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<b>to</b> Don Brandes, Ph.D.	<b>from</b> Xavier Fousserieau, Ph.D., P.E.
Assistant Division Director	<b>date</b> April 3, 2009
St. Johns River Water Management District	<b>project</b> Minimum Flow and Levels Evaluation
PO Box 1429	<b>project number</b> 173707C
Palatka, FL 32178-1429	

<b>via:</b>	<b>for your:</b>	<b>the following:</b>		
<input type="checkbox"/> mail	<input checked="" type="checkbox"/> information/use	<input type="checkbox"/> shop drawings	<input type="checkbox"/> change order	<input type="checkbox"/> specifications
<input type="checkbox"/> messenger	<input type="checkbox"/> approval	<input type="checkbox"/> copy of letter	<input type="checkbox"/> plans	<input type="checkbox"/> other _____
<input type="checkbox"/> fedex	<input checked="" type="checkbox"/> review/comment	<input type="checkbox"/> prints	<input type="checkbox"/> samples	_____

**SUBJ: Review of the environmental component of the Minimum Flow and Levels (MFLs) at four lakes in Central Florida**

Dr. Brandes:

Please find enclosed to this letter in Appendix A the Parsons Brinckerhoff review of the environmental component of the MFLs determination at four lakes: Johns Lake, Lake Avalon, Lake Hiawassee and Prevatt Lake. In addition to Appendix A, the PB team would like to be provided for the four lakes with more explanation on the link between the recommended duration period and the recommended return interval and the structures and changes of lake vegetation. For example, the recommended duration of 30 days and return interval of 2 years for the Frequent High at Johns Lake need further explanation.

Please contact me if you have any questions.

Sincerely,

Xavier Fousserieau, Ph.D., P.E.  
Supervising Engineer



**APPENDIX A**



**Johns Lake:**

**Site Review**

EMD conducted a site tour of Johns Lake on March 12, 2009 to review the vegetation, soils, and other pertinent environmental information at each transect sampled by the District. During the review, EMD had the following comments:

1. EMD requested a copy of the 1996 Kinser document from the District. This is an unpublished document from the District and contains the wetland vegetation classification system that is used with all MFL determination studies.
2. A question was asked of the District as to why only two vegetation transects were sampled at the same location since Johns Lake is a large lake system. The District response was that they felt two transects were adequate. It appeared that there were other representative locations for additional transects.
3. It was discussed with the District that the upland community shown on the island portion of Transect 1 did not appear to be a mesic oak hammock since mature live oak (*Quercus virginiana*) occurred in this plant community.
4. It was noted that Transect 2 was located totally within a wetland area with no upland/wetland interface and currently did not contain a wet prairie vegetative community.

**Environmental Review Findings**

All available scientific and technical data, methodologies, assumptions, and recommendations related to specified MFLs determination reports, and other District documents were reviewed for the following items:

- 1) Assess adequacy of environmental data in terms of quality and length of record.
  - a) Are there any deficiencies and/or errors regarding data availability?
    - i) **Response: *The elevation data for all transect points are not included in the report; therefore, it was not possible to determine the accuracy of the mean elevations determined. In addition, photographs of the monitoring transects taken at the time of the vegetation monitoring survey were not included in the draft report. These photographs should be included in the final report to substantiate and document the vegetative data collected.***
  - b) Were appropriate analytical methods and procedures used for data collection?
    - i) **Response: Yes.**
  - c) Were reasonable quality assurance assessments performed on the data?
    - i) **Response: Yes.**
  - d) Was relevant data available but discarded without appropriate justification?
    - i) **Response: No.**
  - e) Was “best information available” utilized in developing the MFLs?
    - i) **Response: Yes.**
- 2) Assess environmental methods and procedures for data analysis, including, where appropriate, performing appropriate statistical analyses of data to ensure that each is statistically valid and is used appropriately.
  - a) Are there any deficiencies and/or errors in analytical methods and procedures?
    - i) **Response: No.**
  - b) Were appropriate analytical methods and procedures used for data analysis?
    - i) **Response: Yes.**
  - c) Were the analytical methods and procedures appropriate given the “best information available”?
    - i) **Response: Yes.**



