Volunteer Lake Assessment Program Individual Lake Reports

SILVER LAKE, HARRISVILLE, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,408	**Max. Depth (m):**	26.2	**Flushing Rate (yr^{-1}):**	0.2
Surface Area (Ac.):	333	**Mean Depth (m):**	10.4	**P Retention Coef:**	0.79
Shore Length (m):	7,400	**Volume (m^3):**	13,878,500	**Elevation (ft):**	1319

TROPHIC CLASSIFICATION

Year	Trophic class
1990	OLIGOTROPHIC
1998	OLIGOTROPHIC

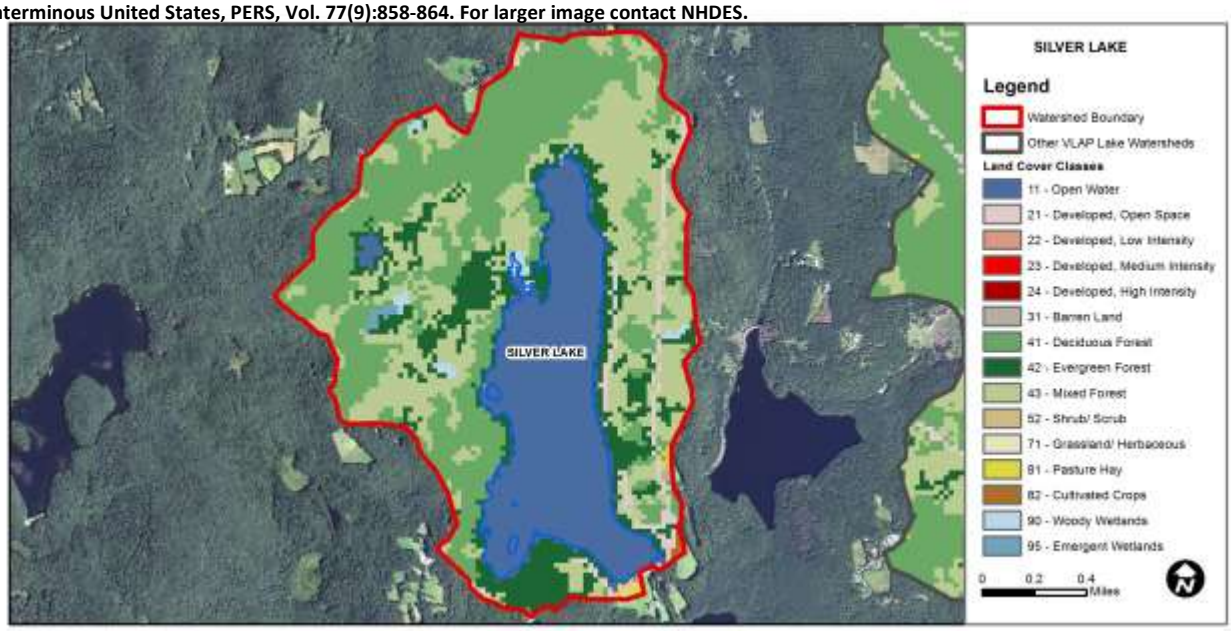
KNOWN EXOTIC SPECIES

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	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	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.
	Chlorophyll-a	Very Good	Sampling data is 50 percent 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.

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.



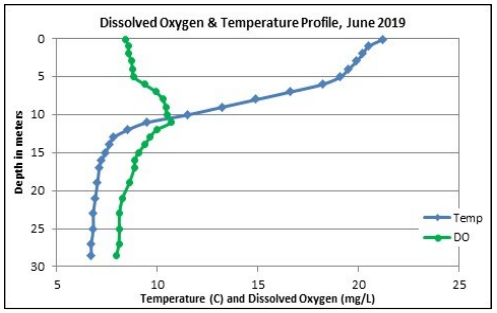
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	23.7	Barren Land	0.07	Grassland/Herbaceous	0
Developed-Open Space	2.88	Deciduous Forest	31.44	Pasture Hay	0.29
Developed-Low Intensity	0.03	Evergreen Forest	14.02	Cultivated Crops	0.15
Developed-Medium Intensity	0	Mixed Forest	26.37	Woody Wetlands	0.76
Developed-High Intensity	0	Shrub-Scrub	0	Emergent Wetlands	0.26

