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

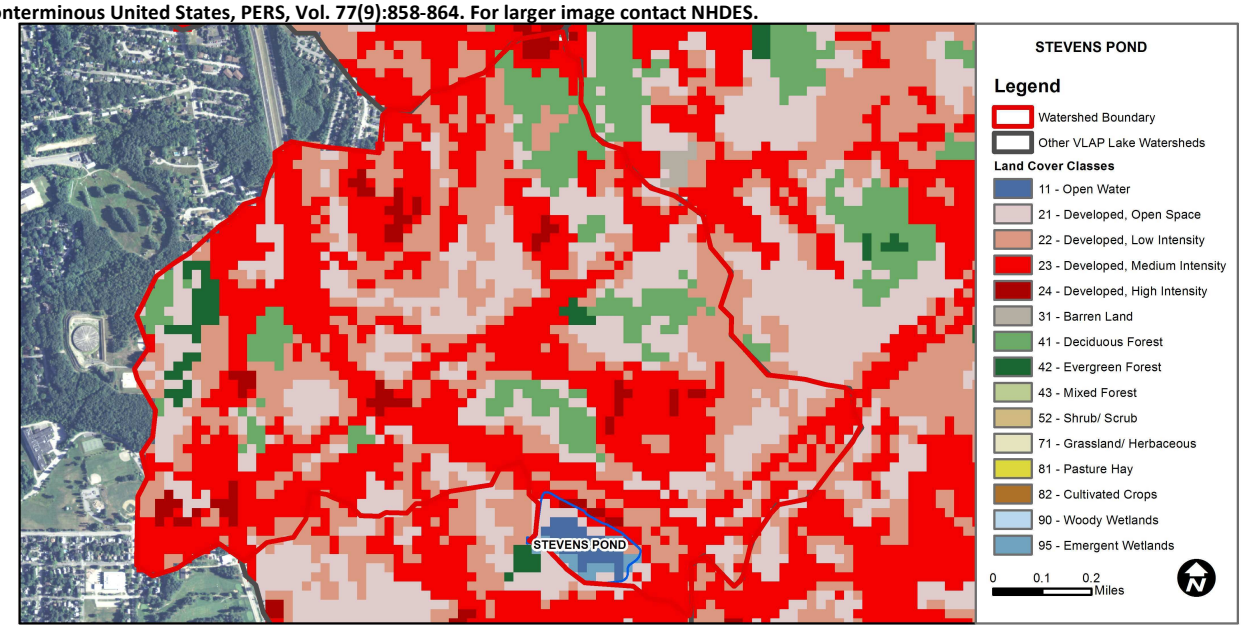
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2016 305(b) report on the status of N.H. waters, and are based on data collected from 2006-2015. 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	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	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.



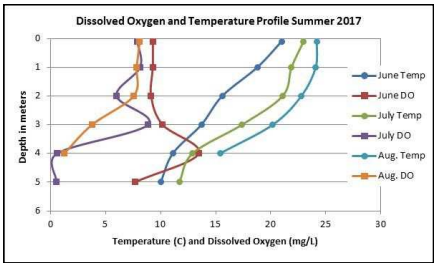
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	1	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	20.7	Deciduous Forest	7.98	Pasture Hay	0
Developed-Low Intensity	26.3	Evergreen Forest	1.45	Cultivated Crops	0
Developed-Medium Intensity	38.4	Mixed 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
2017 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 levels remained below the threshold for eutrophic lakes since 2009, and chlorophyll levels have also generally remained below the threshold with occasional spikes. We hope to see levels consistently remain below the thresholds in the future. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll levels were moderate in June, increased to an elevated level in July, and then decreased to a moderate level in August. Average chlorophyll level decreased from 2016, was greater than the state median, and was less than 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/or chloride levels remained greatly elevated and chloride levels exceeded the state chronic chloride criteria. Historical trend analysis indicates highly variable epilimnetic conductivity levels since monitoring began.
- **Color:** Apparent color was measured in the epilimnion and indicates the pond water is moderately tea colored, or brown.
- **Total Phosphorus:** Epilimnetic and Metalimnetic phosphorus levels were slightly elevated in June, increased in July when algal growth was elevated, and then decreased slightly in August. Average epilimnetic phosphorus decreased from 2016, was much greater than the state median, and was slightly less than the threshold for eutrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels with moderate variability between years. Hypolimnetic phosphorus levels were moderate in June and then increased to elevate levels in July and August. Outlet phosphorus levels fluctuated within a moderate range.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was good in June, decreased in July when algal growth was elevated, and the increased (improved) in August. Average NVS transparency increased (improved) slightly from 2016 and was slightly less than the state median. Historical trend analysis indicate relatively stable transparency with moderate variability between years.
- **Turbidity:** Epilimnetic, Metalimnetic and Outlet turbidity levels were low in June, increased to a slightly elevated range in July when algal growth was elevated, and then decreased to low levels in August. Hypolimnetic turbidity levels were low in June and increased to slightly elevated range in July and August.
- **pH:** Epilimnetic, Metalimnetic, Hypolimnetic, and Outlet pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH levels since monitoring began.



