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

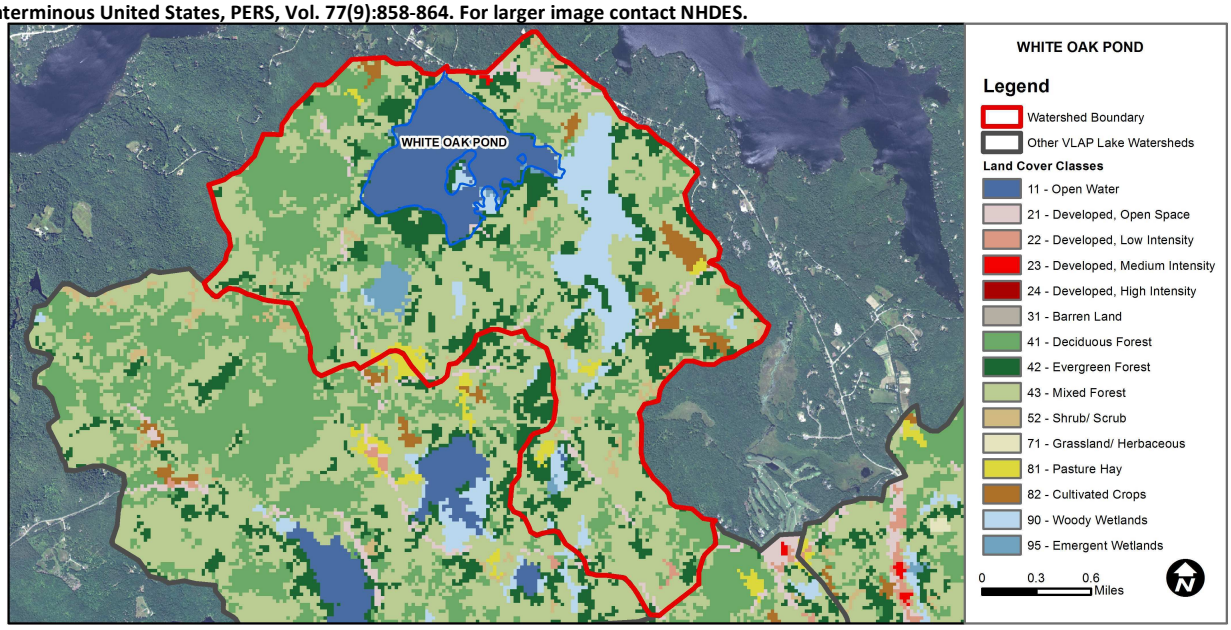
KNOWN EXOTIC SPECIES

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	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	Oxygen, Dissolved	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), 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	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.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of 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	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

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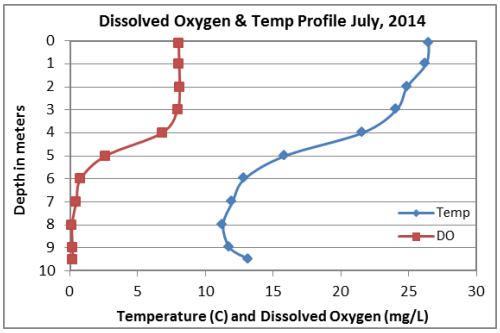
White Oak Pond, Holderness

2014 Data Summary

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

- **Chlorophyll-a:** Chlorophyll levels were low in June, increased to slightly elevated levels in July, and then decreased to low levels in August. Average chlorophyll levels increased from 2013 and were approximately equal to the state median. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **Conductivity/Chloride:** Deep spot, #2 Lamb Swamp Inlet, #3 Dump Inlet, #4 Outlet, and #6 Stone Bridge Inlet conductivity and chloride levels were average and approximately equal to the state medians. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began. Conductivity and chloride in #3 Dump Trib and #9 East Holderness Rd. Trib were slightly elevated, greater than the state medians, and much greater than the other stations.
- **Total Phosphorus:** Epilimnetic phosphorus levels were stable and low from June to August. Average epilimnetic phosphorus remained stable from 2013 and was less than the state median. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus levels since monitoring began. We hope to see this continue! Metalimnetic phosphorus levels were low in June and July and then increased in August likely due to a layer of algae. Hypolimnetic phosphorus was low in June and then increased to average levels in July and August. #2 Lamb Swamp Inlet phosphorus levels were low in June. #3 Dump Inlet phosphorus levels were low in June and July and then increased to average levels in August likely due to low flow conditions. #3 Dump Trib phosphorus levels were elevated in June following a significant storm event and in August potentially due to low flows. #4 Outlet phosphorus levels were low in June and July and then increased to above average levels in August. #6 Stone Bridge Inlet phosphorus levels were low in June and July and then increased in August. #9 E Holderness Rd. Trib phosphorus levels were average for that station.
- **Transparency:** Transparency measured without the viewscope (NVS) was good in June, decreased (worsened) in July when algal growth was high, and then increased (improved) slightly in August. Average transparency improved from 2013 and was better than the state median. Historical trend analysis indicates stable transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity was low on each sampling event. Metalimnetic turbidity increased slightly as the summer progressed likely due to algal growth and movement within the layer. Hypolimnetic turbidity also increased as the summer progressed likely due to the accumulation of organic compounds as the summer progressed and dissolved oxygen levels were depleted. All tributaries had low turbidities except for #3 Dump Trib and #9 E Holderness Rd. whose turbidities were slightly elevated in June and increased by August likely due to low flows.
- **pH:** Epilimnetic pH was within the desirable range 6.5-8.0 units, however metalimnetic and hypolimnetic pH levels were less than desirable. Historical trend analysis indicates relatively stable epilimnetic pH since monitoring began. Tributary pH levels generally remained with the desirable range except for #2 Lamb Swamp Inlet.
- **Recommended Actions:** Chloride monitoring indicates that #3 Dump Trib station and #9 E Holderness Rd Trib are impacted by road salting practices. Encourage local road agents, winter maintenance companies to obtain a Voluntary NH Salt Applicator License through the UNH Technology Transfer Center's Green SnowPro Certification program. More information can be found at www.t2.unh.edu/green-snowpro-training-and-certification**.** The stable and improving water quality trends are a great sign. 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)

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

Station Name	Table 1. 2014 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	6.20	4.43	6	46.3	6	4.02	4.93	0.65	7.05
Metalimnion				48.4	11			2.12	6.11
Hypolimnion				49.7	13			5.08	6.15
#2 Lamb Swamp Inlet			7	48.5	11			0.84	6.34
#3 Dump Inlet			7	50.1	12			0.88	6.61
#3 Dump Trib			55	257.0	24			4.23	6.84
#4 Outlet (Dam)				46.2	11			0.81	6.84
#6 Stone Bridge Inlet			7	45.9	10			0.88	6.82
#9 E Holderness Rd Trib			20	113.8	20			2.47	6.70

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.