

Alford Arm Creek EcoSummary



The Alford Arm tributary is a moderately altered, nitrogen-limited stream located in the northern part of Leon County. The tributary flows from Lake McBride in the Bradfordville area and receives runoff from the heavily developed Killearn Estates and Killearn Acres neighborhoods. Many of the waterbodies within these neighborhoods are former agricultural ponds, most notably the Velda Dairy impoundments that are now seen as residential amenities.

Approximately 55% of land use in the 26,913-acre watershed is agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable

removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

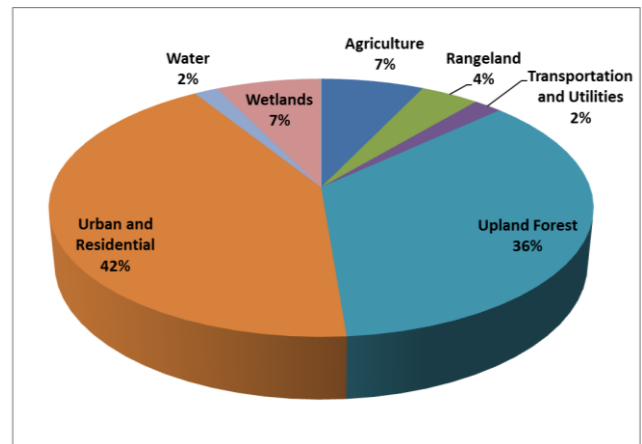


Figure 1. Alford Arm Creek watershed land use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Alford Arm Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP

requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water and back flow conditions, four temporally independent samples per year have never been collected from this station. For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for Total Nitrogen or Total Phosphorus.

Dissolved Oxygen

As **Figure 4** shows, Alford Arm Creek did not always meet the Class III criteria for % dissolved oxygen (DO) saturation. This is not surprising since low gradient, low flow streams often have low DO levels.

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples collected over a thirty-day period was exceeded (580 CFU) during the January 2022 sampling event. Based on anthropogenic land use, the exceedance could possibly be the result of residential development in the watershed (e.g., improperly functioning septic tanks or leaking sewer pipes). Other causes could be wild animals and/or agriculture within the watershed. There were no exceedances in 2023.

Vegetation

Several species of invasive exotic plants are in the water and line the bank of the tributary including tallow tree (*Sapium sebiferum*) and privet (*Ligustrum* sp.). In many cases, exotic plants will crowd out and replace native plants. This may stress native wildlife, which have evolved to depend on native plants for food and shelter. The native wildlife may move away or perish if the native vegetation is replaced by exotic plants.

[Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.](#)

Metals

The copper level was elevated during the 1st quarter of 2023. While the source of copper is unknown, it is a possibility that the copper exceedance was the result of the application of copper-based algaecides.

[Click here for more information on metal levels in Leon County waterbodies.](#)

Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

Past sampling showed that Alford Arm nutrient levels appear, in most cases, to meet the NNC for the East Panhandle Region. Over the sampling period, the Class III criterion for % DO saturation was not always met. This is not a surprising result in this low gradient, low flow stream. The copper level was elevated during the 1st quarter of 2023. While the source of copper is unknown, it is a possibility that the copper exceedance was the result of the application of copper-based algaecides. Several species of invasive exotic plants are in and around the tributary.

Thank you for your interest in maintaining the water quality of Leon County's aquatic resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

[Click here to access the results for all water quality stations sampled in 2023.](#)

[Click here for a map of the watershed – Sample Site 1](#)

