Lake Okeechobee Watershed Project

Open House and Information Exchange

INDIAN RIVER STATE COLLEGE
WILLIAMSON CONFERENCE AND EDUCATION CENTER
Raulerson Auditorium
2229 NW 9th Ave., Okeechobee, FL 34972
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Meeting Summary

1. Welcome and Introductions: James Erskine, Working Group Vice Chair and Allyn Childress, SFERTF

- ***James Erskine, Vice Chair of the Working Group, welcomed everyone.***
- ***He explained that the meeting would start with two presentations and requested that everyone hold their questions until the open house time frame.***
- ***He explained the 6 stations around the room would be utilized for the open house and to exchange information.***

2. Meeting Procedures and Ground Rules: Allyn Childress, SFERTF
https://evergladesrestoration.gov/content/lowp/meetings/040417/welcome_groundrules.pdf

- ***She asked for self-Introductions of the attendees.***
- ***She explained that the goal is to provide an update of the current status of the Lake Okeechobee Watershed Project (LOWP).***
- ***Tables in back by subject matter:***
    1. ***Plan Formulation***
    2. ***Engineering: Design of Reservoirs and Wetlands***
    3. ***Engineering: Modeling***
    4. ***Engineering: ASR and Deep Well Injection***
    5. ***Ecological/Cultural Resources***
    6. ***Water Supply***
- ***After the Open House, everyone will come back together for final comments and questions.***
- ***Materials available on www.EvergladesRestoration.gov under the Task Force link.***
- ***Information is also available on the calendar and she explained how to sign up for the blogs to get future meeting and other Task Force related information.***

3a. Overview and Status of the Lake Okeechobee Watershed Project: Lisa Aley, USACE
https://evergladesrestoration.gov/content/lowp/meetings/040417/Plan_Form_Update.pdf

- ***LOWP is part of larger Comprehensive Everglades Restoration Plan (CERP).***
- ***4 of the 68 CERP components are included in the LOWP.***
- ***4 project objectives:***

1. *Improve quantity, timing, and distribution of flows into Lake Okeechobee to maintain ecologically desired lake stage ranges.*
2. *Improve the salinity regime and the quality of oyster, submerged aquatic vegetation, and other estuarine community habitats in the northern estuaries.*
3. *Increase spatial extent and functionality of wetland habitat throughout the Lake Okeechobee watershed.*
4. *Proposed scope addition: Increase water supply availability for existing permitted water users of Lake Okeechobee.*

- *Phase 1 of the plan is to improve Lake Okeechobee stage conditions, increase availability of water supply, and improve high and low discharges to the Northern Estuaries through Aquifer Storage and Recovery (ASR) and Reservoirs.*
- *Phase 2 is increase the spatial extent and functionality of aquatic and wildlife habitat through wetland restoration within the watershed.*
- *Phase 3 is improve damaging high discharges to the Northern Estuaries through Deep Injection Wells (DIW).*
- *Phase 1 Plan Formulation – Reservoirs*
    - i. *20 reservoir sites initially considered; chose sites downstream with higher water availability and higher percentage of SFWMD-owned land along with other considerations.*
    - ii. *4 reservoir configurations retained (KO5 North, K05 South, K-42 and I-01).*
- *Phase 1 Plan Formulation – ASR*
    - i. *80 wells identified in the 2015 ASR Regional Study;*
    - ii. *Up to 112 considered including reservoir-assisted wells.*
    - iii. *Will look at increments of 60-112 ASR wells per alternative.*
- *Phase 2 Plan Formulation – Wetland Restoration*
    - i. *Used previous LOWP study. Want at least 3,500 acres for spatial extent of habitat.*
    - ii. *Have identified 4 top sites.*
- *Phase 3 Plan Formulation – Deep Injection Wells*
    - i. *Proposing 30-90 DIW to reduce damaging releases to the Northern Estuaries.*
    - ii. *Modeling shows no water supply impacts.*
- *Initial Array of Alternatives*
    - i. *Alternative 1*
        1. *Approximately 18,000 acres of reservoirs, 7,300 acres of wetland restoration, 60-110 ASR wells, and 30-90 DIWs.*
    - ii. *Alternative 2a*
        1. *Approximately 30,000 acres of reservoirs, 13,600 acres of wetland restoration, and 60-110 ASR wells.*
    - iii. *Alternative 2b*
        1. *Approximately 20,000 acres of reservoirs, 13,600 acres of wetland restoration, 60-110 ASR wells, and 30-90 DIWs.*
    - iv. *Alternative 3*
        1. *Approximately 22,000 acres of reservoirs, 10,100 acres of wetland restoration, 60-110 ASR wells, and 30-90 DIWs.*