- d) Do the analyses include all necessary factors?
    - i) **Response: Yes.**
  - e) Were the analyses correctly applied?
    - i) **Response: Yes.**
  - f) Were any limitations and imprecisions in the information handled appropriately?
    - i) **Response: Yes.**
  - g) Are the analyses repeatable?
    - i) **Response: Yes.**
- 3) Evaluate the validity and appropriateness of the environmental assumptions used in the development of the MFLs analysis.
- a) Are the assumptions reasonable and consistent given the “best information available”?
    - i) **Response: Yes.**
  - b) Is there information available that could have been used to eliminate any of the assumptions?
    - i) **Response: No.**
  - c) Are the assumptions stated clearly?
    - i) **Response: *The minimum frequent high (FH) level for Johns Lake was determined as the mean elevation for the transect in the shrub swamp community. Minimum level determinations for other lake systems reviewed have used either the average of the mean elevations of the upper wetland community or the mean maximum elevation for this community to determine FHs. Minimum frequent lows (FLs) were consistently determined utilizing the mean minimum elevations of the shallow marsh communities. However, the reports do not give the rationale used as to why a certain criterion was selected for a particular project. During a telephone conversation with Cliff Neubauer (SJRWMD), it was agreed that a recommendation be made that each report contain an explanation and rationale for the criterion used to determine the FH and FL for each project, to be included in the appendices.***
  - d) What, if any, assumptions are implied or inherent in the methodologies?
    - i) **Response: *See response to 3(c).***
  - e) Are other analytical methods or procedures available that would require fewer assumptions but could provide comparable or better results?
    - i) **Response: No.**
  - f) Are there deficiencies and/or errors in the environmental assessments or application of findings? If so, describe each deficiency and/or error. If the identified deficiencies can be remedied, then enumerate and describe each necessary remedy, including the precision, accuracy, and an estimate of time and effort required to develop and implement each remedy. If the identified deficiencies cannot be remedied, then identify one or more alternative methodologies that are scientifically defensible given the available data. If the reviewer identifies an alternative methodology, the reviewer will also describe the precision, accuracy, and estimate the time and effort required to develop and implement that methodology. If the identified deficiencies cannot be remedied without additional data, then identify what additional data is needed and provide recommendations for capturing such data.
    - i) **Response: *Wetland vegetation communities were classified according to the St. Johns River Water Management District’s Wetland Vegetation Classification System (Kinser, 1996), as stated on page 5, paragraph 6. This system uses the deep marsh classification for areas dominated by a mixture of deep-water emergent species and water lilies, as stated in paragraph 4 on the same page. However, the report refers to this community as ‘aquatic bed’ or ‘aquatic bed/deep marsh’ instead of deep marsh in the following places: page 25 (paragraph 2), page 26 (paragraph 8), page 32 (Table 4), and page 37 (Figure 10). It will be***



*less confusing if one term was used consistently for this community. Since the community is classified as deep marsh by Kinser (1996) and deep marsh is used consistently in other minimum levels evaluation reports, it is recommended to change 'aquatic bed' to 'deep marsh' throughout this report.*

