Abstract

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Assessing Water Quality of the Salt River - An Analysis of an Urban Aquatic Ecosystem in an Arid Environment

The Salt River is primarily a dry riverbed throughout the Phoenix, Arizona metropolitan area. The only part of the river that is ecologically a real river is a 10-kilometer stretch at the base of the Estrella Mountains, that we call the Rio Verdado. This research investigates the improvement of water quality through Rio Verdado from the Tres Rios Wetland, a constructed treatment wetland, to the Lower Buckeye Diversion Dam. Rio Verdado is a mixed restored area with intentionally restored riparian areas; however, it is primarily naturally rehabilitated. Our hypothesis is that water quality will improve as the river flows from Tres Rios, which serves as the headwaters, downstream due to the riparian channel sequestering nutrients and dissolved organic material.

A quantitative approach was employed for this research, using bi-monthly sampling beginning in January 2024 at three locations: the Tres Rios Wetlands outflow, the Base & Meridian Wildlife Area, and the Lower Buckeye Diversion Dam. On-site measurements included dissolved oxygen, conductivity, pH, and temperature. Water samples were collected for laboratory analysis of nitrate, nitrite, ammonium, total nitrogen, soluble reactive phosphorus, total phosphorus, and dissolved organic carbon.

Preliminary findings show that water quality improves between Tres Rios Wetlands and the Lower Buckeye Diversion Dam, showing a decline in nutrient concentrations as the river flows downstream. These results highlight the role that riparian ecosystems play in improving water quality and show the impact that restored water flow has on supporting diverse local biota and providing a place for human-nature interaction.

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Ecosystem Structure and Functioning