Volunteer Lake Assessment Program Individual Lake Reports

TUREE POND, BOW, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,953	**Max. Depth (m):**	3	**Flushing Rate (yr^{-1}):**	9.5
Surface Area (Ac.):	47	**Mean Depth (m):**	1.9	**P Retention Coef:**	0.49
Shore Length (m):	1,800	**Volume (m^3):**	357,000	**Elevation (ft):**	328

TROPHIC CLASSIFICATION

Year	Trophic class
1989	EUTROPHIC

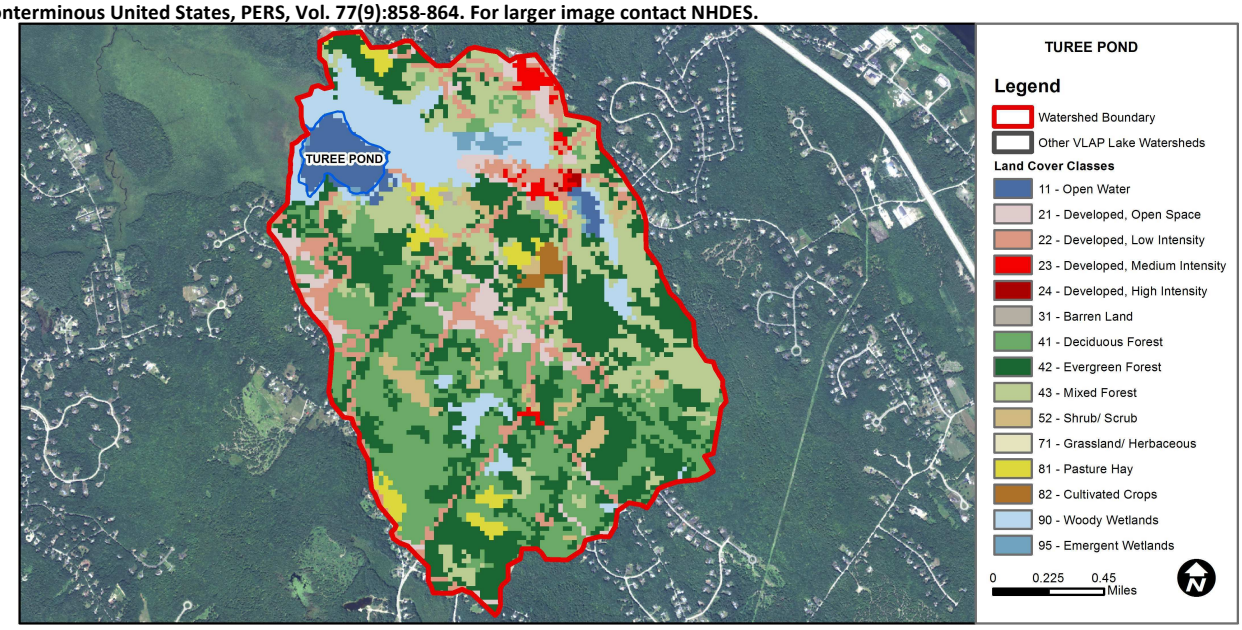
KNOWN EXOTIC SPECIES

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 a given parameter by a small margin.
	Oxygen, Dissolved	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
	Dissolved oxygen satura	Slightly Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a small margin.
	Chlorophyll-a	Very Good	Sampling data is 50 percent better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	Encouraging	Limited data for this parameter predicts water quality standards or thresholds are being met; however more data are necessary to fully assess the parameter.
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

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	3.29	Barren Land	0.29	Grassland/Herbaceous	0
Developed-Open Space	4.64	Deciduous Forest	22.25	Pasture Hay	2.66
Developed-Low Intensity	8.39	Evergreen Forest	27.92	Cultivated Crops	0.58
Developed-Medium Intensity	1.14	Mixed Forest	15.64	Woody Wetlands	9.78
Developed-High Intensity	0.13	Shrub-Scrub	2.5	Emergent Wetlands	0.78