- ii) The FL level for Johns Lake uses the minimum elevation of shallow marsh community along the two transects. However, since Transect 2 is parallel to the main shore and the shallow marsh community from Station 0 to Station 187 does not have an ecotone change to a lower elevation community (as it has an arbitrary beginning point in the middle of the community), the minimum elevation for this portion of the transect is invalid and should not be used to determine the FL. The only valid minimum elevation for Transect 2 is the minimum value for the section of shallow marsh between Station 279 and Station 300 where the shallow marsh changes to deep marsh.*
- iii) The shallow marsh and wet prairie communities located between the main shore of the lake and the parallel island are not typical of this or most lake systems. As they are sheltered from wave action by the island, they more closely resemble isolated herbaceous communities instead of lakeshore herbaceous communities. The area is also not representative of Johns Lake as a whole. The emergent marsh community, however, is representative of the majority of the littoral zone in this lake. This 'emergent marsh' community corresponds with the 'shallow marsh' vegetative community that is used to determine FLs in other minimum level evaluations reviewed. The minimum elevation recorded for the emergent marsh on Transect 1 is approximately one foot higher than the minimum elevation recorded for the shallow marsh system between the shore and the island as well as the FL determined from this data. Since Transect 2 is located in atypical vegetative communities for this lake system, it is recommended that this data not be utilized to determine FHs and FLs. It is recommended that additional transects be installed and sampled in more typical lakeshore habitats on Johns Lake. The data for the portion of Transect 1 corresponding to Station 189 to beyond Station 280 could be combined with the new data to determine more reliable minimum levels.*
- iv) The FH is determined from only one transect (Transect 1) on Johns Lake. The vegetative communities on this transect are not typical of the vegetative communities on Johns Lake, although they are more natural communities. Data from one transect is insufficient to determine a reliable FH and more data needs to be included. As it was recommended above that additional transects be installed and sampled in more typical lakeshore habitats on this lake, the additional data can be combined with Transect 1 data to determine a more reliable FH elevation.*
- g) Identify sources of environmental uncertainty and assess their impact on developing MFLs that will prevent significant harm to the ecology of the area.**
  - i) Response: No other sources of environmental uncertainty were determined, other than those already discussed in this review.**
- 4) Determine if the environmental data, analyses, and interpretation of results support the recommended MFLs.**
  - i) Response: No (see response to 3(f)).**



### **Additional Environmental Comments**

The following are suggested corrections to be made to the report narrative, tables, and figures:

1. Page 3, paragraph 3, line 2: Change 'Winter Park' to 'Winter Garden'.
2. Page 27, paragraph 3, line 2: Use the common name for *Coelorachis cylindrica* (Carolina-tail grass) in the narrative instead of the scientific name to be consistent with all other species in which common names only are used.
3. Page 33, Table 5: Beggarticks (*Bidens alba*) is listed as an obligate wetland species. While *Bidens alba* is the currently accepted name for this species, an older synonym for the species is *Bidens pilosa*. The Florida Wetlands Delineation Manual (FWDM) from Chapter 62-340.450, F.A.C. lists *B. pilosa* as a facultative species. Therefore, the code for beggarticks should be changed in the table from OBL to FAC.
4. Page 33, Table 5: Two species of panic grass (*Dichanthelium commutatum* and *D. dichotomum*) were designated as upland species on this table. These are the currently accepted scientific names for these two species; however, their old synonyms (*Panicum commutatum* and *P. dichotomum*) are listed in Chapter 62-340.450, F.A.C. Using the FWDM codes given for their synonyms, the correct code for *D. commutatum* is FAC and the correct code for *D. dichotomum* is FACW, and should be changed to such on this table.
5. The water quality and rare and endangered flora and fauna aspects of Johns Lake were not provided in the report. Therefore, these scope items could not be reviewed by EMD as required by the scope of work.
6. EMD reserves the right to continue their review of the minimum levels evaluation for Johns Lake and provide comments to the St. Johns River Water Management District until the evaluation report has been finalized.



**Lake Avalon:**

**Site Review**

EMD conducted a site tour of Lake Avalon on March 12, 2009 to review the vegetation, soils, and other pertinent environmental information at each transect sampled by the District. During the review, EMD had the following comments:

1. EMD requested a copy of the 1996 Kinser document from the District. This is an unpublished document from the District and contains the wetland vegetation classification system that is used with all MFL determination studies.
2. Transect 3 of the East Lobe of Lake Avalon is not being considered with the other transects as not enough hydrologic data is available. It appears that the East Lobe acts as a separate entity during lower water elevations when not connected to the main portion of the lake, with up to two feet higher water elevations recorded.
3. There was a concern that we were not able to view any transects during the site investigation. Only a maintained area on the north side of the lake was observed. Therefore, no actual observations of vegetative species and plant communities could be made.
4. A request was made of agency personnel to include photographs taken during the monitoring survey in the report to better document overall conditions at the time of the survey.

