



## Volunteer Lake Assessment Program Individual Lake Reports

### BEAVER LAKE, DERRY, NH

**MORPHOMETRIC DATA**

<b>Watershed Area (Ac.):</b>	5,760	<b>Max. Depth (m):</b>	14	<b>Flushing Rate (yr<sup>1</sup>)</b>	4.1	<b>Year</b>	<b>Trophic class</b>	
<b>Surface Area (Ac.):</b>	134	<b>Mean Depth (m):</b>	5	<b>P Retention Coef:</b>	0.47	1985	EUTROPHIC	
<b>Shore Length (m):</b>	5,800	<b>Volume (m<sup>3</sup>):</b>	2,707,500	<b>Elevation (ft):</b>	287	1999	MESOTROPHIC	

**TROPHIC CLASSIFICATION**
**KNOWN EXOTIC SPECIES**

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)	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for a given 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	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
	Chlorophyll-a	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
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**

BEAVER LAKE - COMEAU'S BEACH	Escherichia coli	No Data	No data for this parameter.
BEAVER LAKE - PARK BEACH	Escherichia coli	No Data	No data for this parameter.
BEAVER LAKE - GALLIEN'S BEACH	Escherichia coli	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.

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



#### BEAVER LAKE DERRY

**VOLUNTEER LAKE ASSESSMENT PROGRAM**

STATIONID	STATION NAME
BEADERC	CAT O BROOK
BEADERD	DEEP SPOT
BEADERJ	JENNY DICKEY BROOK
BEADERM	MANTER BROOK
BEADERCAB	CAT-O-BROOK AT BEAVER RD
BEADERCAT	CAT-O-BROOK AT TSENNETO RD

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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## Beaver Lake, Derry

### 2020 Data Summary

**Recommended Actions:** Great job sampling in 2020! Lake nutrient (phosphorus) levels and algal (chlorophyll) growth, while generally higher than desirable, appear to be stabilizing around the thresholds for mesotrophic lakes. The increased frequency and intensity of storm events (despite a drought year) highlight the importance of managing stormwater runoff to the lake. Consider joining Soak Up the Rain NH ([www.soaknh.org](http://www.soaknh.org)) to implement stormwater improvement projects throughout the watershed. Elevated conductivity and chloride levels indicate the negative impacts of salt application to roadways, parking lots, driveways, and walkways throughout the watershed. However, epilimnetic conductivity levels have decreased steadily since 2016 and we hope this may be a result of local companies and municipalities obtaining NH Voluntary Salt Applicator Licenses through the Green SnowPro Certification Program. Continue to encourage participation in this program as well as clean up of roadside ditches, culverts and catch basins each spring to remove accumulated sand/salt before it enters 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 June and then decreased to a moderate level in August. Average chlorophyll level increased from 2019 and was slightly greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable chlorophyll levels since monitoring began.
- ◆ **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Jenney Dickey, and Manter Brook conductivity and/or chloride levels remained elevated and greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Cat-o Bk. at Beaver Rd. conductivity and chloride levels remained greatly elevated and chloride levels approached the state chronic chloride standard.
- ◆ **Color:** Apparent color measured in the epilimnion indicates the water was moderately tea colored, or brown, and was darkest in June.
- ◆ **Total Phosphorus:** Epilimnetic phosphorus levels were low in June and increased slightly in August. Average epilimnetic phosphorus level decreased slightly from 2019 and remained slightly greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus levels were slightly elevated on each sampling event. Hypolimnetic phosphorus levels were slightly elevated in June and increased to elevated levels in August indicating potential release of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. Jenny Dickey Brook phosphorus levels were elevated in June following a significant storm event. Cat-o-Brook at Beaver Rd. and Manter Brook phosphorus levels remained within a moderate range for those stations.
- ◆ **Transparency:** Transparency measured without (NVS) the viewscope was slightly below average (worse) and remained stable from June to August. Average NVS transparency increased (improved) slightly from 2019 but remained slightly less than the state median. Historical trend analysis indicates relatively stable transparency since monitoring began. Viewscope transparency (VS) was slightly higher (better) than NVS transparency and likely a better measure of actual conditions.
- ◆ **Turbidity:** Epilimnetic turbidity levels remained stable and low from June to August. Metalimnetic turbidity increased from low to moderate levels from June to August. Hypolimnetic turbidity increased from low to slightly elevated levels from June to August. Cat-o-Brook at Beaver Rd., Jenny Dickey and Manter Brook turbidity levels were within a low range.
- ◆ **pH:** Epilimnetic, Cat-o-Brook at Beaver Rd., Jenny Dickey, and Manter Brook pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Metalimnetic and Hypolimnetic pH levels were approximately equal to the low end of the desirable range.

Station Name	Table 1. 2020 Average Water Quality Data for BEAVER LAKE - DERRY									
	Alk.	Chlor-a	Chloride	Color	Cond.	Total P	Trans. (m)		Turb.	pH
	(mg/L)	(ug/L)	(mg/L)	(pcu)	(us/cm)	(ug/L)	NVS	VS	(ntu)	
Epilimnion	22.3	6.10	35	50	152.3	13	3.12	3.81	0.55	7.06
Metalimnion					142.2	20			1.03	6.50
Hypolimnion			34		147.2	40			2.06	6.48
Cat-O-Bk. at Beaver Rd.			157		564.0	17			0.16	7.18
Jenny Dickey Brook			66		235.0	32			0.54	7.02
Manter Brook			40		152.1	15			0.56	7.36

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