3b. Overview and Status of the Lake Okeechobee Watershed Project: Walter Wilcox, SFWMD
https://evergladesrestoration.gov/content/lowp/meetings/040417/initial_alternative_array.pdf

- ***The interagency modeling center (IMC) gathers detailed information to develop the computer models including the maps developed at the first Working Group workshop in August 2016.***
- ***The screening model (RESOPS) was improved and utilized last fall to look at the different concepts and features to see if those management measures provide benefits and to help determine what size the features need to be. An example was provided of how introducing storage (various combinations of surface storage and ASR) into the system could help decrease the occurrence of high discharges to the estuaries.***
- ***More recently the team has moved into a more detailed phase with regional hydrologic models (RSMBN) that emulate the current system. The model includes Lake Okeechobee, the upper Chain of Lakes, the Kissimmee River, the estuaries, and the Everglades Agricultural Area (EAA). The models take a 41 year historic hydrologic record (1965-2005) and see where the water goes, water levels, etc. The model incorporates project features and operating criteria to see how things change with those added features and the team evaluates the results according to ecological benefits.***
- ***The team began this regional round of modeling on February 1st and the information presented includes alternatives 1, 2a, and 3 (2b hasn't been modeled yet). The information is continually evolving as the engineering subteam modifies specific feature configurations so the exact figures in the presentation differ slightly from the handout.***
- ***Alternative 1 includes the K-O5 North and South reservoir (258,000 acre-feet), 60 ASR wells at the K-05 facilities, and an additional 50 ASR wells spread throughout the watershed. All the wells have the ability to take lake water.***
- ***Alternative 2 adds the K-42 reservoir so it has the largest storage of the three alternatives being reviewed today (408,000 acre-feet).***
- ***Alternative 3 moves away from the K-O5 site and has the K-42 and the I-01 reservoirs sites instead. The storage volume is about the same as Alternative 1. Since the K-05 site is not being utilized, the 40 ASR wells in this alternative are distributed throughout the watershed.***
- ***Operational considerations will also need to be looked at, in addition to just adding storage features. The 2008 Lake Okeechobee Regulation Schedule (LORS2008) applies to the current system. In the future we will have options to make different choices because more infrastructure will be available. The team conducted a robust operational refinement for the added infrastructure. The Restudy/Yellow Book actually envisioned that a regulation schedule wouldn't be needed in the future except in emergencies.***
- ***Each alternative went through an optimization process over a four-week period and conducted 10,000 runs for each alternative. These runs helped to identify operations that are capable of achieving the outcomes we want.***
- ***The optimization process allowed them to compare the model results to the desired lake stage envelope (for the lake ecology including healthy submerged aquatic vegetation***

(SAV) and fish populations), the bottom of the LORS2008 schedule (above which regulatory releases can occur for flood protection), and the water shortage trigger line (established by South Florida Water Management District rule and below which there would be restricted allocations to users within the Okeechobee Service Area water including agricultural users and utilities). The optimization results indicate when to divert water to available storage (top line) and when to recover water from storage (lower line) in order to achieve the performance measures. It was noted that when it rains, the lake fills very quickly. Similarly, a drought can quickly lead to lower levels that cause adverse ecological impacts and can violate the lake's Minimum Flows and Levels (MFL).

