



Lake Okeechobee Watershed Program
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December 13, 2007

Armando Ramirez
South Florida Water Management District
MS 7640
3301 Gun Club Road
West Palm Beach, FL 33406

Dear Mr. Ramirez:

On behalf of Audubon of Florida, I am pleased to submit these comments on the draft "Lake Okeechobee Watershed Construction Project: Phase II Technical Plan" (Plan). The cooperating agencies have done a remarkable job of assembling and analyzing large amounts of data in a very short time period. The conclusions in the report which recommend that much more effort be applied upstream of Lake Okeechobee to restore the lake and its downstream systems, are well founded. This cover letter expresses general thoughts about the Plan, and the following pages contain technical comments about Plan detail.

Audubon concurs that 900,000-1.3 million acre-feet of additional storage upstream of Lake Okeechobee will yield significant improvements, keeping lake levels within desirable ranges, reducing harmful estuary releases, in meeting water supply demands, and in reducing phosphorus (P) flows into the lake. These improvements will help not only environmental values, but benefit the economy of south Florida by protecting tourism and ensuring that water supply for our farms and cities is enhanced. Additionally, as projects in Okeechobee's watershed proceed, we see myriad opportunities to improve the health and future prospects for the major lakes of the region, the success of Kissimmee River Restoration, and the ecological integrity of the watershed itself

There has been some confusion about how the Management Measures (MM) mentioned in the report relate to actual storage and treatment plans. For example, page 7-17 identifies a 42,000-acre reservoir in the Indian Prairie region that would contain 600,000 acre-feet of water. While storing this much water in this watershed may be a sound goal, this idea has not been examined in detail and it is very unlikely that a single reservoir of this size will be the optimal way to gain the storage. Rather, Audubon would recommend a diverse approach incorporating a combination of reservoirs, low-to-high volume storage projects on private lands, and perhaps wells and upstream storage. Indeed, throughout this, and all watersheds, there is a need for an intensive effort to retrofit private canal and drainage ditch systems with modern water control structures based on sound hydrologic modeling. Most of the emphasis for MMs tends to be on large structural features and although we have been told verbally that the agencies intend to

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include a strong private lands component in this effort, some of our colleagues have concluded (perhaps prematurely) that the agencies' favored strategies are dominated by these large-scale, constructed features. We recommend that the Plan be revised to include more explanation that, except for existing projects, MMs are conceptual, will include much more diverse approaches than large structural fixes, and that integrated MMs will be studied in detail before final project selection. Indeed, all the details in the Plan can be modified as model refinements and planning continue in ever-increasing detail.

We remain concerned that none of the alternatives appear able to reach the phosphorus (P) goal by 2015. In addition to ongoing projects, an increased focus on P source control must to be made. The Mock-Roos reports of 2003 and 2004 indicated that there still are more than 5000 tons of additional P added to the watershed each year, above and beyond our current problems. This clearly is not sustainable and must be addressed if the Northern Everglades Plan is ever to succeed.

Audubon appreciates the opportunity to work with you on developing and implementing this Plan. We realize the goals identified are daunting, and especially with tax reform and other concerns about funding, full achievement of the Plan will likely take decades. We look forward to implementing components as rapidly as possible and especially to the time when Lake Okeechobee, instead of seemingly getting worse every year, starts showing signs of improvement.

Sincerely,

Paul N. Gray, Ph.D., Science Coordinator
Lake Okeechobee Watershed Program

Technical notes

Suggested Plan refinements for the near future

- There are no plans specified for storage or water quality treatment in the Kissimmee Chain of Lakes region. We support using the KBMOS effort to determine what opportunities for additional storage and treatment are available in the region. Further, the arbitrary constraints on this project dictating that no structural changes or land acquisition be considered, and not including a water quality component (see page 3-10), must officially be removed. The district should take immediate action at the executive or board level to resolve this problem.
- Phosphorus management measures are calculated only against the average amount of P entering the lake. A more robust evaluation would be to compare P management measures for each individual year of the period of record to determine how measures would function in high and low P years, and to be able to calculate the 5-year running average, to match the way TMDL compliance will be evaluated.
- The Plan used the WSE regulation schedule for Lake Okeechobee, which is being updated. As soon as possible, the new schedule that the Corps adopts, in conjunction with the new Lake Okeechobee Water Shortage Management rules, should replace WSE in the models.
- Evaluating salinity envelopes for the St. Lucie River is based on an erroneous target of maintaining at least a 350 cfs flow. The river actually does best with no flow from Lake Okeechobee and evaluations of positive performance should be based on zero flow, not the higher number.
- The Management Measure constraints identified in Chapter 7 (7.4.1) must be refined to reflect different characteristics of the measures. Many of the constraints listed apply to RaSTAs, but are not constraints to measures such as wetland restoration. Indeed, most of the areas deemed of poor suitability in Figure 7-2 have great potential for wetland restoration, with concomitant benefits. This consideration also applies to the ecologic value constraint, where wetland restoration potential may have very high suitability.
- An increased ability to move Lake Okeechobee water southward will be essential for this Plan to gain its full potential. A re-evaluation of storage, treatment, and conveyance needs in the EAA must be conducted in light of the findings in this Plan, as well as including future opportunities from projects in the southern parts of the system including Decomp, Mod Waters, and related efforts.
- Storage estimates in this Plan are based primarily on reducing harmful estuary releases and not on ecologically harmful high water events in the lake (page 7-2). Future refinements should evaluate the lake more carefully.
- Integrating land use planning with water management planning, as discussed on page 9-8, is excellent and should be a strong feature of future refinements to the extent practicable.

