

From: [Will Mahler](#)
To: [Wilson, Matthew S.](#)
Subject: Wekiva River MB Modification Submittal (1 of 3)
Date: Wednesday, August 31, 2016 4:49:21 PM
Attachments: [Letter of Response to Comment Corrections.pdf](#)
[Wekiva FDEP Permit Mod_ final.docx](#)
[ATTACHMENT A. cost estimates.pdf](#)
[ATTACHMENT B.pdf](#)
[ATTACHMENT C.pdf](#)
[ATTACHMENT D.pdf](#)
[ATTACHMENT F.pdf](#)
[ATTACHMENT G.pdf](#)
[ATTACHMENT H. monitoring plan.pdf](#)
[FIGURE 6. construction drawings.pdf](#)

Matt,

I tried using the DEP portal but I could not get past the "Manage Project Site" section where it wanted me to search for the site. I tried searching using multiple parameters but it would process for several minutes and I would have to try again. So, I am hoping I can pass all these files through an email. There should be 3 emails, 12 files total. Please let me know if you do not get them all.

This should be considered our official submittal (not a draft). If you have any questions regarding what we submitted or need additional info, please don't hesitate to contact me.

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August 22, 2016

Matt Wilson
Florida Department of Environmental Protection
Mitigation Banking Section
Submerged Lands and Environmental Resources
Coordination Program
2600 Blair Stone Road, MS 2500
Tallahassee, Florida 32399-2400

**Re: WRMB- Draft Permit Modification: FDEP Comments and Feedback
Wekiva River Mitigation Bank
Lake County, Florida
EC&D Project No. 16-006**

Dear Matt:

Environmental Consulting & Design, Inc. (EC&D), as agent for Wekiva River Mitigation Bank (WRMB), is responding to the FDEP comments made on the WRMB Draft Permit Modification dated June 2016 for the above referenced project in Lake County. The comments are reproduced below and our responses are in bold.

1. Was the submittal official, or should I consider it a draft?
 - a. I recommend we proceed through at least one more draft submittal. Provided the next draft addresses the comments herein, we should be in good shape to have the modification completed quickly.

The first submittal was a draft. The submission attached to this letter is an official submittal.

2. You will need to fill out the SWERP application form (Section A), when you submit.
 - a. The application will need to be signed by Mr. Benbow.

This form was submitted by EC&D and signed by Mr. Benbow.

3. In order for you to submit ERP materials on behalf of the WRMB, we are going to need a letter from Mr. Benbow, designating you as an authorized agent for the WRMB. Please work on getting that letter to me.

The letter designating EC&D as an authorized agent for the WRMB has already been submitted.



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4. Based on my review, the proposed modification would change four of the components listed in rule 62-4.050(4)(h)5.b.(I), Florida Administrative Code (F.A.C.) (1. success criteria, 2. hydrologic structures or alterations, 3. monitoring plans, and 4. the mitigation design).

- a. Therefore, the fee for this modification would be \$6,050, in accordance with rule 62-4.050(4)(h)5.b.(IV), F.A.C.

The fee for this modification will be submitted by Mitigation Marketing, LLC.

5. Please be aware that this document will not supersede the existing WRMB mitigation plan, and therefore should not be referred to as "Mitigation Plan". All aspects of the permitted mitigation plan, including Specific Condition 11c and Permit Attachment C, will remain in full force and effect. Please refer to these changes as "Permit Attachment J: Polygon 5E Corrective Action Plan", rather than a revised mitigation plan. The rationale for this should become clear once you have read through the remainder of these comments.

The Mitigation Plan was renamed as "Permit Attachment J: Polygon 5E Corrective Action Plan."