- ***Some model results were presented and it was noted that all the data, including water budget maps, are available on-line.***
- ***Performance measures summarize the information in different ways, both ecological and hydrological. Some examples were provided that compared the targets, existing conditions/baseline (ECB), future without (FWO), and the three alternatives regarding salinity and high discharge criteria for the estuaries. The number of discharge events were reduced and the events that do occur are shorter in duration for the St. Lucie Estuary. For the Caloosahatchee Estuary, there were less months of the base flow being too low and see improvements in high and extremely high discharge events.***
- ***Flow duration curves illustrate that all three of the alternatives improve on the lake portion of the problem regarding the low and high discharges.***
- ***Stage duration curves for Lake O show the percent of time where you are at a certain stage. It illustrates the benefits of the alternatives on the low side to help avoid water shortage cutbacks. On the high side, they have incorporated more flexibility regarding the Herbert Hoover Dike, assuming it can hold more water when the repairs are completed, but will still have to determine ecologically, what height and for how long those high level events would be suitable for the Lake. The hydrographs show the same information in a different way.***
- ***Lake Okeechobee Stage bar graphs: Performance measures look at standard scores, and the closer to a 100 is the better you are doing for the lake ecology.***
    - ***i. Score above envelope: Don't see much improvement on the high side from the projects, better than FWO but not much different than the current conditions.***
    - ***ii. Score below envelope: Substantial benefits from the project.***
    - ***iii. Extreme high lake stage (above 17' NGVD): Current system doesn't go above 17' due to HHD considerations and LORS2008.***
    - ***iv. Extreme low lake stage (below 10' NGVD): This project avoids going down to 10' because it can recover water from storage features.***
- ***Combined annual ecological scores, the aggregate numbers are higher which mean that there is better ecological performance than the baseline conditions.***
- ***Lake Okeechobee stage and combined ecological score graphic looks at a wetter period and the team is looking for feedback on it. Looking at prolonged wet period from 1995 – 2005. From a lake stage perspective, the extreme high stages aren't peaking higher than the baseline conditions and in some cases are lower. The ecology metric indicates that is pretty similar to the baseline but when wetter, it's more of a mixed bag.***

- ***Water shortage goal is to get back to more WSE-like (Water Supply/Environmental schedule) cutbacks (not WSE-like overall Lake stages). During more moderate drought years, events are almost down to zero. Fewer years with cutbacks and even those have less percentage of cutbacks relative to the baseline.***
- ***Regarding above ground reservoir performance, the reservoir is filling and emptying which indicates fairly high utilization of the reservoir. It is not utilized in droughts but in wetter years, we run out of reservoir space. The storage utilization reflects the hydrological variability of our system.***
- ***Regarding ASR recovery performance, the graph looks at the storage volume retained in the bubble. We are using the Restudy 70% efficiency rate of recovery. This represents the water being held underground. The graph covers 3 facilities and if you take the peak storage, it's over 1.7 million acre-feet.***
- ***Northern Estuaries benefits summary indicates that from the alternatives, the St. Lucie estuary sees about a 50% reduction and the Caloosahatchee Estuary a 66% reduction in regulatory flows relative to current conditions. Reduction of flow is not the only metric that is important. Base flow to the Caloosahatchee Estuary is also important. The frequency of events is also important. The alternatives also reduce the number of years/months with damaging events. In today's system, too wet years occur about half the time, with this project it would be about a quarter of the time. This would allow the ecology to rebound and thrive in between events.***

