Volunteer Lake Assessment Program Individual Lake Reports

SKATUTAKEE, LAKE, HARRISVILLE, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	11,200	**Max. Depth (m):**	6.2	**Flushing Rate (yr^{-1}):**	8.3
Surface Area (Ac.):	261	**Mean Depth (m):**	2.9	**P Retention Coef:**	0.46
Shore Length (m):	6,100	**Volume (m^3):**	3,044,500	**Elevation (ft):**	1202

TROPHIC CLASSIFICATION

Year	Trophic class
1988	MESOTROPHIC
2006	MESOTROPHIC

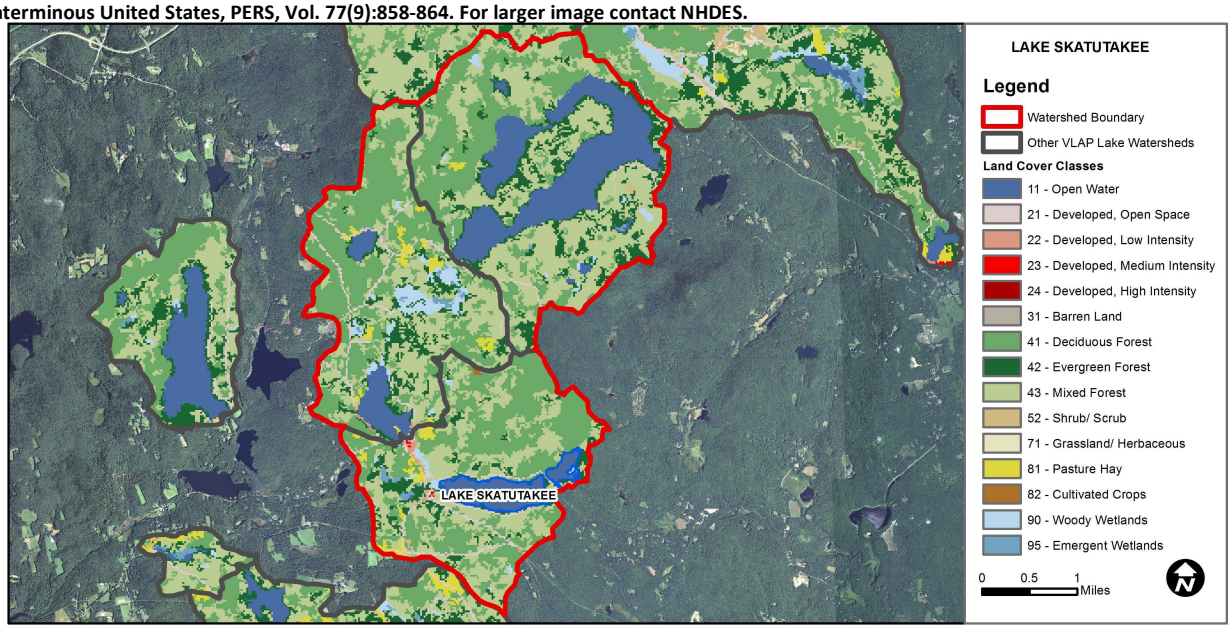
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Good	There are at least 10 samples with one, but < 10% of samples, exceeding criteria.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Encouraging	There are no geometric means or there are > 2 single samples but those samples are within 75% of the geometric means criteria. More data needed.
	Chlorophyll-a	Good	There are at least 10 samples with one, but < 10% of samples, exceeding indicator.

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	14.2	Barren Land	0.03	Grassland/Herbaceous	0.01
Developed-Open Space	2.17	Deciduous Forest	33.73	Pasture Hay	1.57
Developed-Low Intensity	0.31	Evergreen Forest	10.55	Cultivated Crops	0.04
Developed-Medium Intensity	0.03	Mixed Forest	34.67	Woody Wetlands	2
Developed-High Intensity	0	Shrub-Scrub	0.09	Emergent Wetlands	0.44

Volunteer Lake Assessment Program Individual Lake Reports

Skatutakee Lake, Harrisville

2014 Data Summary

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

- **Chlorophyll-a:** Chlorophyll levels were slightly elevated in June, decreased to average levels in July, and then increased to elevated levels in August. The 2014 average chlorophyll level increased from 2013 and was greater than the state median. Historical trend analysis indicates stable chlorophyll levels since monitoring began, however chlorophyll levels have become more variable in recent years.
- **Conductivity/Chloride:** Deep spot, Goose Brook and Outlet conductivity levels were low and less than the state median. Historical trend analysis indicates stable epilimnetic (upper water layer) conductivity since monitoring began. Spring Brook conductivity and chloride levels were greater than the state medians and chloride levels indicate potential impacts from winter de-icing materials.
- **E. coli:** Outlet and Spring Brook E. coli levels were low and much less than the state standards for public beaches (88 cts/100 mL) and surface waters (406 cts/100mL). Goose Brook E. coli levels were slightly higher likely due to wildlife influences, but also remained below the state standards.
- **Total Phosphorus:** Epilimnetic and Hypolimnetic (lower water layer) phosphorus levels were low in June and July and then increased to elevated levels in August, which likely fueled the elevated algal growth. However, average epilimnetic phosphorus levels remained below the state median and historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus since monitoring began. We hope to see this continue! Goose Brook, Outlet and Spring Brook phosphorus levels remained low on each sampling event.
- **Transparency:** Transparency measured without the viewscope (NVS) improved slightly from June to July as algal growth decreased, and then worsened from July to August when algal growth increased. Average transparency improved from 2013 but was less than the state median. Transparency measured with the viewscope followed the same monthly pattern however was generally better than that measure without the viewscope and likely a better representation of actual conditions. Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- **Turbidity:** Epilimnetic turbidity was slightly elevated in August due to the algal growth. Hypolimnetic turbidity was elevated in July likely due to a layer of algae since sample receipt checklist indicated no sediment in the sample. Goose Brook and Outlet turbidities were elevated in June following a significant storm event.
- **pH:** Epilimnetic pH was within the desirable range 6.5-8.0 units, however has fluctuated below the desirable range historically. Hypolimnetic and Goose Brook pH levels were less than desirable on each sampling event. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years.
- **Recommended Actions:** Algal growth has become increasingly variable in recent years despite the decreasing phosphorus trend. Tributary phosphorus levels are also low. It is possible that boat action in shallow areas of the lake is disturbing bottom sediments and releasing phosphorus into the water column making it available for algal growth. The increased frequency and intensity of storm events also may be transporting sediments and phosphorus to the lake. It is important to try and manage stormwater runoff from dirt/gravel roads, steep slopes, agricultural areas, and shoreline properties to try and minimize the impacts of stormwater runoff. DES' "NH Homeowner's Guide to Stormwater Management" is a great resource. Keep up the great work!

Table 1. 2014 Average Water Quality Data for LAKE SKATUTAKEE

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	2.77	6.84		34.7		10	2.91	3.51	1.23	6.59
Hypolimnion				34.8		12			2.22	6.26
Goose Brook				27.7	40	8			0.94	6.35
Outlet				34.1	10	7			1.37	6.59
Spring Brook			22	109.4	10	7			0.35	6.69

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 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 show low variability.	Chlorophyll-a	Stable	Trend not significant; data show low variability.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.