6. I am in agreement with the overall concept of the Corrective Action Plan, with a few exceptions. Please see below:

- a. Please focus on planting longleaf pine instead of slash pine- Under natural conditions, slash pine (*Pinus elliottii*) is typically not the dominant canopy tree in flatwoods communities found in the vicinity of the WRMB. The canopy of natural flatwoods communities in the vicinity should be dominated by long leaf pine (*Pinus palustris*). Ecological factors responsible for the predominance of long leaf pine in these systems include a combination of fire return interval and differential fire tolerances of pine species. Specifically, because young (<5-year-old) slash pine do not tolerate fire, a population of slash pine would not be expected to persist under an appropriate fire management regime. Therefore, longleaf pine are needed in order for the plan to meet the criteria of rule 62-342.400(1)(b, c, and e), F.A.C. Please consider the following:
 - i. The Department has reviewed many banks that have successfully re-established long leaf pine.
 - ii. The Longleaf alliance (<http://www.longleafalliance.org/>) website provides excellent information about how to restore and manage longleaf pine ecosystems.
 - iii. The plan proposes to plant pine at a density of 150 per acre. This should be adequate to restore a mesic flatwood, even with 40-50% mortality. as the target community would be achieved at a density of 50-100 longleaf pine trees per acre.

The planting method mentioned in the Corrective Action Plan will remain consistent with the June submittal. EC&D will be planting long leaf pine in drier locations and slash pine in wetter locations. Please see Figure 4 in the Corrective Action Plan.

7. Please ensure the corrective action plan includes sufficient evaluation measures/time to ensure eradication of pasture grasses prior to applying native seed: It may be worthwhile (and it would be acceptable to the Department) for you to delay seeding for a year, such that you may conduct thorough follow-up pasture grass eradication activities, as contemplated by Specific Condition 11c and Permit Attachment C, to be absolutely certain that the pasture grasses are

dead. As you know, it is critically important that the pasture grasses have been eradicated from the site prior to final site preparation and the completion of the native seeding.

- a. The current proposal includes a target seeding date that corresponds to the first dormant season following a short effort to eradicate the pasture grasses. Because pasture grasses normally enter a dormant stage during the winter months, it may be difficult for you to determine whether the pasture grasses have been truly eradicated, or whether the grasses are only temporarily suppressed and will re-grow the following spring (as appears to have occurred during the last attempt at restoration of this site).
 - i. There is a risk that time, effort, and money could be wasted by applying native seed to a site which has not had the pasture grasses adequately eliminated (as appears to have occurred during the last restoration attempt at this site).
 - ii. It would be acceptable to spread the restoration effort out over multiple growing seasons, as is contemplated in Specific Condition 11c and Permit Attachment C.

The Corrective Action Plan will remain consistent with the methods and activities stated in the June 2016 submittal. Therefore the planting schedule will remain the same.

8. Please ensure all types of pasture grasses in Polygons 5E1 and 5E2 are targeted.
 - a. While the majority of the pasture grass in Phase III is Bahia grass (*Paspalum notatum*), please ensure all other types of pasture grasses are eradicated as well. Other pasture grasses noted onsite include Bermuda grass (*Cynodon dactylon*) and crabgrass (*Digitaria ciliaris*).

All pasture grasses will be eradicated from Polygons 5E1 and 5E2. See updated language in the Corrective Action Plan

9. Please also conduct surveys for remnant pasture grasses within Polygon 5E2.
 - a. Please ensure spot-treatment will occur to eradicate any patches of pasture grasses that remain therein.

See updated language in the Corrective Action Plan.

10. Please include provision for prescribed burning in the Corrective Action Plan.
 - a. As can currently be seen in Polygon 5E2, the initial vegetation regrowth will be quite dense and weedy. A prescribed fire plan for the WRMB was approved by the Department on 2/19/15. Please ensure the Corrective Action Plan includes details regarding the timing of prescribed fire in Phase III (please refer to Specific Condition 13 of the Permit and the approved WRMB Fire Management Plan).

The Corrective Action Plan was updated to include details regarding the timing of prescribed fire in Phase III.

11. The proposed changes to the monitoring plan are acceptable.
 - a. The coverage of the transects is relatively small. This is acceptable provided that the permittee is aware that attainment of interim and/or final release criteria will be evaluated on a site-wide basis, using representative transects to assist with the evaluation. Any areas not meeting interim release or final success criteria would need to be brought in line with the transects prior to interim releases or determination of final success.

The language in the monitoring plan was not changed.

