Volunteer Lake Assessment Program Individual Lake Reports

HALFMOON POND, WASHINGTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	4,947	**Max. Depth (m):**	5.8	**Flushing Rate (yr^1)**	16.6
Surface Area (Ac.):	83	**Mean Depth (m):**	2.6	**P Retention Coef:**	0.38
Shore Length (m):	3,200	**Volume (m^3):**	856,000	**Elevation (ft):**	1432

TROPHIC CLASSIFICATION

Year	Trophic class
1981	MESOTROPHIC
2001	MESOTROPHIC

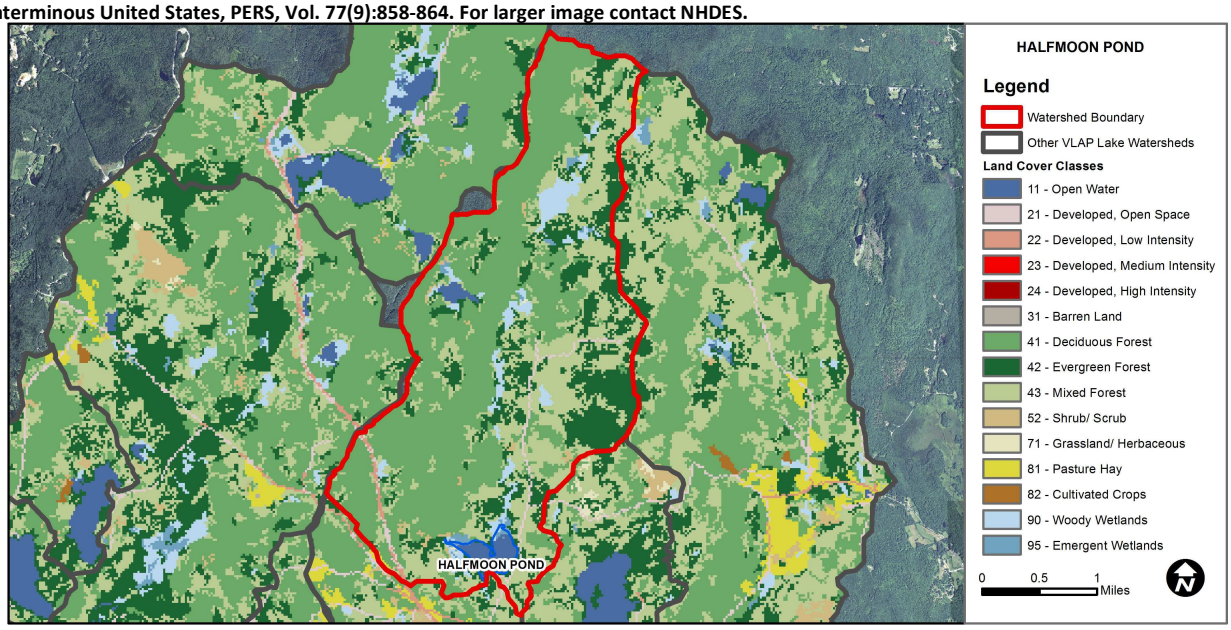
KNOWN EXOTIC SPECIES

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	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), 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	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of 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	1.87	Barren Land	0	Grassland/Herbaceous	0.04
Developed-Open Space	1.21	Deciduous Forest	44.45	Pasture Hay	0.16
Developed-Low Intensity	0.4	Evergreen Forest	19.38	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	26.91	Woody Wetlands	4.1
Developed-High Intensity	0	Shrub-Scrub	0.73	Emergent Wetlands	0.76

