Volunteer Lake Assessment Program Individual Lake Reports

PAWTUCKAWAY LAKE, NOTTINGHAM, NH

MORPHOMETRIC DATA | **TROPHIC CLASSIFICATION** | **KNOWN EXOTIC SPECIES**

Watershed Area (Ac.):	13,248	**Max. Depth (m):**	15.2	**Flushing Rate (yr^{-1})**	2.3	**Year**	**Trophic class**	
Surface Area (Ac.):	900	**Mean Depth (m):**	3.1	**P Retention Coef:**	0.61	1989	MESOTROPHIC	
Shore Length (m):	27,700	**Volume (m^3):**	10,740,000	**Elevation (ft):**	250	1998	MESOTROPHIC	

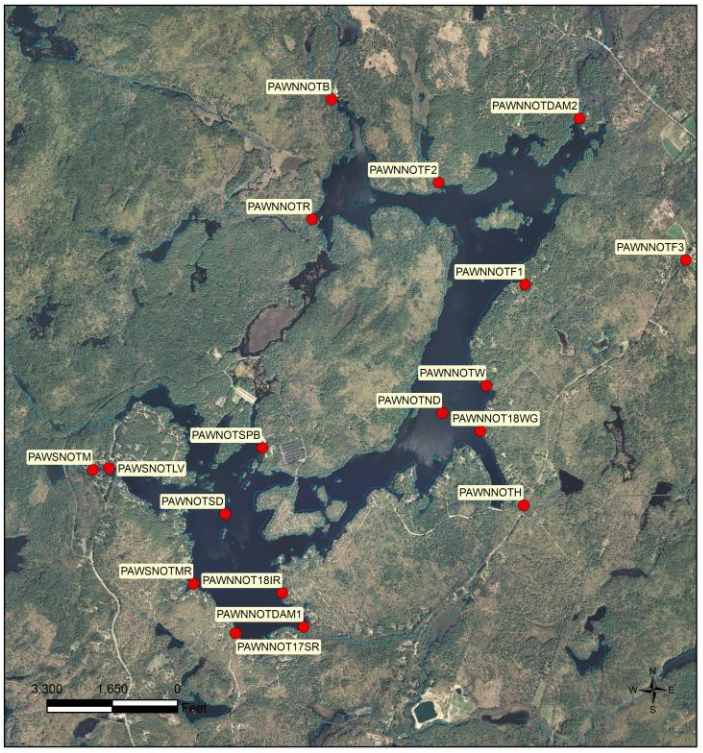
The Waterbody Report Card tables are generated from the DRAFT 2020 305(b) report on the status of N.H. waters, and are based on data collected from 2010-2019. Detailed waterbody assessment and report card information can be found at NHDES' Water Quality Assessment Website.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	Data exceed water quality standards or thresholds for this parameter by a small margin.
	pH	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large 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 this parameter by a small margin.
	Chlorophyll-a	Slightly Bad	Data exceed water quality standards or thresholds for this parameter by a small margin.
Primary Contact Recreation	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
	Cyanobacteria hepatoto	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

PAWTUCKAWAY LAKE - TOWN BEACH	Escherichia coli	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
PAWTUCKAWAY LAKE - PAWTUCKAWAY STATE PARK BEACH	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
PAWTUCKAWAY LAKE - PAWTUCKAWAY STATE PARK BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).

VLAP SAMPLE STATION MAP: This map depicts the location of routine sampling stations discussed on page two of the report.



PAWTUCKAWAY LAKE
NOTTINGHAM
VOLUNTEER LAKE ASSESSMENT PROGRAM

STATIONID	STATION NAME
PAWNNOTB	BACK CREEK B
PAWNNOTF1	FERNALDS A
PAWNNOTF2	FUNDY BROOK
PAWNNOTR	ROUND PD BROOK
PAWNNOTW	WHITE GROVE BROOK
PAWNOTND	NORTH DEEP SPOT
PAWNOTSD	SOUTH DEEP SPOT
PAWSNOTM	MOUNTAIN BROOK
PAWNNOTF3	#09 FERNALDS B
PAWNOTSPB	STATE PARK BEACH
PAWSNOTMR	MOORES RD
PAWNNOTDAM2	DROWNS DAM
PAWNNOTDAM1	DOLLOF DAM
PAWNNOT18WG	18 WHITE GROVE
PAWNNOT17SR	17 SOUTH RD
PAWNNOT18IR	18 INDIAN RD
PAWSNOTLV	LAKEVIEW DR
PAWNNOTH	HIGHLAND AVE