**Environmental Review Findings**

All available scientific and technical data, methodologies, assumptions, and recommendations related to specified MFLs determination reports, and other District documents were reviewed for the following items:

- 1) Assess adequacy of environmental data in terms of quality and length of record.
  - a) Are there any deficiencies and/or errors regarding data availability?
    - i) **Response: The elevation data for all transect points are not included in the report; therefore, it was not possible to determine the accuracy of the mean elevations determined. In addition, photographs of the monitoring transects taken at the time of the vegetation monitoring survey were not included in the draft report. These photographs should be included in the final report to substantiate and document the vegetative data collected.**
  - b) Were appropriate analytical methods and procedures used for data collection?
    - i) **Response: Yes.**
  - c) Were reasonable quality assurance assessments performed on the data?
    - i) **(1) Response: Yes.**
  - d) Was relevant data available but discarded without appropriate justification?
    - i) **Response: No.**
  - e) Was “best information available” utilized in developing the MFLs?
    - i) **Response: Yes.**
- 2) Assess environmental methods and procedures for data analysis, including, where appropriate, performing appropriate statistical analyses of data to ensure that each is statistically valid and is used appropriately.
  - a) Are there any deficiencies and/or errors in analytical methods and procedures?
    - i) **Response: No.**
  - b) Were appropriate analytical methods and procedures used for data analysis?



- i) **Response: Yes.**
  - c) Were the analytical methods and procedures appropriate given the “best information available”?
    - i) **Response: Yes.**
  - d) Do the analyses include all necessary factors?
    - i) **Response: Yes.**
  - e) Were the analyses correctly applied?
    - i) **Response: Yes.**
  - f) Were any limitations and imprecisions in the information handled appropriately?
    - i) **Response: Yes.**
  - g) Are the analyses repeatable?
    - i) **Response: Yes.**
- 3) Evaluate the validity and appropriateness of the environmental assumptions used in the development of the MFLs analysis.
- a) Are the assumptions reasonable and consistent given the “best information available”?
    - i) **Response: *The mean maximum elevation of the deep marsh community was used to determine the minimum frequent low (FL) for Transects 1 and 2 (page 47, paragraph 2). While this makes sense due to the paragraphs that follow pertaining to the landward extent of Nymphaea odorata, all other minimum level reports reviewed use the mean minimum elevation of the shallow marsh community to determine the FL. As the mean maximum elevation of the deep marsh community is the same as the mean minimum elevation of the shallow marsh community, it is recommended that the latter criterion be used for the sake of consistency with all other minimum level reports. If this recommendation is followed, the criterion will need to be changed in all subsequent areas of the report where the maximum elevation of the deep marsh community is mentioned.***
  - b) Is there information available that could have been used to eliminate any of the assumptions?
    - i) **Response: No.**
  - c) Are the assumptions stated clearly?
    - i) **Response: *The minimum frequent high (FH) level for Lake Avalon was determined as the average of the mean elevations for transects in the wet prairie community. Minimum level determinations for other lake systems reviewed have used either the average of the mean elevations of the upper wetland community or the mean maximum elevation for this community to determine FHs. Minimum frequent lows (FLs) were consistently determined utilizing the mean minimum elevations of the shallow marsh communities.) However, the reports do not give the rationale used as to why a certain criterion was selected for a particular project. During a telephone conversation with Cliff Neubauer (SJRWMD), it was agreed that a recommendation be made that each report contain an explanation and rationale for the criterion used to determine the FH and FL for each project, to be included in the appendices.***
  - d) What, if any, assumptions are implied or inherent in the methodologies?
    - i) **Response: See response to 3(c).**
  - e) Are other analytical methods or procedures available that would require fewer assumptions but could provide comparable or better results?
    - i) **Response: No.**
  - f) Are there deficiencies and/or errors in the environmental assessments or application of findings? If so, describe each deficiency and/or error. If the identified deficiencies can be remedied, then enumerate and describe each necessary remedy, including the precision, accuracy, and an estimate of time and



effort required to develop and implement each remedy. If the identified deficiencies cannot be remedied, then identify one or more alternative methodologies that are scientifically defensible given the available data. If the reviewer identifies an alternative methodology, the reviewer will also describe the precision, accuracy, and estimate the time and effort required to develop and implement that methodology. If the identified deficiencies cannot be remedied without additional data, then identify what additional data is needed and provide recommendations for capturing such data.