- A trend analysis of P dynamics in Lake's Istokpoga and Kissimmee should be conducted. P control measures from these lakes are based on average loads over the past 15 years, but we note that P concentrations have roughly doubled from these lakes over this time period (Fig. 1 shows recent Istokpoga trends). If the increasing trend continues, calculations based on the present average will underestimate future needs.

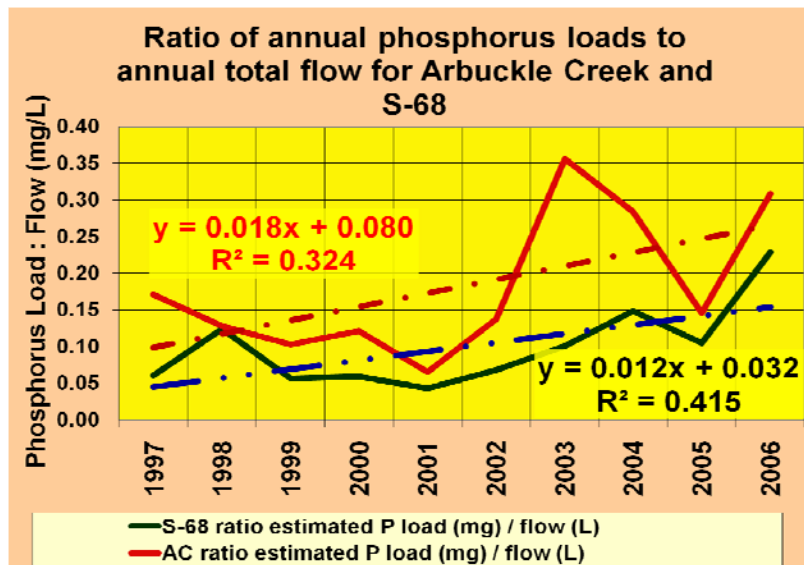


Fig. 1. Phosphorus loads entering, and leaving, Lake Istokpoga have increased over the last decade. If this trend continues, using an “average” phosphorus load for planning Northern Everglades features will underestimate needs. (Courtesy: Clell Ford, Highlands County Lakes Manager, from 2007 North American Lake Management Society talk, “Lake Istokpoga’s Link to Lake Okeechobee and Everglades Restoration.”)

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- Redesigning the function of private lands as part of the water management infrastructure: The entire Okeechobee watershed is latticed with privately-constructed drainage features which were built before regulatory requirements and are indicative of haphazard design and gross overdrainage. Yet, they are the water management infrastructure for the vast majority of the land (and water) in the watershed. Many canals and ditches have no water control structures, or the structures are in disrepair or inoperable. Specifically modeling these canals and ditches, and developing a plan to install modern structures, possibly telemetered in the case of larger canals, should be undertaken by the SFWMD. Raising water levels in these canals only a foot or so could result in hundreds of thousands of acre feet of storage without significantly interfering with current agricultural land uses or future land development potential.

In addition to raising ground water levels through installation of control structures in private canals, the district should explore the benefits of reflooding wetlands throughout the watershed, compensating landowners for use of their land. Water storage in rehydrated wetlands could be a multiple use that would be compatible on many properties if landowners were given financial reward for participating.

The Kissimmee Basin is an example of a vast region that was deemed of low suitability for management measures in the Plan. If a combination of the last two approaches were spread widely throughout the basin, this region has the potential to gain comparable overall water storage capacities (and water quality benefits) as deep reservoirs. And possibly do so without the risks, high land acquisition costs, and high construction costs (especially considering recent standards for dam structures) of structural features.

