Hoppes, Linda

From: Elliott, Rebecca
Sent: Wednesday, October 03, 2012 7:43 PM
To: Hoppes, Linda
Cc: Gefvert, Cynthia; Scott, W Ray
Subject: LWC WSP 2012 Update - August 2012 Draft Comments
Attachments: LWC WSP August 2012 Draft Comments 100312 Submitted RE .docx

Hi Linda,

Please find my comments on the draft for the LWC WSP 2012 Update attached. Apologies for the delay in providing these to you. I encountered several unanticipated events that derailed the timeline for completing my written comments.

I have focused on the chapters and appendices with loose ends most likely to be of interest to agricultural concerns. These are the Executive Summary, Chapter 2, Chapter 3, Chapter 4, Chapter 7, and Appendices G, H and I. If time allows, I may take a look at a few more chapters, such as Chapter 5, or appendices, such as Appendix A, and send additional comments as appropriate.

Please do not hesitate to contact me for additional information or discussion.

Thanks,

Rebecca Elliott
Water Policy Liaison
FDACS/Office of Agricultural Water Policy
PO Box 24680 / MS 4410
West Palm Beach, FL 33416-4680
(561) 682-6040

DATE: Oct. 3, 2012

TO: Linda Hoppes, SFWMD

FROM: Rebecca Elliott, FDACS

RE: 2012 Lower West Coast Water Supply Plan Update
Comments for Aug. 2012 Draft of LWC WSP 2012 Update

General Comments

The SFWMD staff's efforts to gather information and stakeholder input during the development of the Lower West Coast Water Supply Plan 2012 Update is appreciated. It has been extensive. Below are additional comments on the August 2012 Draft.

Comments were submitted June 22, 2012 on Draft Chapter 3, Chapter 4 and Appendix G. Based on subsequent discussions with you, it is my understanding that some of those comments would result in revisions to Chapters 3 & 4 but all potential revisions were not included in the August 2012 Draft. Due to this, I am retaining those comments in this review for follow-up. I would appreciate a chance to review the changes related to the June 22 comments before this phase of draft review is completed.

I also understand previous comments on Appendix G have been addressed by a rework of Appendix G into Appendices G, H and I. A new round of comments has been provided for these sections.

There is still concern about the lack of an identifiable consolidated plan of action to address the water supply shortfall projected for future agricultural water supply demands. The sources of additional future water supply described in the draft are not feasible on a wide spread basis and cannot be considered a source option for substantial increases in regional or alternative water supply availability. Water supply meeting the 1:10 drought condition level of service will require strategies beyond tailwater recovery, stormwater retention ponds, blending of brackish groundwater with freshwater, dispersed water management and conservation. The limited nature of the strategies listed above should be clearly stated and should not be anticipated as major water supply components in the consumptive use regulatory program.

Throughout the document the sentence "New or increased allocations will likely require a cumulative impact analysis and will be evaluated on a case-by-case basis." occurs. It is not clear how a "case-by-case" water use permit application could have the data or resources to perform a cumulative impact analysis. This may need some rewording since I do not think it is your intention to link a cumulative impact analysis to a single permit application. While the impact analysis process is a regulatory function, its nexus with the water supply plans could be resources and actions identified in the plan to support a cumulative impact analysis. Agricultural stakeholders would be open to a technical meeting to discuss this aspect of water supply

planning. Doing a document search for this phrase and separating the cumulative impact analyses from case-by-case permitting is recommended.

Executive Summary

1) General Summary
The inclusion of text addressing the "… necessary repairs to the Lake Okeechobee Herbert Hoover Dike." and "…studies to identify additional sources of water for agriculture are needed." is noted. These items are of particular importance to the producers in the LWC since their ability to develop alternative water supply sources is limited by crop requirements and economic considerations.

2) Issues and Evaluation (Chapter 3)
Please refer to Chapter 3 below for my comments on the bullets included in this section.

3) Evaluation of Water Source Options (Chapter 4)
The first paragraph ends by acknowledging that future Agricultural Self-Supply water demands will not be met in a 1:10 drought condition over the 20 year planning horizon. The following three paragraphs then describe alternative/supplemental sources of water identified for agricultural use such as "….stormwater retention ponds as supplemental water supply for crop irrigation." and "Potential uses of reclaimed water include landscape and agricultural irrigation,….". These sources of water rarely, if ever, can be used by agriculture to meet water supply needs in an average year's dry season and have no utility in a 1:10 drought condition. A technical meeting with water planning staff and agricultural stakeholders for further exploration of this topic for the LWC WSP 2012 update is recommended.

Please refer to Chapter 4 below for additional comments.

4) Water Resource Development Projects and Water Supply Development Projects (Chapters 5 and 6)
This information covers topics and efforts associated with PWS utilities and appears to omit information on future agricultural water supply.

5) Future Directions (Chapter 7)
Agree with the conclusion that completion of the necessary repairs to the Lake Okeechobee Herbert Hoover Dike along with appropriate water resource management and diversification are needed to meet future demands.

Chapter 2: Demand Estimates and Projections

The time and effort taken by SFWMD water supply planning staff to research and develop the agricultural land and water use projections for the water supply plan update are appreciated. My review indicates previous comments have been addressed.

Chapter 3: Issues and Evaluations

1) Page 35 and 36 – Under "Summary of Issues Identified for 2030"
a) Bullet one ends with "New or increased allocations will likely require a cumulative impact analysis and will be evaluated on a case-by-case basis." It is not clear how a "case-by-case" water use permit application could have the data or resources to perform a cumulative analysis. This may need some rewording since I do not think it is your intention to link a cumulative analysis to a single permit application.
b) The intensification of water shortages due to LORS 08 is still not clearly stated. Something like " The LORS08 regulation schedule adopted in 2008 has reduced the LOSA level of service to a 1:6 drought condition." could convey the information.
c) Recommend providing a footnote reference to the term "base condition water use" for the second bullet.
d) The Picayune Strand Restoration project reservation established since the 2005-2006 update has also limited fresh water availability from surface and groundwater sources identified for consumptive use water supply in the 2005-2006 LWC Plan Update. This should be clearly stated in the plan update in this section as part of the overall decline in regional freshwater availability to meet future LWC water use demands.