**i) Response: No.**

**g) Identify sources of environmental uncertainty and assess their impact on developing MFLs that will prevent significant harm to the ecology of the area.**

**i) Response: *No other sources of environmental uncertainty were determined, other than those already discussed in this review.***

**4) Determine if the environmental data, analyses, and interpretation of results support the recommended MFLs.**

**i) Response: Yes.**

#### **Additional Environmental Comments**

The following are the suggested corrections to be made to the report narrative, tables, and figures:

1. Page 35, Table 3: Laurel oak is listed as *Quercus hemispherica* with an upland Florida Wetlands Delineation Manual (FWDM) code from Chapter 62-340.450, F.A.C. (The proper spelling of the species epithet is *hemisphaerica*). *Quercus laurifolia* is the currently accepted scientific name for laurel oak, with *Q. hemisphaerica* in synonymy, and the proper Florida Wetlands Delineation Manual (FWDM) code is FACW (facultative wet). The scientific name and FWDM code for laurel oak should be changed in the table.
2. The water quality and rare and endangered flora and fauna aspects of Lake Avalon were not provided in the report. Therefore, these scope items could not be reviewed by EMD as required by the scope of work.
3. EMD reserves the right to continue their review of the minimum levels evaluation for Lake Avalon and provide comments to the St. Johns River Water Management District until the evaluation report has been finalized.



**Lake Hiawassee:**

**Site Review**

EMD conducted a site tour of Lake Hiawassee on March 12, 2009 to review the vegetation, soils, and other pertinent environmental information at each transect sampled by the District. During the review, EMD had the following comments:

1. EMD requested a copy of the 1996 Kinser document from the District. This is an unpublished document from the District and contains the wetland vegetation classification system that is used with all MFL determination studies.
2. Due to the nature of Transect 5 and artificial earthwork along the edge of the lake, a true upper edge and elevation of the landward extent of the wetland habitat (wet prairie) was not determined.
3. Data from Transects 1, 2, and 4 list beggarticks as *Bidens mitis* with an obligate wetland code. On Transect 1 it is the dominant herbaceous species. However, it was determined that the species was actually *Bidens alba* which is FAC (facultative wetland plant). It is listed in Chapter 62-340 as *Bidens pilosa*, which is in synonymy with the currently accepted name of *B. alba*.
4. Transects 2 and 4 were heavily impacted subsequent to field sampling with little of the vegetation currently remaining due to heavy mowing; whereas, vegetation on Transects 1 and 3 remain intact and relatively undisturbed.
5. A question was asked as to how the transect locations were determined. The District stated that they tried to find the most representative location that had the least amount of human disturbance at the time of the data sampling. When they determined the locations, there were areas that contained more natural communities. However, the property owners would not give authorization to use their property for the study.

**Environmental Review Findings**

All available scientific and technical data, methodologies, assumptions, and recommendations related to specified MFLs determination reports, and other District documents were reviewed for the following items:

- 1) Assess adequacy of environmental data in terms of quality and length of record.
  - a) Are there any deficiencies and/or errors regarding data availability?
    - i) **Response: The elevation data for all transect points are not included in the report; therefore, it was not possible to determine the accuracy of the mean elevations determined.**
  - b) Were appropriate analytical methods and procedures used for data collection?
    - i) **Response: Yes.**
  - c) Were reasonable quality assurance assessments performed on the data?
    - i) **Response: Yes.**
  - d) Was relevant data available but discarded without appropriate justification?
    - i) **Response: No.**
  - e) Was "best information available" utilized in developing the MFLs?
    - i) **Response: Yes.**
- 2) Assess environmental methods and procedures for data analysis, including, where appropriate, performing appropriate statistical analyses of data to ensure that each is statistically valid and is used appropriately.
  - a) Are there any deficiencies and/or errors in analytical methods and procedures?
    - i) **Response: No.**



