Rangeley Lakes Heritage Trust

CONSERVE | RESTORE | STEWARD

2026 Water Quality Report

Gull Pond



Survey History:

Gull Pond, located in Dallas Plt, ME is a developed water body in the area. It has a mean depth of 4.5m (15ft) and a maximum depth of 12.2m (40ft). The maximum depth is represented by station 1 (*Figure 1).* Monitoring on Gull Pond began in 1991 and has continued since with multiple gaps in the data. This station provides important information about water clarity, water temperature, dissolved oxygen, and water chemistry parameters, including phosphorus. Collecting and studying this data helps with understanding not only the current state of Gull Pond, but also how it has been changing in recent years due to rising temperatures, shorter winters, and increased runoff from developments.

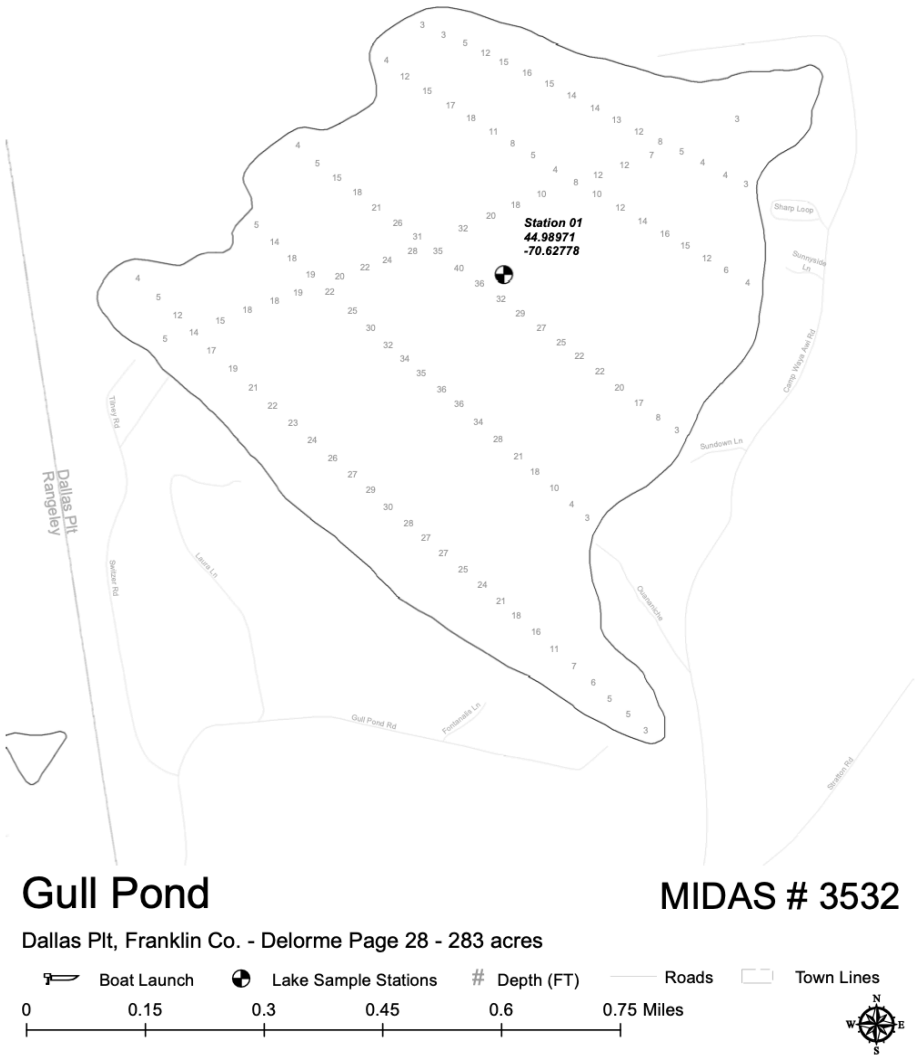


Figure 1. Map of Gull Pond and its sample station. Via Lakes Stewards of Maine

At each lake and pond monitored, annual readings of water transparency, dissolved oxygen, and water temperature are recorded, as well as one phosphorus sample that is collected in late summer. In recent years, these readings have been taken by RLHT's Headwaters Coordinator twice a month between May and October. In the past, some years had a lack of volunteers or the resources to monitor the water body biweekly as suggested by the state and Lake Stewards of Maine. Therefore, the data has some gaps which could account for minor inconsistencies in the data. Due to warming air temperatures and increased lakefront development, most lakes in Maine have been warming and have a greater chance of change.

