTER, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	445	**Max. Depth (m):**	5.2	**Flushing Rate (yr^{1})**	4.9
Surface Area (Ac.):	15	**Mean Depth (m):**	2.8	**P Retention Coef:**	0.51
Shore Length (m):	1,075	**Volume (m^3):**	176,000	**Elevation (ft):**	315

TROPHIC CLASSIFICATION

Year	Trophic class
1981	EUTROPHIC
1997	EUTROPHIC

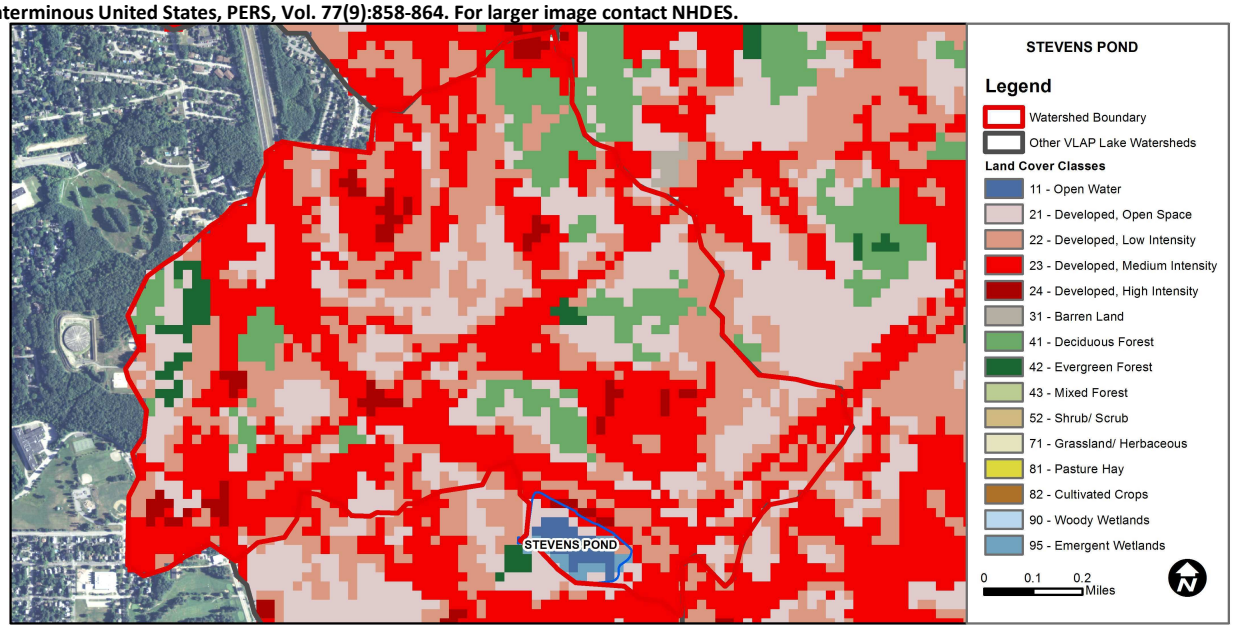
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2018 305(b) report on the status of N.H. waters, and are based on data collected from 2008-2017. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
	Dissolved oxygen satura	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



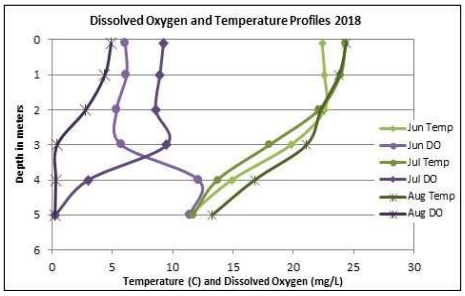
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	1	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	20.7	Deciduous Forest	7.98	Pasture Hay	0
Developed-Low Intensity	26.3	Evergreen Forest	1.45	Cultivated Crops	0
Developed-Medium Intensity	38.4	Mixed Forest	0	Woody Wetlands	0
Developed-High Intensity	2.82	Shrub-Scrub	0	Emergent Wetlands	0.52

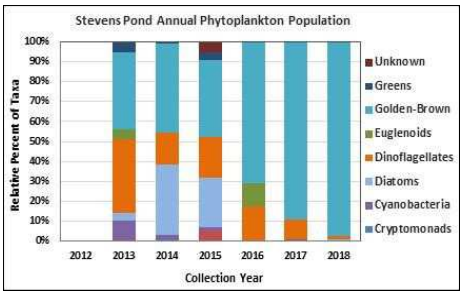
Volunteer Lake Assessment Program Individual Lake Reports
Stevens Pond, Manchester
2018 Data Summary

Recommended Actions: Stevens Pond is an urban pond that receives a high pollutant load from the surrounding watershed. The elevated conductivity and chloride are a result of road salting practices. Pond phosphorus and chlorophyll levels spiked above the threshold for eutrophic lakes and were indicative of an algal bloom in July. Dissolved oxygen levels spiked in the Hypolimnion in June due to a layer of algae that migrated up to the Metalimnion in July and phytoplankton data indicate a Diatom bloom. Due to the urban environment combined with fluctuating climate conditions, occasional spikes in nutrient loads and algal growth is expected. Keep up the great work.