- b) Were appropriate analytical methods and procedures used for data analysis?
    - i) **Response: Yes.**
  - c) Were the analytical methods and procedures appropriate given the “best information available”?
    - i) **Response: Yes.**
  - d) Do the analyses include all necessary factors?
    - i) **Response: Yes.**
  - e) Were the analyses correctly applied?
    - i) **Response: Yes.**
  - f) Were any limitations and imprecisions in the information handled appropriately?
    - i) **Response: Yes.**
  - g) Are the analyses repeatable?
    - i) **Response: Yes.**
- 3) Evaluate the validity and appropriateness of the environmental assumptions used in the development of the MFLs analysis.
- a) Are the assumptions reasonable and consistent given the “best information available”?
    - i) **Response: Yes.**
  - b) Is there information available that could have been used to eliminate any of the assumptions?
    - i) **Response: No.**
  - c) Are the assumptions stated clearly?
    - i) **Response: *The minimum frequent high (FH) level for Lake Hiawassee was determined as the average of the mean elevations for transects in the wet prairie community. Minimum level determinations for other lake systems reviewed have used either the average of the mean elevations of the upper wetland community or the mean maximum elevation for this community to determine FHs. Minimum frequent lows (FLs) were consistently determined utilizing the mean minimum elevations of the shallow marsh communities. However, the reports do not give the rationale used as to why a certain criterion was selected for a particular project. During a telephone conversation with Cliff Neubauer (SJRWMD), it was agreed that a recommendation be made that each report contain an explanation and rationale for the criterion used to determine the FH and FL for each project, to be included in the appendices.***
  - d) What, if any, assumptions are implied or inherent in the methodologies?
    - i) **Response: *See response to 3(c).***
  - e) Are other analytical methods or procedures available that would require fewer assumptions but could provide comparable or better results?
    - i) **Response: No.**
  - f) Are there deficiencies and/or errors in the environmental assessments or application of findings? If so, describe each deficiency and/or error. If the identified deficiencies can be remedied, then enumerate and describe each necessary remedy, including the precision, accuracy, and an estimate of time and effort required to develop and implement each remedy. If the identified deficiencies cannot be remedied, then identify one or more alternative methodologies that are scientifically defensible given the available data. If the reviewer identifies an alternative methodology, the reviewer will also describe the precision, accuracy, and estimate the time and effort required to develop and implement that methodology. If the identified deficiencies cannot be remedied without additional data, then identify what additional data is needed and provide recommendations for capturing such data.
    - i) **Response: *The FL determined for Lake Hiawassee is an average of the lowest elevations recorded for the shallow marsh communities on all transects. However, Transect 5 is atypical of all other transects monitored on this lake. The low elevation for the shallow***



*marsh community is  $\geq 2.0$  feet lower than the low elevations for the other four transects established on Lake Hiawassee.*

- ii) *If the minimum elevation from Transect 5 is included to determine the mean low elevation, it results in an average elevation of 0.42 feet lower than the average determine using only the four 'typical' transects.*
- iii) *If the FL is determined using the data from all five transects, the resulting FL ranges from 0.3 to 0.5 feet lower than the lowest elevations for the shallow marsh community on Transects 1 through 4. Therefore, this FL would be too low to adequately support the wetland vegetative communities.*
- iv) *It is possible that the break between the shallow marsh and deep marsh communities was incorrectly determined at the time of monitoring, perhaps due to very low water levels present at the time of the original survey (as evidenced by photographs included in the report). Either the community break needs to be re-determined, along with the corresponding ground elevations, or the data for this transect needs to be discarded as significantly deviant. Conversely, the median of the wet prairie elevations for Transect 5 is approximately 2.5 feet lower than the medians for the other four transects of this community type.*
- v) *In addition, if the data for Transect 5 is included in the determination, the FH is 0.5 foot lower (76.4 feet) than that determined using only the data for the first four transects (76.9 feet). Either the communities and associated elevations for Transect 5 need to be re-determined in the field, or the data needs to be discarded as significantly deviant. The upland/wet prairie break on Transect 5 is an artificial break (fill berm); therefore, the elevation at this point may not be an accurate elevation to use in determining the mean and the FH for this lake.*
- g) Identify sources of environmental uncertainty and assess their impact on developing MFLs that will prevent significant harm to the ecology of the area.
  - i) **Response: No other sources of environmental uncertainty were determined, other than those already discussed in this review.**
- 4) Determine if the environmental data, analyses, and interpretation of results support the recommended MFLs.
  - i) **Response: Data for vegetative communities and elevations for Transect 5 may result in incorrect MFLs (see response for 3(f)). It is recommended that either the vegetative communities and associated elevations for Transect 5 be re-determined in the field under current conditions or the data for Transect 5 be discarded as significantly deviant.**

