



Volunteer Lake Assessment Program Individual Lake Reports

PAWTUCKAWAY LAKE, NOTTINGHAM, NH

MORPHOMETRIC DATA

TROPIC 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	

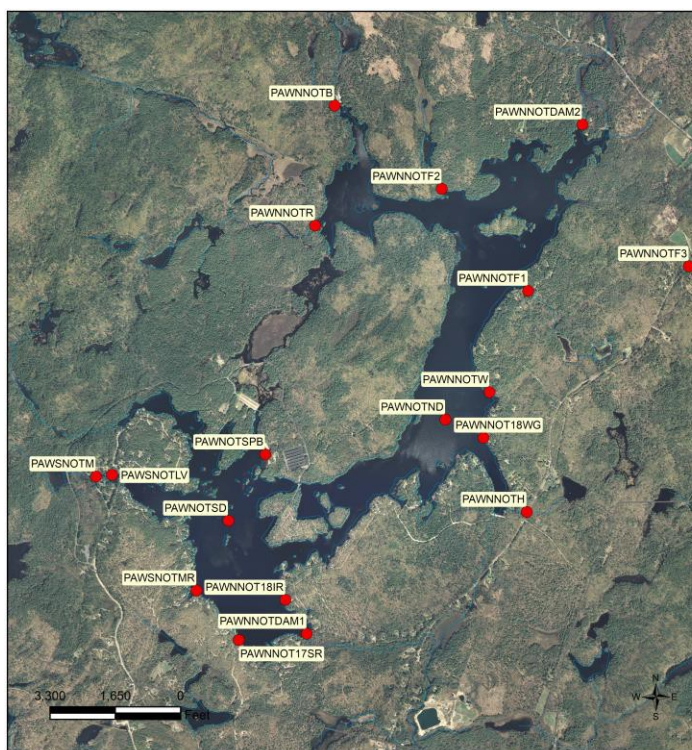
The Waterbody Report Card tables are generated from the DRAFT 2020 305(b) report on the status of N.H. waters, and are based on data collected from 2010-2019. Detailed waterbody assessment and report card information can be found at [NHDES' Water Quality Assessment Website](#).

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

Source: The data layers are derived from NHDES data and are under constant revision. NHDES is not responsible for the use or interpretation of this information. Not intended for legal use. NHDES Watershed Management Bureau Date: 2/17/2021





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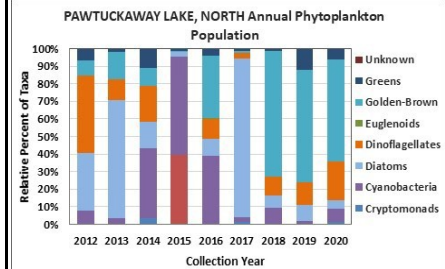
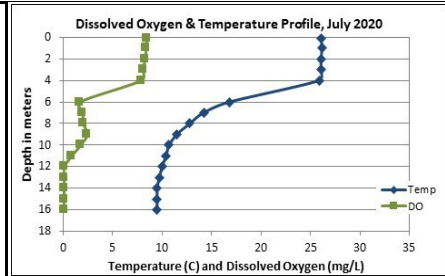
Pawtuckaway Lake, North Stn. Nottingham

2020 Data Summary

Recommended Actions: Great job sampling in 2020! Drought conditions and increased recreational use of the lake in 2020 likely resulted in elevated nutrient (phosphorus) levels which increased algal growth (chlorophyll). The worsening phosphorus and chlorophyll levels are concerning. Shoreline management efforts to stabilize steep slopes and prevent erosion of shoreline areas is important. Encourage shoreline property owners to be certified LakeSmart through NHLAKES lake-friendly living program www.nhlakes.org/lakesmart/. Several tributaries experience spikes in nutrient levels following storm events. Stormwater management efforts should be focused in these sub-watersheds to reduce phosphorus loading to the lake. Consider partnering with Soak Up the Rain NH to identify areas prone to stormwater runoff and install stormwater controls to prevent runoff to tributaries and the lake. Keep up the great work!

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

- ◆ **Chlorophyll-a:** Chlorophyll level was slightly elevated in May, increased to elevated level in July, and then decreased to a slightly elevated level in September. Average chlorophyll level increased from 2019 and was greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly increasing (worsening) chlorophyll levels since monitoring began.
- ◆ **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Back Creek B, and Fundy Bk. conductivity and/or chloride levels were approximately equal to the state median. Historical trend analysis indicates relatively stable epilimnetic conductivity levels since monitoring began. Fernalds A, Highland Ave. and White Grove Brook conductivity and/or chloride levels were slightly elevated and greater than the state median. #09 Fernalds B conductivity level was elevated but chloride levels were only slightly elevated and much less than the state chronic chloride standard.
- ◆ **Color:** Apparent color measured in the epilimnion indicates the water was moderately tea colored, or brown, in May and then gradually lightened to within a clear, with little to no tea coloring, range in September. Hypolimnetic color was moderately tea colored in May and then increased to highly tea colored, or dark brown, conditions in July and September indicating high levels of decomposition of bottom sediments.
- ◆ **Total Phosphorus:** Epilimnetic and Metalimnetic phosphorus levels fluctuated within a slightly elevated range from May through September. Average epilimnetic phosphorus level increased from 2019 and was greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly increasing (worsening) epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus level was greatly elevated in July and September due to the release of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. Back Creek B and Highland Ave. phosphorus levels were elevated in July following a storm event. Fundy Bk. phosphorus levels were elevated in September during low flow conditions. Round Pd. Brook phosphorus levels were elevated in July and September. White Grove phosphorus levels were low in May. Fernalds A and B phosphorus levels continue to be extremely elevated.
- ◆ **Transparency:** Transparency measured with the viewscope (VS) was within an average range for the lake in May and increased steadily as the summer progressed and as water color became lighter. Average transparency decreased slightly from 2019 and was slightly higher (better) than the state median. Historical trend analysis indicates stable VS transparency since 2007. Prior to 2007 represents transparency measured without the viewscope.
- ◆ **Turbidity:** Epilimnetic, Metalimnetic, Back Creek B, Fernalds A, and White Grove Brook turbidity levels fluctuated within a low range. Hypolimnetic turbidity level was slightly elevated in July and September due to the formation and accumulation of organic compounds under anoxic conditions. Fundy and Round Pd. Brook turbidity levels were slightly elevated in September during low flows. Highland Ave. turbidity level was slightly elevated in July following a storm event.
- ◆ **pH:** Epilimnetic, Fernalds A and B pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began. Back Creek B and White Grove Brook pH levels were slightly less than desirable. Hypolimnetic, Fundy Brook, Highland Ave., and Round Pd. Brook pH levels were slightly acidic.



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: 4.5 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

Station Name	Table 1. 2020 Average Water Quality Data for PAWTUCKAWAY LAKE - NORTH STN								
	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	4.3	8.12	8	40	41.8	16	3.58	0.67	6.90
Metalimnion					41.4	16		0.63	6.32
Hypolimnion				153	49.0	98		4.03	6.00
Fernalds A			28		160.3	938		0.82	6.93
#09 Fernalds B			37		364.0	4520		5.50	6.67
Back Creek B					56.3	31		0.49	6.25
Fundy Brook					45.4	29		1.14	5.17
Highland Ave.			26		97.8	30		2.28	5.96
Round Pd. Brook					24.9	44		1.15	5.88
White Grove Brook					146.0	17		0.61	6.22

Historical Water Quality Trend Analysis

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

