Volunteer Lake Assessment Program Individual Lake Reports

WHITE OAK POND, HOLDERNESS, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	3,008	**Max. Depth (m):**	10.7	**Flushing Rate (yr^{-1})**	1.3
Surface Area (Ac.):	291	**Mean Depth (m):**	4	**P Retention Coef:**	0.66
Shore Length (m):	5,100	**Volume (m^3):**	4,697,500	**Elevation (ft):**	583

TROPHIC CLASSIFICATION

Year	Trophic class
1979	MESOTROPHIC
1990	MESOTROPHIC

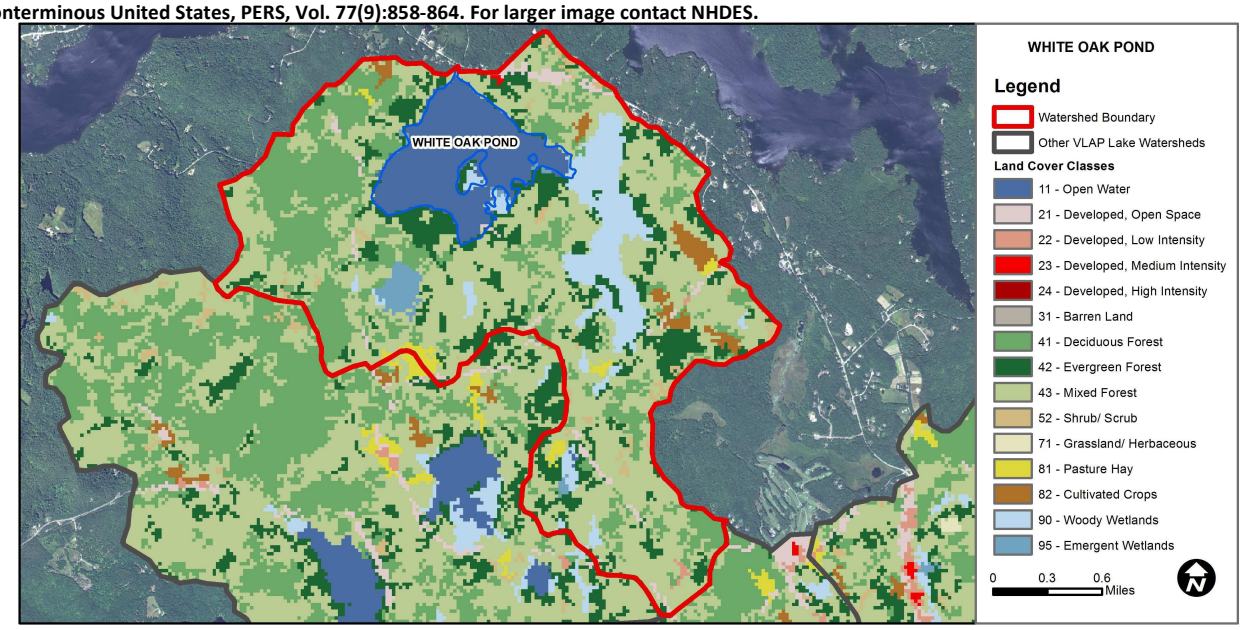
KNOWN EXOTIC SPECIES

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

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	Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a large 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	Good	Sampling data is 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.



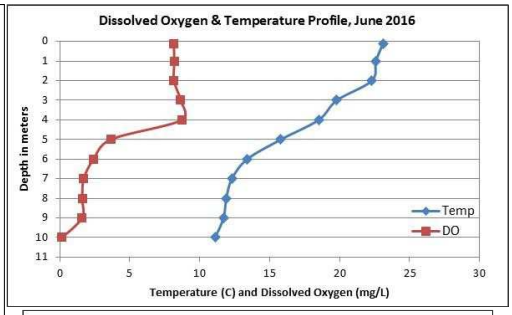
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	9.79	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	1.52	Deciduous Forest	19.95	Pasture Hay	0.9
Developed-Low Intensity	0.14	Evergreen Forest	13.33	Cultivated Crops	1.7
Developed-Medium Intensity	0.04	Mixed Forest	42.43	Woody Wetlands	7.71
Developed-High Intensity	0	Shrub-Scrub	1.26	Emergent Wetlands	1.3

