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

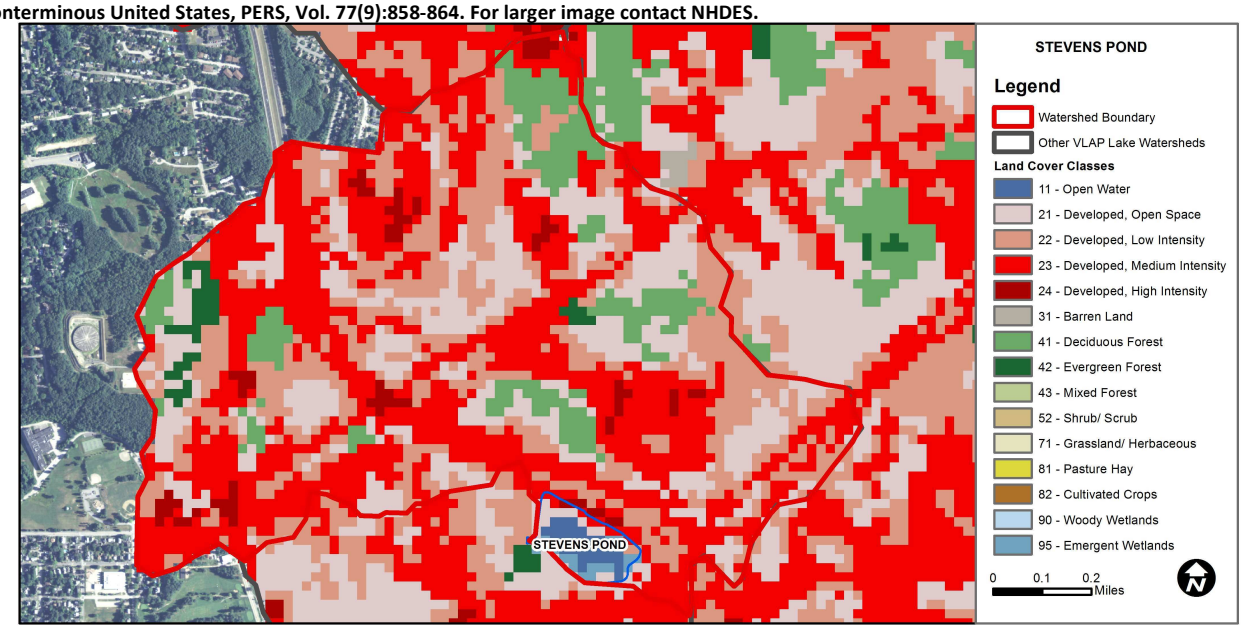
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/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

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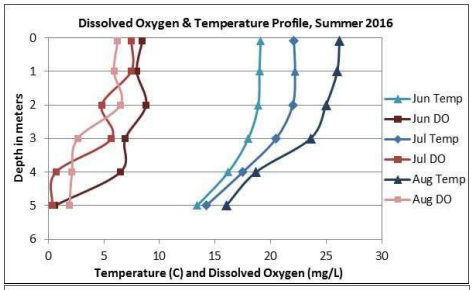
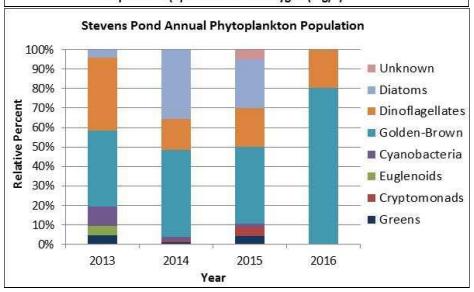
Stevens Pond, Manchester
2016 Data Summary