2) Page 37 – Under "Surface Water Availibility is Limited"
a) Recommend that another bullet be added to the list about the level of service for LWC water users in LOSA being 1:6 instead of 1:10.

b) Last paragraph - A brief statement about the Phase 2 CERP C-43 Reservoir Project to provide additional water to meet the CERP natural system and built system water objectives for the C-43 Basin would complete the information.

3) Page 38 – Under "Surficial Aquifer System"
The last two sentences in the second paragraph are noteworthy. "However, new or increased allocations from the SAS will likely require a cumulative impact analysis and will be evaluated on a case-by-case basis. Additional study is needed to identify potential sources of fresh water for uses such as agriculture." While it is clear that agricultural stakeholders need additional freshwater to meet demands; it is not clear how a "case-by-case" water use permit application could have the data or resources to perform a cumulative analysis. There are several ideas contained in these two sentences that may need to be separated and reworded since I do not think it is your intention to link a cumulative analysis to a single permit application.

4) Page 58 – Under "Surface Water"
Recommend that Lake Okeechobee be added to the sub-topics with a reference to the LEC WSP for additional information.

Chapter 4: Evaluation of Water Source Options

1) Groundwater - This section could benefit from its own map that shows the aquifers. The first paragraph of Page 2 does references a cross section in Chapter 1 but it is not easy to follow which of the aquifers are considered fresh groundwater and which are not. Figure 1 could also be used to depict wells that are fresh and the ones that are not.

It would provide a more comprehensive picture on the geological region of water use and water use problems if it could be accomplished without undo effort. Also, it could provide a clearer picture of the IAS that is both fresh and brackish and has many names.

2) Page 66 paragraph one has the Sandstone being used as a major supply of Ag in western Hendry County. This is more applicable to southwestern Hendy and Northern Collier and should probably be limited to those areas. Chloride concentrations increase in the Sandstone as the aquifer extends north towards the Caloosahatchee River.

3) Page 66 – Limited development of fresh groundwater sources. These descriptions demonstrate just how difficult it is to meet permitting criteria for relatively minor amounts of water at specific localities for individual permits. Part of the evaluation of freshwater source options could be to identify areas where regulatory actions, modeling or studies could result in identifying a more widespread availability of fresh groundwater.

4) The evaluation of water source options text discussions could benefit from some standard headers under each source such as:

1. Description of Water Source
2. Description of why water source is (is not) Limited.
3. Options for development of water source in the future (a little water, a lot of water).
4. Options for reconsidering if the source is limited.

5) Page 69 – paragraph 2. We suggest deleting " to ensure the project provides the intended benefits to the natural system." The draft rule only precludes the allocation of the water in the reservoir for consumptive uses. The attainment level of intended benefits will be determined once the project is built and operational.

6) Page 72 – Projects to Capture, Treat, and Store Water. The projects described do not provide water supply for consumptive use and do not appear to significantly enhance groundwater supply in such a way as to provide more water availability at a 1:10 level of service. The Picayune Strand has actually reduced water availability in the vicinity of the project via the reservation for the project. The C-43 West Reservoir has no consumptive uses associated with it. We recommend that water source options for consumptive uses and water supply for environmental purposes somehow be clearly differentiated in the LWC planning process. Perhaps the restoration/reservoir/retention projects do not fit into Chapter 4 or should have their own section for environmental purposes.

7) Page 77 - Summary of Water Source Options – Will there be a table or matrix that matches the water source options with the actual future needs? The first paragraph of this section states "The future water demands of the LWC Planning Area can be met during a 1 in 10 year drought condition over the 20 year planning horizon using appropriate source options." This is true enough but it does not detail a plan for what sources will be used by what water use group or identify the projects that may be necessary to provide the water needed. It appears that PWS has enough source option capacity to meet future demands but we suspect that source options for agriculture are limited and will require some proactive measures in order to meet future demands.

8) Page 78 - Summary of Water Source Options - Third paragraph. Agricultural water supply demand will not be met over the 20 year planning horizon by relying on the blending of FAS water with freshwater agricultural retention ponds. This may be a source option for some farms but has very limited application due to crop requirements and the variety of criteria that must be met for blending to succeed.

9) Page 105 – Agricultural Use – Tools, Programs, and Potential Savings. 2nd and 3rd paragraphs. Follow-up confirmation of two items in these paragraphs as stated or implied is requested.
a) Some citrus growers in the LWC have adopted an open hydroponics/advanced citrus production system as the main mode for their citrus production.
b) SFWMD requires new water permit applications for citrus, vegetable and container nurseries to use low volume irrigation or other systems of equivalent efficiency. It is my understanding that the permitting requirements include some irrigation efficiency criteria but they are tied to irrigation system efficiencies and industry standards – not an arbitrary low volume irrigation system.

10) Page 106 – We are in agreement with comments on Agricultural Mobile Irrigation Labs and the Florida Automated Weather Network submitted by Charlie Shinn, Florida Farm Bureau via email on Sept.5, 2012.

