Volunteer Lake Assessment Program Individual Lake Reports

WICWAS LAKE, MEREDITH, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	5,312	**Max. Depth (m):**	10.9	**Flushing Rate (yr^{1})**	2
Surface Area (Ac.):	328	**Mean Depth (m):**	3.9	**P Retention Coef:**	0.58
Shore Length (m):	9,500	**Volume (m^3):**	5,110,500	**Elevation (ft):**	502

TROPHIC CLASSIFICATION

Year	Trophic class
2009	MESOTROPHIC
2009	MESOTROPHIC

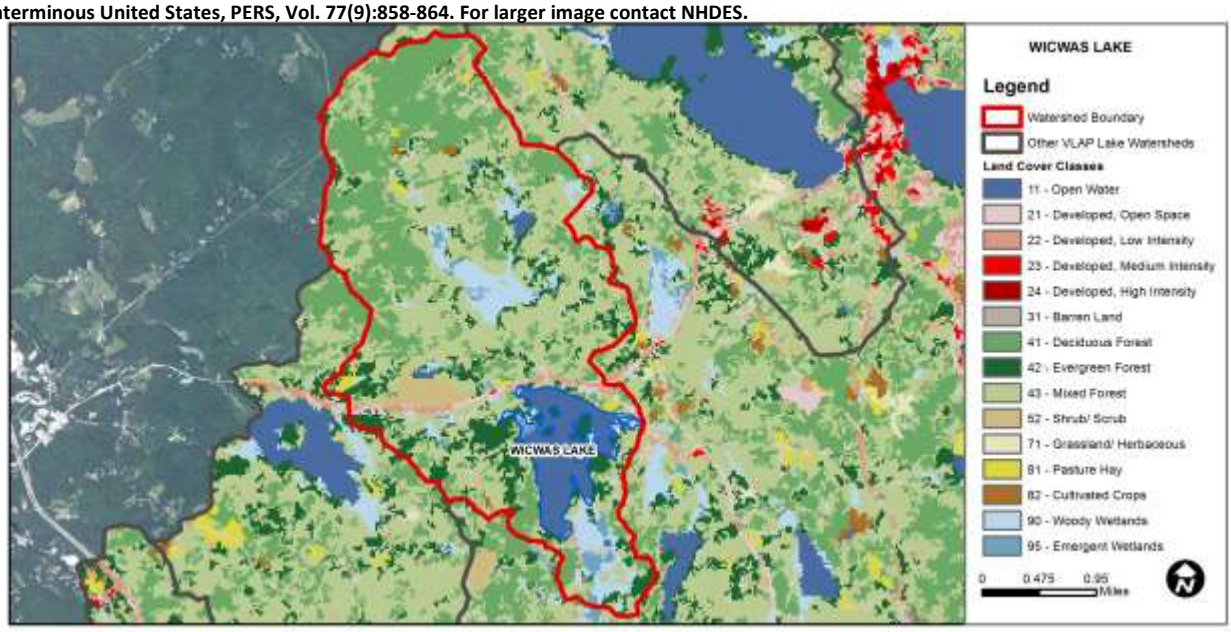
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2018 305(b) report on the status of N.H. waters, and are based on data collected from 2008-2017. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organization/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	Slightly Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a small margin.
	Oxygen, Dissolved	Very Good	All sampling data meet water quality standards or thresholds for this 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	Very Good	All sampling data meet water quality standards or thresholds for this 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	6.47	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	1.73	Deciduous Forest	26.65	Pasture Hay	0.59
Developed-Low Intensity	0.92	Evergreen Forest	12.49	Cultivated Crops	0.24
Developed-Medium Intensity	0.02	Mixed Forest	39.88	Woody Wetlands	6.75
Developed-High Intensity	0	Shrub-Scrub	2.66	Emergent Wetlands	1.57

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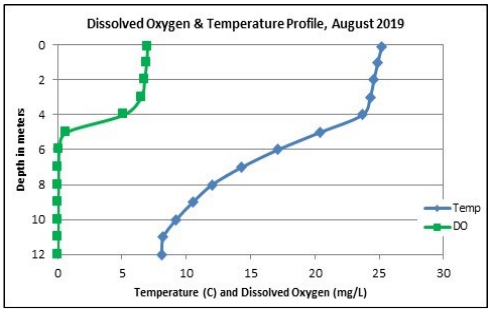
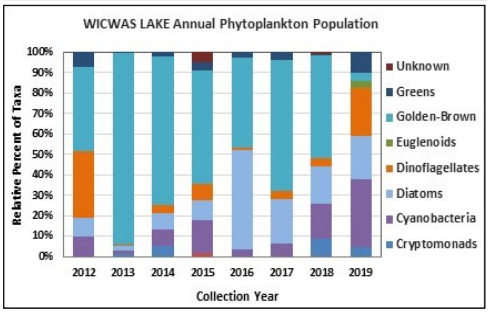
Lake Wicwas, Meredith
2019 Data Summary