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 chlorophyll and phosphorus levels have stabilized since 2009 however within a slightly higher range than the period 2000-2005. The early ice out and start to the growing season combined with warmer water temperatures and drought conditions likely contributed to the spike in phosphorus and algal growth this summer. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll levels were average in June, increased to greatly elevated levels indicative of an algal bloom in July, and then decreased to slightly elevated levels in August. The 2016 average chlorophyll level increased sharply from 2015 and was much greater than the state median. Historical trend analysis indicates stable chlorophyll levels with high variability between years.
- **Conductivity/Chloride:** Deep spot and Outlet conductivity and chloride levels remained greatly elevated. Chloride levels exceeded the state chronic chloride standard. Historical trend analysis indicates stable epilimnetic (upper water layer) conductivity levels with high variability between years.
- **Total Phosphorus:** Epilimnetic phosphorus levels were average in June, increased to greatly elevated levels in July during the algal bloom, and then decreased to average levels in August. The average epilimnetic phosphorus level increased from 2015 and was much greater than the state median. Historical trend analysis indicates stable epilimnetic phosphorus levels with moderate variability between years. Metalimnetic (middle water layer) phosphorus levels were slightly elevated on each sampling event, and Hypolimnetic (lower water layer) phosphorus levels were elevated and increased as the summer progressed. Outlet phosphorus levels were within an average range in June and July and increased slightly in August.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was higher (better) in June and then decreased as the summer progressed. Average NVS transparency decreased from 2015 and was less than the state median. Historical trend analysis indicates stable transparency with moderate variability between years.
- **Turbidity:** Epilimnetic and Metalimnetic turbidity levels were slightly elevated on each sampling event, particularly in July during the algal bloom. Hypolimnetic turbidity levels were elevated in June, increased in July and then decreased in August. Outlet turbidity levels were slightly elevated in June and July, and then decreased in August.
- **pH:** Epilimnetic, Metalimnetic and Outlet pH levels were within the desirable range 6.5-8.0 units however Hypolimnetic pH levels fluctuated below the desirable range in August. Historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH levels since monitoring began.





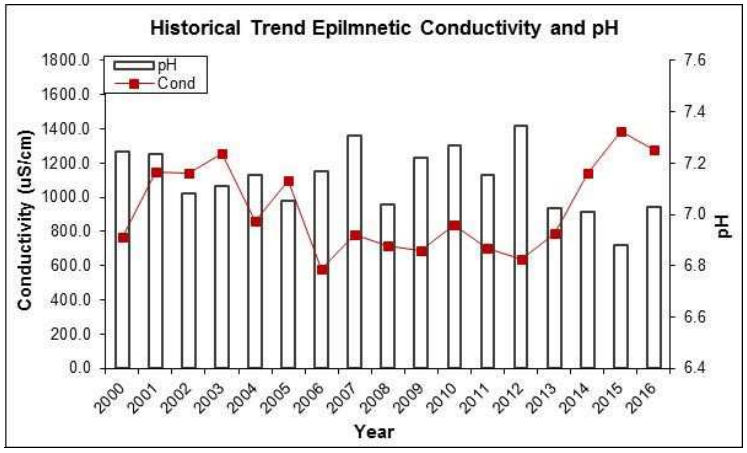
Station Name	Table 1. 2016 Average Water Quality Data for STEVENS POND-MANCHESTER								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	37.0	18.94	343	1,276.7	28	2.16	2.23	3.37	7.03
Metalimnion				1,226.3	34			3.86	6.97
Hypolimnion				1,348.0	82			12.92	6.64
Outlet			353	1,273.3	21			2.03	6.89

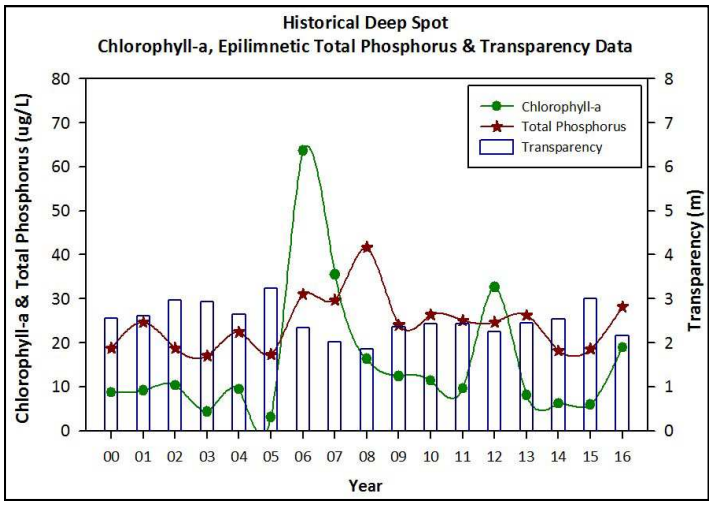
NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

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