4a. Open House and Information Exchange: Open House Forum

- ***Shannon Estenoz, Executive Director of the SFERTF, explained that the Task Force has the ability to convene in a different and in-depth way. She encouraged everyone to take advantage of this opportunity to ask questions and get answers.***
- ***The workshop participants were then given time to visit the staffed tables:***
    - ***i. Plan Formulation***
    - ***ii. Engineering: Design of Reservoirs and Wetlands***
    - ***iii. Engineering: Modeling***
    - ***iv. Engineering: ASR and Deep Well Injection***
    - ***v. Ecological/Cultural Resources***
    - ***vi. Water Supply***

4b. Open House and Information Exchange: Questions from Audience/Participants

- ***Dawn Shirreffs (Everglades Foundation) asked about the project's timeframe, including land acquisition challenges and unknowns regarding DIWs. She stated concern regarding the de-authorization process of inactive projects as identified in WRDA 2016, and what would happen if the project took too long. Staff responded that LOWP is an active project and is moving forward to meet the required 3 year planning timeframe. The first goal is to develop a Tentatively Selected Plan which is needed for the local sponsor to move forward with any associated land acquisition. Regarding DIW uncertainty, staff stated that there are deep injection wells that have been operating dependably around Lake Okeechobee by utilities for the last decade without any monitoring or operational issues. DIWs are included in this project as a technical solution to***

reduce the high discharges to the estuaries that could occur even after the reservoirs and ASR facilities are constructed.

- ***Paul Gray (Audubon Florida) expressed concerns regarding the health of Lake Okeechobee, particularly regarding prolonged and repetitive damaging high water events (as occurred between 1995 and 2005). He asked if there was a way to determine how much the reservoirs and ASR wells are helping as opposed to using the Lake like a reservoir. He also asked if the model could be run with the Lake being managed according to the LORS to help tease out what this project does for the Lake. Staff responded that yes, the very wet years are very challenging and that the project team is conscious of those concerns and are looking to find a balance between existing LORS condition and to use performance measures to make sure Lake conditions don't get worse.***
- ***Dave Urich (Responsible Growth Coalition of Fort Myers) stated that he is opposed to DIWs because it is cost prohibitive and we might over-rely on it. He would rather see that money spent to get the water out of the Water Conservation Areas and under the bridges, to the Everglades, Taylor Slough, and into Florida Bay.***
- ***Steve Davis (Everglades Foundation) expressed concerns about how the planning process will address water quality beyond phosphorus, specifically water injected and recovered in ASR and surface storage and whether RSTAs (reservoirs and stormwater treatment areas) will be employed. Staff indicated that water quality is not an objective of this study, but it is an opportunity. Due to federal policy, the Corps will not cost-share on water quality treatment features, and therefore STAs and RASTAs will not be formulated as part of the LOWP. Staff indicated that ASR is a regulated activity. Water is checked and treated to drinking water quality standards before recharging for ASR. Prior to recovering from ASR and returning the water to the originating surface waters, it will need to be oxygenated and checked for constituents of concern. The pilot ASR system that was built and operated along the north rim of Lake Okeechobee successfully demonstrated that water quality standards could be met during ASR operation. Any nutrients in the water sent to DIWs won't be seen again in the system.***
- ***Diana Umpiere (Broward Sierra) stated that it would be helpful to state why water quality is not included, as they see it as a missed opportunity to improve the quality of water going into the lake.***
- ***Martha Musgrove (Florida Wildlife Federation) believes that the project should provide benefits to Lake Okeechobee. FWF prefers LORS to WSE as far as operating schedules. While understand legal impediments and cost-sharing issues, they would like to get a measure as to how much phosphorus reduction will occur for the Lake and the watershed through this project.***
- ***Tommy Clay (DL Pearce Ranch Inc. also Okeechobee Utility Authority board member although not here representing them) expressed concerns that the project's reservoir locations will have significant eminent domain issues, particularly with land owners who have been here since 1939. They have businesses to run in the meantime and he suggested that some simple things could be done immediately to store water in Paradise Run and implement other smaller projects to hydrate local marshes. Staff responded that smaller wetland and reservoir sites were looked at on SFWMD-owned properties, but indicated that distributed above-ground impoundments do not provide cost effective solutions to meeting the protection goals and objectives. Paradise Run is one of the top-performing wetland sites so it's included in the majority of the plans. 3,500 acres is the target for wetland restoration. It was noted that LOWP is part of the overall CERP project but***