Chapter 7: Future Direction

1) Page 166 – Water Sources - First paragraph.
The sentence "Therefore new or increased allocations from the SAS and IAS will likely require a cumulative impact analysis and will be reviewed on a case-by-case basis." should be revisited. It is not clear how a "case-by-case" water use permit application could have the data or resources to perform a cumulative impact analysis. This may need some rewording since I do not think it is your intention to link a cumulative impact analysis to a single permit application. While the impact analysis process is a regulatory function, its nexus with the water supply plans could be resources and actions identified in the plan to support a cumulative impact analysis. Agricultural stakeholders would be open to a technical meeting to discuss this aspect of water supply planning.

2) Page 166 – Water Sources - Second paragraph.
The last sentence is so broadly stated it may give some readers the impression that the alternative sources identified are accessible on a regional scale. Some limited number of agricultural water users for a limited portion of the hydrologic cycle can benefit from projects such as stormwater and tailwater recovery, and more efficient water conservation practices. While supporting the use of the practices listed where feasible; the impression that they comprise a regional water supply strategy to meet future agricultural water demands should be avoided.

3) Page 166 – Water Sources - Third paragraph.
The last part of this paragraph reads "Agriculture is the largest use category in the planning area, and agricultural users are the primary users of surface water for crop irrigation. Traditional sources may or may not be available to meet all new irrigation requirements depending on the specific locations for new operations. Fresh groundwater may be available, but quantities will depend on local conditions, including other uses in the area."
As a future direction this sounds like a tossup instead of a plan to meet future agricultural water demands in a 1:10 drought condition. Agricultural stakeholders are available for a technical meeting to provide input into how this section's future direction for agricultural water supply can be improved.

4) Page 167 – Groundwater – Third bullet.
Agree and appreciate the third bullet regarding the need to identify areas of available fresh water to meet future needs for agriculture.

5) Page 167 – Surficial Aquifer System – First bullet.
The sentence "The potential use of the SAS for new or increased allocations will likely require a cumulative impact analysis and will be evaluated on a case-by-case basis through the SFWMD's consumptive use permitting process." should be revisited. It is not clear how a "case-by-case" water use permit application could have the data or resources to perform a cumulative impact analysis. This may need some rewording since I do not think it is your intention to link a cumulative impact analysis to a single permit application. While the impact analysis process is a regulatory function, its nexus with the water supply plans could be resources and actions identified in the plan to support a cumulative impact analysis.

6) Page 168 – 169 – Surface Water - Second bullet.
A brief statement about the Phase 2 CERP C-43 Reservoir Project to provide additional water to meet the CERP natural system and built system water objectives for the C-43 Basin would complete the information.

7) Page 170 – New Storage Capacity for Surface Water or Groundwater
There is still concern that projects providing incremental hydrological benefits for environmental purposes for a portion of the year are being represented as water supply projects. Recommend that the environmental projects be clearly separated from water supply projects in the WSP.

8) Page 170 – 171 - Water Conservation – Ninth bullet.
Recommend adding "economically feasible" to the "applicable and appropriate" qualifiers in this bullet pertaining to the installation of higher efficiency irrigation systems.

Appendix G: Minimum Flows and Levels Criteria, Recovery and Prevention Strategies
1) Page 261 – Under "Recovery Strategy - CERP Caloosahatchee River (C-43) West Basin Storage Reservoir Project"
The CERP C-43 Basin project included more than the C-43 West Basin Storage Reservoir. In order to meet the goals and objectives of CERP, additional C-43 Basin storage was anticipated for the benefit of both the estuary and consumptive use water supply. The C-43 West Basin Storage Reservoir project was initially referred to as Phase I of the CERP C-43 Basin project with a Phase II – perhaps even III – to capture additional basin run-off during the wet season and provide water supply in the dry season. The Caloosahatchee Basin Recovery Plan will not be fully realized until the additional storage envisioned in CERP is in place. The need for additional storage should be part of the Recovery Strategy narrative.

2) Page 263 – Water Reservation Rule, first paragraph, last sentence - We suggest deleting "the rule will ensure the project provides the intended benefits to the natural system." The draft rule only precludes the allocation of the water in the reservoir for consumptive uses. The attainment level of intended benefits will be determined once the project is built and operational.

Alternate text could be *" The SFWMD's objective in establishing this water reservation is to ensure that all water contained in the reservoir is protected for the natural system to support project benefits for the Caloosahatchee Estuary."*

3) Page 264 – Previously Considered CERP Caloosahatchee River ASR Project (Removed from Strategy)
At the June 19, 2012 meeting of the LEC Plan update, we heard that ASR wells are being considered for relocation to LaBelle or Clewiston. Therefore, we suggest not deleting the concept of ASR as an option to provide water which CERP identified for the Caloosahatchee River. The Plan should keep the ASR concept and state that additional options for ASR will be explored as part of Phase 2 of CERP's C-43 Reservoir Project which includes additional storage in the upper basin whether in another stand alone reservoir or in conjunction with ASR.

Appendix H – No comment.

Appendix I – No comment.

Thanks for the opportunity to comment. Please feel free to contact me if you would like additional information or discussion.

Hoppes, Linda

From: Barbara Petyo [BPetyo@cityftmyers.com]
Sent: Wednesday, October 03, 2012 3:34 PM
To: Hoppes, Linda
Subject: City of Fort Myers Demand Projections
Attachments: KMBT35020121003140911.pdf

Ms. Hoppes

Please see attached letter.

Barbara Petyo
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Public Works Administration
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City of Palms

City of Fort Myers, Florida

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Saeed Kazemi, P.E.
Public Works Director
E-mail: skazemi@cityftmyers.com

October 2, 2012

Ms. Linda Hoppes, AICP
South Florida Water Management District
Water Resources Division, Water Supply Planning
lhoppes@sfwmd.gov

Re: Draft 2012 SFWMD Lower West Coast Water Supply Plan Update—City of Fort Myers Demand Projections

Dear Ms. Hoppes:

The City of Fort Myers has reviewed the SFWMD's draft (2012) Lower West Coast Water Supply Plan Update and considers the District's population and demand projections substantially consistent with the City's projections for the planning period through 2020 addressed in the City's latest 10-Year Water Supply Facilities Work Plan adopted in 2011.

