



# Audubon OF FLORIDA

## Distributed or Dispersed Water Management and Storage in the Lake Okeechobee Watershed

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**Audubon of Florida proposes that the South Florida Water Management District formally initiate a comprehensive program to construct projects that achieve “distributed” or “dispersed” storage throughout the tributaries to Lake Okeechobee. The purpose is to achieve improved results for storage and removal of phosphorus pollutants while making better use of the landscape and enlisting private landowners in solutions that restore the lake and protect downstream estuaries and Everglades.**

“Distributed or “Dispersed” storage are terms used interchangeably. They describe water management methods consisting of new water control structures in existing ditches and canals that are currently over-draining the landscape. The structures restore the hydroperiod of previously drained wetlands, elevate ground water tables to take advantage of storage capacity in aquifers impacted by drainage, and create shallow impoundments to manage water and re-create wetlands. “Dispersed” storage contrasts with the construction of large-scale reservoirs or conventional stormwater treatment areas (STAs) in that the components are much smaller, more numerous, and do not require the permanent acquisition of land to build large public works projects.



**The aerial photo above shows conditions representative of those typically found throughout the Okeechobee drainage basin, and in particular the Kissimmee River Watershed. The red line traces a ditch with its characteristic pattern of spoil piles through a rangeland area. The blue line traces the route of a canal dug through a cypress slough.**

Thousands of miles of privately constructed canals and ditches exist in the watershed. Few have any water control structures. Little if any engineering was utilized in the construction of most of these canals and ditches. Most were built in the era prior to permit requirements.

The basic mission of the program recommended by Audubon is the retrofit canals and ditches with water control structures to take advantage of opportunities to hold higher water levels further upstream in the watershed. Shallow catchment areas would be constructed at numerous, widespread locations throughout the basin to act similar to STAs to intercept phosphorus and provide removal through enhancing the particulate settlement rate, and through vegetative uptake in wetlands created in wetter areas that emerge behind the water control structures.



**Low level water control structures such as this could become the standard method employed to achieve water storage and aid in meeting water quality goals in the Northern Everglades.**

The long term goal of this program is retention/detention of a large portion of the 900,000 to 1,300,000 acre feet of water that needs to be managed in the Northern Everglades as a result of the enactment of Section 373.4595, Florida Statutes, and the adoption of planning documents required under that statutory authority, including the Lake Okeechobee Watershed Protection Plan (LOPP) and the Lake Okeechobee Watershed Construction Project Phase II Technical Plan. Current proposals to implement the Northern Everglades program as expressed in these planning documents rely heavily on centralized regional reservoirs and STAs which are in almost all cases now proposed only at a conceptual design level. Most of these conceptually proposed public works projects are currently suggested at locations far downstream in the system near Lake Okeechobee itself.

One STA, known as “Lakeside Ranch” is, however, completely designed and actually under construction. It is projected to be completed at a cost of \$76,000,000 in 2013, creating a project 1,750 acres in size. Cost estimates for the initial implementation stage of the preferred Lake Okeechobee Watershed Construction Project Phase II Technical Plan are a total of \$1.72 billion, of which approximately \$700 million is theoretically available through a federal 50% share in Comprehensive Everglades Restoration Program (CERP) funding. It is clear that at the level of actual costs experienced in the construction of the Lakeside Ranch STA project (in excess of \$45,000 per net usable acre), the acreage of reservoirs and STAs that can be constructed at a funding level of \$1.72 billion will be not be sufficient to store and treat even 50% water that the above referenced plans indicate must be managed.

Audubon recommends that a significantly larger proportion of these water management goals be achieved cumulatively through reliance upon more cost effective construction programs conducted under cooperative relationships with landowners to build numerous low-level control structures. This project should be formally integrated into the “Northern Everglades” effort as its primary component.

The program should be configured as a scaled-up effort that builds on the program design insights and experiences secured through the “Florida Ranchlands Environmental Services Project” (FRESP). The SFWMD project Audubon proposes would be planned and implemented at a watershed-wide level.

The policy in 373.4595, Florida Statutes, clearly allows this to be done. The underpinning statutory authority for the Northern Everglades program provides that “... ***the coordinating agencies encourage and support the development of creative public-private partnerships and programs, including opportunities for water storage and quality improvement on private lands...***”

An increasing challenge to the Northern Everglades program is adequate funding. Present funding sources are largely annual appropriations from the Legislature, some federal CERP fund promises, and District Ad valorem taxes. A program to pay landowners for creation of water management features on their land that are compatible with retaining the land in agriculture will allow landowners to become

“water farmers” who will receive revenue quantified by acre-feet retained or pounds of phosphorus removed. This will build a strong regional coalition of interests to seek new permanent funding sources.



