

89251

oral

Early water quality changes from stream and wetland restoration in former agriculture land

Sebastian Teas, Zachary Rundell, Kehinde Ositimehin, Jen Bowman, and Natalie Kruse Daniels*, *Ohio University, Athens, Ohio USA.*

krusen@ohio.edu

The Stream and Wetlands Foundation of Ohio has restored an 80 acre portion of the historical Bloody Run Swamp in Licking County, Ohio. The site was tiled for drainage and is surrounded by drainage ditches conveying water to Bloody Run and the South Fork Licking River. The watershed is impaired by nutrient and sediment enrichment. The restoration project included restoring the levies between the drainage network and adjacent fields, raising grade to retain water in the restored wetland, breaking tiles, and constructing a stream channel flowing through the north end of the wetland and infilling the ditch that previously flowed along the north end of the site. The stream conveys the majority of the flow on the north end of the site, with overflow in the remnants of the north ditch. Ohio University measured hourly water level, and biweekly nutrient and solids concentrations and flow prior to restoration (Spring-Summer 2022) and during the construction period (Fall 2022). When correlated with antecedent precipitation index, the response of water level to precipitation was less during construction than prior to construction, suggesting that more water is being retained in the site as construction proceeds. Nitrogen concentrations were significantly lower during construction than prior to construction, in concert with a reduction in nitrite and nitrate, but a significant increase in ammonia. No significant change in phosphorous was measured. Total dissolve and total solids were lower during construction than prior to construction. These data support this method of combined stream and wetland restoration for nitrogen and solids reduction and transient water storage. Further monitoring is continuing in 2023 as the project is completed.

Keywords: nutrients, natural channel design, watershed management