Minor differences between the SFWMD's and the City's demand projections do exist. These mainly appear related to:

- Inclusion in the City's Work Plan of 0.5 mgd bulk water sales to FGUA (per agreement)
- Inclusion in the City's Work Plan of unaccounted for losses (5.27%)
- Per capita demand differences—SFWMD Water Supply Plan appears to use historical per capita demands (133 gpdpc), while the City uses a per capita demand of 150 gpdpc based on Level of Service standards adopted by Comprehensive Plan policy

The City of Fort Myers will continue to reflect these demand figures listed above in the next City of Fort Myers 10-Year Water Supply Facilities Work Plan, which will be required within 18 months of adoption of the SFWMD's Water Supply Plan Update. The City seeks concurrence from the SFWMD that these explainable discrepancies listed above are not inconsistent with the Lower West Coast Water Supply Plan Update, as these demand figures are adopted in the City's current Work Plan and will be reflected in the City's next Work Plan. Please respond to indicate if the District concurs that these explainable discrepancies listed above are not inconsistent with the District's Water Supply Plan Update.

Should you have any questions or comments, you may contact me at 239-321-7216.

Sincerely,

Saeed Kazemi, P.E.
Public Works Director

Hoppes, Linda

From: Rae Ann Wessel [rawessel@sccf.org]
Sent: Monday, October 01, 2012 11:26 AM
To: Hoppes, Linda; Gefvert, Cynthia; Elsner, Mark
Cc: Powell, Dean
Subject: Lower West Coast Water Supply Plan Comments
Attachments: SCCFWSupplyPlanCmtLtr912.pdf

Attached please find SCCFs comment letter on the Lower West Coast Water Supply Plan. Thank you.

Rae Ann Wessel
Natural Resource Policy Director
Sanibel Captiva Conservation Foundation
Tel: 239.731.7559
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Web: www.sccf.org
RECON water quality real-time sensors: http://recon.sccf.org

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September 27, 2012

Linda Hoppes
LWC Water Supply Plan Coordinator
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33416-4680

Re: Lower West Coast Water Supply Plan Update Comments

Dear Ms. Hoppes:

This letter is submitted on behalf of the Sanibel Captiva Conservation Foundation to comment on the SFWMD 2012 Lower West Coast Water Supply Plan update.

The stated goal of the plan is to "ensure adequate supply of water to protect natural systems and to meet all existing and projected reasonable beneficial uses, while sustaining water resources for future generations".

The plan update concludes that "the future water demands of the LWC Planning Area can continue to be met through the 2030 planning horizon with appropriate management and continued diversification of water supply sources and completion of the necessary repairs to the Lake Okeechobee Herbert Hoover Dike."

The statement that water demands will ***continue*** to be met infers that current demands are being met. However since the last plan update in 2006, this region has suffered five years of drought, arguably the best test of the robustness of a water supply plan since demands generally increase in drought and there are no fewer users competing for the reduced water supply. In each of the five drought years the natural systems have suffered drought conditions resulting in harm to and loss of habitats, fisheries and water quality by being restricted or denied freshwater supplies even when permitted users were not restricted. The fact that there is not an "adequate supply of water to protect natural systems" documents that the current plan is not meeting current demands.

We do not share the confidence of this plans conclusion that water supplies are being met or can meet the projected 51% increase in population growth demand and 18% projected increase in agricultural water needs through 2030.

While we fully support the need for and understand the challenges of developing a plan for future water supply planning and appreciate the Districts efforts, this plans conclusion and reliance on flawed assumptions about water source augmentation leaves us concerned that the same planning

omissions and assumptions that have resulted in shortfalls of adequate water supplies today will continue unaddressed into this next planning horizon, further compounding harm. This is all the more important today as climate projections anticipate an increase in the length of dry seasons, shorter higher volume wet seasons and sea level rise that will exacerbate salt water intrusion into groundwater aquifer sources.

Water Budget

A fundamental flaw with the plan is the absence of a comprehensive water budget from which water demands can be assessed against water available in the system to meet projected needs. Without such a fundamental accounting the District does not truly know the water needs and consequently cannot assure that there is sufficient water available to meet current and future needs when: 1) there is no water budget documenting the available supply 2) natural system water needs, that are dependent upon freshwater, are not accounted for as users and 3) the volumes available from sources, once natural systems baseline needs are accounted for, are not quantified.

The need for a water budget is evidenced by the fact that current natural system needs consistently fall short and are sacrificed in order to meet other user demands. To be a meaningful planning document there must be a comprehensive budget that inventories all sustainable water sources and volumes and details all water needs to assure that there is a sufficient quantity of water available to be sustainably allocated for competing demands. This plan does not provide that level of assurance to prove up water allocations for today or in the future.

Projected Water Needs

The plan is very vague regarding how projection numbers were established and how the projected 51% increase in population and 18% increase in agricultural demand will be met. At the plan review meeting it was disclosed that the agricultural demand numbers are not based on modeling but rather by asking current permittees what water volume needs they anticipate. Given that agricultural water demand today is twice the volume of all other listed users combined and there are no new sources projected to meet natural system needs, how is it possible that the increased water demands are not going to worsen impacts to natural systems from lack of adequate water when that need is not even quantified in the plan?