12. The proposed success criteria will need to reflect the type of mitigation (Enhancement vs. Restoration) being conducted.
 - a. The mesic flatwoods interim release/final success criteria in the current permit were written for mesic flatwood *Enhancement* areas. These mesic flatwoods enhancement areas were already relatively intact when the permit was written.
 - i. This is reflected by the language in Permit Attachment B, which describes Polygon 6 as an Enhancement Project.
 - ii. In addition, note that comparison of Permit Figure 3 with aerial photography from the early 2000s demonstrates that the areas identified as Polygon 6 correspond to areas that had an intact canopy prior to issuance of the permit.
 - b. The sandhill criteria in the current permit are generally more appropriate for a pasture restoration.
 - i. This is reflected by the language in Permit Attachment B, which describes Polygon 5 as a Restoration Project.

EC&D modified Polygon 5E to be referred to as a restoration activity and Polygon 6 to be an enhancement activity.

13. Proposed Changes to Interim/Success Criteria for the Restoration Activities: The Department understands that the permittee is of the opinion that certain success criteria are un-attainable, namely final success criteria 22.a-Sandhill-2, which requires 25 desirable ground cover species per transect; and interim release criteria 23.b, which similarly requires certain numbers of desirable ground cover species per transect in restored sandhill communities.
 - a. The criteria included in the permit were based on the restoration plan that was proposed and the functional assessment (i.e. UMAM) that was completed at the time of permitting.
 - b. It would be inappropriate to reduce success criteria simply because they are not being met, especially given that all parties recognize the current state of the restoration is a nearly total failure.
 - c. Contrary to statements made in past correspondence from WRMB and its attorneys, the ground cover diversity requirements in the current WRMB permit are comparable to other upland restoration/enhancement mitigation bank projects that have been permitted by the Department (see permits for Devil's Swamp, Corkscrew Regional, Breakfast Point, Bayfield, Sweetwater, St. Marks, Bear Creek, and Heather Island). WRMB's requirement to document 25 species actually falls within the lower end of the range that has been used in Department permits.
 - d. As a compromise, the Department is open to eliminating the criteria requiring 25 desirable ground cover species, provided they are substituted with limits on the percent cover of pasture grasses. This change would be appropriate, given that the presence of pasture grasses is a main factor limiting natural succession on the site. I have proposed new interim release and final success criteria below.

EC&D understands the concerns noted above. However, the success criteria for the restoration activities will remain consistent with the stated criteria from the Corrective Action Plan.

14. The interim release criteria for 5E1 and 5E2 should be the same.

- a. While 5E2 may be a bit closer to achieving the mitigation objectives, those objectives (and the Part II UMAM scores) are the same for these polygons.

The success criteria stated in the June 2016 submittal will not be altered. Therefore the interim release criteria for 5E1 and 5E2 will remain consistent to what was previously submitted in June 2016.

15. Proposed Interim Release Criteria for Restored Mesic Flatwoods (Specific Condition 23b) and Enhanced Mesic Flatwoods (Specific Condition 23c).

- a. Distinguish "Polygon 6 - *Enhanced* Mesic Flatwoods" from "Polygon 5 - *Restored* Mesic Flatwoods", throughout the Permit.

Language was updated throughout the permit to distinguish Polygon 6 enhancement activities from Polygon 5 restoration activities.

- b. In Specific Condition 23b, replace the word "Sandhill" with "Polygon 5 - Restored Mesic Flatwoods".

All usage of the term "sandhill" was replaced with "mesic flatwoods" throughout the Permit and Permit Attachments.

- c. In Specific Condition 23b, replace the ground cover diversity requirements with limitations on the percent cover (total areal cover) of pasture grasses.

- i. Suggested interim levels of pasture grasses are as follows: Year 1=10%, Year 2=7%, Year 3=5%, Year 4=2%.

The suggested interim levels of pasture grasses will be kept consistent with what was stated in the approved permit in 2008.

- d. In Specific Condition 23c, replace the word "mesic flatwoods" with "Polygon 6 – Enhanced Mesic Flatwoods" leaving all criteria the same.

Language was updated in Specific Condition 23c and criteria remained the same.