Other comments:

The East Okeechobee Basin P reductions are projected to attain a load of 8 mt. While we support a number in this range, the Lake Okeechobee Operating Permit allows twice this amount (16.84 mt). The discrepancy may need to be addressed.

page 1-9, line 277 Rather than state a goal of reducing P inflows by 409 tons, it is preferable to state the goal is "meeting the TMDL." As the period of record changes, the reduction goal will change but the TMDL will not.

p. 2-6 line 195 I am confused about the definition of improved pasture vs. natural areas. As I understand it, wetlands in improved pastures are counted as natural areas, even though they function as grazing land. This might have importance if runoff values are calculated based on land use in basins and the pastures and wetlands are assigned artificially different P coefficients. Please clarify how these definitions are applied.

p. 3-7 We strongly support further work on the feasibility of dredging sediments from the lake bottom. We suggest that the agencies include experimental dredging in the Government Cut, along with Eagle Bay Island activities.

p. 3-9 Kissimmee Headwaters project. It would be good to include the number of acres that will be reflooded in the Headwaters project because it is a large number (~30,000 acres) that the agencies should take credit for.

p. 3-9 and 3-10. The Kissimmee Chain Long Term Management Plan and the Kissimmee Basin Modeling and Operation Study are good projects that have had artificial, and crippling, restrictions placed on them. As noted in lines 409-413, there is no water quality component and no structural component in the KBMOS. These restrictions must officially be removed or the projects cannot possibly succeed as part of a successful Okeechobee restoration effort.

3-14 lines 593-596 contain an excellent narrative on how site-specific projects not only improve that site, but also improve regional conditions. This consideration merits more emphasis as the various efforts move forward.

- 3-19 The extreme low lake stages discussion should include a narrative on the peat soils of the southern islands that are home to the endangered Okeechobee Gourd and are at risk of subsidence from oxidation and/or fire during low water, thereby threatening the gourd.
- 3-19 lines 770-772 say climate has the most important factor in recent record levels. The 1955-56 drought was as dry as present, but the lake only dropped to 10.25 (higher than it is today). It must be noted that drainage has helped make this drought worse.
- 3-21 as noted earlier, the goal for the St. Lucie flow should be zero, not a minimum of 350 cfs
- 5-7 This section notes that the Kissimmee Chain lakes are absorbing P and improvements in upstream inflows is unlikely to show substantial improvement in outflows. This argument omits the conclusions of White et al that these lakes might soon be P saturated, which would tend to increase their P outflows significantly. P saturation must be avoided if Okeechobee's P TMDL is to be met and sustained, and if the Kissimmee River, and lakes themselves, are to be protected from water quality problems. We recommend a distinct discussion of the future water quality in the region be included (all planning studies try to predict future changes in population, water demand etc. to meet those challenges, why not predict future P changes?).
- 5-8 Line 143 states an intention to use the restored Kissimmee River as a P treatment facility. This will lead to P saturation, seriously impairing the river, and creating increased P flows to Lake Okeechobee. A specific component of this Plan should be to prevent this from happening.
- 5-13 The same concerns discussed for changing P levels and future saturation on the Kissimmee Chain and River apply to Istokpoga (Fig. 1). Planning to use these lakes to treat P in the short term will cause more severe, and expensive, P problems in the long term. The Plan must explicitly develop strategies to prevent P saturation.
- 5-23 We concur with using 1991-2005 as the period of record for current analysis. It has a mix of "drier" years from the early 1990s, the drought of 2001, plus volatile wet years since 1995, giving a well-rounded range of P conditions to consider.
- 5-21 Figure 5-11 is an interesting comparison of P amounts compared with flow rates, but the Y-axis units should be changed to metric tons so it can be compared with actually meeting the TMDL (and not the % of total P load, which is an "accident of history" unrelated to legal mandates of restoration). Having the Y-axis as it is, leads to the novel conclusion that the 55 tons of P from Fisheating Creek are more of a threat to Okeechobee's TMDL than the 91 tons of P coming from the Kissimmee Chain. Such a conclusion is erroneous. While targeting Fisheating Creek and Indian Prairie (p. 5-24) may be efficient, the higher-loads from the Kissimmee Chain must receive more reduction, and attention.
- 6-1 We note that a 1970-2005 period of record has about two-thirds of the years from a drier climate pattern than we appear to have been in since 1995. Although not a fatal flaw, it must be remembered that model predictions might tend to be skewed toward drier forecasts than upcoming years might yield.
- 7-4 section 7.3 This is a place where the Plan might benefit from an expanded explanation of wetland restoration-type MMs and their role in future plans

7-10 Lines 403-405 consider evaporation from reservoirs a negative. We note that in most years too much water enters Lake Okeechobee to be handled without some harm, therefore in most years evaporation from reservoirs should be considered beneficial.

7-12 Ecologic value—lands with a high EVS (>4) actually can be highly suitable for wetland restoration, not “low suitability” as concluded here. We understand that restoring very low value lands (e.g., a parking lot would score 0) leaves the most room for improvement (boost the score), but restoring partially intact systems has a higher likelihood of ending with an appropriate hydrology, high biodiversity and other desirable characteristics. This is a MM that must be scored with more caveats to work appropriately.

8-23 The decreased water supply cutbacks predicted for the 2001 drought is encouraging.

9-3 This has a good discussion of the mix of measures that will be considered and similar text could be added to chapter 7 and other key places