While agricultural projections are self established by the users, natural system water supply needs are relegated to an unscheduled five year future study to reevaluate an MFL, a level of supply at the harm threshold, not even on par with agricultural or municipal uses. The Caloosahatchee is in its sixth consecutive year of serious harm with the loss of over 300 acres of tapegrass. It is unacceptable for a water supply plan to include self generated numbers for one user and no numbers or well documented, inadequate numbers for natural systems. This is a plan that assures the status quo of harm or worse for natural systems.

In addition, the increase in future agricultural demands includes conversion to more water intensive crops and an increase in flood irrigation which will require much more water and has higher ET losses. The plan does not identify the supply that will provide for these additional demands or address the current shortfall being suffered by natural systems in order to meet the no harm permitting standard. This plan fails to quantify the shortfalls or address how more water demand by the largest user group will not exacerbate these conditions.

Projected Sources/Limitations
The plan relies on raising Lake Okeechobee water levels one foot to augment water supply. However the operation of the lake at current stages (12.5 - 15.5 ft) is based on and is appropriate for supporting the ecological integrity of the lake ecosystem which should not be sacrificed to make water available for increased permitted demands. Any source augmentation that causes harm to natural systems or other users should not be included in the water equation. Raising lake levels is damaging to the lake and the estuaries and therefore is not a sustainable source augmentation to build a plan upon.

The plan cites the lake regulation schedule LORS 08 as limiting water supply, however this schedule was adopted and in place when the District reissued Consumptive Use Permits for the LOSA basin. The over allocation of available water is the result of not having a comprehensive water budget through which the District can demonstrate that there is sufficient water for natural systems and permit allocations, not the result of the Lake O regulation schedule. We encourage the District to eliminate lake level augmentation as a sustainable source of water in the 2030 planning horizon.

Currently water allocations in the Lake Okeechobee Service Area (LOSA) are driven by and delivered based on permitted demand without regard for the availability of water to supply that demand. This has been a problem during the dry season and droughts when the burden of water shortage is shifted onto natural systems while permitted users still receive all or nearly all their demand while natural systems experience actual harm and loss. In the past six years of drought this has occurred numerous times resulting in significant harm to multiple natural systems while agriculture not only experiences no harm but enjoys record profits. We recommend that water allocations return to a supply side formulary that ties water allocations and deliveries to water actually available in the basin and triggers water restrictions for all users when water supplies are reduced. This would begin to address shared adversity concerns and keep the burden from being shouldered solely by natural systems.

Caloosahatchee MFL
Since 2001 when the Caloosahatchee MFL was established it has not been met in seven of those eleven years. Monitoring of the system by SCCF and the District has shown that the stated MFL of 300 cfs is not sufficient to prevent serious harm and has caused complete loss of *Vallisneria* year after year in the upper estuary. The District then revised the estimate to 450 cfs to account for tidal basin inflow, however that was not codified and again, monitoring of the actual response of the system to flows of that magnitude resulted in significant harm, beyond the standard of an MFL. In fact, the Districts own scientists have documented that flows of 650 to 800 cfs are needed to support salinity conditions to support fisheries in the estuary. And a study of the system contracted by the District to the local University, FGCU, documents the need for flows of 800 to 1000 cfs are needed to offset the salinity compression against the S79 Lock and Dam.

Despite all of this science and data from real time operations, the District in this plan proposes to conduct further studies and delay for another five years addressing the water needs of natural systems. In fact there is more science available for the flow needs of the estuary than that used to estimate agricultural demand for the coming planning horizon, yet agricultural permittees are allowed to create their demand numbers while the documented, science based needs of the estuary are ignored and relegated to further study, prolonging the harm and further reducing the resiliency of the estuary.

The fish, shellfish and habitat that are fundamental to the natural systems of Lake Okeechobee, the Caloosahatchee and St. Lucie estuaries are existing legal users. Water needs for these systems need to be established on par with permitted users to meet the Districts authority and responsibility for managing water established in Florida Statues. This plan fails to deal realistically with this aspect of water planning and management.

C43 West Basin Reservoir

The plan overstates the functional capacity of the proposed C43 reservoir (WBR) project to provide "a consistent flow of freshwater to the estuary". The Caloosahatchee Watershed Protection Plan makes it clear that the 170,000 acre ft capacity would accommodate approximately half the storage needed to achieve that performance. While that project has been conceived for eleven years there is no timeframe for construction so over reliance on that as a source of water to meet natural system needs is unrealistic.

In addition, although the purpose of the WBR is described as being entirely for meeting the estuary freshwater needs, in a recent WBR CERP Reservation meeting it was disclosed that: 1) the perimeter canals around the WBR would be tapped 24/7/365 to meet water supply needs of agricultural users in the surrounding area and 2) because it is a prospective reservation water would not be restricted from allocation until the project was finished and being filled with water. Both of these conditions add to the limited benefit that will be realized for natural system water supply and therefore overstate the estimated benefit in this plan.

Prevention and Recovery Strategy

The prevention and recovery strategy for the Caloosahatchee consists entirely of a project that has not been built for the past eleven years and there is no assurance that it will be built to supply any function in the next five year planning cycle. As previously discussed the WBR and storage currently being discussed does not supply enough capacity to be considered the touchstone for prevention and recovery, an even higher standard. Instead, a realistic prevention and recovery strategy needs to be established to address the inequity in water availability that leaves natural systems chronically cut off from water supplies while other permitted users are not restricted and when no reasonable risk of water shortage is expected.

Retired permits

The Regional Water Availability Rule was presented to west coast stakeholders as an opportunity to tag much needed water for natural systems from retired or decreased existing permits. However, in the three years since its passage water from those permits has not been protected from allocation or designated to address natural system needs. On the contrary, in 2009, unpermitted users were brought in, no questions asked, adding to the allocated supply without any demonstration of the public interest test or the harm standard by which all these permits are supposed to be limited. We urge the District to take action to protect retired water from further permit allocation and reserve it for the well documented natural system needs that exist throughout the greater Everglades ecosystem.