16. Proposed Final Success Criteria (Specific Condition 22) for Restored Mesic Flatwoods (Polygon 5) and Enhanced Mesic Flatwoods (Polygon 6). The final success criteria for the Polygon 5 Restored Mesic Flatwoods should reflect the nature of the mitigation being conducted (Restoration vs. Enhancement), as well as the target community. To assure consistency with the original Permit, the restoration plan, and the functional assessment (i.e. UMAM), appropriate final success criteria would be best developed as a hybrid between the existing criteria in Specific Condition 22 for flatwoods and sandhill, reflecting the nature of the mitigation (restoration), adapted for the new target community.

- a. 70% herbaceous cover, with < 30% cover by trees/shrubs.
- b. Average cover of graminoids being at least 30%, with no individual transect having less than 20% cover.
- c. Average cover of *Andropogon* species not exceeding 50% of the graminoids in each transect.
- d. Each transect shall either attain at least 30% coverage with graminoid species or shall exhibit a clear trend over time of increasing graminoid coverage.

No changes were made to the above mentioned comments.

- e. In short, we need to:
 - i. Eliminate the Sandhill criteria from SC22.
All referenced "sandhills" were removed from the permit and attachments.
 - ii. Distinguish "Polygon 6 - Enhanced Mesic Flatwoods" from "Polygon 5 - Restored Mesic Flatwoods".

Polygon 5 and Polygon 6 were referenced accordingly.

- 1. Polygon 6 - Enhanced Mesic Flatwoods criteria will remain as currently written in SC22.

Polygon 6 criteria was not altered from SC22.

- 2. For Polygon 5 - Restored Mesic Flatwoods, do the following:
 - a. Import sandhill criteria 1, 3, 4, 5, and 6.
 - b. Modify sandhill criteria 2 to replace the ground cover diversity requirement of 25 species with a limit on the total cover of pasture grasses to less than 1% cover in any one acre.

The success criteria stated in the June 2016 submission has been approved and therefore will not be altered.

- 17. Mitigation Bank/Conservation Easement Boundary-Wekiva Parkway Right-of-Way: It appears that the right-of-way for the Wekiva Parkway has been finalized. The final right-of-way configuration is inconsistent with the permitted WRMB and the conservation easement.
 - a. We need to update the conservation easement and the WRMB boundary to reflect the final alignment of the road.
 - b. This appears as though it would slightly reduce the acreage of Polygon 5P, and the overall bank.
 - c. The minor boundary change does not appear as though it will affect the credit assessment.
 - d. Please use the new WRMB boundary on any revised maps that are submitted with the modification, and ensure the polygon and overall mitigation bank acreages are corrected using the new boundary. The conservation easement will need to be re-surveyed, and re-recorded.

The conservation easement will be updated with the accepted Wekiva Parkway Right-of-Way within 120 days of approval of this modified permit.

- 18. New Road and Low Water Crossing: It is not clear whether any improvement in hydrology occurred as a result of this work, nor is it clear what degradation may have occurred.
 - a. It appeared clear in the field that the crossing is well-located and should adequately convey flows across the road, while also facilitating access between the central and eastern farm fields. I am in agreement with the proposal to add this work to the permit, without altering the credit assessment or calculated impacts, as an after-the-fact modification.

The Low Water Crossing was added to the permit and the credit assessment and calculated impacts were not altered.

19. The proposed modification will require modifications to several items in the permit, as well as substantial portions of the permit language. Below I have provided a list of changes to the permit that will be needed:

Permit Modifications are shown below. Please reference the Permit document for locating the changes:

