

Volunteer Lake Assessment Program Individual Lake Reports MASCOMA LAKE, ENFIELD, NH

MORPHOMETRIC DATA

TROPHIC CLASSIFICATION KNOW

KNOWN EXOTIC SPECIES

Watershed Area (Ac.):	97,918	Max. Depth (m):	20.1	Flushing Rate (yr ¹)	4.6	Year	Trophic class	Eurasian Milfoil
Surface Area (Ac.):	1115	Mean Depth (m):	8.7	P Retention Coef:	0.39	2000	MESOTROPHIC	
Shore Length (m):	15,100	Volume (m ³):	39,458,000	Elevation (ft):	751	2008	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			Catego	ry	Comment	its				
Aquatic Life	Phosphorus (Total)		Slightly	Bad	Data exceed v	d water quality standards or thresholds for a given parameter by a small margin.				
рН			Slightly Bad		Data periodically exceed water quality standards or thresholds for a given parameter by a small margin.					
	Oxygen, Dissolved		Good		Sampling data commonly meet water quality standards or thresholds for this parameter.					
	Dissolved oxygen satura		Slightly Bad		Data periodically exceed water quality standards or thresholds for a given parameter by a small margin.					
	Chlorophyll-a		Slightly	Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.					
Primary Contact Recreation	Escherichia coli		Very Good AI		All sampling d	All sampling data meet water quality standards or thresholds for this parameter.				
	Cyanobacteria hepatoto		Slightly Bad		Cyanobacteria bloom(s).					
	Chlorophyll-a		Very Good		All sampling data meet water quality standards or thresholds for this parameter.					
BEACH PRIMARY CONTACT AS	<u>US</u>									
MASCOMA LAKE - DARTMOUTH COLLEGE		Escheric	chia coli Good			Sampling data commonly meet water quality standards or thresholds for this parameter.				
BEACH										
MASCOMA LAKE - SHAKOMA BEACH		Escheric	chia coli Good			Sampling data commonly meet water quality standards or thresholds for this parameter.				
MASCOMA LAKE - CRESCENT BEACH		Escheric	hia coli No Data			No data for this parameter.				
MASCOMA LAKE - DARTMOUTH COLLEGE		Cyanoba	icteria	eria Slightly Bad		Cyanobacteria bloom(s).				
BEACH										
MASCOMA LAKE - SHAKOMA BEACH		Cyanoba	icteria	ria Slightly Bad		Cyanobacteria bloom(s).				

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	3.57	Barren Land	0.2	Grassland/Herbaceous	0.77
Developed-Open Space	2.03	Deciduous Forest	24.1	Pasture Hay	1.91
Developed-Low Intensity	0.73	Evergreen Forest	25.43	Cultivated Crops	0.85
Developed-Medium Intensity	0.3	Mixed Forest	33.58	Woody Wetlands	4.2
Developed-High Intensity	0.04	Shrub-Scrub	2.03	Emergent Wetlands	0.18



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS MASCOMA LAKE, STN. 1, ENFIELD 2019 DATA SUMMARY

RECOMMENDED ACTIONS: A flood event within the watershed in July resulted in significant erosion and runoff to the lake causing elevated phosphorus and turbidity levels at the deep spot and Outlet, a significant decline in water clarity, and an increase in algal growth in August. The positive sign is that water quality had generally returned to normal in September, however the increased frequency of these types of events highlights the importance of evaluating watersheds for flood potential, and to ensure stream crossings and culverts are properly sized. Continue to conduct advanced sampling for conductivity and chloride in 2019. Browns Bk. continued to experienced elevated phosphorus and conductivity levels worthy of further investigation. Keep up the great work!

