# Volunteer Lake Assessment Program Individual Lake Reports

## TUREE POND, BOW, NH

**MORPHOMETRIC DATA**

| | | | | | |
|---|---|---|---|---|---|
| **Watershed Area (Ac.):** | 1,953 | **Max. Depth (m):** | 3 | **Flushing Rate (yr$^{-1}$):** | 9.5 |
| **Surface Area (Ac.):** | 47 | **Mean Depth (m):** | 1.9 | **P Retention Coef:** | 0.49 |
| **Shore Length (m):** | 1,800 | **Volume (m$^3$):** | 357,000 | **Elevation (ft):** | 328 |

**TROPHIC CLASSIFICATION**

| Year | Trophic class |
|---|---|
| 1989 | EUTROPHIC |
| | |

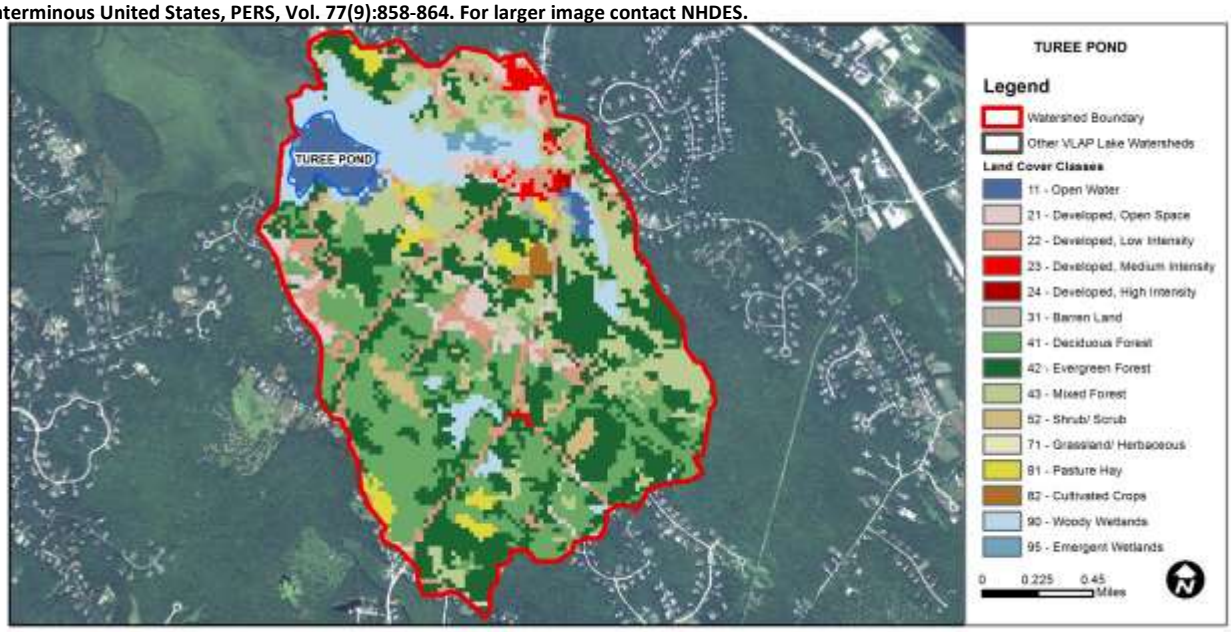
**KNOWN EXOTIC SPECIES**

**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 | Slightly Bad | Data periodically exceed water quality standards or thresholds for a given parameter by a small margin. |
| | Oxygen, Dissolved | Cautionary | Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter. |
| | Dissolved oxygen satura | Slightly Bad | Data periodically exceed water quality standards or thresholds for a given parameter by a small margin. |
| | 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 | 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 | 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 | 3.29 | Barren Land | 0.29 | Grassland/Herbaceous | 0 |
| Developed-Open Space | 4.64 | Deciduous Forest | 22.25 | Pasture Hay | 2.66 |
| Developed-Low Intensity | 8.39 | Evergreen Forest | 27.92 | Cultivated Crops | 0.58 |
| Developed-Medium Intensity | 1.14 | Mixed Forest | 15.64 | Woody Wetlands | 9.78 |
| Developed-High Intensity | 0.13 | Shrub-Scrub | 2.5 | Emergent Wetlands | 0.78 |