20. Project Description:
a. Will need to be updated to reflect acreage change due to final Wekiva Parkway Right-of-Way;
See updated acreages in on Page 1, Line 32 and 33.
b. Will need to delete reference to “sandhill”.
Please note that all references to “sandhill” have been removed and replaced with “mesic flatwoods” throughout the permit, figures, and attachments.
21. Project Location: No changes will be needed.
22. General Conditions:
a. Will be updated to reflect the SWERP General Conditions in rule 62-330, F.A.C.
This will be updated by the responsible parties.
23. Specific Conditions 1 and 2: No changes will be needed.
24. Specific Conditions 3 and 4:
a. Update FDEP Contact Information.
See updated FDEP contact information on Page 6, line 14 & 19.
25. Specific Condition 5:
a. Update to require that the conservation easement be resurveyed and re-recorded to excise the additional portion of the Wekiva Parkway right-of-way.
See updated language Page 6, line 27.
26. Specific Condition 6:
a. Specific Condition 6c: eliminate reference to “sandhill” and replace with “mesic flatwoods”
See updated language Page 7, Line 6.
27. Specific Condition 7: No changes will be needed.
28. Specific Condition 8:
a. SC8, First Paragraph: Replace the words, “in accordance with the attached conservation easement” with “via a conservation easement. That conservation easement shall remain in full force and effect. However, the CE will need to be resurveyed to reflect the final alignment of the Wekiva parkway right-of-way, and shall be re-recorded, using the updated boundary, within 120 days of the date of this modification.”
See updated language Page 7, Line 42.

b. SC8, Second Paragraph: Update to reflect activities that have occurred contrary to the original permit, and make it clear than no additional such activities may occur.

Agricultural activities previously mentioned in the 2008 permit were removed from the text. The updated language for SC8 can be seen on page 8.

c. SC8 Remainder: No further changes should occur.
29. Specific Condition 9:

a. Update language to reflect that all phases have been implemented.
See updated language Page 8, Line 31.

b. New cost estimates (Permit Attachment A) will be needed for both Construction and Implementation and for Perpetual Management, as part of this modification. These will need to be referenced in Specific Condition 9.

See updated language Page 8, Line 39. The table was removed and Attachment A has been updated accordingly.

c. Eliminate the table in the condition and all reference to it. Instead reference the new mitigation cost estimates (Permit Attachment A).

See updated language Page 8, Line 41. All language in this Specific Condition was modified to reference Attachment A.

d. No other changes will be needed.
30. Mitigation Activities: No changes will be needed.

31. Specific Condition 10:

a. Change first paragraph to note that Figure 6 is now in 11 or more sheets (due to the addendum for the new road, culverts, and LWC);

See updated language Page 9, Line 25.

b. 10a- update to reflect that there will be more than 10 pages in Figure 6;

See updated language Page 9, Line 27.

c. 10b- update to reflect construction of new elevated road and installation of culverts/LWC in Polygon 2.

See updated language Page 9, Line 34.

i. Also, update to reflect that there are now 11 LWCs and 30 culverts.

See updated language Page 9, Line 35.

d. 10c, 10d, and 10e- No changes will be needed.
32. Specific Condition 11:

a. 11a and 11b- No changes will be needed.

b. 11c- Update to eliminate references to sandhill;

As stated previously, all references to sandhill were replaced with mesic flatwood.

i. Update to eliminate reference to Polygon 6.

Reference to Polygon 6 was removed from Specific Condition 11c.

- ii. Add language to note that the first attempt failed, and reference the corrective action plan (Permit Attachment J);

See updated language Page 10, Line 42.

33. Specific Condition 12: No changes will be needed.

34. Specific Condition 13:

- a. Update language to eliminate references to sandhills;

As stated previously, all references to “sandhills” were replaced with mesic flatwoods.

- b. Update language to reflect that a fire management plan was approved on 2/19/15. The fire management plan will be added to the Permit as Attachment K as part of this modification.

See updated language Page 11, line 25.

- i. Note, that the current version of the fire management plan refers to “sandhills”. Therefore, Attachment K will also need to be updated to reflect the correct community type.

See updated language in Attachment K.

35. Specific Condition 14: No changes will be needed.

36. Specific Condition 15:

- a. Update table, as needed.

See updated table Page 12, Line 9.

37. Specific Conditions 16, 17, and 18: No changes will be needed.

38. Specific Condition 19:

- a. Update language to reflect that submittals are to be made to the FDEP, Submerged lands and Environmental Resources Coordination Program.

See updated language Page 14, line 7.

39. Specific Condition 20:

- a. Update language to reflect that submittals are to be made to the FDEP, Submerged lands and Environmental Resources Coordination Program.

See updated language Page 14, Line 16.

