Sept '93

ARCH CREEK
EXECUTIVE SUMMARY

This report provides preliminary pollution assessment of Arch Creek as initiated by contract C91-2429, between the South Florida Water Management District and Metro-Dade County Department of Environmental Resources Management via a State of Florida, Surface Water Improvement and Management grant. Historical research, results of preliminary surface water, groundwater and soil sampling are presented. A Best Management Plan to investigate the potential of reclaiming, reconstructing or constructing new inland freshwater wetlands as part of a storage and water quality enhancement system is recommended.

Arch Creek c. 1890

The historical research revealed a pristine environment up to the early 1900's. Two thousand years before Columbus discovered America, the natural bridge of Arch Creek, today in the area of the City of North Miami, Dade County, Florida, served the Tequesta Indians as a natural limerock bridge between the two banks of the creek. During the next couple of millennium, the natural bridge stood much as it had for the previous tens of thousands of years. As late as the early 1800's, the natural bridge and the rich diversified habitat of the creek, which historically flowed from the Everglades eastward into Biscayne Bay, supported a large portion of the Seminole Indian population. During the third Seminole War (1855 - 1859) the U.S. Army established a military trail between Ft. Capron (five miles north of Ft. Pierce) and Ft. Dallas at the mouth of the Miami River. The trail passed over the natural arch of Arch Creek and served to cut off the source of war material from Cuba. A turning point in this war came when General W.S. Harney and his men attacked Luis The Breed, a gun runner, nicknamed because he was believed to be part Indian and part Cuban. The attack on Luis The Breed at his stone house and mill just north of the arch, killed Luis and the Indians, demoralized, retreated deep into the Everglades. This point in time, more that any other, marks the beginning of colonization and development in the Arch Creek area.

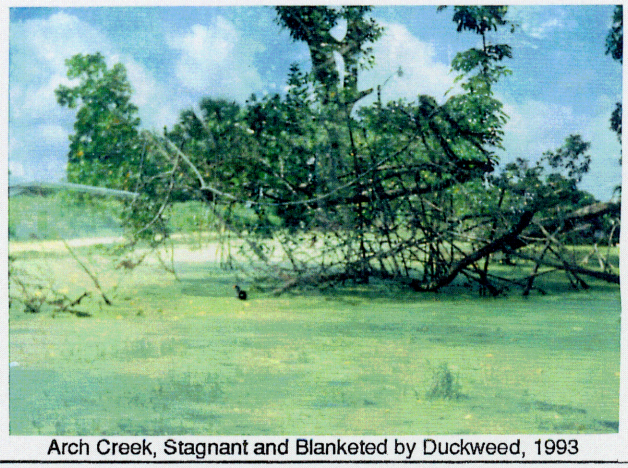
In 1896 Caroline Washburn-Rockwood described this area in her memoirs as "a perfect fairyland of arching trees, trailing vines, suspended, swinging mangrove roots, delicate ferns, and hundreds of tropical shrubs, plants and grasses that shadow the clear waters of the creek, which in return, reflects the glimpses of blue sky, the dazzling glints of sunlight, and every quivering, dancing leaf, grass and flower, until it was hard to tell where the real ended and the reflection began... Every ripple seemed to announce some fresh new discovery, we passed several gator crawls were the reeds and grasses were broken and pressed aside by the weight of the saurians. What a lovely home these reptiles have! Then looking up through the moss-draped trees, a white plumed egret sailed away over the live oaks. Then I see, there is an otter and still another! The shores had grown abrupt and the white coral edges were festooned and garnished with delicate ferns, vines and water plants, that looked as though arranged by some artist's hand."

Development in the area dates back to 1847, when the first known survey was carried out by the Federal Government under the authority of the U.S. 30th Congress, 1st. Session for the purpose of studying and engineering an area drainage program. In 1858, Mr. George Lewis, in association with Mr. Robert Fletcher, built in the center of the arch Dade County's first industry, a starch mill. In 1892, Dade County's first road, built at taxpayers' expense, used the Natural Bridge to cross the creek, this road later became known as *Old U.S. 1.* This area remained mostly farm land for about the first twenty years of the 20th century. At the height of the 1920's land boom, the only development adjacent to Arch Creek sold out in one day.

Picnic at Arch Creek c. 1910

In 1947 a hurricane struck the area, but because of its high ground, the surrounding homes suffered no flood damage.