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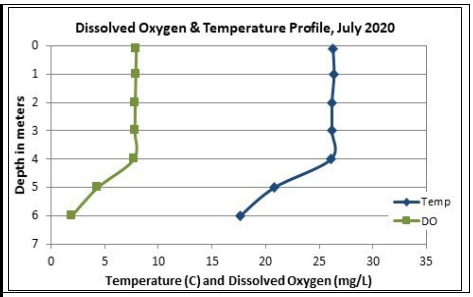
Pawtuckaway Lake, South Stn. Nottingham
2020 Data Summary

Recommended Actions: Great job sampling in 2020! Water quality remained representative of mesotrophic, or average, conditions with phosphorus and chlorophyll levels stabilizing around the thresholds for mesotrophic lakes. We hope to see this continue. Epilimnetic pH levels have generally improved since 2009 indicating some recovery from historical inputs of acid rain, which is a positive sign. Continue to monitor water quality at Moores Rd. as phosphorus levels were elevated in 2020. Efforts should continually be made to reduce stormwater runoff from lake front shoreline properties, stabilize steep slopes, convert sandy beaches to perched beaches, and plant vegetative buffers along the shoreline. DES' "NH Homeowner's Guide to Stormwater Management", and UNH Cooperative Extension's "Landscaping at the Water's Edge" are great resources. Encourage shoreline property owners to be certified LakeSmart through NHLAKES lake-friendly living program www.nhlakes.org/lakesmart/. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll level was low in May, remained stable in July, and increased to a slightly elevated level in September. Average chlorophyll level increased slightly from 2019, was slightly greater than the state median, and was approximately equal to the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), Hypolimnetic (lower water layer) and Mountain Brook conductivity and/or chloride levels were low and approximately equal to the state median. Historical trend analysis indicates stable epilimnetic conductivity levels since monitoring began. Moores Rd. conductivity and chloride levels were slightly greater than the state medians but within a low range for NH lakes.
- **Color:** Apparent color measured in the Epilimnion indicates the water was lightly tea colored, or light brown, in May and then lightened to a clear, with little to no tea coloring, range in September. Hypolimnetic color was lightly tea colored in May and July and then increased to moderately tea colored, or brown, conditions in September.
- **Total Phosphorus:** Epilimnetic phosphorus level was low in May, decreased slightly in July, and then increased slightly in September. Average epilimnetic phosphorus level remained stable with 2019 and was slightly less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus level was slightly elevated in September. Moores Rd. phosphorus levels were greatly elevated in May potentially due to low flows and wetland influences. Mountain Brook phosphorus levels were slightly elevated in July following a storm event.
- **Transparency:** Transparency measured with the viewscope (VS) was high (good) for the lake in May, increased (improved) in July, and then decreased (worsened) in September when algal growth was higher. Historical trend analysis indicates relatively stable VS transparency since 2007. Prior to that transparency was measured without the viewscope.
- **Turbidity:** Epilimnetic, Hypolimnetic and Mountain Brook turbidity levels fluctuated within a low range for those stations. Moores Rd. turbidity level was slightly elevated in May.
- **pH:** Epilimnetic pH level was within the desirable range 6.5-8.0 units and historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began. Hypolimnetic and Mountain Brook pH levels were slightly less than desirable. Moores Rd. pH levels were slightly acidic and less than desirable.



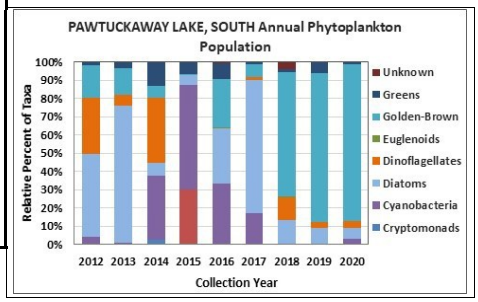


Table 1. 2020 Average Water Quality Data for PAWTUCKAWAY LAKE - SOUTH STN

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	Total P ug/l	Trans. m / VS	Turb. ntu	pH
Epilimnion	6.1	4.99	7	30	40.3	10	3.93	0.44	7.12
Hypolimnion				43	40.8	13		0.75	6.37
Moores Rd.			12		73.6	103		1.69	6.10
Mountain Brook					43.2	23		1.18	6.43

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

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)

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 moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.