#### Additional Environmental Comments

The following are suggested corrections to be made to the report narrative, tables, and figures:

1. Page 30, paragraph 2: Beggar-ticks, recorded as the dominant species in the upland habitat, is listed as *Bidens mitis*, an obligate wetland species. During the site review it was observed that the species of beggar-ticks occurring in the upland habitat on this and other transect on Lake Hiawassee had been



misidentified and should be changed to *Bidens alba*. This is the currently accepted name for this species, with *B. pilosa* in synonymy. The Florida Wetlands Delineation Manual (FWDM) codes from Chapter 62-340.450, F.A.C. list *B. pilosa* as a facultative species. Therefore, the species in the report should be changed to *B. alba* with a FAC code.

2. Page 30, paragraph 2: Elephant ear tree is listed as *Enterlobium cyclocarpum*. The genus is misspelled and should be *Enterolobium*. In addition, the species epithet of *cyclocarpum* was misapplied to Florida material in Long & Lakela (1980). *Enterolobium cyclocarpum* does not occur in Florida. The correct name for this species in Florida is *Enterolobium contortisiliquum*; however, the FWDM code of UPL is correct.
3. Page 56, Table 4: The scientific names for beggar-ticks and elephant ear tree should be changed as noted above, in addition to the FWDM code for beggar-ticks.
4. Page 57, Table 5: The scientific name and FWDM code for beggar-ticks should be changed as noted above.
5. Page 59, Table 7: The scientific name and FWDM code for beggar-ticks should be changed as noted above.
6. The water quality and rare and endangered flora and fauna aspects of Lake Hiawassee were not provided in the report. Therefore, these scope items could not be reviewed by EMD as required by the scope of work.
7. EMD reserves the right to continue their review of the minimum levels evaluation for Lake Hiawassee and provide comments to the St. Johns River Water Management District until the evaluation report has been finalized.



**Prevatt Lake:**

**Site Review**

EMD conducted a site tour of Prevatt Lake on March 12, 2009 to review the vegetation, soils, and other pertinent environmental information at each transect sampled by the District. During the review, EMD had the following comments:

1. EMD requested a copy of the 1996 Kinser document from the District. This is an unpublished document from the District and contains the wetland vegetation classification system that is used with all MFL determination studies.
2. No obvious problems with the vegetative communities or species recorded on site were noted. Due to drought conditions in recent years, the system had dried up and the dominant plant from the dominant plant from the upland edge to the lower edge of the marsh community was dog fennel. Following Tropical Storm Faye, water levels rose to extremely high levels (one agency personnel commented that it was over the dirt trail that the peer team drove on to get to the lake. Water levels within the lake remained very high for a long enough period of time that adventitious roots formed on the dog fennel stems at a level from three to four feet above ground surface (as evidenced by photographs taken during the site review). Water levels are currently much lower; therefore, very little live vegetation was present at the time of the site review as a result of drought-flood-drought conditions.
3. A request was made of agency personnel to include photographs taken during the monitoring survey in the report to better document overall conditions at the time of the survey.

**Environmental Review Findings**

All available scientific and technical data, methodologies, assumptions, and recommendations related to specified MFLs determination reports, and other District documents were reviewed for the following items:

- 1) Assess adequacy of environmental data in terms of quality and length of record.
  - a) Are there any deficiencies and/or errors regarding data availability?
    - i) **Response: *The elevation data for all transect points are not included in the report; therefore, it was not possible to determine the accuracy of the mean elevations determined. In addition, photographs of the monitoring transects taken at the time of the vegetation monitoring survey were not included in the draft report. These photographs should be included in the final report to substantiate and document the vegetative data collected.***
  - b) Were appropriate analytical methods and procedures used for data collection?
    - i) **Response: Yes.**
  - c) Were reasonable quality assurance assessments performed on the data?
    - i) **Response: Yes.**
  - d) Was relevant data available but discarded without appropriate justification?
    - i) **Response: No.**
  - e) Was "best information available" utilized in developing the MFLs?
    - i) **Response: Yes.**
- 2) Assess environmental methods and procedures for data analysis, including, where appropriate, performing appropriate statistical analyses of data to ensure that each is statistically valid and is used appropriately.