Current Trends:

Common trends occurring on lakes and ponds in Maine is the tendency to become warmer and more polluted due to climate change and lake front development. Warmer waters are not capable of holding as much oxygen compared to colder waters. When oxygen levels drop too low, lakes are unable to support fish, plants, and other aquatic organisms. When pollutants increase, such as runoff from fertilizers, herbicides, human and pet waste, and other man-made materials, it creates a viable environment for increased algae growth and decreased oxygen and water transparencies. Although these trends are common statewide, they are not necessarily the same trends that are being observed on Gull Pond.

Water Transparency:

Water transparency readings are taken with a Secchi disk and an Aquascope to determine the depth at which light can penetrate through the water. This reading tells us how clear or turbid the water is at any given time. Taking readings with the secchi disk also suggests how abundant pollutants are in the water. Turbid water typically indicates the lake has more runoff. It is important to note, however, that natural factors like rain, seasonal changes, and proximity to the shore can influence secchi readings to be lower due to increased sediments in the water. A higher secchi reading is preferred as it suggests that the water is clear, unpolluted, and contains little to no runoff. A lower secchi reading suggests increased pollution and runoff. Deeper secchi readings suggest clearer waters which expand the littoral zone allowing more plants to grow and improve the health of fish and loons by allowing more light penetration and visibility.

Gull Pond is experiencing positive water transparency trends. Since monitoring began in 1991, a weakly correlated trend shows that water transparency has slightly increased (*Figure 2*). This implies that water transparency is remaining stable with a slight increase. Increasing water transparency is a sign that there is a limited amount of runoff and pollution entering the water. Overall, the trends observed suggest healthy and relatively unpolluted waters on Gull Pond.

