



Volunteer Lake Assessment Program Individual Lake Reports

PEA PORRIDGE POND, BIG, MADISON, NH

MORPHOMETRIC DATA

TROPHIC CLASSIFICATION

KNOWN EXOTIC SPECIES

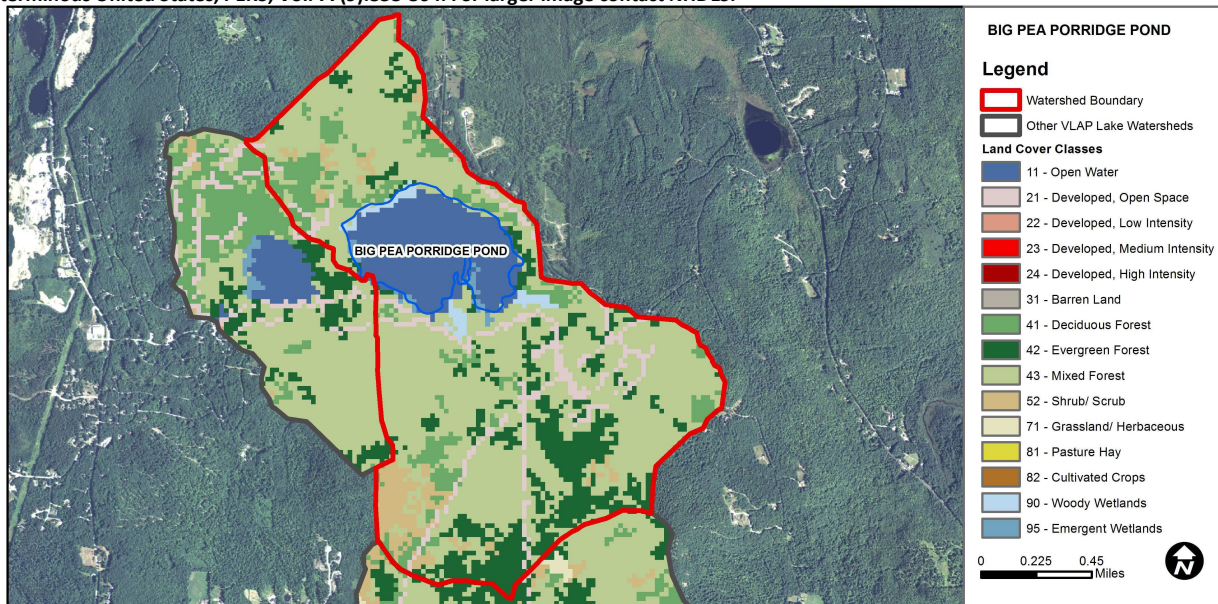
Watershed Area (Ac.):	1,431	Max. Depth (m):	13.7	Flushing Rate (yr ¹):	1.5	Year	Trophic class	
Surface Area (Ac.):	142	Mean Depth (m):	4	P Retention Coef:	0.63	1979	MESOTROPHIC	
Shore Length (m):	3,900	Volume (m ³):	2,295,500	Elevation (ft):	648	2001	OLIGOTROPHIC	

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 this parameter by a small margin.
	Oxygen, Dissolved	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.
	Dissolved oxygen satura	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.
Primary Contact Recreation	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	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	11.6	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	5.48	Deciduous Forest	8.39	Pasture Hay	0
Developed-Low Intensity	0.05	Evergreen Forest	14.52	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	53.29	Woody Wetlands	1.33
Developed-High Intensity	0	Shrub-Scrub	4.71	Emergent Wetlands	0.66



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

BIG PEA PORRIDGE POND, MADISON

2018 DATA SUMMARY

RECOMMENDED ACTIONS: Pond chlorophyll and phosphorus levels were indicative of oligotrophic, or high quality, conditions. However, conductivity levels have worsened, and an enhanced sampling effort in the spring identified several problematic areas with high conductivity and chloride levels. Now that some problem areas have been identified, efforts to educate local road agents, private winter maintenance companies and watershed residents on ways to reduce application of de-icing products and dust suppressants on roads, walkways and driveways can help reduce the pollutant load. NHDES's Watershed Assistance Program website and UNH Technology Transfer Center's Road Salt Reduction website are excellent resources. Keep up the great work!