that the Florida Fish and Wildlife Conservation Commission has invested in many of these smaller projects like Fisheating Creek, Paradise Run, and others. The LOWP is at the larger landscape level but other agency programs have mechanisms to make improvements on those smaller projects. Tommy Clay invited everyone out to see some of the smaller, local sites.

- ***Commissioner Ed Fielding (Martin County) mentioned that in the last 18 months, there have been records set for the wettest and driest and that project planning needs to address these intense extremes. He stated that the plan needs to address the most serious priorities as urgently as possible to be competitive for federal funding. He believes we need 1 million acre feet of reservoir north of lake because once water gets into the lake, estuaries are the only places forced to take water regardless of quality. Need reservoirs because ASR can't help during emergencies.***
- ***Keith Pearce (Pearce Ranch) stated that a simple modification of his surface water use permit could allow him to utilize more water than it does now. Prior to today's workshop, he was told by SFWMD staff that the permit was not to water pastures, it was for watering cows. However, in order to grow his crop (cows), he needs to water the pastures. By modifying irrigation ditches and adding water control structures, he could utilize more water that will slowly seep into the ground and eventually enter Lake Okeechobee. Water quality testing shows the water leaving his property is cleaner than that in the canals. He stated that hundreds of ranchers would be willing to help store more water before it gets into the Lake and it would improve the water quality as well. He stated that there are other options besides reservoirs and was concerned that Paradise Run would be flooded and destroyed to serve as a 10' reservoir. Staff clarified that Paradise Run will be utilized for wetland restoration, not as a reservoir. Staff also stated that the SFWMD has a program in place (known as the Dispersed Water Management Program) where public/private partnerships are developed with agriculture land owners to improve water quality and hydrology on a local and regional level. Under the Dispersed Water Management Program land owners small and large are paid for providing these environmental services. Mr. Pearce reiterated that it is important to consider the smaller landowners.***
- ***Bill Louda (Florida Atlantic University) stated that in regards to water quality, because of the most recent Algal Bloom, we need to be concerned with Nitrogen in addition to Phosphorus. He also stated that if this project can't look at water quality issues, that filtering marshes could be looked at as habitat restoration. Restoration should look at the Kissimmee River and the widening of the riparian marshes not as filtering marshes but as a means to generate wildlife habitat.***
- ***Elizabeth Tetreault (Progress for All, organization based in Broward County) asked if there is a plan for the overall restoration effort, not just what is happening north of Lake Okeechobee. Staff indicated that for the overall restoration effort is the Comprehensive Everglades Restoration Plan (CERP) that includes a total of 68 different project components. LOWP has four of those 68 components. Studies have shown that we need to have one million acre/feet of storage, three-quarters of which needs to be north of the Lake. The Integrated Delivery Schedule (IDS) sequences CERP projects components to obtain the most environmental benefits as early as possible in the CERP program.***
- ***Darryl Rutz asked if a healthy dike would alleviate all the water problems. Staff explained that beyond storing water, the ecology of the Lake is also important. Recreation and tourism depend on a healthy lake, lake vegetation, and fish populations. LOWP will provide storage north of the lake which will help the health of the Lake. We need to get the water right in the lake as well.***

- ***Gary Ritter (Florida Farm Bureau) stated that the region has 8 million people and is still growing and that the planning process should factor in future development. He also stated that he hopes that the Basin Management Action Plans (BMAPs) currently being developed will address water quality. Staff responded that other agencies such as DOT plan for infrastructure based upon population projections. This project is also an investment and infrastructure project in a region twice the size of New Jersey.***

5. Adjourn, James Erskine Allyn Childress