Volunteer Lake Assessment Program Individual Lake Reports

HIGHLAND LAKE, STODDARD, NH

MORPHOMETRIC DATA | **TROPHIC CLASSIFICATION** | **KNOWN EXOTIC SPECIES**

Watershed Area (Ac.):	19,008	**Max. Depth (m):**	9.1	**Flushing Rate (yr^{-1})**	7	**Year**	**Trophic class**	
Surface Area (Ac.):	712	**Mean Depth (m):**	2.4	**P Retention Coef:**	0.49	1993	MESOTROPHIC	
Shore Length (m):	25,300	**Volume (m^3):**	6,971,500	**Elevation (ft):**	1294	2004	MESOTROPHIC	

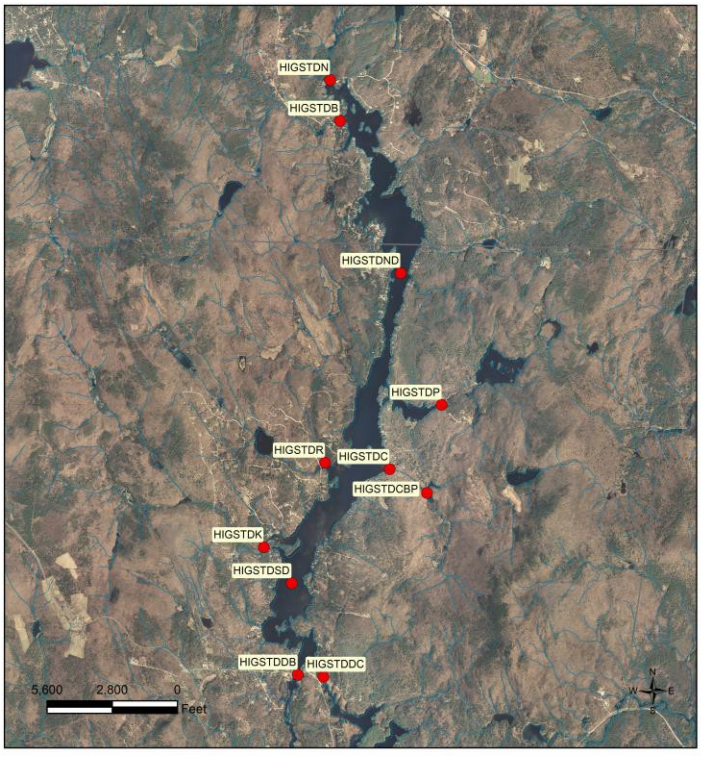
The Waterbody Report Card tables are generated from the DRAFT 2020 305(b) report on the status of N.H. waters, and are based on data collected from 2010-2019. Detailed waterbody assessment and report card information can be found at NHDES' Water Quality Assessment Website.

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	Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a large margin.
	Oxygen, Dissolved	Very Good	All sampling data 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	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

HIGHLAND LAKE-HIGHLAND LAKE BOAT LAUNCH	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.

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



HIGHLAND LAKE
STODDARD
VOLUNTEER LAKE ASSESSMENT PROGRAM

STATIONID	STATION NAME
HIGSTDC	CARR BROOK
HIGSTDDB	DEAD BROOK
HIGSTDDC	DAM COMPOSITE
HIGSTDK	KENNEDY BROOK
HIGSTDND	STATION N DEEP SPOT
HIGSTDP	PICKEREL COVE BROOK
HIGSTDR	RICE BROOK
HIGSTDSD	STATION S
HIGSTDB	BARDEN POND BROOK
HIGSTDN	NORTH INLET
HIGSTDCBP	CARR BROOK POND

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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Highland Lake, North Stn., Stoddard
2020 Data Summary

Recommended Actions: Great job sampling in 2020! Lake quality is representative of borderline oligotrophic/mesotrophic, or high to average quality, conditions. The improving water quality trends are encouraging and we hope to see these continue! Epilimnetic pH levels, while slightly less than desirable, have also improved in recent years indicating slow recovery from historical acid rain impacts. Drought conditions in 2020 did not negatively impact lake water quality, however tributaries ran dry. The storm event prior to August sampling did result in an increased in lake turbidity levels which highlights the importance of managing stormwater runoff within the watershed and particularly from shoreline properties. Encourage property owners to become certified LakeSmart through NHLAKES lake-friendly living program www.nhlakes.org/lakesmart/. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll level was low in June and decreased slightly in August. Average chlorophyll level increased from 2019, was approximately equal to the state median, and was less than the threshold for mesotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began.
- **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 less than the state median. Epilimnetic chloride level was also low and approximately equal to 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 moderately tea colored, or brown, in June and August.
- **Total Phosphorus:** Epilimnetic phosphorus level was low in June and increased in August but remained within a low range. Average epilimnetic phosphorus level remained stable with 2019 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus levels since monitoring began. Metalimnetic and Hypolimnetic phosphorus levels were low in June and increased to moderate levels in August during drought conditions.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was high (good) in June and decreased to an average range for the lake in August. Average NVS transparency decreased slightly from 2019 and was approximately equal to the state median. Historical trend analysis indicates relatively stable NVS transparency since monitoring began.
- **Turbidity:** Epilimnetic, Metalimnetic and Hypolimnetic turbidity levels fluctuated within a low range and were slightly higher in August following a significant storm event during drought conditions.
- **pH:** Epilimnetic pH levels were slightly less than desirable range 6.5-8.0, and historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began. Metalimnetic and Hypolimnetic pH levels were slightly acidic and potentially critical to aquatic life.

Station Name	Table 1. 2020 Average Water Quality Data for HIGHLAND LAKE - NORTH STN.									
	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	2.2	4.33	5	55	25.2	9	3.24	3.58	0.64	6.42
Metalimnion					27.1	12			0.52	6.04
Hypolimnion					27.8	14			0.97	5.80

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