Volunteer Lake Assessment Program Individual Lake Reports

TOM POND, WARNER, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	601	**Max. Depth (m):**	4.4	**Flushing Rate (yr^1)**	3.5
Surface Area (Ac.):	32	**Mean Depth (m):**	2.5	**P Retention Coef:**	0.57
Shore Length (m):	1,600	**Volume (m^3):**	314,000	**Elevation (ft):**	383

TROPHIC CLASSIFICATION

Year	Trophic class
1998	MESOTROPHIC
2006	MESOTROPHIC

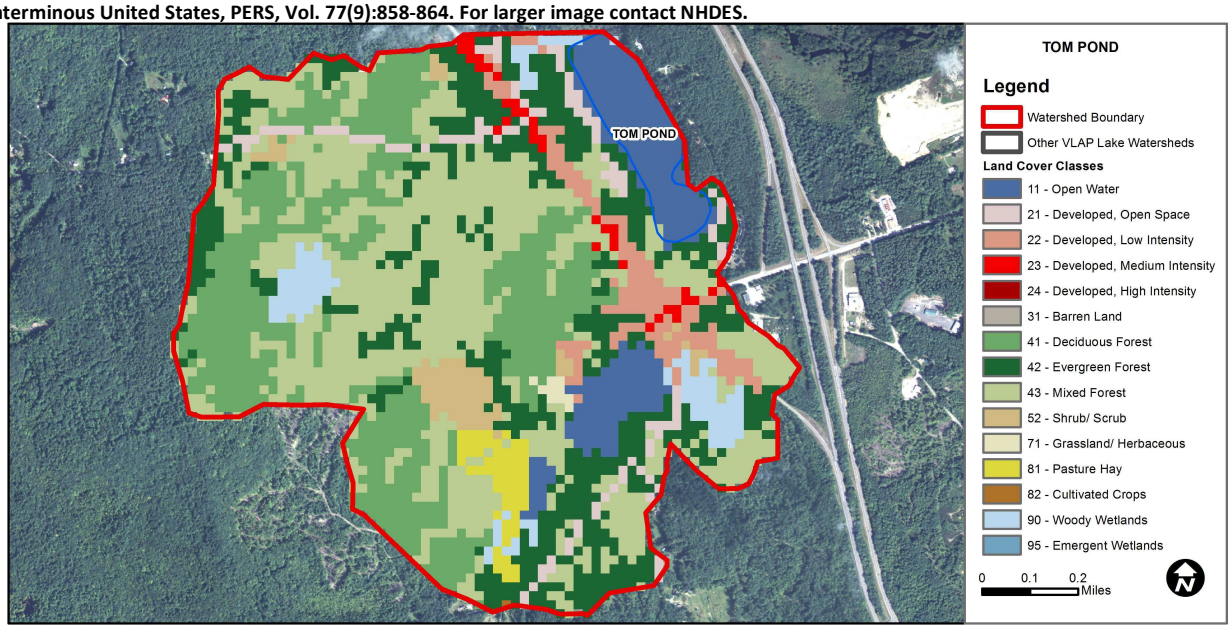
KNOWN EXOTIC SPECIES

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)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Slightly Bad	There are >10% of samples (minimum of 2), exceeding indicator.

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	8.48	Barren Land	0	Grassland/Herbaceous	0.32
Developed-Open Space	3.66	Deciduous Forest	21.77	Pasture Hay	1.97
Developed-Low Intensity	4.56	Evergreen Forest	19.51	Cultivated Crops	0.03
Developed-Medium Intensity	1.2	Mixed Forest	32.06	Woody Wetlands	3.82
Developed-High Intensity	0	Shrub-Scrub	2.62	Emergent Wetlands	0

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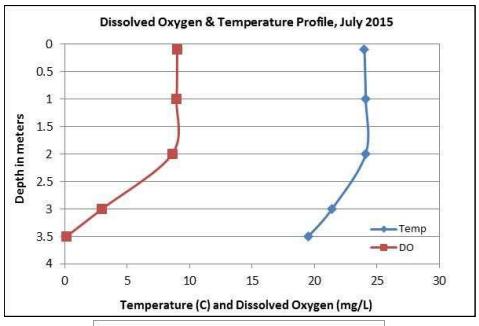
Tom Pond, Warner