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

- CHLOROPHYLL-A: Chlorophyll levels were low in June and July, increased to slightly elevated in August, and then decreased to a low level in September. Average chlorophyll level increased slightly from 2018 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- CONDUCTIVITY/CHLORIDE: Deep spot, Outlet, Knox River, and Mascoma River conductivity and chloride levels were slightly greater than the state medians, yet less than a level of concern. LaSalette Brook conductivity and chloride levels were low. Browns Bk., Manchester Dr. Culvert, Pump Station Culvert, and Shaker Bk. conductivity and chloride levels were elevated and much greater than the state medians. Chloride levels at Pump Station Culvert, and Shaker Bk. conductivity and chloride levels were elevated chronic chloride standard but did not exceed it. Historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity levels since monitoring began.
- COLOR: Apparent color measured in the epilimnion indicated the lake water was moderately tea colored in June, August and September, and increased to highly tea colored in July following a flood event.
- E. COLI: Knox River and Mascoma River E. coli levels were much less than the state standard of 406 cts/100 mL for surface waters.
- TOTAL PHOSPHORUS: Epilimnetic phosphorus levels were low in June, increased to elevated levels in July following a flood event, decreased to slightly elevated levels in August, and then decreased to a low level by September. Average epilimnetic phosphorus level increased greatly from 2018 and was greater than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Metalimnetic (middle water layer) phosphorus levels were also slightly elevated in July and August. Hypolimnetic (lower water layer) phosphorus levels fluctuated within a moderate range for that station and increased gradually as the summer progressed. Browns Bk. phosphorus levels were elevated on each sampling event and lad an oted colored water and organic matter. Outlet and Knox River phosphorus levels fluctuated within an average range for those stations.
- TRANSPARENCY: Transparency measured with (VS) and without (NVS) the viewscope was within an average range in June, decreased (worsened) significantly in July, and then increased to a high (good) range through September. Average NVS transparency decreased from 2018 and was less than the state median. Historical trend analysis indicates relatively stable transparency since monitoring began.
- TURBIDITY: Epilimnetic and Outlet turbidity levels were greatly elevated in July following the flood event. Metalimnetic turbidity levels were elevated in July, and in August when algal growth was higher. Hypolimnetic turbidity levels were elevated in September. Browns Bk. turbidity levels were elevated in August likely due to organic matter. Knox River, LaSalette Bk., Mascoma River, and Shaker Bk. turbidity levels fluctuated within a low to moderate range for those stations
- PH: Epilimnetic and tributary pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates relatively stable epilimnetic pH level since monitoring began. Metalimnetic and Hypolimnetic pH levels were slightly less than desirable.

Station Name		Table 1. 2019 Average Water Quality Data for MASCOMA LAKE - ENFIELD									
	Alk.	Chlor-a	Chloride	Color	Cond.	E. coli	Total P	Trans.		Turb.	рН
	mg/l	ug/l	mg/l	pcu	us/cm	#/100ml	mg/l	m		ntu	
								NVS	VS		
Epilimnion	11.0	2.34	10	95	65.1		13	2.44	3.20	3.53	6.98
Metalimnion			8		60.5		10			1.86	6.44
Hypolimnion			8		62.4		18			2.74	6.29
Browns Brook			62		254.6		54			4.63	6.52
Dam Outlet			16		57.9		16			5.89	7.06
Knox River Inlet			22		99.1	103	13			1.08	7.16
LaSalette Brook			3		33.6		8			0.41	7.21
Manchester Dr. Culvert			118		274.0						
Mascoma River Inlet			15		85.4	41	14			2.32	7.17
Pump Station Culvert			168		421.5						
Shaker Brook			113		472.9		14			0.58	7.30



Dissolved Oxygen & Temperature Profiles, 2019

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

HISTORICAL WATER QUALITY TREND ANALYSIS Parameter Parameter Trend Explanation Trend Explanation Data significantly increasing. Stable Trend not significant; data moderately variable. Conductivity Worsening Chlorophyll-a 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.





This report was generated by the NHDES Volunteer Lake Assessment Program (VLAP). For more information contact VLAP at (603) 271-2658 or sara.steiner@des.nh.gov