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## MFL PEER REVIEW REPORT

**Subject:** Technical peer review, minimum flows and levels (MFL) re-evaluation, Indian Lake, Volusia County, Florida (Contract #SK376F0, Work Order #3)

**For:** St. Johns River Water Management District (SJRWMD or “District”)

**Reviewer:** Douglas T. Shaw, Ph.D., The Nature Conservancy

**Date:** April 3, 2009

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### Introduction and Scope of Review

This letter report comprises my peer review of the District’s minimum level re-evaluation for Indian Lake in Volusia Co., Florida, one of six lake MFL evaluations reviewed as part of this contract. The evaluation and proposed minimum levels are documented in the draft SJRWMD technical report ***Minimum Levels Reevaluation: Indian Lake, Orange County, Florida*** by J.W. Mace, St. Johns River Water Management District, Palatka, Florida, 2008 (“Indian Lake MFL Report” or “MFL Report”). My report is based on review of the draft technical report, documentation provided during our field visits to the six lakes August 27-29, 2008, as well as the following supplemental documents:

1. *Minimum Flows and Levels Method of the St. Johns River Water Management District, Florida, USA* by C.P. Neubauer, G.B. Hall, E.F. Lowe, C.P. Robsion, R.B. Hupalo and L.W. Keenan, *Environmental Management* 42(6):1101-1114, 2008.
2. *A Quantitative Method for Determining Surface Water Inundation/Dewatering Signatures for Riparian Plant Communities*, Draft manuscript by C.P. Neubauer, C.P. Robison, T.C. Richardson, P. Valentine-Darby and G.B. Hall, *Ecological Engineering*, 2008.
3. *Hydrology of Central Florida Lakes – A Primer* by D.M. Schiffer, U.S. Geological Survey, Circular 1137, 1998.

Detailed comments below are confined to the Indian Lake MFL Report.

The scope of the review includes the following:

- Assessment of the adequacy of the environmental data used in the MFL evaluation in terms of quality and length of record
- Assessment of the methods and procedures for data analysis, including statistical analyses where appropriate

- Evaluation of the validity and appropriateness of all assumptions used in the development of MFLs
- Determination if the data, analyses, and interpretation of results support the recommended MFLs.

**Review Comments** (Page citations refer to Indian Lake MFL Report unless otherwise noted)

1. Page vii, Executive Summary and Page 62, Conclusion and Recommendation – Item 3 refers to periodic reassessments of the MFLs. It would be helpful to include a statement about any plans for additional or continuing data collection and/or the process that would be used to trigger re-evaluation of MFLs for Indian Lake and other water bodies in the future.
2. Pages 1-2, Factors to be Considered When Determining MFLs and Pages 10-12, Consideration of Environmental Values Identified in Rule 62-40.473, *F.A.C.*– it would be helpful to indicate here which factors were considered in the development of the Indian Lake MFLs. Also, for riverine MFLs, the District typically contracts or conducts a water resource values (WRV) assessment in addition to preparing an MFL determination study. Because it is not mentioned in the Indian Lake MFL Report, I am assuming a separate WRV assessment will not be conducted for this MFL. However, it would be helpful if this were clarified in the MFL Report.
3. Page 16, Figure 3 – It would be helpful if modeled drawdown contours for the Daytona Beach and Ormond Beach wellfields were shown overlain on the aerial map of the Indian Lake vicinity in this figure.
4. Pages 23-51, Field Data Transects 1 and 2 – these sections are particularly well written and documented.
5. Pages 52-54, Minimum Levels Determination Criteria – Likewise, this section is very well written and provides excellent context for the recommended minimum levels for Indian Lake that follow.
6. Pages 54-60, Minimum Levels Reevaluation for Indian Lake – Better explanation is needed to document how the “event duration” for each of these levels, 30 days for FH, 180 days for MA and 120 days for FL, is chosen. Is this professional judgment or standard practice for defining hydrologic events or is there a more substantive basis? I think this may be addressed to some extent in the MFL methods paper, but here in the MFL Report it comes across as arbitrary.

## **Findings and Recommendations**

1. **Recommendation:** Improve Indian Lake MFL Report by addressing the editorial comments 1-6 above.
2. **Finding:** Based on my review of the Indian Lake MFL Report and field inspection of transects, I feel that the environmental data from the site and the data collection procedures used to support this MFL determination are appropriate, repeatable and scientifically sound. The District has done a commendable job through research and modeling to gain an understanding of how sandhill lakes such as Indian Lake function hydrologically, and that knowledge is appropriately incorporated into this MFL determination. Similarly, the methods and procedures for data analysis are valid and appropriate, and the assumptions used in data analysis and MFL determination are reasonable and justified by the District's previous experience and literature citations.
3. **Finding and Recommendation:** The data interpretation and analyses, which build on the District's extensive previous experience setting MFLs for rivers, lakes and wetlands, is scientifically sound and supports the recommended minimum levels. The Indian Lake re-evaluation approach relies on the natural drawdown and inundation characteristics of stable vegetation communities and soils on site to set minimum frequent low, frequent high and average levels. SWIDS do not appear to be used for setting levels here, even as support for other indicators. The rationale for re-evaluating the previously adopted minimum levels for the lake appears sound, and the recommended levels are consistent with what is now the District's standard approach for determining MFLs. However, because this is a re-evaluation of a previously adopted MFL, I recommend that the District include a section (or perhaps a table) in the report that more directly compares the currently adopted and recommended minimum levels, documents the reasons why re-evaluation was warranted and identifies any benefits to the resource of the new (recommended) levels. This is particularly important to avoid the erroneous impression that the District is merely changing the baseline for the minimum levels.