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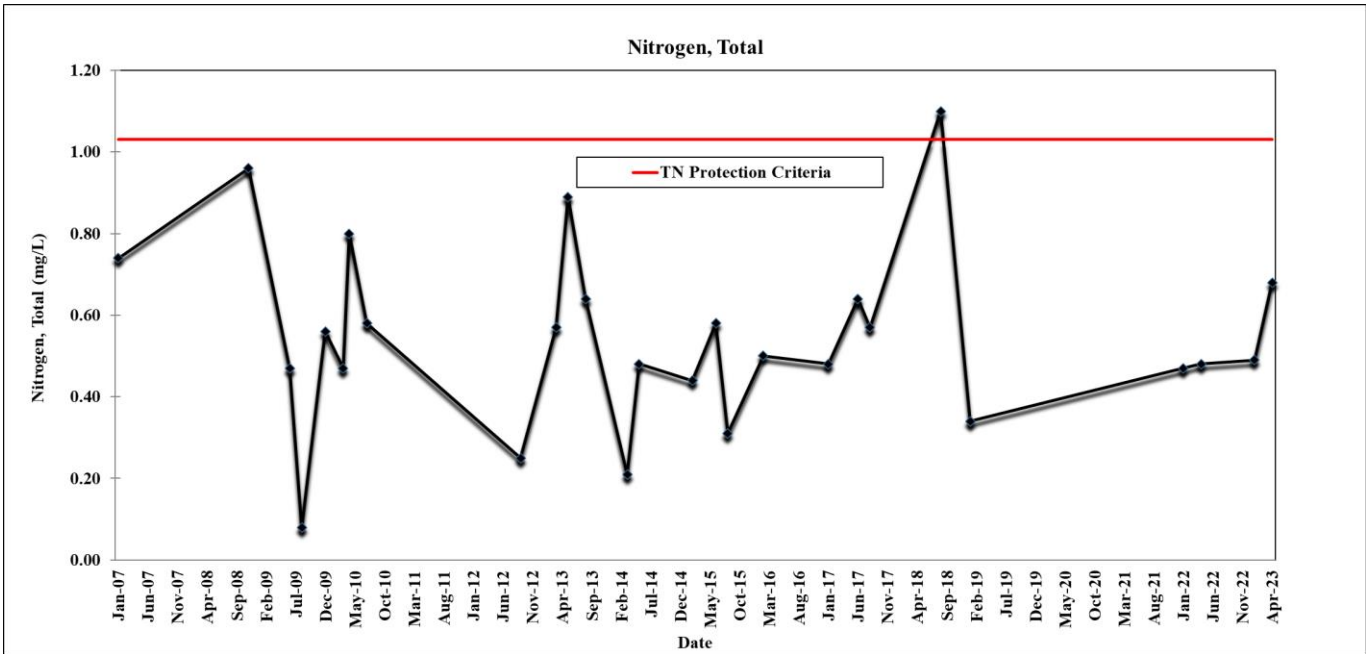


Figure 2. Total Nitrogen results for Alford Arm Creek.