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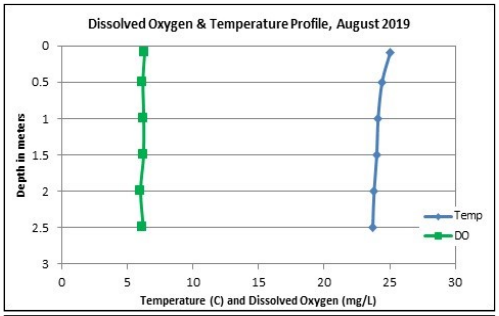
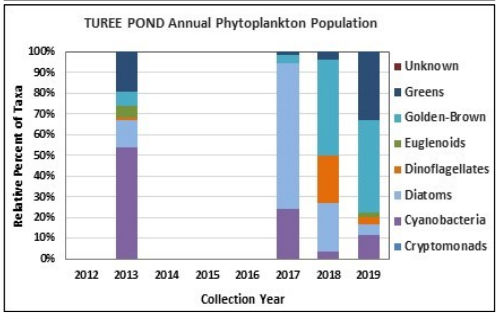
# Turee Pond, Bow
# 2019 Data Summary

**Recommended Actions:** Pond phosphorus and chlorophyll levels have remained within a slightly higher range since 2009, and although levels remain below the thresholds for eutrophic lakes, it is important to note as exotic aquatic plant management activities may cause levels to increase further. The increased frequency and intensity of significant storm events and flushing of waters rich in dissolved organic matter that imparts a "tea" or brown color to the water has likely contributed to the reduced water clarity (transparency). Continue monitoring apparent color of the water as it relates to water clarity. Conductivity and chloride levels were highest at White Rock Hill Rd. Culvert and further downstream at the Firehouse Pond Inlet station. Continue conducting spring chloride monitoring to better assess contributions to the increasing pond conductivity and chloride levels and identify areas to implement best practices when applying winter de-icing materials. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll level was within a low range in June, increased to a slightly elevated level in July, and then decreased to a low level in August. Average chlorophyll level increased slightly from 2018, was slightly greater than the state median, and was less than the threshold for eutrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since 2007.
- **Conductivity/Chloride:** Epilimnetic (deep spot), 1B, Firehouse Pond Inlet and Outlet, and Seasonal Inlet conductivity and/or chloride levels fluctuated within an elevated range however chloride levels did not exceed the state chronic chloride standard. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since 2007 and significantly increasing epilimnetic chloride levels since 2010. White Rock Hill Rd. Culvert conductivity and chloride levels spiked in July during low flows and chloride levels approached the chronic chloride standard.
- **Color:** Apparent color measured in the epilimnion indicates the water was highly tea colored, or dark brown.
- **Total Phosphorus:** Epilimmnetic phosphorus levels fluctuated within a moderate range. Average epilimnetic phosphorus level decreased from 2018, was greater than the state median, and was less than the threshold for eutrophic lakes. Historical trend analysis indicates stable epilimnetic phosphorus levels since 2007. Station 1B phosphorus levels were elevated in June following a significant storm event and during high flows. Firehouse Pond Outlet and White Rock Hill Rd. Culvert phosphorus levels fluctuated within a moderate range. Firehouse Pond Inlet phosphorus levels were low in June and increased to an elevated level by August. Seasonal Inlet phosphorus levels were elevated in August and the turbidity of the sample was also slightly elevated during low flows.
- **Transparency:** Transparency measured without the viewscope (NVS) was below average (worse) on each sampling event potentially due to the dark water color. Average NVS transparency remained stable with 2018 and was less than the state median. Historical trend analysis indicates significantly decreasing (worsening) transparency since 2007. Viewscope transparency was higher (better) than NVS transparency and likely a better measured of actual conditions.
- **Turbidity:** Epilimnetic turbidity levels fluctuated within a slightly elevated range for that station. Stations 1B, Firehouse Pond Outlet and White Rock Hill Rd. Culvert turbidity levels fluctuated within a low range. Firehouse Pond Inlet and Seasonal Inlet turbidity levels were slightly elevated in August.
- **pH:** Epilimnetic, 1B, Firehouse Pond Inlet and Outlet, Seasonal Inlet, and White Rock Hill Rd. Culvert pH levels were within the desirable range 6.5-8.0 units, however epilimnetic pH levels have historically fluctuated below the desirable range. Historical trend analysis indicates stable epilimnetic pH levels since 2007.




| Station Name | Table 1. 2019 Average Water Quality Data for TUREE POND - BOW | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | 13.8 | 7.76 | 72 | 135 | 274.2 | 19 | 1.28 | 1.71 | 1.59 | 6.78 |
| 1B | | | 55 | | 202.9 | 20 | | | 0.44 | 6.67 |
| Firehouse Pond Inlet | | | 76 | | 269.2 | 17 | | | 1.54 | 6.74 |
| Firehouse Pond Outlet | | | 51 | | 224.7 | 15 | | | 0.65 | 6.60 |
| Seasonal Inlet | | | 41 | | 219.0 | 43 | | | 2.91 | 6.79 |
| White Rock Hill Rd. Culvert | | | 91 | | 391.7 | 14 | | | 0.83 | 6.72 |

**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 | Worsening | Data significantly increasing. | 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 show low variability. |