

Water Quality Monitoring and Modeling for the A.R.M. Loxahatchee National Wildlife Refuge:

Brief and Status Update

In FY04, Congress specifically appropriated \$1,000,000 to the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge) for water quality monitoring. This appropriation is intended to improve the scientific understanding of water quality issues in the Refuge, establish a network that is reasonably representative of the waters in the refuge, and to gather additional information in order to understand future exceedances, if any, that occur, as well as to take management action to better protect refuge resources..

A work plan was developed by Refuge staff outlining studies in three areas: (1) increased monthly water quality sampling sites; (2) monitoring of canal water intrusion using surface water conductivity transects into the interior marsh; (3) development of hydrodynamic and water quality modeling. These three areas are consistent with long-term goals identified in the Refuge's 15 year Comprehensive Conservation Plan and recommendations made by the Technical Oversight Committee for addressing exceedances observed in interim phosphorus levels within the Refuge.

The existing monitoring network is estimated to cover approximately 60% of the Refuge, leaving 40% of the marsh uncharacterized. A total of 40 additional monitoring stations have been identified to focus on the uncharacterized areas and will be sampled monthly. Thirty of the sites will be located on seven transects extending from the canal to 4 km into the interior. Ten additional points will be located in the northwest and southeast portions of the refuge. The sampling will begin in May 2004.

The same seven transects will be equipped with water conductivity data loggers set to collect conductivity and temperature data. Two transects have been instrumented and the remaining transects will be completed by May 2004. This information can then be used to refine operations, when possible, to minimize canal water intrusion into the interior marsh.

The goal of the modeling exercise is to provide support for Refuge management decisions and planning related to water control operations, water supply, and water quality, as well as provide a foundation for future ecological studies. A modeling contractor has been identified and plans are underway to establish an independent model selection committee who will recommend the model(s) to be used and provide technical input.

The plan was provided to State, other Federal, and Tribal partners for review and comment in February 2004, and has been improved based on constructive comments received. The plan includes mechanisms for future modification based on principles of adaptive science and adaptive management.