Recommended Actions: Pond quality is representative of mesotrophic, or average, conditions. Algal growth occasionally spikes above the threshold for mesotrophic lakes and phosphorus levels in the hypolimnion suggest an internal load of phosphorus being released into the water column from bottom sediments. This can occur when dissolved oxygen levels are depleted below 1.0 mg/L, as indicates by the dissolved oxygen/temperature profile. This likely fueled the cyanobacteria bloom that occurred in late August. Increase monitoring frequency to once per month, typically June, July and August, to better assess seasonal conditions and reduce variability in trend analysis. The improving pH levels are encouraging. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll level was low in August, increased slightly from 2018, and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable, yet variable, chlorophyll levels since 2002.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), East Cove, Rte. 104 Inlet, and West Cove conductivity and/or chloride levels were slightly greater than the state medians, yet less than a level of concern. Historical trend analysis indicates stable, yet variable, epilimnetic conductivity levels since 2002. Hypolimnetic conductivity levels were slightly elevated potentially due to accumulation of organic compounds under anoxic (no dissolved oxygen) conditions. Chemung Wetland and North Culvert chloride levels were slightly elevated and much greater than the other stations, however levels were less than the state chronic chloride standard. Launch Ramp chloride levels were low.
- **Color:** Apparent color measured in the epilimnion indicates the lake was lightly tea colored, or light brown.
- **E. coli:** East Cove, Rte. 104 Inlet and West Cove E. coli levels were very low and much less than the state standards for public beaches and surface waters.
- **Total Phosphorus:** Epilimnetic phosphorus level was low in August, increased slightly from 2018, and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since 2002. Metalimnetic phosphorus level was within a moderate range. Hypolimnetic phosphorus level was elevated and the turbidity of the sample was also elevated indicating release of phosphorus from bottom sediments under anoxic conditions. East Cove, Rte. 104 Inlet and West Cove phosphorus levels were within a low range.
- **Transparency:** Transparency measured without the viewscope (NVS) was within an average range for the lake, remained stable with 2018, and was higher (better) than the state median. Historical trend analysis indicates stable, yet variable, transparency since 2002. Viewscope transparency (VS) was slightly higher (better) than NVS transparency and likely a better measure of actual conditions.
- **Turbidity:** Epilimnetic, East Cove, Rte. 104 Inlet, and West Cove turbidity levels were within a low range. Metalimnetic turbidity level was slightly above average potentially due to algal growth. Hypolimnetic turbidity level was slightly elevated likely due to formation and accumulation of organic compounds under anoxic conditions.
- **pH:** Epilimnetic, Hypolimnetic, East Cove, Rte. 104 Inlet, and West Cove pH levels were within the desirable range 6.5-8.0 units, however epilimnetic pH levels have historically fluctuated below the desirable range. Historical trend analysis indicates significantly increasing (improving) epilimnetic pH levels since monitoring began. Metalimnetic pH levels were slightly acidic and less than desirable potentially due to a layer of algae/cyanobacteria and by-products of respiration.





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. 2019 Average Water Quality Data for LAKE WICWAS - MEREDITH										
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	E. coli mpn/100ml	Total P mg/l	Trans. m		Turb. ntu	pH
								NVS	VS		
Epilimnion	6.5	2.74	15	40	74.9		7	4.30	4.72	0.31	6.70
Metalimnion					84.9		13			1.26	5.96
Hypolimnion					120.0		46			3.40	6.51
Chemung Wetland			45								
East Cove					76.1	4	7			0.31	6.81
Launch Ramp			7								
North Culvert			91								
Rte. 104 Inlet			12		75.0	2	8			0.44	6.77
West Cove			13		81.0	2	7			0.42	6.79

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.5 mg/L
Chlorophyll-a: 4.39 ug/L
Conductivity: 42.3 uS/cm
Chloride: 5 mg/L
Total Phosphorus: 11 ug/L
Transparency: 3.3 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)	Improving	Data significantly increasing.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.