

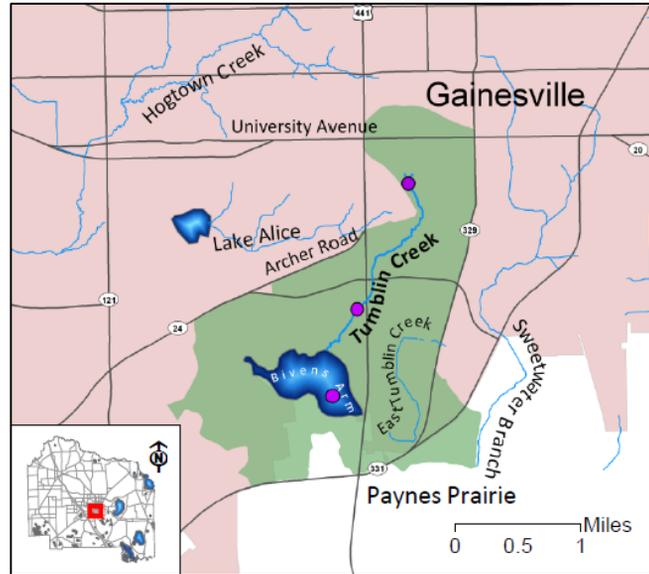


# Bivens Arm

## Fact Sheet

### The Watershed

- The lake is approximately 189 acres and supports a wide variety of plant and animal life.
- Bivens Arm is a part of the Tumblin Creek watershed and forms the northern extension of the greater Paynes Prairie watershed.
- The lake is located within Gainesville and the predominate land uses in the watershed are 25% residential, 21% institutional (owned by the University of Florida), 19% transportation, and 7% commercial.
- The state of Florida designated the lake area as a wildlife sanctuary in 1965.



Map of Bivens Arm watershed (green).

### Potential Pollution

- Runoff of nitrogen and phosphorus from agricultural practices.
- Failing septic systems and wildlife introduce fecal material which is a source of nitrogen, phosphorus, and bacteria such as *E. coli*.
- One side of the lake is bordered by Highway 441, serving as a source of run-off and litter.



Bivens Arm during 2016 sampling event.

### Biology

Bivens Arm is classified as hypereutrophic, as indicated by the high levels of nutrients, extensive algal and aquatic plant growth, and high productivity. Bivens Arm is home to several invasive species, including water hyacinth, water lettuce, wild taro, and hydrilla. However, there are native populations of plants and animals including alligators, catfish, tilapia, crappie, bass, and bluegill. Many bird species frequent the lake including osprey, eagles, herons, and egrets.

# Water Quality

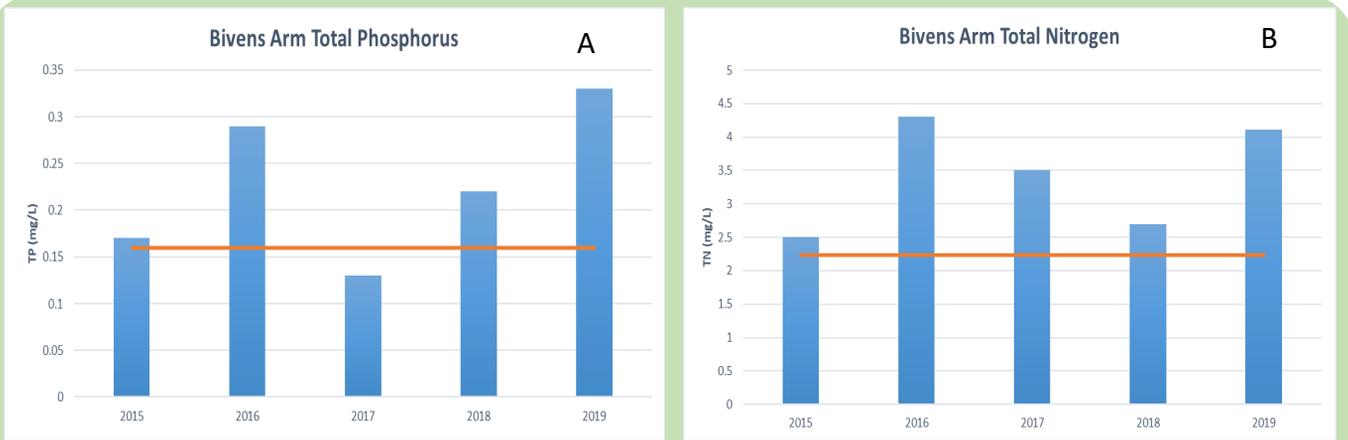


Figure 1. Annual geometric mean of A) total phosphorus (TP) and B) total nitrogen (TN). Numeric Nutrient Criteria (NNC) for each analyte denoted by orange line.

**Nutrients:** The current FDEP water quality rule on nutrient standards went into effect February 2016. A potential phosphorus source is the erosion of phosphorus rich soils that compose the Hawthorn clays which underlie some of the stream beds in the watershed. Nitrogen is likely entering the lake through surrounding septic systems of private residences. The major source of pollutants is most likely from Tumblin Creek, a basin composed of 60% impervious surfaces, which contributes stormwater and other urban products from southern Gainesville into Bivens Arm.

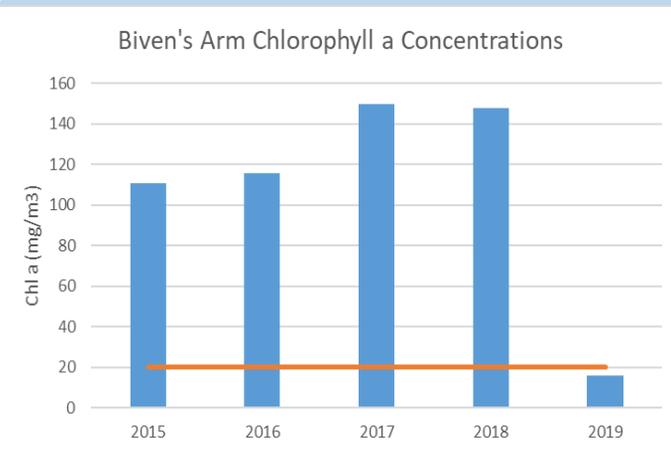


Figure 2. Annual geometric mean of Chlorophyll- $\alpha$  (corrected).

## Chlorophyll- $\alpha$ :

Algal abundance is commonly measured in the amount of chlorophyll- $\alpha$  in water. The high nutrient concentrations have led to the elevated chlorophyll- $\alpha$  concentrations. The chlorophyll- $\alpha$  patterns closely reflect the TN results shown in Figure 1B. Rainfall also influences the chlorophyll- $\alpha$  abundance.

## Current Human Impacts

- Bivens Arm is surrounded by apartments, restaurants, hotels, private residences, and the University of Florida's restricted access property. Tumblin Creek, which feeds the lake, flows through urban, commercial, and residential areas, picking up nutrients and pollutants during rain events.

- Fish advisories can change regularly, so be sure to check out FWC's list of advisories before consuming fish from the lake.



Bivens Arm during low water conditions in 2012.