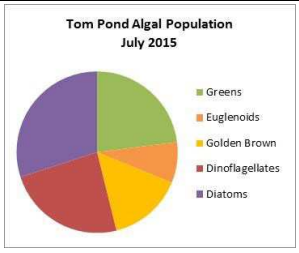
2015 Data Summary

Recommended Actions: Total phosphorus and chlorophyll levels have remained higher and variable since 2005. Prior to that, phosphorus and chlorophyll levels appeared to be improving in the pond. The dry weather conditions in 2015 resulted in improved deep spot water quality with lower levels of phosphorus and algal growth and good transparency. This highlights the potential negative impacts when water levels are high and the Warner River backflows into the pond. Speak with the Army Corps of Engineers at Hopkinton Dam about their water level control practices and how it may be affecting Tom Pond. Install a staff gauge at the Outlet of pond to regularly monitor and record water levels to better understand how they fluctuate. The worsening conductivity level is likely a result of winter road salt usage on major roadways, particularly in the Inlet's sub-watershed. Encourage local road agents to obtain a Voluntary NH Salt Applicator License through UNH's Technology Transfer Center's Green SnowPro certification program. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll levels decreased sharply in 2015 from elevated levels measured in 2013 and 2014. Specifically, chlorophyll levels were low in June and increased to slightly elevated levels in July and average chlorophyll was slightly greater than the state median. August chlorophyll data were invalidated for suspected analytical error; we apologize for the inconvenience. Historical trend analysis indicates moderately variable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), hypolimnetic (lower water layer) and Outlet conductivity remained elevated and greater than the state median. Epilimnetic chloride was also slightly elevated however much less than the state chronic chloride standard. Historical trend analysis indicates significantly increasing (worsening) conductivity since monitoring began. Inlet conductivity and chloride levels were also elevated reflecting the impacts of winter road salt usage in the Inlet's sub-watershed.
- **E. coli:** Inlet and Outlet E. coli levels were low to average and less than the state standard for public beaches (88 cts/100 mL) and surface waters (406 cts/100 mL).
- **Total Phosphorus:** Epilimnetic phosphorus was low from June through August and average phosphorus levels decreased from 2014 and were less than the state median. Historical trend analysis indicates highly variable epilimnetic phosphorus since monitoring began. Hypolimnetic phosphorus was low in June, increased to slightly elevated levels in July likely due to the elevated algal growth, and then decreased to average levels in August. Inlet phosphorus levels were low in June and Outlet phosphorus levels remained low from June through August.
- **Transparency:** Transparency was very good in June when algal growth was low, decreased in July when algal growth was elevated, and then increased (improved) in August. Average transparency was the best measured since 2007 and was approximately equal to the state median. Historical trend analysis indicates highly variable transparency since monitoring began.
- **Turbidity:** Epilimnetic and Hypolimnetic turbidities were within average ranges for those stations. Inlet turbidity was elevated in June. The sample was noted as have a small amount of sediment and being highly colored both of which can affect turbidity. Outlet turbidity was slightly elevated in July.
- **pH:** Epilimnetic, hypolimnetic, Inlet, and Outlet pH levels were within the desirable range 6.5-8.0 units however have fluctuated below the desirable range historically. Historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH since monitoring began.

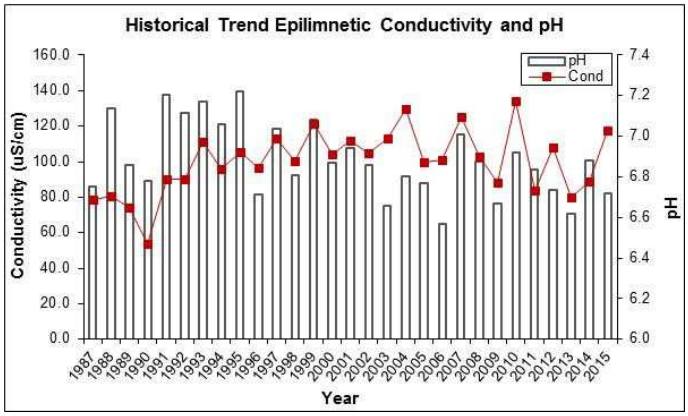
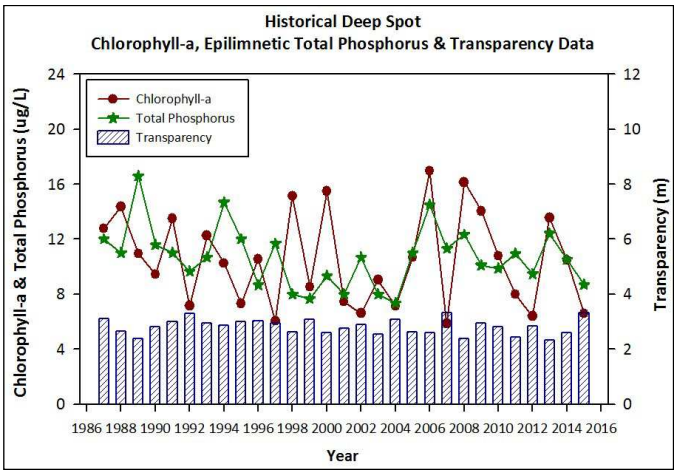




Station Name	Table 1. 2015 Average Water Quality Data for TOM POND									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	12.9	6.58	22	117.4		9	3.33	2.75	1.26	6.72
Hypolimnion				113.7		12			2.08	6.65
Inlet			47	227.0	60	81			25.80	6.49
Outlet				114.6	10	9			2.27	6.79

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)

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

Historical Water Quality Trend Analysis

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