Conservation

The importance of conservation in water management cannot be overstated. We would urge the District add to its toolbox meaningful conservation measures throughout the system adding early water shortage triggers during water shortages for all users to prolong supplies. In water bodies

where MFLs have been exceeded or violated water shortage triggers should be mandatory and enforced and applied across all users.

The plan is very vague on conservation practices for agriculture. We urge the District to implement a plan developed by the UF IFAS that goes beyond tail water recovery called Recycle Water Containment Areas (RWCA) to allow for agricultural water to be stored onsite and recycled for increased availability reducing demands from other sources while capturing and treating nutrients that can be redirected onto crops to reduce additional nutrient enrichment.

Thank you for the opportunity to comment on the Lower West Coast Water Supply Plan Update. Please feel free to contact me to discuss any questions related to these comments.

Sincerely,

Rae Ann Wessel
Director, Natural Resource Policy
Sanibel Captiva Conservation Foundation

Hoppes, Linda

From: Jim Beever [jbeever@swfrpc.org]
Sent: Wednesday, October 03, 2012 1:55 PM
To: Hoppes, Linda
Subject: RE: Lower West Coast Water Supply Plan Comments due to the District this Friday, September 28, 2012
Attachments: Climate change comments for the LWCWSP.docx

I have been in the field working on my WQFAM project and have now had time to respond to e-mails. Attached is my language to help improve and strengthen the Climate Change section of the LWCWP document. Depending on what parts you decide to use I can provide the citations sources or you can find them at http://www.swfrpc.org/content/Natural_Resources/Ecosystem_Services/Vulnerability_Assessment_Final.pdf

Thank you

Jim Beever
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Telephone (239) 338-2550 ext 224
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E-mail: jbeever@swfrpc.org
Website: http://www.swfrpc.org/

From: Hoppes, Linda [mailto:lhoppes@sfwmd.gov]
Sent: Monday, September 24, 2012 10:52 AM
To: Hoppes, Linda
Subject: Lower West Coast Water Supply Plan Comments due to the District this Friday, September 28, 2012

Hello Lower West Coast Stakeholders,

This is a friendly reminder that any comments you may have regarding the DRAFT 2012 Lower West Coast Water Supply Plan Update are due this Friday, September 28, 2012. The link for the three documents (planning, appendices and support) is listed below:

http://www.sfwmd.gov/portal/page/portal/xweb%20-%20release%203%20water%20supply/lower%20west%20coast%20plan

Again, thanks for your participation and support.

Linda

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Climate change comments for the LWCWSP.

Southwest Florida is currently experiencing climate change. The natural setting of southwest Florida coupled with extensive overinvestment in the areas closest to the coast have placed the region at the forefront of geographic areas that are among the first to suffer the negative effects of a changing climate. More severe tropical storms and hurricanes with increased wind speeds and storm surges have already severely damaged both coastal and interior communities of southwest Florida. Significant losses of mature mangrove forest and low salt marsh, water quality degradation, and barrier island geomorphic changes have already occurred. Longer, more severe dry season droughts coupled with shorter duration wet seasons consisting of higher volume precipitation have generated a pattern of drought and flood impacting both natural and man-made ecosystems. Even in the most probable, lowest impact future climate change scenario predictions, the future for southwest Florida will include increased climate instability; wetter wet seasons; drier dry seasons; more extreme hot and cold events; increased coastal erosion; continuous sea level rise; shifts in fauna and flora with reductions in temperate species and expansions of tropical invasive exotics; increasing occurrence of tropical diseases in plants, wildlife and humans; destabilization of aquatic food webs including increased harmful algae blooms; increasing strains upon and costs in infrastructure; and increased uncertainty concerning variable risk assessment with uncertain actuarial futures.

Maintaining the status quo in the management of aquatic ecosystems in the face of such likely changes would result in substantial losses of ecosystem services and economic values as climate change progresses. In the absence of effective avoidance, mitigation, minimization and adaptation, climate-related failures will result in greater difficulty in addressing the priority problems identified in the LWCWSP.

This vulnerability study examines the current climate and ongoing climate change in southwest Florida along with five future scenarios of climate change into the year 2200. These scenarios include:

1) a condition that involves a future in which mitigative actions are undertaken to reduce the human influence on climate change (Stanton and Ackerman 2007),

2) a 90% probable future predicted by the Intergovernmental Panel on Climate Change (IPCC 2007b),

3) a 50% probable future predicted by IPCC,

4) a 5% probable future predicted by the IPCC, and

5) a "very worst" future in which no actions are taken to address climate change (Stanton and Ackerman 2007). This fifth scenario also corresponds with some of the other worst case scenarios postulated by scientists who think the IPCC estimations are under-estimated (USEPA CRE 2008).

This report also assesses significant potential climate changes in air and water and the effects of those changes on climate stability, sea level, hydrology, geomorphology, natural habitats and species, land use changes, economy, human health, human infrastructure, and variable risk projections, in southwest Florida. Among the consequences of climate change that threaten ecosystem services, the most serious involve interactions between climate-dependent processes and human responses to those climate changes.

Depending upon the method of prioritization utilized, some climate change effects will be experienced and can be compensated for in the relative near-term. Other effects with longer timelines will be more costly in habitat impact or human economic terms. There are a number of planning actions that, if undertaken now, could significantly reduce negative climate change effects and their costs in the future while providing positive environmental and financial benefits in the near term.

There are crucial areas where adaptation planning and implementation will be needed in order to avoid, minimize and mitigate the anticipated effects to the natural and man-altered areas of southwest Florida. Some effects, such as air temperature and water temperature increases, will be experienced throughout the region. Others, such as sea level rise and habitat shifts, will occur in specific geographic and clinal locations. In the course of the project 246 climate change management adaptations were identified (Beever et al. 2009) that could be utilized to address the various vulnerabilities identified for the region. Future adaptation plans will identify the management measures best suited for each geographic location.