Observations (*Refer to Table 1 and Historical Deep Spot Data Graphics*)

- **Chlorophyll-a:** Chlorophyll levels were low in June, increased to elevated levels indicative of an algal bloom in July, and then decreased to slightly elevated levels in August. Average chlorophyll level increased from 2017 and was greater than the state median and the threshold for eutrophic lakes. Historical trend analysis indicates highly variable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), and Outlet conductivity and chloride levels remained elevated and much greater than the state medians. Chloride levels exceeded the state chronic chloride standard in the Epilimnion, Hypolimnion and Outlet. Historical trend analysis indicates highly variable epilimnetic conductivity levels since monitoring began.
- **Color:** Apparent color was measured in the epilimnion and indicated the pond water went from moderately tea colored in June to highly tea colored in August.
- **Total Phosphorus:** Epilimnetic and Metalimnetic phosphorus levels were moderate in June and increased to elevated levels by August following above average rainfall. Average epilimnetic phosphorus level increased from 2017, was much greater than the state median, and was slightly greater than the threshold for eutrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus levels were moderate in June and July and then increased to greatly elevated level in August and lab data noted colored water with organic material. Outlet phosphorus levels were moderate in June and July and elevated in August following above average rainfall.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was high (good) in June when algal growth was low, decreased (worsened) slightly in July, and decreased again in August following the above average rainfall. Average NVS transparency decreased slightly from 2017 and was less than the state median. Historical trend analysis indicates relatively stable transparency since monitoring began.
- **Turbidity:** Epilimnetic and Metalimnetic turbidity levels were slightly elevated in July and August due to algal growth and stormwater runoff. Hypolimnetic turbidity levels were greatly elevated in August and lab data noted colored water with organic material. Outlet turbidity levels fluctuated within a low to moderate range and increased in August following above average rainfall.
- **pH:** Epilimnetic, Metalimnetic, Hypolimnetic, and Outlet pH levels were within the desirable range 6.5-8.0 units, however historical trend analysis indicates significantly decreasing (worsening) epilimentic conductivity levels since monitoring began.

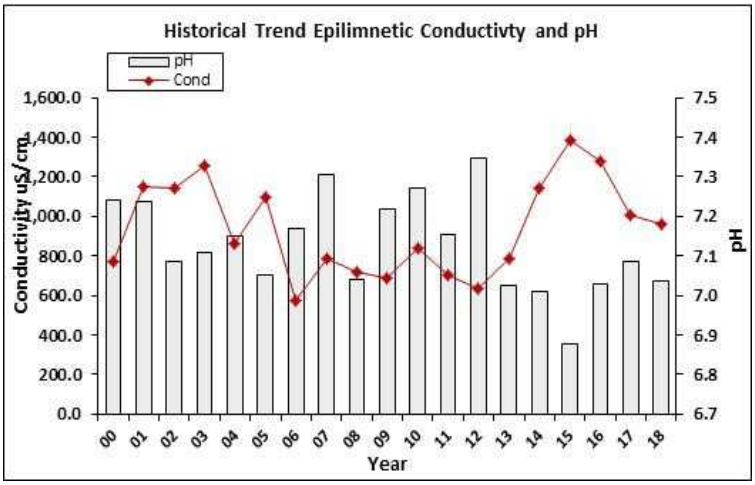
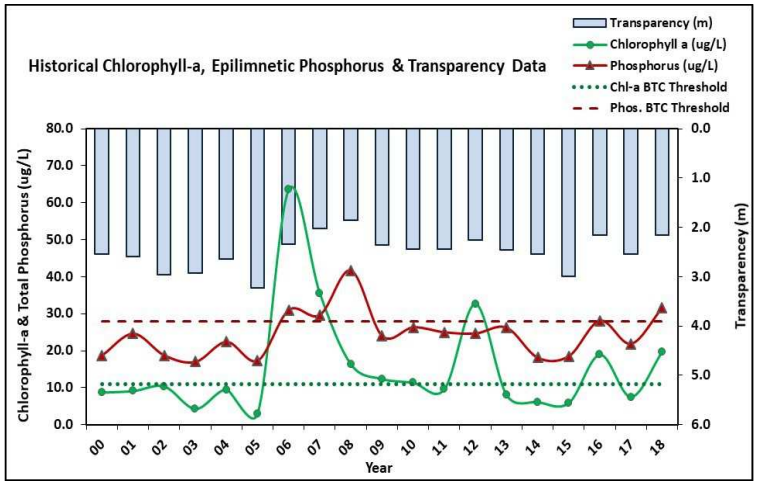




Station Name	Table 1. 2018 Average Water Quality Data for STEVENS POND - MANCHESTER									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	Total P mg/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	29.3	19.65	276	107	961.0	32	2.15	2.42	3.38	7.04
Metalimnion					1100.3	34			2.75	6.86
Hypolimnion			326		1488.0	49			9.35	6.73
Outlet			300		986.7	24			1.57	6.74

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.5 mg/L
Chlorophyll-a: 4.39 mg/m^3
Conductivity: 42.3 uS/cm
Chloride: 5 mg/L
Total Phosphorus: 11 ug/L
Transparency: 3.3 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data highly variable.
pH (epilimnion)	Worsening	Data significantly decreasing.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.