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

- ◆ **CHLOROPHYLL-A:** Chlorophyll levels were within a low range in June and decreased slightly in August. July chlorophyll results were invalidated due to an analytical error. Average chlorophyll level remained stable with 2017, was much less than the state median, and well within the range expected for an oligotrophic pond. Historic trend analysis indicates stable chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (bottom water layer), Big Rock Inlet, and Outlet conductivity levels fluctuated within a narrow, slightly elevated range throughout the summer, however conductivity levels were not above a level of concern. Muddy Beach Inlet conductivity levels were slightly elevated in June and July but decreased to an average range by August. Epilimnetic, Big Rock Inlet and Muddy Beach Inlet chloride levels were slightly greater than the state median however much less than the state chronic chloride standard. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. An intensified sample event during April to pinpoint sources of elevated chloride and conductivity identified Brenner At Townline, Allard & Gotzens, #7 Eidelweiss Dr, and #8 Brenner Dr. as the highest (worst) sources.
- ◆ **COLOR:** Apparent color was measured in the epilimnion and indicated lightly tea colored water in June and July and increased to moderate tea colored water in August following above average rainfall early in the month.
- ◆ **E. COLI:** Shore and Thusis Beach E. coli levels were low and remained much less than the state standard for public beaches.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic, Metalimnetic, and Hypolimnetic phosphorus levels were low in June, slightly elevated in July, and returned to within a low to average range in August. Big Rock Inlet phosphorus levels fluctuated within a moderate range throughout the summer. Muddy Beach Inlet and Outlet phosphorus levels were low. Average epilimnetic phosphorus level increased slightly from 2017 but remained less than the state median and the threshold for oligotrophic lakes. Historic trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began.
- ◆ **TRANSPARENCY:** Transparency measured without the viewscope (NVS) increased (improved) from average to above average as the summer progressed. Average NVS transparency was increased (improved) from 2017 and was much higher (better) than the state median. Historical trend analysis indicates relatively stable transparency since monitoring began. Viewscope transparency (VS) was higher (better) than NVS transparency and likely a better measure of actual conditions.
- ◆ **TURBIDITY:** Epilimnetic and Metalimnetic turbidity levels were slightly above average in June and decreased to low levels as the summer progressed. Hypolimnetic turbidity levels were within an average range in June and July and decreased to a low range by August. Big Rock Inlet turbidity level was elevated in June potentially due to low flow conditions. Muddy Beach Inlet turbidity levels were slightly elevated in July and sediment was noted in the sample. Outlet turbidity levels were slightly elevated in June and decreased to a low range in July and August.
- ◆ **pH:** Epilimnetic, Metalimnetic, Big Rock Inlet, Muddy Beach Inlet, and Outlet pH levels were within the desirable range of 6.5–8.0 units. Hypolimnetic pH levels were slightly acidic and below the desirable range. Historic trend analysis indicates significantly increasing (improving) epilimnetic pH levels since monitoring began.

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 mg/m³
- 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. 2018 Average Water Quality Data for BIG PEA PORRIDGE POND - MADISON										
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	E. Coli mpn/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
								NVS	VS		
Epilimnion	4.9	1.89	12	30	64.3	7	7	4.90	5.38	0.71	6.86
Metalimnion					63.2	9				1.00	6.69
Hypolimnion					63.2	12				1.23	6.11
Big Rock Inlet			16		75.6	14				4.42	6.76
Muddy Bch Inlet			11		57.6	4				1.05	6.68
Outlet					61.4	8				0.84	6.81
Shore Beach						7					
Thusis Beach						3					

Station Name	Table 2. 2018 Conductivity & Chloride Study	
	Chloride mg/l	Cond. us/cm
#11A Allard Hill Rd.	12	51.5
#14A Bickford Rd.	7	31.8
#14C Modock Hill Rd.	19	86.2
#7 Eidelweiss Dr.	60	212.0
#7A Eidelweiss Dr.	4	26.6
#8 Brenner Dr.	40	150.5
#9 Lizum Place	22	93.5
99 Eidel	9	44.8
Arlberg & Brenner	20	91.1
Arlberg End	9	56.3
#7B Lot 99 Ed	2	18.8
Allard & Gotzens	83	293.0
Brenner At Townline	220	745.0
Curve Sign Allard Hill	8	43.9
Modock at Log Cabin	21	99.6

HISTORICAL WATER QUALITY TREND ANALYSIS

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