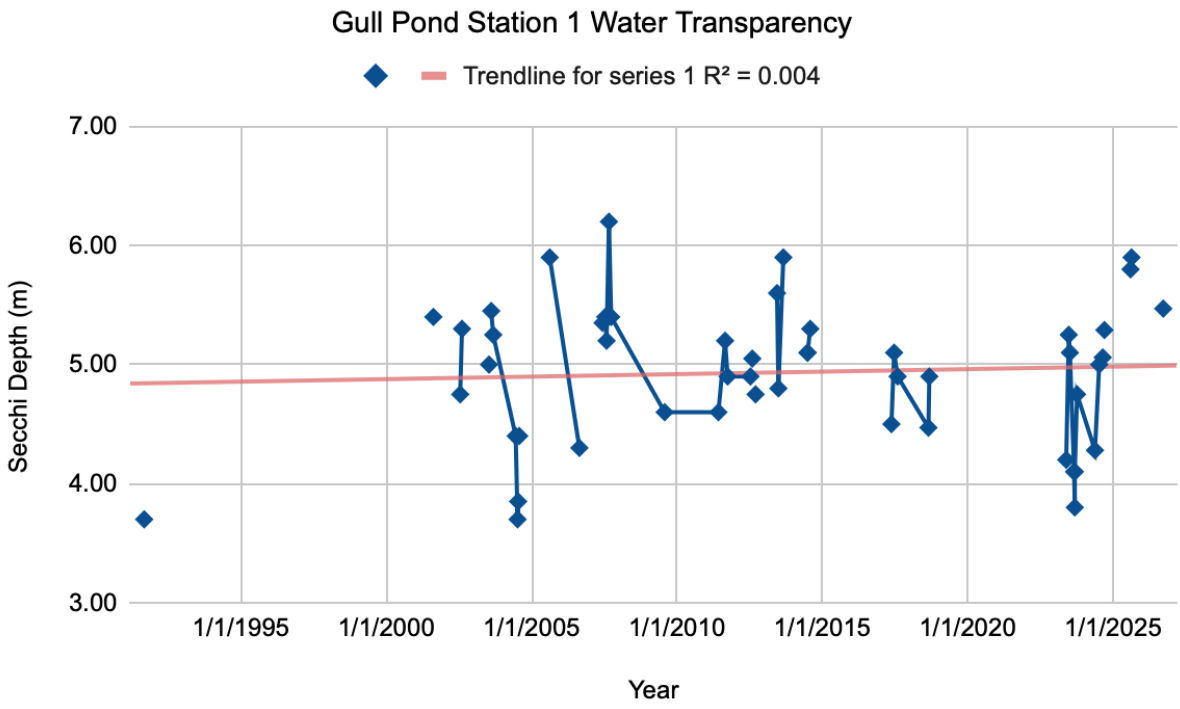


Figure 2: Water transparency readings on Gull Pond from 1991-2026 showing a slight increase.

Dissolved Oxygen:

Dissolved Oxygen (DO) readings are taken with a dissolved oxygen meter that is slowly lowered from the surface of the lake to the bottom in 1m increments. DO levels can fluctuate greatly from the surface to the bottom for a host of reasons, including water temperatures, decomposing matter, light penetration, and photosynthesis abilities. In the summer, it is expected that DO will be lower at the bottom of a water body. However, if DO levels are too low throughout the entire column for long periods of time, aquatic life will not be able to thrive. According to the US EPA, when dissolved oxygen levels drop below 5mg/L, the waters become stressful to fish and other aquatic life. When levels drop below 3mg/L, they can no longer support fish. Anything below 1mg/L is considered a hypoxic dead zone where nothing can survive. When temperatures rise, or excess nutrients such as phosphorus and nitrogen enter the water, DO levels will decrease.

Gull Pond is experiencing a significant increase in DO. Since 1991, a strong correlation shows that DO has increased by over 1mg/L (*Figure 3*). This is a positive trend that suggests more oxygen is in the water which is allowing aquatic life to thrive. However, this trend is not common as the station is also experiencing increasing water temperatures which usually results in lowered dissolved oxygen readings. It is important to note that DO levels on Gull Pond have surpassed the 5mg/L threshold three times in the past. This results in stressful conditions for aquatic organisms, however, in recent years, DO is showing positive trends. Although this is a positive trend, it is important to note there are multiple gaps in the data which could account for some inconsistencies. It is important to continue monitoring Gull Pond to make sure DO continues to increase.