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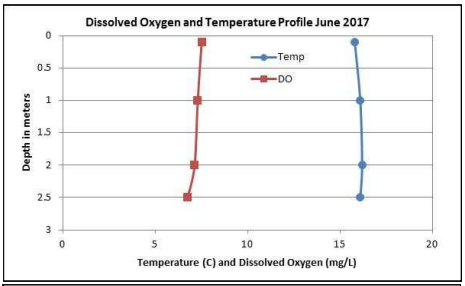
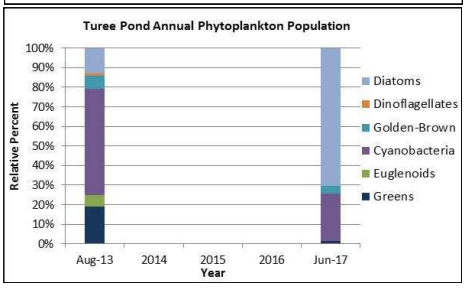
2017 Data Summary

Recommended Actions: Welcome back and great job monitoring in 2017! Pond phosphorus levels were elevated in 2017 and fueled elevated algal growth that resulted in lower water clarity (transparency). While nutrient levels and algal growth remained below the threshold for a eutrophic pond, nutrient levels have remained within a higher range since 2007. Above average spring and early summer rainfall likely transported excess nutrients to the pond through stormwater runoff and erosion. Early summer chemical treatment for milfoil may have also contributed nutrients from plant die-off and decay. Identify areas of stormwater runoff and erosion (boat launch) and prioritize implementation of stormwater management activities in the watershed. Pond and tributary chloride levels were slightly elevated likely due to the application of winter de-icing materials on road, parking lots, walkways, and driveways throughout the watershed. Keep an eye on this as increasing chloride levels can impact reproduction and survival of aquatic life. Maintain monitoring program to better assess seasonal and historical variations and trends in water quality. 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 slightly elevated level in August and September. Average chlorophyll level was slightly elevated, was the highest measured since monitoring began, was greater than the state median, however was less than the threshold for eutrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability since 2007.
- **Conductivity/Chloride:** Epilimnetic (deep spot), Firehouse Pond Inlet, and 1C conductivity and chloride levels were elevated and much greater than the state medians, however chloride levels were less than the state chronic chloride standard. Historical trend analysis indicates relatively stable epilimnetic conductivity levels with moderate variability since 2007.
- **Color:** Apparent color was measured in the epilimnion and indicates the pond is highly tea colored or dark brown.
- **Total Phosphorus:** Epilimnetic phosphorus levels were moderate in June and then increased to slightly elevated levels and remained stable through September. Average epilimnetic phosphorus increased greatly from 2015, was much greater than the state median, however was slightly less than the threshold for eutrophic lakes. Historical trend analysis indicates stable epilimnetic phosphorus levels since 2007. Station 1C phosphorus levels were elevated in June following a significant storm event and then decreased to a slightly elevated range and remained stable through September. Firehouse Pond Inlet phosphorus levels were moderate in June, increased to a slightly elevated level in July and August, and then increased to an elevated level in September. The turbidity of the sample was also elevated with lab data noting sediment in the sample.
- **Transparency:** Transparency measured without (NVS) the viewscope was below average (worse) in June, remained stable in July, decreased (worsened) in August, and then increased (improved) to a more normal range in September. Average NVS transparency decreased greatly from 2015 and was less than the state median. Historical trend analysis indicates highly variable transparency since 2007. Transparency measured with the viewscope (VS) was generally much higher (better) than NVS transparency and likely a better measure of actual conditions.
- **Turbidity:** Epilimnetic turbidity levels were low in June and then remained slightly elevated from July through September potentially due to algal growth. Station 1C turbidity levels were slightly elevated on each sampling event, particularly in September and low levels of sediment were noted in the sample. Firehouse Pond Inlet turbidity levels were low in June, slightly elevated in July and August, and increased to an elevated level in September due to sediment in the sample.
- **pH:** Epilimnetic and Station 1C pH levels were within the desirable range 6.5-8.0 units. Firehouse Pond Inlet pH levels were slightly acidic in June and then increased to within the desirable range by August and September. Historical trend analysis indicates stable epilimnetic pH levels since 2007.





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)

Table 1. 2017 Average Water Quality Data for TUREE POND - BOW

Station Name	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		
1C			69	160	241.6	31			2.60	6.67
Epilimnion	14.0	8.05	64		251.6	24	1.26	1.79	1.72	6.72
Firehouse Pond Inlet			74		288.4	28			4.28	6.45

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	Stable	Trend not significant; data moderately variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Stable	Trend not significant; data show low variability.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.