Monitoring of the effects and results of climate changes will be necessary to assess when and where adaptive management needs to be and should be applied. A critical goal of this monitoring is to establish and follow indicators that signal approach toward an ecosystem threshold that, once passed, puts the system into an alternative state from which conversion back is difficult to impossible. The likely effects of climate change, particularly tropical storms, drought and sea level rise, on southwest Florida ecosystems and infrastructure development are too great for policymakers, property owners, and the public-at-large to stand by and wait for greater evidence before considering strategies for adaptation. It is essential to plan and act now to avoid, mitigate, minimize, and adapt to the negative effects of climate change, and to examine the possibilities of providing benefits to human and natural systems by adapting to the changing planet.

Altered Hydrology

Known Hydrologic Changes and Events that Have Occurred

Sea levels in Florida are expected to eventually rise to the degree that saltwater intrusion will threaten the aquifers that currently supply much of Florida's drinking water in low-lying areas. This problem will be exacerbated by increased withdrawals of water for the anticipated increase in Florida's population.

Shallow coastal aquifers are already experiencing saltwater intrusion. The freshwater Everglades recharge Florida's Biscayne aquifer, the primary water supply to the Florida Keys. As rising water levels submerge the land, the low-lying portions of the coastal Everglades will become more saline, decreasing the recharge area and increasing saltwater intrusion (IPCC 2007c). The

South Florida Water Management District (SFWMD) already spends millions of dollars per year to prevent Miami's Biscayne aquifer from becoming brackish (Miller et al. 1989).

Gulf Coast ecosystems are linked by the flow of water from the uplands through freshwater lakes, rivers, and wetlands to the coastal and marine systems downstream. Vast wetland areas of the region require periods of flooding to maintain healthy habitats and sustain food webs. While there remains uncertainty about how global warming will affect rainfall, stream flow, soil moisture, and overall water availability, human consumption of water resources is almost certain to increase as a result of the region's population growth.

Water resources are affected by changes in precipitation as well as by temperature, humidity, wind, and sunshine. Thus, changes in stream flow tend not just to reflect, but to magnify changes in precipitation. Water resources in drier climates tend to be more sensitive to climate changes, and, because evaporation is likely to increase with warmer climate, lower river flows and lower lake levels could be expected, particularly in the summer. If stream flow and lake levels drop, groundwater also could be reduced.

A critical factor in Florida's development, especially in southern Florida, has been availability of freshwater. Although south Florida receives an annual average of 54 inches of rain, annual evaporation sometimes can exceed this amount. Rainfall variability from year to year is also high, resulting in periodic droughts and floods. Competing demands for water — for residences, agriculture, industry, and for the Everglades and other natural areas — are placing stress on south Florida's water resources.

Potential Future Climate Changes

Rising air and sea temperatures combined with a rising sea level will change future hydrology. By 2200, the mean sea level is estimated to rise over 177 inches (14.74 feet), inundating most of Monroe County and two-thirds of Miami-Dade County. The Everglades south of I-75, including the Everglades National Park, will no longer be a freshwater ecosystem, causing a catastrophic environmental change for the species inhabiting that area. The incalculable effects on freshwater flows put surface water supplies throughout southern Florida at risk but three main changes can be expected (Stanton and Ackerman 2007). Flooding will result from changes in the intensity of precipitation and will cause stream bank erosion. Changes in the frequency of precipitation and increases in evaporation will cause drought. The sea level rise, lower water levels in the surface and groundwater result in salt water intrusion.

Increases in precipitation, including heavy and extreme precipitation events, affects all land surfaces and receiving water bodies. Precipitation is expected to increase five to 10% over the levels of the 20th century. The altered timing of seasonal hydrologic changes will affect coastlines and wetlands. An increase of freshwater in rivers and estuaries will lead to more severe sediment-loading and flash flooding that results in damage to fish and wildlife resources, human infrastructure, and human safety. Changes in timing of the dry and wet seasons change the flow of pollutants and will affect river discharge balance (University of Washington 2007; USNOAA 2008; SCCP 2005; FOCC 2009; USEPA CRE 2008).

Rising sea temperatures are also expected to increase the frequency of droughts and floods, causing changes to hydroperiod and to water quantity especially during dry periods. The changing timing of seasonal temperature cycles may also disrupt the hydrologic run-off cycle (Peterson et al. 2007). Changes in the volume and intensity of precipitation contribute to erosion, flooding, and run-off at coastlines. Drought from decreased precipitation will cause lower stream flows and result in erosion and subsidence of stream banks (UWCSES 2007; USNOAA 2008; USEPA CRE 2008).

Water constraints are a major threat to the future of Florida's agriculture, by far the biggest user of water. Even the new proposals for sugar cane-based bioethanol will require continuing massive flows of water for irrigation. Changes, even slight ones, in rainfall patterns and amounts may change the agricultural yields of rain-irrigated crops and silviculture directly. Rainfall pattern deviation may alter the spread and severity of plant diseases, pests, and rates of decomposition. Groundwater-irrigated crops are affected as well, due to the variation in water recharge cycles. Changes in rainfall patterns change soil moisture levels which could result in increasing the need for irrigation from groundwater or alternative surface water sources in some areas (Mulkey 2007; Fiedler et al. 2007; USNOAA 2008; FOCC 2009; USEPA CRE 2008).