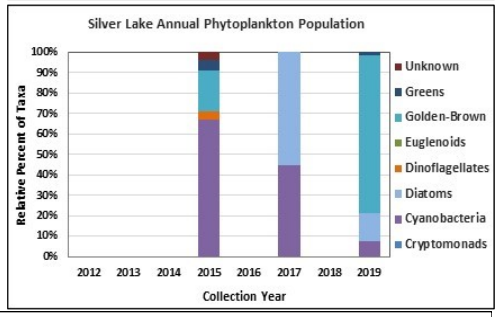
Volunteer Lake Assessment Program Individual Lake Reports
Silver Lake, Harrisville
2019 Data Summary

Recommended Actions: Lake quality remains representative of oligotrophic, or high quality, conditions. Lake clarity has significantly decreased or worsened in recent years. This may a result of increases algal and/or cyanobacteria growth in Metalimnetic waters (thermocline). Trend analysis of lake turbidity data revealed a significant increase in turbidity levels in the Metalimnion which is likely due to more abundant algae or cyanobacteria growth. The declining clarity may also be due to flushing of wetland systems rich in dissolved organic matter that imparts a tea color to the water, and/or sediments from increased boating traffic and impacts to shallow waters and shorelines. DES Fact Sheet WD-WMB-25 "Impacts of Motorized Craft on New Hampshire's Waterbodies" is a great resource. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll levels were low in June, remained stable in July, and then increased slightly in August. Average chlorophyll level remained stable with 2018 and was much 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 and tributary conductivity levels remained within a low range and less than the state median. Epilimnetic (upper water layer) and Sucker Brook chloride levels were also low and less than the state median. Historical trend analysis indicates significantly decreasing (improving) epilimnetic conductivity levels since monitoring began.
- **Color:** Apparent color measured in the epilimnion indicates the water was clear, with very little tea (brown) coloring.
- **Total Phosphorus:** Epilimnetic, Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) phosphorus levels fluctuated within a low range. Average epilimnetic phosphorus level increased slightly from 2018 and was much less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates highly variable epilimnetic phosphorus levels since monitoring began. Eastside Inlet, Lead Mine Inlet 2, Outlet, and Sandy Bch. Inlet 1 phosphorus levels were within a low range. Lead Mine Inlet 1 phosphorus levels were slightly elevated in June and the turbidity of the sample was also elevated. Sucker Brook phosphorus levels were elevated in July during low flows.
- **Transparency:** Transparency measured without the viewscope (NVS) was good in June, remained stable in July, and increased (improved) in August. Average NVS transparency increased slightly from 2018 and was much higher (better) than the state median. However, historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began. Viewscope transparency (VS) was much higher (better) than NVS transparency in June and August and likely a better measure of actual conditions.
- **Turbidity:** Deep spot, Lead Mine Inlet 2, Outlet, Sucker Brook, and Sandy Bch. Inlet 1 turbidity levels fluctuated with a low range. Eastside Inlet turbidity levels were slightly elevated in August following a storm event. Lead Mine Inlet 1 turbidity levels were elevated in June.
- **pH:** Epilimnetic, Metalimnetic, Outlet, and Sandy Bch. Inlet 1 pH levels were within the desirable range 6.5-8.0 units, however epilimnetic pH levels have historically fluctuated below the desirable range. Lead Mine Inlet 1 pH levels were slightly less than desirable. Hypolimnetic, Eastside Inlet, Lead Mine Inlet 2, and Sucker Brook pH levels were acidic and potentially critical to aquatic life.





Station Name	Table 1. 2019 Average Water Quality Data for SILVER LAKE - HARRISVILLE									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	Total P mg/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	2.6	1.80	3	17	23.4	4	8.08	8.71	0.27	6.55
Metalimnion					23.6	7			0.47	6.57
Hypolimnion					24.3	8			0.32	5.87
Eastside Inlet					26.4	4			0.40	5.58
Lead Mine Inlet 1					26.8	10			1.42	6.40
Lead Mine Inlet 2					14.8	3			0.08	5.83
Outlet In Stream					24.2	3			0.43	6.58
Sandy Bch. Inlet 1					31.4	9			0.18	6.55
Sucker Brook			3		14.3	18			0.45	5.58

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