### **Audubon Recommendations -- What the South Florida Water Management District Should Do:**

- Northern Everglades Legislation requires that the Lake Okeechobee Protection Plan (LOPP), be revised this year. The plan now provides that “...*the majority of the (phosphorus) load reductions are proposed to be met through the regional solutions contained in the CERP Lake Okeechobee Watershed Project (LOWP)*”. In other words, the current LOPP relies largely upon construction of large reservoirs and stormwater treatment areas, generally north of the lake. Audubon recommends that SFWMD modify this approach in the Okeechobee tributary areas. The District should amend the LOPP to shift the primary effort to distributed/dispersed storage and water management facilities constructed in cooperation with private (and in some cases public) landowners.
- The priorities of a significant part of the District staff and resources currently utilized to plan, design, and eventually supervise the construction of large centralized reservoirs and STAs in Okeechobee Tributary areas should be changed. Greater staffing and funding emphasis should be placed on planning, design and implementation of distributed/dispersed storage and water management facilities, and carrying out these cooperative projects with landowners.
- Under these new priorities, more District staff and fiscal resources should be utilized to pursue the following efforts:
  - Proactively identify an expanded group of landowners willing to commit to participation in distributed/dispersed storage projects. Facilitate the widespread implementation of projects on those lands as on an expedited basis as willing landowners are identified.
  - Increase funding and support for the “Payment for Environmental Services Program” being developed by the Florida Ranchlands Environmental Services Project, and expand District collaborative efforts with non-governmental organizations to support NRCS Wetland Reserve projects that may be configured to produce distributed/dispersed storage benefits.
  - Implement a detailed drainage ditch and canal mapping effort using advanced methods such as airborne laser profiling (LIDAR) to inventory the spatial distribution and conveyance capacity of canals and ditches in the Okeechobee Tributary basins which are not part of the SFWMD system but drain water to it.
  - Initiate a comprehensive engineering study and hydrologic model development to pinpoint optimum locations for a large number of small water control structures, and low level impoundments throughout the basin. The outcome of the engineering study and modeling would be determinations on a basin-wide and sub-basin level about the practical capacity for water retention/detention and storage in acre-feet and the practical capacity for nutrient removal linked to Okeechobee TMDL goals through distributed/dispersed storage and water management projects. The projects would involve minimal structures, to mimic “natural” hydrology.

- Implement program components through the District and/or NGO collaborators to build and maintain distributed/dispersed storage and water quality improvement projects on a comprehensively planned basis throughout the tributary basins. The implementation programs are intended to adapt to varied landowner preferences:
  - (a) A program to provide specifications for results (such as acre feet of water stored, or pounds of phosphorus removed) to be achieved by landowners through landowner constructed and maintained structures in exchange for payment for environmental services.
  - (b) A program for District installed and maintained structures at District expense on private lands in conjunction with negotiated easements and contracts with payment to landowners in either a lump sum or on an annual basis.
  - (c) A program identical to (b) above but configured to install water control structures in ditches and canals on existing public land holdings to achieve distributed/dispersed storage and water management benefits.
- The District should undertake a coordinated effort to propose, gain consensus upon and implement additional funding mechanisms for a comprehensive watershed wide program of distributed/dispersed storage and water management. This would include both using untapped funding mechanisms within existing legal authority, and seeking new funding through legislation. The goal should be to launch a collaborative effort with landowner interests, the Florida Department of Agriculture and Consumer Services, Agriculture advocacy groups such as the Florida Farm Bureau, Florida Cattleman’s Association, and conservation organizations. To the extent new funding authority in legislation or appropriations is needed, a joint approach to the Legislature and Congress is recommended in 2011-2012.

**The Advantages:**

- A cooperative Program with landowners. Land is dedicated to providing needed water and phosphorus retention under contract or easements and is not acquired through purchase or eminent domain for big public works projects. There is less risk of government/landowner conflict.
- A greater consensus can be built around funding mechanisms seen as an advantageous source of revenue to rural agricultural landowners. The program helps incentivize retention of land in agriculture.
- Restoring water levels, re-hydrating wetlands, raising ground water levels, all have secondary benefits to fish and wildlife. In certain locations, substantial wetland restoration may be achieved.
- Fewer risks and challenges & quicker results than construction of conventional reservoirs and STAs.

**A Cost Comparison:**

A rough, conceptual, cost comparison for these different types of projects can be obtained by examining the “Lakeside Ranch STA” built through conventional public works processes, and the “Lykes West Waterhole” FRESP project. Costs shown are both construction and rough projected operating costs through 2013:

<p><b><u>Lakeside Ranch STA</u></b> 2750 Acres          (Effective treatment area 1750 acres)          New Costs (total): \$76,000,000.00</p>	<p><b><u>Lykes West Waterhole FRESP</u></b> 2500 acres          New Costs: \$2,402,728          Preexisting Structure costs:\$1,000,000+-          Total Costs \$3,402,728</p>
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**Conclusion**

Audubon of Florida recommends that the Lake Okeechobee Protection Plan (LOPP) be revised to formally incorporate “distributed” or “dispersed” water management as the centerpiece of efforts to increase water storage and achieve water quality goals through the construction of works in all the upstream tributaries to Lake Okeechobee. The revised LOPP will then become a powerful tool to forge an alliance between SFWMD, landowners, and conservation organizations. Working in unison, that alliance will have a strong chance of success in obtaining permanent, adequate funding for the new Northern Everglades program.