40. Specific Condition 21: No changes will be needed.

41. Specific Condition 22:

- a. Update the table to eliminate reference to Sandhill and replace with “Restored Mesic Flatwoods” as the community type in the row corresponding to Polygon 5E;

See updated table page 15, Line 1.

- b. Update the table to identify “Enhanced Mesic Flatwoods” as the community type in the row corresponding to Polygon 5E;

See table page 15.

- c. Specific Condition 22a – Hydric Hammock: No changes will be needed.

- d. Specific Condition 22a – Sandhill:

- i. Eliminate references to “Sandhill” in the title and change to “Polygon 5 Restored Mesic Flatwoods”;

See updated title Page 15, line 22.

- ii. 22a1-Eliminate reference to “xeric sandhill” and change to “Polygon 5 Restored Mesic Flatwoods”;

See updated language Page 15, Line 23.

- iii. 22a2- replace the ground cover diversity requirement of 25 species with a limit on the total cover of pasture grasses to less than 1% cover in any one acre.

This language was not altered since the success criteria submitted in June 2016 was previously accepted. See updated language Page 15, Line 26.

- iv. 22a3- Eliminate reference to “Herbaceous-Sandhill plant list” and replace with “Herbaceous Species – Mesic Flatwoods”

The community requirements for the success criteria was updated to reflect the language accepted in the Corrective Action Plan. Therefore this replacement did not occur since an “Herbaceous Sandhill plant list” was not mentioned.

- v. 22a4,5,& 6- No changes will be needed.

- e. Specific Condition 22a – Mesic Flatwoods:

- i. Change the title to “Polygon 6 Enhanced Mesic Flatwoods”;
See updated title Page 16, line 12.

- ii. 22a1,2,3, & 4- No changes will be needed.

- f. Specific Condition 22a – Wet Prairie: No changes will be needed.

- g. Specific Condition 22b, c, d, & e – No changes will be needed.

- 42. Specific Condition 23:

- a. Specific Condition 23a- No changes will be needed.

- b. Specific Condition 23b-

- i. Eliminate references to “sandhill” and change to “Polygon 5 Restored Mesic Flatwoods”;

See updated language Page 17, line 23.

- ii. Replace the yearly ground cover diversity requirements with limitations on the percent cover (total areal cover) of pasture grasses.

- 1. Suggested interim levels of pasture grasses are as follows: Year 1=10%, Year 2=7%, Year 3=5%, Year 4=2%.

As stated previously, the success criteria will not be altered from the accepted Corrective Action Plan submitted in June 2016. See updated interim release criteria Page 17, Line 20.

- c. Specific Condition 23c- Replace the word “mesic flatwoods” with “Polygon 6 – Enhanced Mesic Flatwoods” leaving all criteria the same.

See updated title Page 18, Line 1.

- d. Specific Condition 23d & e- No changes will be needed.

43. Specific Conditions 24, 25, and 26: No changes will be needed.
44. Specific Condition 27: Update language to reflect that the Monitoring Plan has been reviewed and approved as part of this modification. Reference new Monitoring Plan in Permit Attachment H.
See updated language Page 20, line 8.
45. Specific Conditions 28, 29, and 30: No changes will be needed.
46. Attachments List:
- a. Add CE as Attachment I
The conservation easement will be added as an attachment within 120 days of the approval of the permit modification.
 - b. Add Corrective Action Plan as Attachment J
See attachment J for Corrective Action Plan.
 - c. Update page numbers for each attachment, as applicable.
All page numbers were properly formatted.
47. Figure 1:
- a. Update to reflect new permit boundary due to right-of-way change.
See Figure 1 attached to this permit.
48. Figure 2: No changes will be needed.
49. Figure 3:
- a. Update to reflect new permit boundary due to right-of-way change.
See Figure 3 attached to this permit.
50. Figure 4:
- a. Update to reflect new permit boundary due to right-of-way change.
 - b. Update to add new road, culverts, and LWC.
See Figure 4 attached to this permit.
51. Figure 5:
- a. Update to reflect new permit boundary due to right-of-way change.
 - b. Update to add new road, culverts, and LWC.
 - c. Update to change "Flatwoods" to "Polygon 6 Flatwoods"
 - d. Update to change "Sandhill" to "Polygon 5 Flatwoods"
See Figure 5 attached to this permit.
52. Figure 6 (Construction Drawings):
- a. Leave these "as they are", except add a location map, cross-section, and specifications for the new road, culverts, and LWC as an Addendum to Figure 6.
See updated Figure 6 and Addendum listed on sheet 1 of 11 of the construction drawings.
53. Attachment A: Cost Estimates
- a. These need to be updated as part of this modification, and will be referenced in Specific Condition 9.
See Attachment A for updated cost estimates.
54. Attachment B: Mitigation Plan

