



# Volunteer Lake Assessment Program Individual Lake Reports

## TODD LAKE, NEWBURY, NH

### MORPHOMETRIC DATA

Watershed Area (Ac.):	384	Max. Depth (m):	6.1	Flushing Rate (yr <sup>-1</sup> )	0.5
Surface Area (Ac.):	168	Mean Depth (m):	2.2	P Retention Coef:	0.88
Shore Length (m):	5,100	Volume (m <sup>3</sup> ):	1,466,500	Elevation (ft):	670

### TROPHIC CLASSIFICATION

Year	Trophic class
1991	MESOTROPHIC
2009	MESOTROPHIC

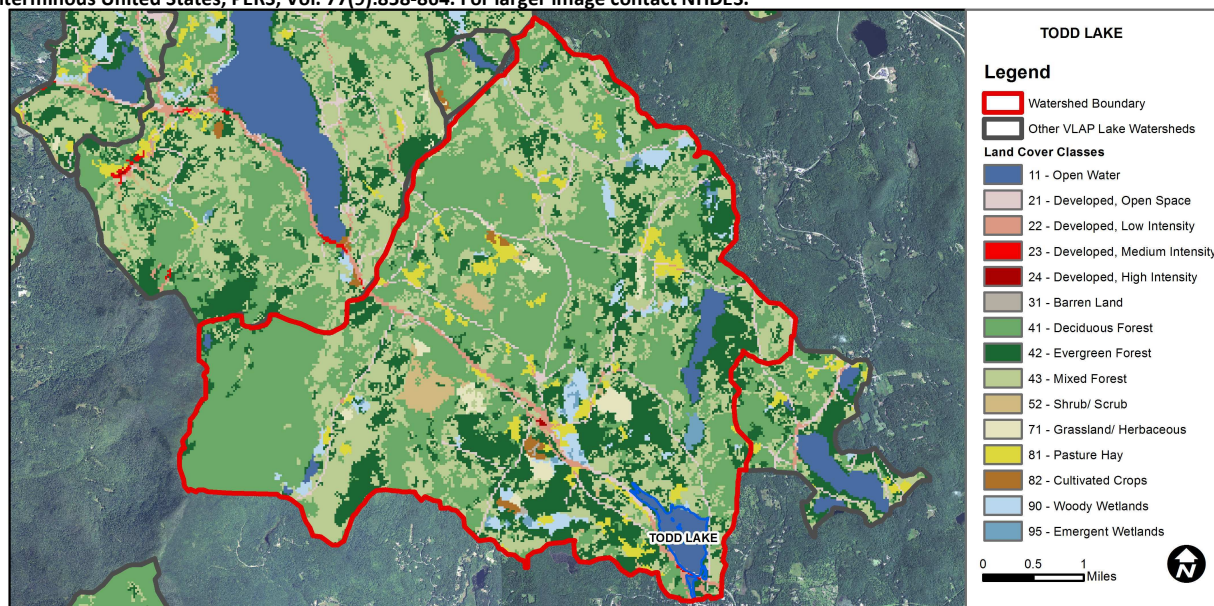
### KNOWN EXOTIC SPECIES


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](http://www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm)

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Very Good	There are a total of at least 10 samples with 0 exceedances of criteria.
	Dissolved oxygen satura	Good	There are at least 10 samples with one, but < 10% of samples, exceeding criteria.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 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	Good	There are at least 10 samples with one, but < 10% of samples, 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	2.52	Barren Land	0.05	Grassland/Herbaceous	1.44
Developed-Open Space	2.83	Deciduous Forest	41.51	Pasture Hay	2.92
Developed-Low Intensity	1.03	Evergreen Forest	18.9	Cultivated Crops	0.31
Developed-Medium Intensity	0.04	Mixed Forest	23.99	Woody Wetlands	2.36
Developed-High Intensity	0.02	Shrub-Scrub	1.5	Emergent Wetlands	0.6



## VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

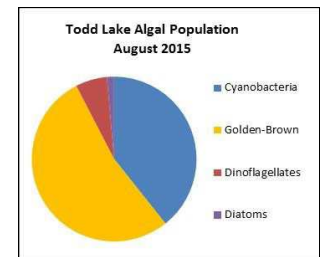
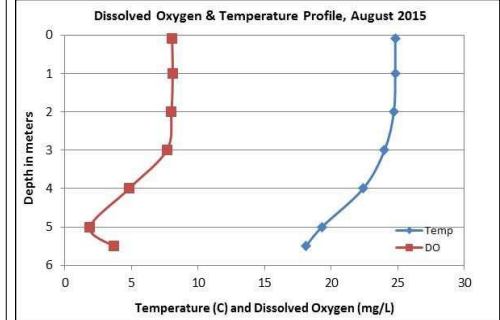
### TODD LAKE, NEWBURY

### 2015 DATA SUMMARY

**RECOMMENDED ACTIONS:** Lake water quality has generally remained with average ranges for NH lakes and is indicative of Mesotrophic conditions. The stable trends are a good sign indicating water quality has not significantly changed since monitoring began; however data appears to have become more variable over time. The increased frequency and intensity of storm events and resulting stormwater runoff and wetland flushing may be impacting the lake. Residents should identify areas prone to erosion and install stormwater controls to reduce erosion into tributaries and the lake. Maintaining vegetated buffers along shorelines to prevent erosion of steep slopes is also important in protecting water quality and reducing the impacts of both stormwater runoff and wave action from boating activities. Keep up the great work!

#### OBSERVATIONS (Refer to Table 1 and Historical Deep Spot Data Graphics)

- **CHLOROPHYLL-A:** Chlorophyll levels were slightly elevated in June and then decreased to low levels in August. Average chlorophyll levels remained stable with 2014 and were slightly less than the state median. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), hypolimnetic (lower water layer), Andrew Bk., and Outlet conductivity and chloride levels were slightly greater than the state medians but not above a level of concern. Gillingham Dr. Inlet and Reservoir Bk. conductivities were low.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were higher in June when algal growth was higher and then decreased to low levels in August. Average epilimnetic phosphorus decreased from 2014, was less than the state median, and was the lowest measured since 2004. Historical trend analysis indicates highly variable epilimnetic phosphorus since monitoring began. Hypolimnetic phosphorus levels were within a moderate range and remained fairly stable from June to August. Andrew Bk. phosphorus levels were slightly elevated in June following a storm event and sediment was noted in the sample. Gillingham Dr. Inlet phosphorus levels were elevated in August during low flow conditions. Reservoir Bk. and Outlet phosphorus levels were within low to moderate ranges.
- **TRANSPARENCY:** Transparency was low (worse) in June likely due to algal growth, increased (improved) in early August, and then decreased to a low range in late August due to wind and wave action. Average transparency improved slightly from 2014 and was slightly less than the state median. Historical trend analysis indicates highly variable transparency since monitoring began. Transparency measured with the viewscope (VS) was much better than that measured without (NVS) and likely a better representation of actual conditions.
- **TURBIDITY:** Epilimnetic and hypolimnetic turbidities were slightly elevated and above average for those stations, particularly in August. Gillingham Dr. Inlet turbidity was elevated in early and late August likely due to low flow conditions and water rich in organic acids, or moderately colored. Outlet turbidities remained low. Andrew and Reservoir Bks. turbidities were slightly elevated in June and sediment was noted in both samples.
- **pH:** Epilimnetic, Andrew Bk., Outlet, and Reservoir Bk. pH levels were within the desirable range 6.5-8.0 units. However, historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH since monitoring began. Hypolimnetic pH was less than desirable and slightly acidic.



Station Name	Table 1. 2015 Average Water Quality Data for TODD LAKE								
	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	8.4	4.18	8	54.9	9	3.13	4.29	1.62	6.61
Hypolimnion				54.8	14			2.30	6.16
Andrew Brook			14	87.2	20			1.69	6.88
Gillingham Dr. Inlet			3	35.0	27			2.45	6.44
Outlet				55.0	10			0.69	6.75
Reservoir Brook				31.7	15			0.95	6.70

**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<sup>3</sup>

**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)	Worsening	Data significantly decreasing.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.