The agricultural, natural, and cultivated landscape will be negatively affected by the droughts caused by increased atmospheric temperatures. Plant, animal and human communities will suffer from the lowered water tables and deep aquifers. Less water in rivers and reservoirs increases the water supply demands. Subsequent water stress will result in a higher mortality rate for those plant, animal, and human communities from the lack of sufficient water resources (USNOAA 2008; USEPA CRE 2008).

The increased salinity of riverine and estuarine ecosystems is an effect of drought. Increased penetration of saltwater from upstream tidal movement of marine waters will truncate isohaline ecotones. Pollutants from urban runoff are expected to be more concentrated in freshwater systems due to lower water levels. Increased water temperatures and reduced dissolved oxygen will occur as a result of shallower streams. Marine exotics will spread and some freshwater exotics will be advantaged while native species suffer (University of Washington Center for Science in the Earth System 2007; USNOAA 2008; USEPA CRE 2008).

Rising sea levels will lead to increased saltwater infiltration into aquifers, particularly since water levels in the aquifers are dropping and freshwater recharge is diminishing. Groundwater supplies, which provide most of the state's drinking water, will tend to become brackish. Rising sea levels will also block the traditional water flow through the Everglades ecosystem, which is slowly being reconstructed at great expense. Eventually, if sea levels continue to rise, surficial aquifers throughout the state will be threatened with salt water intrusion into community water supplies (Freed et al. 2005; Dausman and Langevin 2005).

Conservation of water uses measures including grey-water recycling and cistern collection. While these measures may offset some of the future water use demand, they have their own environmental consequences, including discharge of nutrient laden waters for irrigation,

increases in breeding loci for *Anopheles* mosquitoes, and more difficult accommodation for future population increase.

New water supplies will increasingly mean new investment in more expensive alternative sources. New reservoirs are being built wherever possible, including underground storage of freshwater in some cases. Wastewater treatment is becoming a growing industry in the state. Many areas have access to brackish groundwater but, while traditional ground and surface water supplies often cost less that $1 per 1,000 gallons, desalination of brackish water can cost up to $3 per 1,000 gallons (American Membrane Technology Association 2007). The drawbacks of desalination include creating large volumes of waste water and requiring large amounts of energy. With the reverse osmosis process, used in almost all existing plants, 100 gallons of brackish water is turned into about 75 gallons of useable water and 25 gallons of brine which is often pumped underground (Reeves 2007). The energy requirements of the process are great as well because such high pressure is require to properly force water through thousands of fine-mesh filters. A reliance on desalination would increase the demand for electricity, which in turn would increase the demand for cooling water in power plants, creating a loop. Despite this technology, it's still less expensive to pipe in freshwater from the mainland (Reid 2007).

The state's first large-scale ocean desalination plant was built for Tampa Bay Water, a regional authority in one of the most water-scarce regions. It has been plagued by technical problems, multi-year delays, and financial overruns, reaching a cost of $158 million by the time it began operation in 2003. The plant hoped to reach its design capacity of 25 MGD of freshwater, with water costs of a little over $3 per thousand gallon, by the end of 2007 (Barnett 2007; Reid 2007). In view of these problems, no one else in Florida is rushing to build a similar facility.

While the Tampa Bay plant is large compared to previous desalination efforts, it is small compared to Florida's water needs. To meet the growth in the demand for water through 2050 (as projected above), 186 Tampa-sized plants would be needed — more than one new plant coming on line every three months from now through 2050.
In short, there are no feasible supply-side options for providing this much water; most of the gap will have to be filled by conservation and reduction in demand.

Even under the best of circumstances — under the rapid stabilization scenario, with minimal damages due to climate change — Florida's economic and demographic growth is headed for a collision with the lack of additional water. The Florida Department of Environmental Protection (FDEP) projects an increase in water requirements of 22 percent by 2025 (FDEP 2007b). Looking farther ahead, if agricultural water use remains constant, since there is little land for agricultural expansion, and if all other water uses grow in proportion to population, then by 2050 the state would need 12,800 million gallons per day (MGD) of freshwater (Stratton and Ackerman 2007). This is a 57 percent increase over water use in 2000, a quantity that appears to be impossible to provide from existing freshwater sources. At the current cost of desalination, $3 per 1,000 gallons (see above), the additional water needed by 2050 would cost almost $6 billion per year — if it were available. Groundwater supplies are already encountering limits. The water level in the Floridan Aquifer has been dropping for decades (Marella and Berndt 2005); it can no longer meet the growing needs of many parts of the state. Meanwhile, the state has turned down Miami-Dade County's request for a big increase in its withdrawals from the Biscayne Aquifer,

which is also under stress; the county will instead be forced to invest in expensive alternatives such as a high-tech wastewater disinfection plant (Goodnough 2007). Surface water supplies are limited in most areas, and will be further constrained in south Florida by the long-term effort to restore the Everglades ecosystem. Floridians, therefore, can look forward to more intensive conservation efforts, such as strict limits on lawn watering, combined with promotion of alternative vegetation that requires less water than a grassy lawn.

Meeting Florida's water needs will be challenging, even in the absence of climatic change. The business-as-usual climate scenario will make a bad situation much worse, with average temperatures rising by 10°F, rainfall decreasing from 54 to 49 inches per year, and sea levels rising by almost four feet over the course of the twenty-first century.

Hotter, drier conditions will increase the demand for water for irrigation and other outdoor uses, while at the same time decreasing supplies. Surface water flows will be diminished by the decreased rainfall and increased evaporation. Groundwater supplies will also gradually diminish, as less rainfall and more evaporation means less water percolating down through the soil to recharge the aquifers. The decreased rainfall will not be uniform and predictable from year to year; rather, there will be more frequent droughts, resembling the conditions of 2001 and 2007. With water levels in Lake Okeechobee and elsewhere dropping under drought conditions, the water supplies for much of south Florida, and much of the state's agriculture, are at risk.