a. This will remain mostly “as-written”. However, the section for “Polygon 5E – Sandhill restoration” will need to be modified to eliminate references to restoration of sandhill and instead reference restoration to mesic flatwoods.

b. Also, the section for “Polygon 6 – Mesic Flatwoods Enhancement” will need to be modified to eliminate references to adjacent sandhills.

All references to sandhills were removed from the Mitigation Plan.

55. Attachment C: Attachment C is and will remain part of the permit. Restoration should continue to follow this plan.

a. This plan may be modified to de-emphasize sandhill and focus more on flatwoods. The restoration plan should not change.

See Attachment C for updated language.

b. I intend to modify Specific Condition 11c to indicate that the plan was not carried out, and that the permittee has a continuing obligation to complete the restoration to achieve final success. I commit to working openly and transparently with you to that end. I am not sure changes will be needed, but I wanted to let you know up-front that we will have to look at it.

56. Attachment D: Credit Assessment No changes will be needed.

57. Attachment E: Ledger

a. I will update this with the current ledger when the modification is issued.

58. Attachment F: Community Descriptions & Desirable Plant Lists

a. Eliminate the Section for “Sandhill (Polygon 5)”, and update the mesic flatwoods description to include both Polygon 5 and Polygon 6.

b. Update Table F-1 to combine the species from Sandhill into Mesic Flatwoods and eliminate the sandhill.

See updated language in Attachment F.

59. Attachment G: Management Plan

a. Update Table G-1 to eliminate reference to Sandhill and instead reference mesic flatwoods in Polygon 5E and 5P.

b. Update Text of Attachment G to eliminate reference to “restored Sandhill” and instead reference “Restored Mesic Flatwoods”.

See updated language in Attachment G.

60. Attachment H: Monitoring Plan

a. Update Attachment H using the proposal in the draft modification.

b. Eliminate any references to “Sandhill” and replace with “Polygon 5 – Restored Mesic Flatwoods”

c. Eliminate any references to “mesic flatwoods” and replace with “Polygon 6 – Enhanced Mesic Flatwoods”

61. Attachment I: Conservation Easement No changes will be needed.

a. However, we will want to note that the CE will be revised within 120 days of the date of the modification, to reflect the new mitigation bank boundary (due to the corrected right-of-way).

It has been previously stated in the permit that the conservation easement will be revised within 120 days of the date of the modification.

62. Attachment J: Polygon 5E Corrective Action Plan

a. This will be the new section describing how the initial effort failed and how the bank will be brought into compliance.

See updated Attachment J: Polygon 5E Corrective Action Plan.

Specific Comments Regarding the Submittal:

1.0 Project Goals and Objectives:

No comments/questions at this time

2.0 Project Location:

63. In the first bullet-point, please add “eradicating pasture grasses” to the list of goals to be achieved in Polygon 5E1.

See updated language Page 3, Line 40.

64. In the first bullet-point, please eliminate “Slash pine (*Pinus elliottii*)” from the list of tree species to be planted in Polygon 5E1.

Slash pine will not be eliminated from the Corrective Action Plan. See updated language Page 3, Line 42.

65. In the second bullet-point, please replace “Slash pine” with “Longleaf pine” for the tree species to be planted in Polygon 5E2.

Longleaf pine and Slash pine will both be used in the Corrective Action Plan. See updated language Page 3, Line 43.