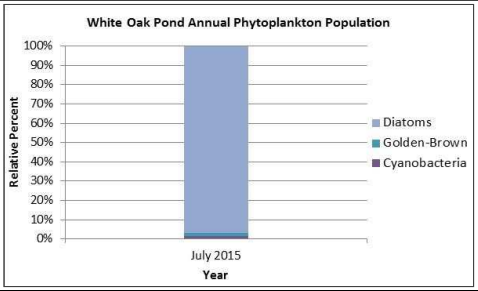
Volunteer Lake Assessment Program Individual Lake Reports
White Oak Pond, Holderness
2016 Data Summary

Recommended Actions: Pond water quality is generally indicative of mesotrophic, or average water quality conditions and the significantly improving epilimnetic phosphorus levels is a great sign! Chlorophyll levels suggested higher levels of algal growth in the spring/early summer following a mild winter with an early start to the growing season. E. Holderness Rd. Trib. turbidity levels were within average ranges in July and August following significant storm events which is an improvement, however phosphorus levels remained elevated. Low flow and stagnant conditions contributed to elevated phosphorus, conductivity and turbidity levels in #3 Dump Trib. Chloride levels also remained elevated in #3 Dump Trib. and slightly elevated in #9 suggesting influences from the dump and/or road salting practices. Encourage local road agents to obtain a NH Voluntary Salt Applicator License offered through UNH Technology Transfer Center's Green SnowPro Certification program. Keep up the great work!

Observations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were elevated in June and approached levels indicative of an algal bloom, then decreased to average levels in July and August. The 2016 average chlorophyll level increased from 2015 and was greater than the state median. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **Conductivity/Chloride:** Deep spot and tributaries #2, #3 Inlet, #4, and #6 conductivity and chloride levels remained stable and low from June through August. Average epilimnetic (upper water layer) conductivity remained relatively stable with 2015 and was slightly greater than the state median, however historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began. #9 E. Holderness Rd. Trib. And #3 Dump Trib. conductivity and chloride levels were slightly elevated and greater than the state medians, particularly at the Dump Trib. station.
- **Total Phosphorus:** Epilimnetic phosphorus was higher in June when algal growth was high, but was not above an average level for the pond, then decreased to low levels in July and August. Average epilimnetic phosphorus remained stable with 2015 and was less than the state median. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus since montioring began. Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) phosphorus levels were slightly elevated in June then decreased to average levels in July and August. Tributaries #2, #3 Dump Inlet, #4, and #6 phosphorus levels were within low to average ranges. #3 Dump Trib phosphorus levels were elevated in June during stagnant conditions and then decreased in July but remained in an elevated range. #9 E. Holderness Rd. Trib. phosphorus levels were elevated on each sampling event levels in both tributaries with the highest measured since monitoring began.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was good in June despite the elevated algal growth, decreased in July and then increased (improved) in August. Average NVS transparency remained stable with 2015 and was higher (better) than the state median. Historical trend analysis indicates stable transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity was within a low to average range, Metalimnetic and Hypolimnetic turbidities were slightly above average in June and July. #2, #3 Dump Inlet, #4, and #6 turbidities were within low to average ranges for those stations. #3 Dump Trib. and #9 E. Holderness Rd. Trib. turbidities were elevated in June due to stagnant and low flow conditions then decreased to lower levels in July and August.
- **pH:** Epilimnetic, #2, #3 Dump Inlet and Trib., #4, #6, and #9 pH levels were within the desirable range 6.5-8.0 units. Metalimnetic and Hypolimnetic pH levels were less than desirable and slightly acidic. 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)

Station Name	Table 1. 2016 Average Water Quality Data for WHITE OAK POND								
	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	6.7	6.83	8	51.8	8	4.00	4.33	1.03	6.87
Metalimnion				53.2	15			1.76	6.36
Hypolimnion				53.6	14			2.13	6.34
#2 Lamb Swamp Inlet			8	50.8	10			0.98	6.67
#3 Dump Inlet			8	52.6	8			1.19	6.73
#3 Dump Trib.			46	239.0	48			4.71	6.54
#4 Outlet (Dam)				52.4	7			0.77	6.89
#6 Stone Bridge Inlet			8	51.7	11			0.76	6.94
#9 E Holderness Rd. Trib.			22	131.4	38			3.31	6.66

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	Worsening	Data significantly increasing.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.