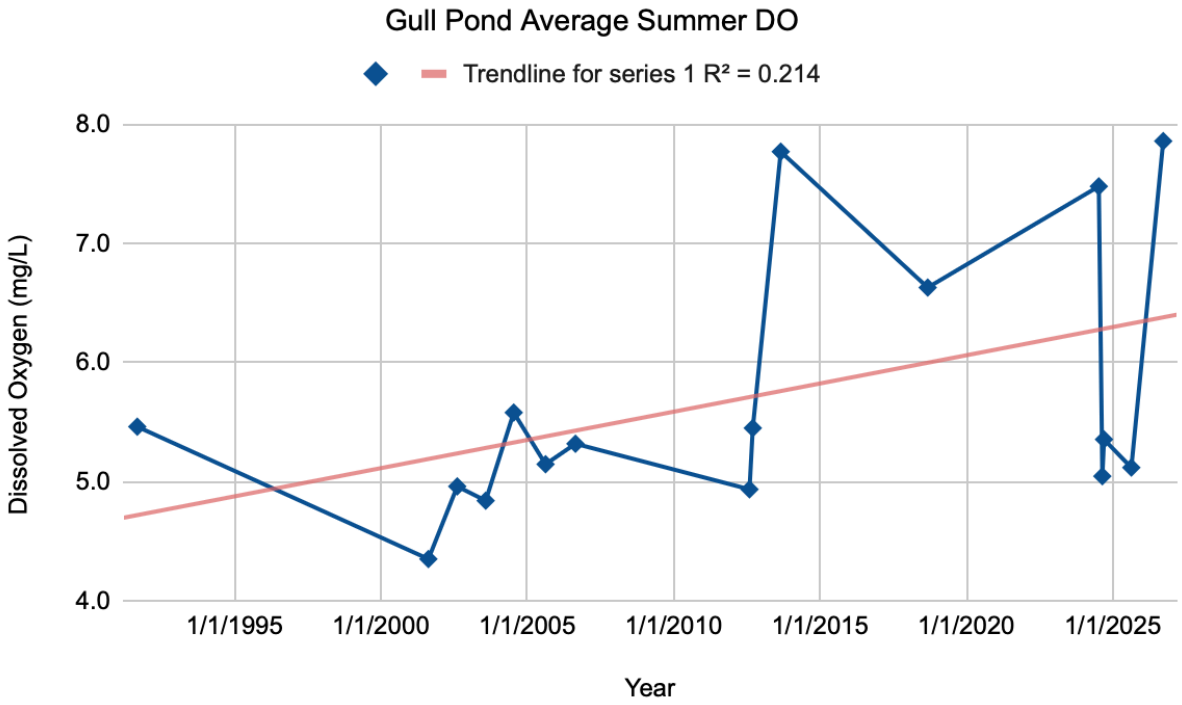


Figure 3. Average summer DO readings taken between May and October since 1991 showing a significant increase of over 1mg/L.

Water Temperature:

Water temperature readings are taken with the same meter as DO and are measured in 1m increments from the surface to the bottom of the lake. In the summer, temperatures are typically higher closer to the surface while they are much cooler closer to the bottom. Rising temperatures in a lake can directly affect fish and other aquatic life, as well as increasing algal blooms, decreasing DO levels, and in extreme cases, lead to hypoxic dead zones. Lake temperatures have been increasing across New England for decades, and Gull Pond is experiencing similar trends.

Gull Pond is experiencing a slight increase in water temperatures. Since monitoring began in 1991, trends show temperatures have increased by about 2°F (*Figure 4*). Unfortunately, this trend is common in the region. It is important to note that there are multiple gaps in the data which could account for inconsistencies in the data. Although water temperatures have slightly increased, it is not significant and implies healthy conditions on Gull Pond.

