



# Volunteer Lake Assessment Program Individual Lake Reports

## DANFORTH POND, LOWER, FREEDOM, NH

### MORPHOMETRIC DATA

Watershed Area (Ac.):	11,776	Max. Depth (m):	16.8	Flushing Rate (yr <sup>1</sup> ):	31.6
Surface Area (Ac.):	32	Mean Depth (m):	7.1	P Retention Coef:	0.07
Shore Length (m):	1,400	Volume (m <sup>3</sup> ):	918,500	Elevation (ft):	408

### TROPIC CLASSIFICATION

Year	Trophic class
1983	MESOTROPHIC
2001	MESOTROPHIC

### KNOWN EXOTIC SPECIES

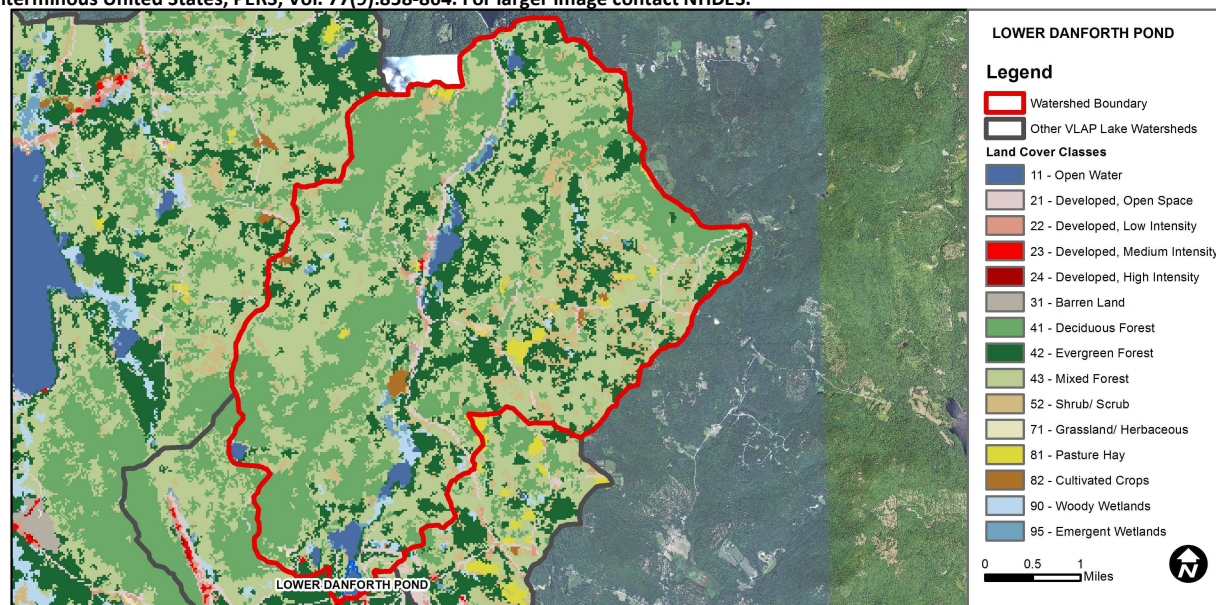
Variable Milfoil

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	No Data	No data for this parameter.
	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	2.09	Barren Land	0.1	Grassland/Herbaceous	0.08
Developed-Open Space	2.61	Deciduous Forest	29.82	Pasture Hay	0.85
Developed-Low Intensity	0.26	Evergreen Forest	16.21	Cultivated Crops	0.41
Developed-Medium Intensity	0.03	Mixed Forest	40.01	Woody Wetlands	1.18
Developed-High Intensity	0	Shrub-Scrub	5.62	Emergent Wetlands	0.74



## VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

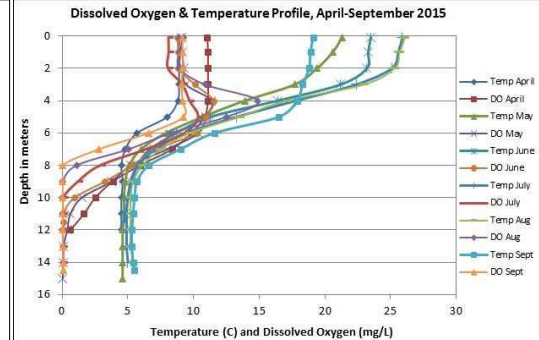
### LOWER DANFORTH POND, FREEDOM

### 2015 DATA SUMMARY

**RECOMMENDED ACTIONS:** Spring sampling indicated elevated turbidity and decreased transparency or water clarity following spring snow melt after a winter of heavy snow accumulation. The above average snowfall, snowmelt and sand/salt application to local roadways and driveways likely contributed to the elevated turbidity and low water clarity. Road agents should be encouraged to remove any sand accumulated along roadsides, and to clean culverts and catch basins after the winter months to prevent any sediment and debris from entering nearby streams and the lake. A significant storm event in June also caused a decrease in water clarity. This indicates that stormwater runoff can negatively impact water quality. Educate lake and watershed residents on ways to reduce stormwater runoff from properties and continue to implement stormwater management activities at areas prone to erosion. Keep up the great work!

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

- ◆ **CHLOROPHYLL-A:** Chlorophyll levels were very low in April and May, increased to average levels in June and July, increased to slightly elevated levels in August, and then decreased to low levels in September. The 2015 average chlorophyll level was low, decreased from 2014 and was less than the state median. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer) conductivity fluctuated between a low to average range and was slightly greater than the state median. Historical trend analysis indicates stable epilimnetic conductivity since monitoring began. Metalimnetic (middle water layer) conductivity remained within an average range and hypolimnetic (upper water layer) conductivity was slightly elevated on each sampling event.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic and metalimnetic phosphorus levels remained within a low range from April to September. Average epilimnetic phosphorus remained stable with 2014 and was less than the state median. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Hypolimnetic phosphorus was low in April and May and then increased to elevated levels as the summer progressed and dissolved oxygen levels were depleted causing phosphorus to be released from bottom sediments.
- ◆ **TRANSPARENCY:** Transparency was lowest (worst) in April following spring snow melt and runoff. Transparency improved and was highest (best) in May when algal growth was extremely low. Transparency decreased in June following a significant storm event and then increased (improved) in July and remained fairly stable through September. Average transparency improved from 2014 and was slightly better than the state median. Historical trend analysis indicates highly variable transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic turbidity was elevated in April following spring snow melt and runoff and then decreased to an average range. Metalimnetic turbidity was slightly above average from June through August as algal growth increased. Hypolimnetic turbidity was low in April and then increased to elevated levels from May through September due to the formation and accumulation of organic compounds in hypolimnetic waters as the summer progresses and dissolved oxygen levels are depleted.
- ◆ **pH:** Epilimnetic pH was within the desirable range 6.5-8.0 units from April to September. Metalimnetic pH fluctuated below the desirable range and Hypolimnetic pH was less than desirable and slightly acidic on each sampling event. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years.



**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

Station Name	Table 1. 2015 Average Water Quality Data for DANFORTH POND, LOWER							
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m	Turb. ntu	pH
Epilimnion	9.7	2.92	8	57.1	8	3.96	4.23	0.88
Metalimnion				59.2	9			1.05
Hypolimnion				104.6	21			10.24

#### HISTORICAL WATER QUALITY TREND ANALYSIS

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