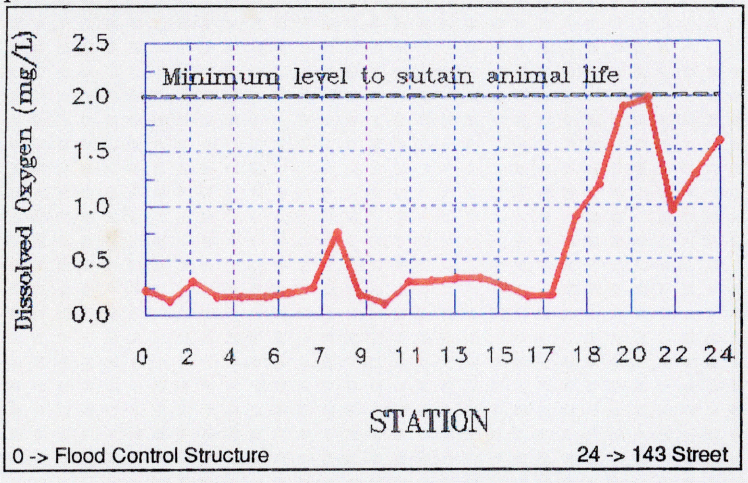
In 1959, under Resolution No. 367 the Central and Southern Florida Flood Control District (CSFFCD) designed and installed a flood control structure in Arch Creek at about 135th St. The result was the reduction or elimination of the natural water flow between the creek's source and Biscayne Bay, thus effectively turning Arch Creek into a pond. During an October 1988 -- *Miami Times* - interview, Kathy Copeland, a spokesperson for the South Florida Water Management District (previously CSFFCD), says changes to the dam are not even under consideration; "...the dam is functioning as it was designed to function, our primary concern is for flood protection, which is the reason the structure was modified in 1985."



Arch Creek, Stagnant and Blanketed by Duckweed, 1993

By preventing flushing, the flood control structure also intended to prevent salinity intrusion to the adjacent groundwater, however in the case of Arch Creek, both potable well fields nearby, one in the City of North Miami Beach, the other in the City of North Miami, were abandoned, in mid to late 1980's, due to salt water intrusion.

Sampling of surface waters, groundwater and soil indicate a severe deterioration of Arch Creek environment. Results of this preliminary assessment highlight the contradiction between the area's stormwater drainage system, design to facilitate the removal of large quantities of rainfall by directing its flow to Arch Creek and subsequently to Biscayne Bay and the flood control structure at 135th St. installed to accomplish the opposite purpose of preventing the loss of fresh water. Stagnant waters and continuous pollutant loading by the surrounding urban infrastructures, turned Arch Creek into a very large batch reactor. Consequently, nearly all of the stations sampled and practically all of the parameters monitored showed levels that did not meet regulatory or recommended surface water quality standards. Total coliform bacteria, routinely showed concentration levels one to three orders of magnitude higher than the standard. Phosphate and nitrogen loading, possibly from septic tanks and fertilizer runoff, have contributed greatly the creek's eutrophication stage. *Lemna minor,* better known as Duckweed, has become an opportunistic species and during the warm months blankets the entire creek giving it a slimy green surface. At the time of our sampling, the entire creek bottom dissolved oxygen concentration was below the minimum of 2 mg/L necessary to sustain animal life. Research shows that solid waste has been accumulating throughout the creek since at least 1969. In 1973, its most acclaimed landmark, the Natural Bridge, collapsed into the creek. In just a few decades Arch Creek has been plundered, polluted and dammed.



The Best Management Plan developed recomends that a twofold phase, along with community involvement, be initiated. First, design and execute a pilot study to investigate the potential of reclaiming, reconstructing or constructing new inland freshwater wetlands as part of a storage and water quality enhancement system that will lower peak discharges and enhance water quality. This phase removes accumulated solid waste, investigates rates, constants, and reaction kinetics parameters for storage, detention, and pollutant reduction requirements. The objective is the construction of storage and water quality enhancement wetland between 143 St and 142 St. This phase also includes comparison and ranking of discrete options and drainage systems while developing a draft physical plan of land use. The second phase will further refine the physical plan, design and conduct demonstration projects, and develop a master plan for implementation. A two year completion period is anticipated for the first phase and four years for the second.

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