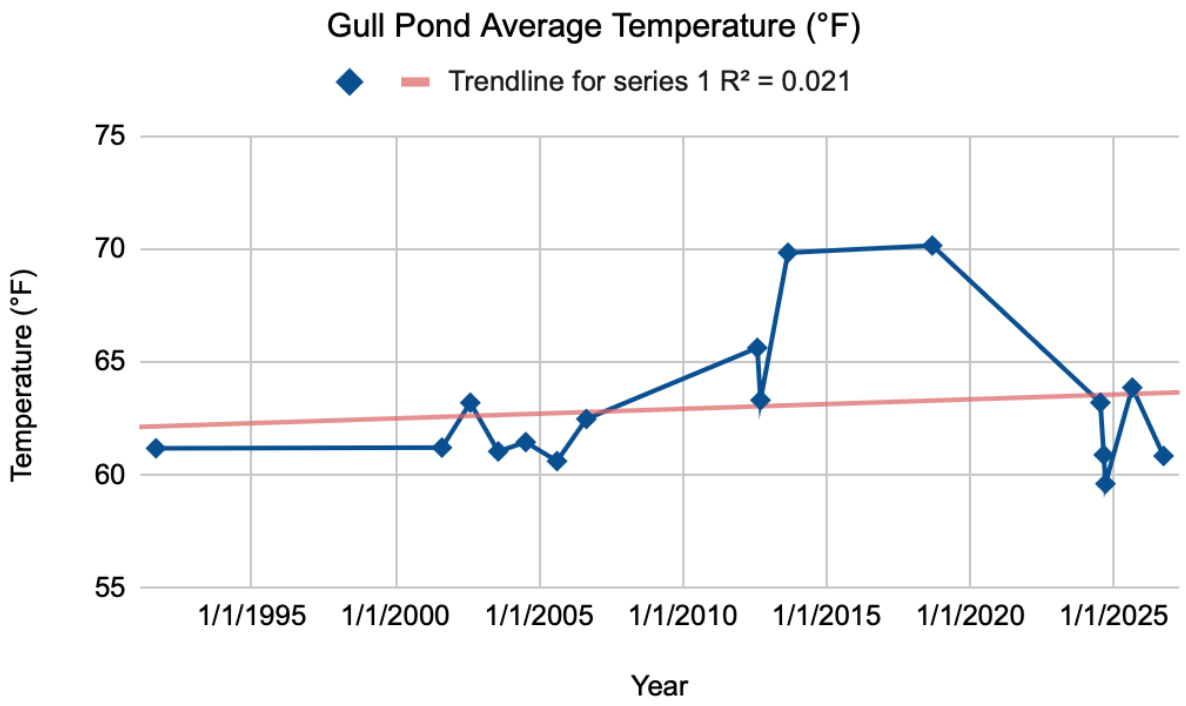


Figure 4. Average summer water temperature readings taken between May and October since 1991 showing a slight increase.

Phosphorus:

Phosphorus tests are taken during the summer at the surface of the lake. A small sample of water is collected and sent to the Maine Health and Environmental Testing Laboratory. Phosphorus is a naturally occurring nutrient found in soils and sediments which is vital for plant growth. However, if too much phosphorus accumulates in a water body, it increases the chances of excessive bacterial and algae growth, also known as an algal bloom. These blooms can decrease water clarity and even produce harmful toxins for humans and animals. Phosphorus is commonly found in fertilizers and sewage which can easily find its way into a water body from lakefront gardens, yards, or faulty septic systems. The USEPA suggests that levels of phosphorus in a water body should stay below 0.05mg/L to maintain a healthy lake, however, other sources suggest maintaining levels below 0.03mg/L is best. We test for this nutrient in the water to understand how much runoff is entering the lake and if there is any potential for harmful algal blooms and decreased lake health.

Total phosphorus levels of Gull Pond are showing a slight decrease (*Figure 5*). This decrease suggests there is little to no runoff entering the pond. However, there have been a few spikes since monitoring began in 1991. The largest spike was in 2012 reaching 0.015mg/L. These spikes were likely caused by minor pollution events that the pond seems to have recovered from or from contaminated tests. Despite these spikes, phosphorus levels have remained below the 0.03mg/L threshold and have remained stable.