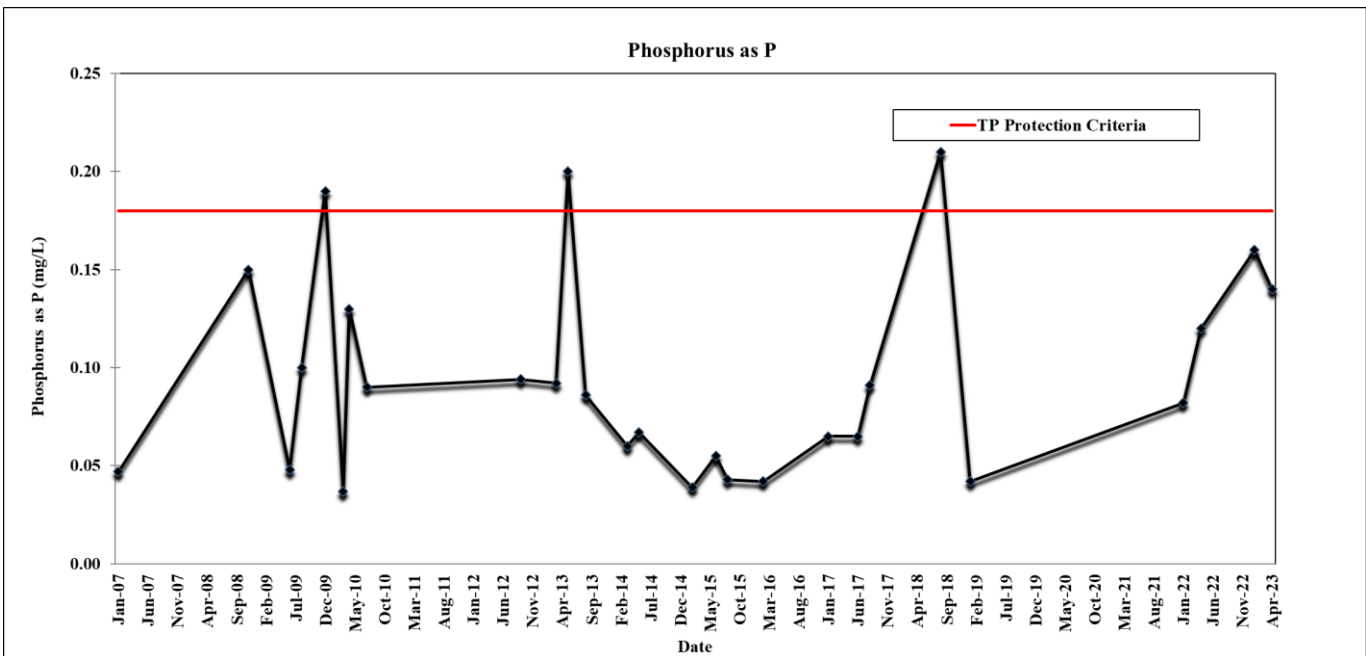


Figure 3. Total Phosphorus results for Alford Arm Creek.

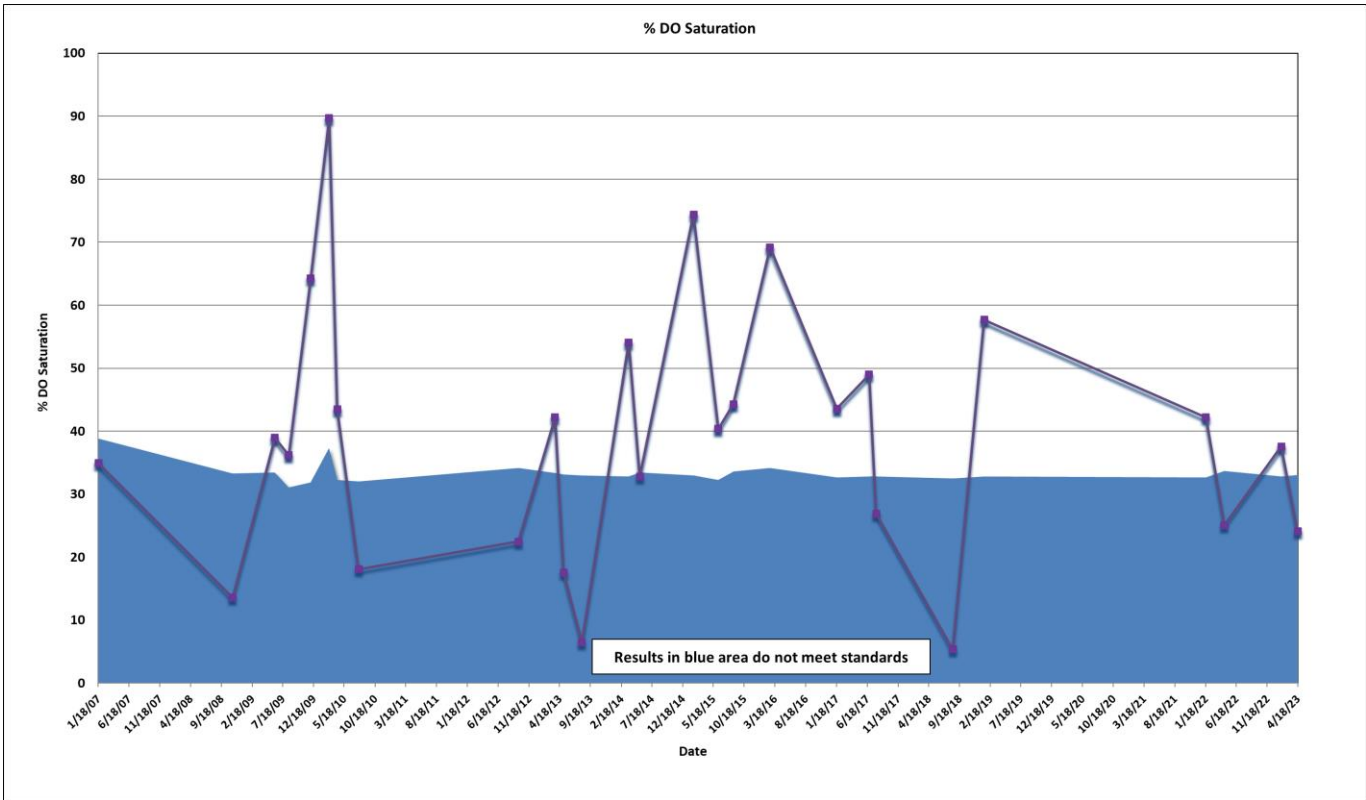


Figure 4. Dissolved Oxygen Percent Saturation results for Alford Arm Creek.