



## Volunteer Lake Assessment Program Individual Lake Reports

### HERMIT LAKE, SANBORNTON, NH

#### MORPHOMETRIC DATA

Watershed Area (Ac.):	3,718	Max. Depth (m):	15.2	Flushing Rate (yr <sup>-1</sup> ):	4.2
Surface Area (Ac.):	176	Mean Depth (m):	2.5	P Retention Coef:	0.58
Shore Length (m):	8,700	Volume (m <sup>3</sup> ):	1,756,000	Elevation (ft):	624

#### TROPHIC CLASSIFICATION

Year	Trophic class
1980	MESOTROPHIC
2003	EUTROPHIC

#### 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)

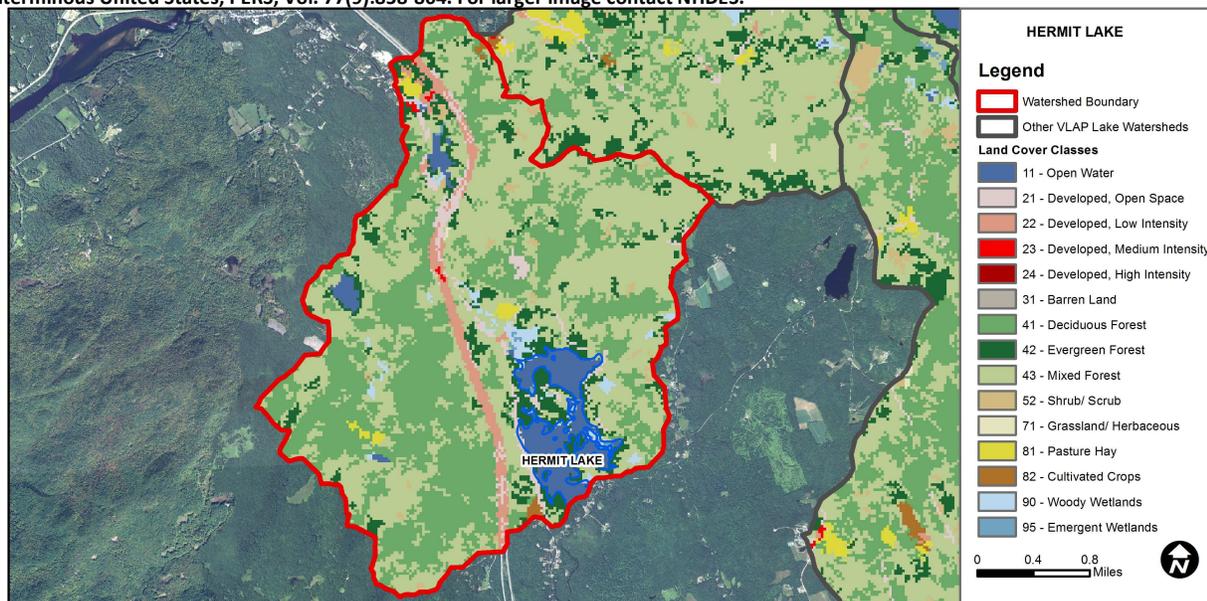
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Very Good	The calculated median is from 5 or more samples and is $\leq 1/2$ indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Chlorophyll-a	Very Good	The calculated median is from 5 or more samples and is $\leq 1/2$ indicator.
Primary Contact Recreation	Escherichia coli	Encouraging	There are no geometric means or there are > 2 single samples but those samples are within 75% of the geometric means criteria. More data needed.
	Cyanobacteria hepatoto	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

#### BEACH PRIMARY CONTACT ASSESSMENT STATUS

HERMIT LAKE - TOWN BEACH	Escherichia coli	Slightly Bad	There are $\geq 1$ exceedance(s) of the geometric mean and/or $\geq 2$ single sample criterion exceedances. Exceedances are $< 2X$ criteria.
HERMIT LAKE - TOWN BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).

#### 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	5.32	Barren Land	0.03	Grassland/Herbaceous	0.03
Developed-Open Space	2.8	Deciduous Forest	33.81	Pasture Hay	0.64
Developed-Low Intensity	3.02	Evergreen Forest	8.39	Cultivated Crops	0.26
Developed-Medium Intensity	0.14	Mixed Forest	42.92	Woody Wetlands	1.56
Developed-High Intensity	0	Shrub-Scrub	0.89	Emergent Wetlands	0.2



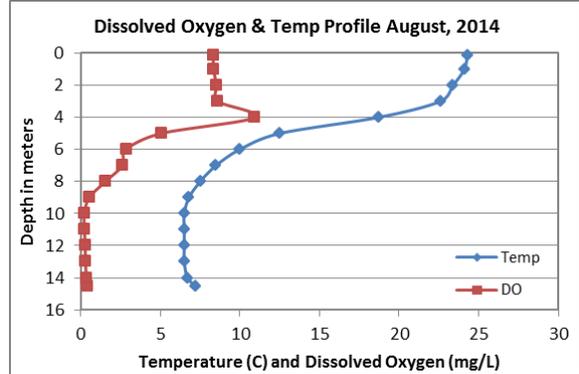
# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

## HERMIT LAKE, SANBORNTON

### 2014 DATA SUMMARY

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

- CHLOROPHYLL-A:** Chlorophyll levels were elevated in August, much greater than 2013 levels and the state median, and approaching levels indicative of an algae bloom. Historical trend analysis indicates highly variable chlorophyll levels between years.
- CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride levels were slightly greater than the state medians. Shannon's Inlet conductivity was much higher than normal in 2014 potentially due to low flow conditions. Historical trend analysis indicates highly variable epilimnetic (upper water layer) conductivity since monitoring began. The high variability is also noticeable in the tributaries.
- TOTAL PHOSPHORUS:** Epilimnetic and metalimnetic (middle water layer) phosphorus levels were low in August, less than the state median, and within an average range for those stations. Historical trend analysis indicates highly variable epilimnetic phosphorus since monitoring began. Hypolimnetic (lower water layer) phosphorus levels were slightly elevated and the highest measured since 2002. This was likely a result of phosphorus being released into the water column from bottom sediments when dissolved oxygen levels decreased below 1.0 mg/L, which was the case in August. This process is called internal phosphorus loading. Rt. 132 Inlet, Shannon's Inlet and Outlet phosphorus levels were average.
- TRANSPARENCY:** Transparency improved slightly in 2014 and was slightly better than the state median. Transparency measured with the viewscope (VS) was much better (deeper) than without and likely a more accurate representation of lake clarity. Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- TURBIDITY:** Epilimnetic, metalimnetic, and tributary turbidities were low. Hypolimnetic turbidity was elevated and likely a result of the accumulation of organic compounds in the hypolimnion under anoxic conditions.
- pH:** Epilimnetic pH was within the desirable range of 6.5–8.0 units, however metalimnetic and hypolimnetic pH were less than the desirable range and slightly acidic. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years.
- RECOMMENDED ACTIONS:** Increase monitoring frequency to once per month, typically June, July and August. The increased frequency will allow better assessment of summer water quality as conditions can change daily, weekly and monthly, as well as better assessment of historical water quality trends by decreasing variability between years. Keep up the great work!



**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)

Station Name	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	5.7	10.03	31	126.4	5	3.73	4.68	0.54	6.67
Metalimnion				129.6	9			0.84	6.24
Hypolimnion				161.0	18			10.5	6.25
Dam Outlet				103.7	11			0.89	6.81
Rt 132 Inlet			23	108.3	10			0.77	6.69
Shannon's Inlet			22	108.2	9			0.83	6.59

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