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Halfmoon Pond, Washington

2015 Data Summary

Recommended Actions: Drier than normal weather conditions likely contributed to the slightly above average phosphorus and turbidity at some stations. However, epilimnetic phosphorus and deep spot chlorophyll and transparency improved during the dry conditions. The increased frequency of high intensity of storm events highlights the importance of managing stormwater runoff from lake and watershed properties and dirt and gravel roads. DES' "NH Homeowner's Guide to Stormwater Management" is a great resource. Conductivity in West Inlet is much greater than the rest of the pond. Monitor for chloride to determine if road salting practices may impact conductivity at this station. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll levels increased slightly from July to September and were slightly less than the state median. Historical trend analysis indicates stable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot, Outlet and North Inlet conductivity remained low and much less than the state median. Historical trend analysis indicates significantly decreasing (improving) epilimnetic (upper water layer) conductivity since monitoring began. West Inlet conductivity was elevated and greater than the state median, and was the highest conductivity measured since 2003. This likely contributed to the slightly higher conductivity measured in the pond in 2015.
- **Total Phosphorus:** Epilimnetic phosphorus was low and decreased slightly from July to September. Average epilimnetic phosphorus was slightly less than the state median and decreased from 2014. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Hypolimnetic (lower water layer) phosphorus was slightly elevated in July and September and was slightly above average for that station. Turbidity was also slightly elevated and the sample may have contained a small amount of bottom sediment as water levels were low on each sampling event. Outlet and North Inlet phosphorus levels were low to moderate and within average ranges for those stations. West Inlet phosphorus was slightly elevated and the turbidity was also slightly elevated. Wetland influences and stagnant conditions likely contributed to the elevated phosphorus.
- **Transparency:** Transparency was high (good) in July and decreased slightly in September. Average transparency improved greatly from 2014 and approximately equal to the state median. Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- **Turbidity:** Epilimnetic turbidity was slightly elevated and above average for that station on each sampling event. Low water levels and algal growth may have contributed to the slightly higher turbidity. Hypolimnetic, North Inlet and West Inlet turbidities were also slightly elevated and above average for those stations and low water levels, low flows and stagnant conditions likely contributed to higher turbidities. Outlet turbidity was low.
- **pH:** Epilimnetic pH was slightly less than the desirable range 6.5-8.0 in July but improved to desirable levels in September. Historical trend analysis indicates highly variable epilimnetic pH since monitoring began. Hypolimnetic, North Inlet, Outlet, and West Inlet pH levels were less than desirable and potentially critical to aquatic life.

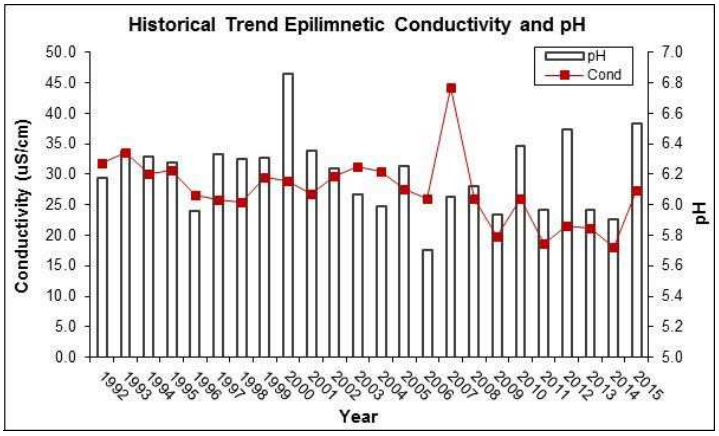
Station Name	Table 1. 2015 Average Water Quality Data for HALFMOON POND							
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
					NVS	VS		
Epilimnion	3.2	4.22	27.3	8	3.13	3.50	1.37	6.53
Hypolimnion			26.3	20			3.38	5.80
Dam Outlet			27.1	6			0.75	6.14
North Inlet			23.8	13			1.43	5.99
West Inlet			117.7	31			3.43	5.80

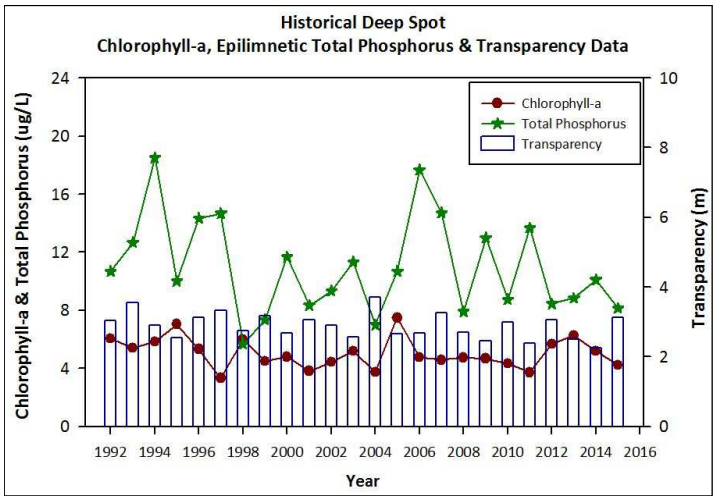
NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

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





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