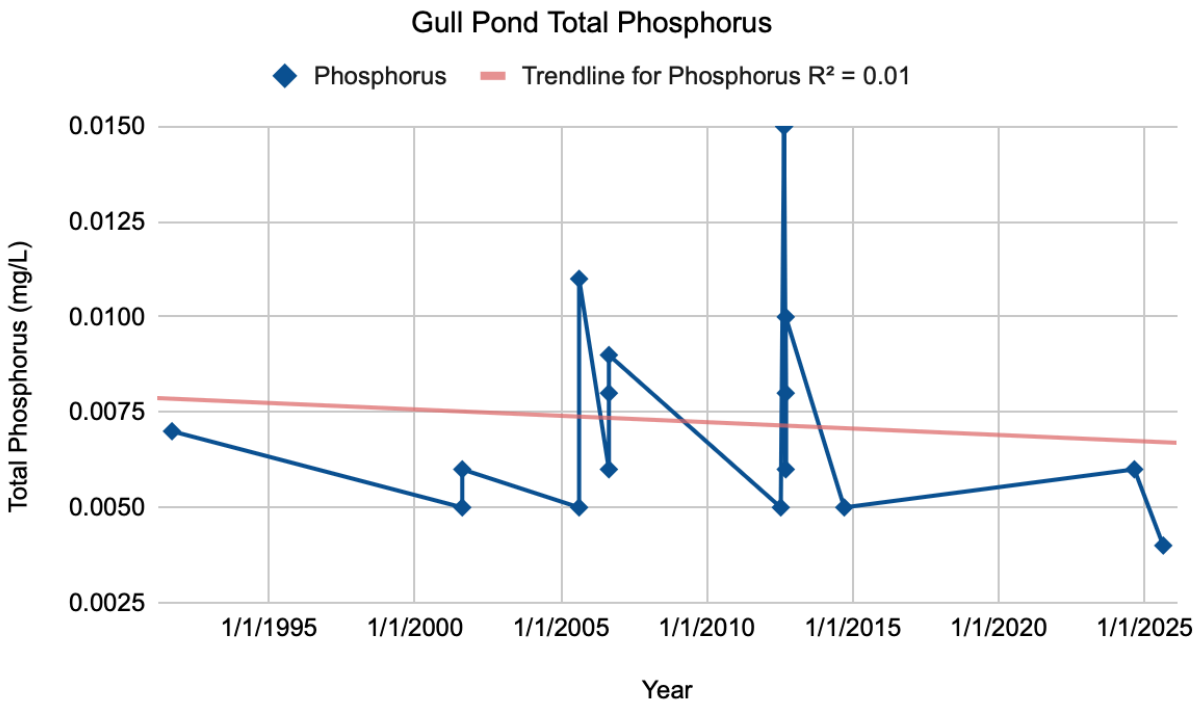


Figure 5. Phosphorus readings on Gull Pond since 1991 showing a slight decrease.

Suggestions:

Possible actions to decrease lake temperatures:

Actions	Benefit	Location
Implement rain gardens and infiltration steps	-Allows stormwater to enter underground aquifers to cool instead of entering directly into the lake -Reduces the risk of erosion	Lakefront homes and properties
Maintain a native vegetative buffer at the shoreline	-Reduces the flow of stormwater directly into the lake -Reduces the risk of erosion	-Lakefront homes and properties -Shoreline around the entire lake
Plant mature trees along lake edge	-Directly shades and cools shallow waters along the lake -Helps reduce the flow of stormwater into the lake	-Lakefront homes and properties -Shoreline around the entire lake
Maintain narrow, shaded roadways	-Shades and cools the land around lake	Large and small roads surrounding the lake
Continuous monitoring of potential invasive plants	-Reduces the possibility of invasive plants entering the water body, disrupting the ecosystem, and contributing to warming temperatures.	-Boat Launches -Littoral zone surrounding the lake

Maintain healthy and shaded tributaries	-Deposits cold water directly into lake -Improves fish habitat and movement	-Haley Brook -Geneva Bog Brook -Rock Pond Stream

Possible actions to limit decreasing DO:

Actions	Benefits	Locations
Maintain a vegetative buffer and native forests surrounding the lake	-Intercepts stormwater and prevents large amounts of runoff from entering the lake -Reduces soil erosion	Lakefront homes and properties
Implement highly permeable soils	-Sandy and permeable soils increase filtration of stormwater before entering the lake	-Lakefront gardens -Lakefront lawns
Care for septic systems	-Reduces the risk of chemicals, bacteria, and viruses from entering the water	Lakefront homes and properties
Limit use of herbicides, pesticides, and fertilizers	-Prevents toxic chemicals from getting the chance to enter the water	-Lakefront homes and properties -Nearby farms
Maintain driveways and roads with less impervious surfaces	-Minimizes road chemicals entering the lake directly	-Lakefront homes and properties -Roads surrounding the lake
Consider becoming LakeSmart certified	-Allows waterfront properties to be individually analyzed -Provides feedback on how to improve your home lake impact	Lakefront homes

While any of these actions could be beneficial to the health of Rangeley's water bodies, there is no way for us to understand our impact without continued monitoring. The volunteer water quality monitoring program needs volunteers to continue taking annual readings at the sampling stations on the lakes. Individuals can become certified to take Secchi and DO readings through Lake Stewards of Maine. With the information gathered, we can observe current trends and take immediate action if concerning trends are observed. For more information on joining the volunteer effort, or with any other questions, please reach out to headwaters@rlht.org.

Sources:

Lakes Environmental Association

United States Environmental Protection Agency-Climate Change Workbook

United States Environmental Protection Agency-Dissolved Oxygen

USGS-EPA Phosphorus levels

Maine Lakes

Lake Stewards of Maine