



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 ⁻¹)	0.5
Surface Area (Ac.):	168	Mean Depth (m):	2.2	P Retention Coef:	0.88
Shore Length (m):	5,100	Volume (m ³):	1,466,500	Elevation (ft):	670

TROPHIC CLASSIFICATION

Year	Trophic class
1991	MESOTROPHIC
2009	MESOTROPHIC

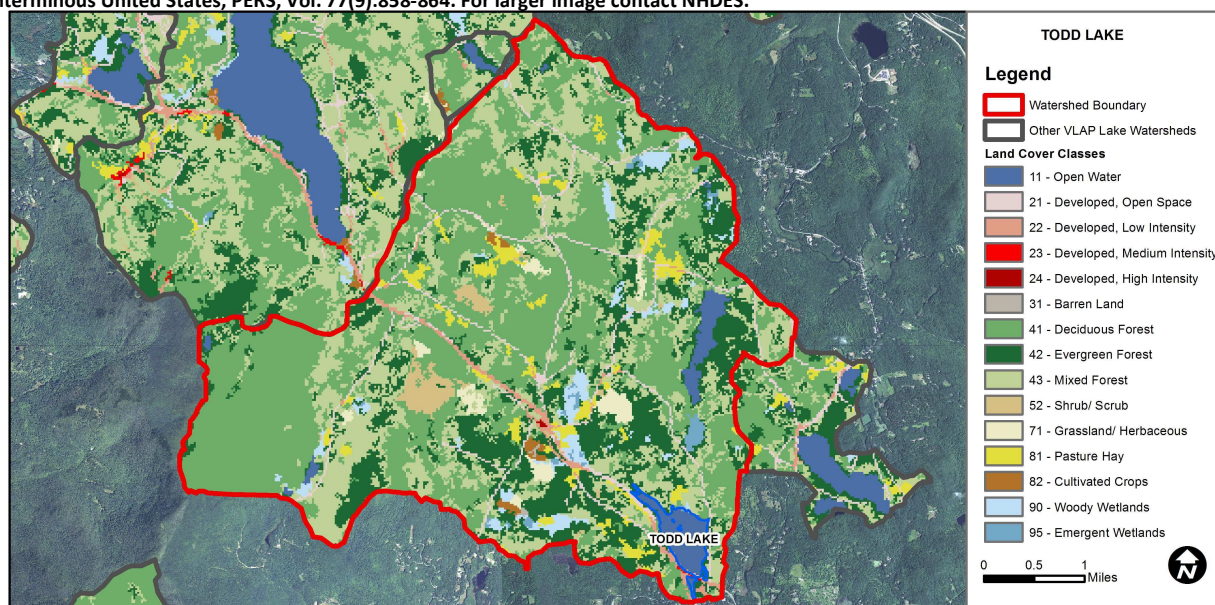
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Good	>=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

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

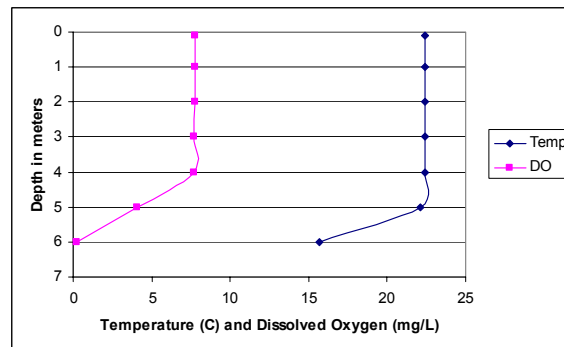
TODD LAKE, NEWBURY, NH

2012 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (Refer to Table 1 and Historical Deep Spot Data Graphic)

- ♣ **CHLOROPHYLL-A:** Chlorophyll levels remained stable throughout the summer and were less than the NH lake median. Historical trend analysis indicates chlorophyll levels fluctuate from year to year.
- ♣ **CONDUCTIVITY/CHLORIDE:** Conductivity and chloride levels were relatively low and generally only slightly greater than the NH lake medians.
- ♣ **E. COLI:** E. coli levels were much less than the state standards for public beaches and surface waters.
- ♣ **TOTAL PHOSPHORUS:** Epilimnetic (upper water layer) phosphorus levels were low and less than the NH lake median. Historical trend analysis indicates epilimnetic phosphorus fluctuates from year to year. Hypolimnetic (lower water layer) phosphorus was relatively low and remained stable throughout the summer. Andrew Bk. phosphorus was elevated in August and the turbidity was also elevated. Outlet phosphorus was slightly elevated in September and the turbidity was also elevated. Reservoir Bk. phosphorus was elevated in September. Elevated turbidity can contribute to elevated phosphorus levels.
- ♣ **TRANSPARENCY:** Transparency remained relatively stable throughout the summer and improved slightly from 2011. Historical trend analysis indicates transparency fluctuates from year to year.
- ♣ **TURBIDITY:** Turbidity levels were slightly elevated at all stations in June, at Andrew Bk., Hypolimnion, Gillingham and the Outlet in August, and Andrew Bk., Hypolimnion and Outlet in September. Rainfall was noted prior to sampling in August and September and stormwater runoff could have contributed to the turbidity. Hypolimnetic turbidity was likely due to either organic compound release from the sediments or bottom sediment contamination.
- ♣ **pH:** pH tends to fluctuate below desirable levels due to natural causes.
- ♣ **RECOMMENDED ACTIONS:** Turbidity and phosphorus levels increased slightly after storm events indicating stormwater runoff may be impacting tributaries and the lake. Identify areas in the watershed that may contribute to sediment erosion during storm events. If possible, implement best management practices to reduce erosion. Educate watershed residents on ways to reduce stormwater runoff from their properties utilizing DES' "NH Homeowner's Guide to Stormwater Management".

Dissolved Oxygen & Temperature Profile



NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m³

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: 6.5-8.0 (unless naturally occurring)

Station Name	Table 1. 2012 Average Water Quality Data for TODD LAKE								
	Alk.	Chlor-a	Chloride	Cond.	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	ug/l	m		ntu	
						NVS	VS		
Andrew Brook			3	78.2	16			1.67	6.71
Deep Epilimnion	7.27	3.23	6	46.1	11	2.75	3.55	1.01	6.5
Deep Hypolimnion				46.7	14			2.99	6.22
Gillingham				40.8	11			1.91	6.54
Gillingham Dr Inlet			5	54.2	8			0.97	6.93
Outlet				49.3	12			1.40	6.27
Reservoir Brook				30.6	18			1.44	6.77

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.
Transparency	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.
Phosphorus (epilimnion)	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.

This report was generated by the NH DES Volunteer Lake Assessment Program (VLAP). For more information contact:
Sara Steiner
PO Box 95
Concord, NH 03302-0095
(603) 271-2658
sara.steiner@des.nh.gov



Historical Deep Spot Chlorophyll-a, Epilimnetic Total Phosphorus & Transparency Data