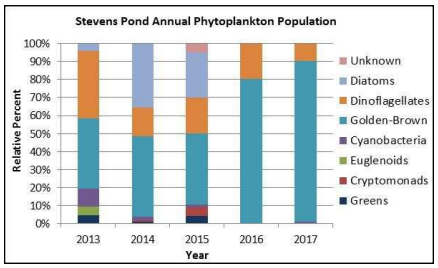


Table 1. 2017 Average Water Quality Data for STEVENS POND-MANCHESTER

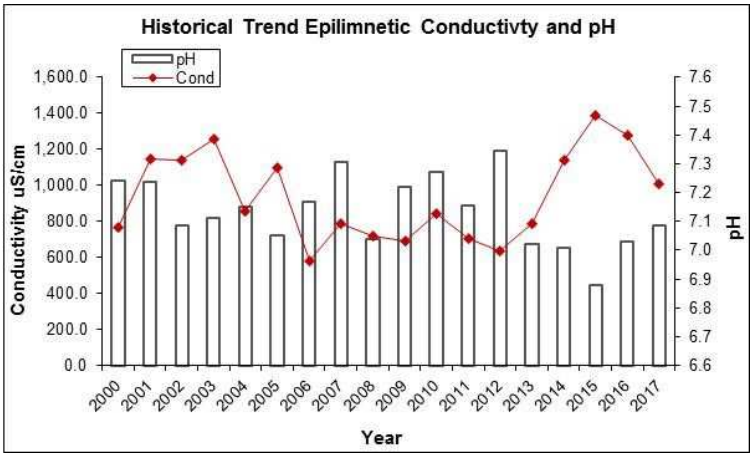
Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color PCU	Cond. uS/cm	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Epilimnion	31.2	7.51	256	63	1006.0	22	2.54	3.13	1.46	7.09
Metalimnion					1055.7	22			1.95	6.89
Hypolimnion					1447.7	25			2.51	6.63
Outlet			287		1011.0	16			1.39	6.79

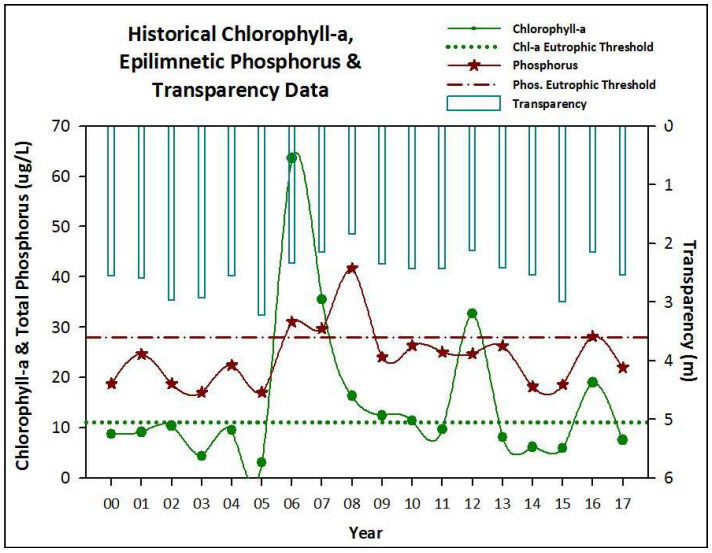
NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

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.





This report was generated by the NH DES Volunteer Lake Assessment Program (VLAP). For more information contact VLAP at (603) 271-2658 or sara.steiner@des.nh.gov