



## Volunteer Lake Assessment Program Individual Lake Reports

### BERRY BAY, FREEDOM, NH

**MORPHOMETRIC DATA**

MORPHOMETRIC DATA				TROPIC CLASSIFICATION		KNOWN EXOTIC SPECIES	
Watershed Area (Ac.):	230,326	Max. Depth (m):	11.6	Flushing Rate (yr <sup>1</sup> )	254	Year	Trophic class
Surface Area (Ac.):	145	Mean Depth (m):	3.7	P Retention Coef:	-0.01	1987	OLIGOTROPHIC
Shore Length (m):	5,800	Volume (m <sup>3</sup> ):	2,147,000	Elevation (ft):	406	2003	MESOTROPHIC

The Waterbody Report Card tables are generated from the DRAFT 2020 305(b) report on the status of New Hampshire 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)	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	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
	Dissolved oxygen satura	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

**BEACH PRIMARY CONTACT ASSESSMENT STATUS**

BROAD BAY - CAMP HUCKINS BEACH	Escherichia coli	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
BROAD BAY - CAMP ROBIN HOOD BEACH	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
LEAVITT BAY - CAMP MARIST BEACH	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

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



**BERRY BAY  
FREEDOM  
VOLUNTEER LAKE ASSESSMENT PROGRAM**

STATIONID	STATION NAME
BERFRED	DEEP SPOT

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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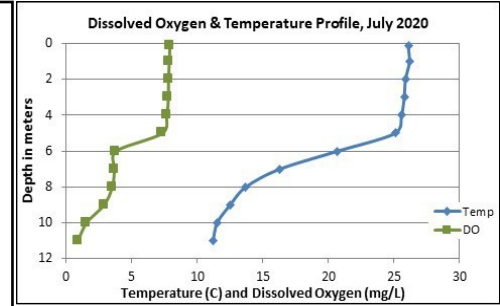
## Berry Bay, Freedom

### 2020 Data Summary

**Recommended Actions:** The improving algal (chlorophyll) growth is encouraging and both phosphorus and chlorophyll levels have stabilized below the threshold for oligotrophic lakes. Drought conditions and the lack of flushing of waters rich in dissolved organic matter that impart a tea, or brown, color to the water likely helped to improve water clarity in 2020. Continue efforts to implement the watershed management plan and reduce stormwater runoff and erosion throughout the watershed. Encourage shoreline property owners to be certified LakeSmart through NHLAKES lake-friendly living program [www.nh.lakes.org/lakesmart/](http://www.nh.lakes.org/lakesmart/). Continue watershed education and outreach efforts to maintain the health of the Ossipee Lake System. Keep up the great work!

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

- ◆ **Chlorophyll-a:** Chlorophyll level was within a low range in July, remained stable with 2019 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began. We hope to see this continue!
- ◆ **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) conductivity levels were within a low range for NH lakes and approximately equal to the state median. Epilimnetic chloride level was also within a low range for NH lakes and slightly greater than the state median. Historical trend analysis indicates relatively stable epilimnetic conductivity levels since monitoring began.
- ◆ **Color:** Apparent color measured in the epilimnion indicates the water was within a clear range with little to no tea, or brown coloring.
- ◆ **Total Phosphorus:** Epilimnetic and Metalimnetic phosphorus levels were within a low range. Epilimnetic phosphorus level decreased slightly from 2019 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates stable epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus level was elevated in July.
- ◆ **Transparency:** Transparency measured without the viewscope (NVS) was within an average range for the pond, increased (improved) from 2019 and was higher (better) than the state median. Historical trend analysis indicates stable, yet variable, NVS transparency since monitoring began. Viewscope transparency (VS) was higher (better) than NVS transparency and likely a better measure of actual conditions.
- ◆ **Turbidity:** Epilimnetic, Metalimnetic and Hypolimnetic turbidity levels were within a low range in July.
- ◆ **pH:** Epilimnetic pH level was within the desirable range 6.5-8.0 units and historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Metalimnetic and Hypolimnetic pH levels were acidic and potentially critical to aquatic life.



Station Name	Table 1. 2020 Average Water Quality Data for BERRY BAY - FREEDOM									
	Alk. (mg/L)	Chlor-a (ug/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/cm)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
							NVS	VS		
Epilimnion	9.4	1.63	14	20	45.2	6	4.00	4.90	0.30	6.67
Metalimnion					48.4	8			0.78	5.59
Hypolimnion					44.2	17			0.45	5.14

**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 moderately variable.	Chlorophyll-a	Improving	Data significantly decreasing.
pH (epilimnion)	Stable	Trend not significant; data show low variability.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.