- a) Are there any deficiencies and/or errors in analytical methods and procedures?
    - i) **Response: No.**
  - b) Were appropriate analytical methods and procedures used for data analysis?
    - i) **Response: Yes.**
  - c) Were the analytical methods and procedures appropriate given the “best information available”?
    - i) **Response: Yes.**
  - d) Do the analyses include all necessary factors?
    - i) **Response: Yes.**
  - e) Were the analyses correctly applied?
    - i) **Response: Yes.**
  - f) Were any limitations and imprecisions in the information handled appropriately?
    - i) **Response: Yes.**
  - g) Are the analyses repeatable?
    - i) **Response: Yes.**
- 3) Evaluate the validity and appropriateness of the environmental assumptions used in the development of the MFLs analysis.
- a) Are the assumptions reasonable and consistent given the “best information available”?
    - i) **Response: Yes.**
  - b) Is there information available that could have been used to eliminate any of the assumptions?
    - i) **Response: No.**
  - c) Are the assumptions stated clearly?
    - i) **Response: *The minimum frequent high (FH) level for Prevatt Lake was determined as the mean maximum elevation for the shrub marsh community. Minimum level determinations for other lake systems reviewed have used either the average of the mean elevations of the upper wetland community or the mean maximum elevation for this community to determine FHs. Minimum frequent lows (FLs) were consistently determined utilizing the mean minimum elevations of the shallow marsh communities. However, the reports do not give the rationale used as to why a certain criterion was selected for a particular project. During a telephone conversation with Cliff Neubauer (SJRWMD), it was agreed that a recommendation be made that each report contain an explanation and rationale for the criterion used to determine the FH and FL for each project (to be included in the appendices).***
  - d) What, if any, assumptions are implied or inherent in the methodologies?
    - i) **Response: See response to 3(c).**
  - e) Are other analytical methods or procedures available that would require fewer assumptions but could provide comparable or better results?
    - i) **Response: No.**
  - f) Are there deficiencies and/or errors in the environmental assessments or application of findings? If so, describe each deficiency and/or error. If the identified deficiencies can be remedied, then enumerate and describe each necessary remedy, including the precision, accuracy, and an estimate of time and effort required to develop and implement each remedy. If the identified deficiencies cannot be remedied, then identify one or more alternative methodologies that are scientifically defensible given the available data. If the reviewer identifies an alternative methodology, the reviewer will also describe the precision, accuracy, and estimate the time and effort required to develop and implement that methodology. If the identified deficiencies cannot be remedied without additional data, then identify what additional data is needed and provide recommendations for capturing such data.
    - i) **Response: No.**



- g) Identify sources of environmental uncertainty and assess their impact on developing MFLs that will prevent significant harm to the ecology of the area.
  - i) **Response: No other sources of environmental uncertainty were determined, other than those already discussed in this review.**
  
- 4) Determine if the environmental data, analyses, and interpretation of results support the recommended MFLs.
  - i) **Response: Yes.**

**Additional Environmental Comments**

The following are suggested corrections to be made to the report narrative, tables, and figures:

1. Page 34, Figure 12: The figure uses the original FH (56.0 ft) and not the reevaluated FH (55.8 ft).
2. Page 36, Figure 14: The figure uses the old FL (50.9 ft) and not the reevaluated FL (50.4 ft).
3. The water quality and rare and endangered flora and fauna aspects of Prevatt Lake were not provided in the report. Therefore, these scope items could not be reviewed by EMD as required by the scope of work.
4. EMD reserves the right to continue their review of the minimum levels evaluation for Prevatt Lake and provide comments to the St. Johns River Water Management District until the evaluation report has been finalized.