3.0 Site Mitigation Plan:

66. Please refer to this as the “Phase III Corrective Action Plan”, rather than the mitigation plan.

Please see the updated title on Page 4, Line 2.

67. **3.1, 3.2:** I am in agreement with the proposed locations of the work as designated by Polygons 1E, 5E1, 5E2 (we set this boundary in the field during our field visit on June 23).

68. **3.2:** Polygon 5E2: This section states that the “groundcover is appropriate and adequately dense”. I don’t feel this is a good characterization. The ground cover is extremely weedy, and is far denser with *Rubus* pp. and *Solidago* spp. than is appropriate for a flatwoods community. Instead I would state that, “the ground cover is composed of native species”.

See updated language Page 4, Line 23.

69. Table 1: Please adjust the schedule, as needed, if you decide to take longer to complete the restoration process to better assure permanent eradication of the pasture grasses.

The schedule located in the June 2016 submission will remain unchanged.

70. **3.4.2:** This section states that, *"The trees will be installed using mechanical means, and will be planted so as to provide for non-native species maintenance between the planted materials."*.

What does this mean?

- a. Is it WRMB's intention to plant trees in rows? Please be aware that row planting is generally not appropriate for an ecological restoration/mitigation bank project.

It is our intention to plant the trees in rows to provide non-native species maintenance between the planted materials. This language was not altered from the accepted submittal in June 2016.

71. 3.5 Revised Monitoring Plan: I am in agreement with the proposed changes. However, the monitoring plan will need to cover the entire WRMB. The Monitoring Plan will need to be included as a stand-alone attachment (Permit Attachment H).

- a. Note that the last WRMB Monitoring Plan was approved on July 9, 2015.
- b. Please start with the 7/9/15 version of the monitoring plan, make any necessary changes, and submit as a new Permit Attachment H.

See Attachment H for updated language from the previously approved Monitoring Plan.

72. 3.6 Success Criteria: Please see my previous comments regarding the success criteria. Suggested changes to the Success Criteria and Interim Release Criteria were provided in Items 12, 13, 14, 15, 16, 41 and 42 (above).

The success criteria will remain consistent with the submission that has been accepted from June 2016. Therefore the criteria will not be altered.

Figures:

73. Figure 1 and Figure 2: Please adjust the WRMB boundary to reflect the changes necessitated due to the final alignment of the Wekiva Parkway Right-of-Way.

74. Figure 3: Please provide an accompanying map that shows the location of the new road, culverts, and LWC. This could be an entirely new map or you could simply add the location on Figures 4 and 5 in the existing Permit.

In addition, this Figure will actually be an Addendum to Figure 6 in the existing Permit (it should be Figure 6 - Sheet 11).

See attached Figures 1, 2, and 3, and Figure 6 which includes the Addendum mentioned previously.

Thank you for your assistance during this permit modification process. If you have any questions please contact me at (352) 339-1118.

Sincerely,



Carl Salafrio
President

1 This permit is issued under the authority of Part IV of Chapter 373, F.S., and Chapter 62-342, Florida
2 Administrative Code (F.A.C.). The activity is not exempt from the requirement to obtain this mitigation
3 bank/ environmental resource permit. Pursuant to operating agreements executed between the
4 Department and the Water Management Districts, as referenced in Chapter 62-113, F.A.C., the
5 Department is responsible for reviewing and taking final agency action on this activity.
6

7 This permit also constitutes certification of compliance with water quality standards under Section
8 401 of the Clean Water Act, 33 U.S.C. 1341, and a finding of consistency with Florida's Coastal Zone
9 Management Program, as required by Section 307 of the Coastal Management Act.
10

11 A copy of this authorization also has been sent to the U.S. Army Corps of Engineers (USACOE) for review.
12 The USACOE may require a separate permit. Failure to obtain this authorization prior to construction
13 could subject you to enforcement action by that agency. You are hereby advised that authorizations also
14 may be required by other federal, state, and local entities. This authorization does not relieve you from
15 the requirements to obtain all other required permits and authorizations.
16

17 The above named permittee is hereby authorized to construct the work shown on the application and
18 approved drawing(s), plans, and other documents attached hereto or on file with the Department and
19 made a part hereof. This permit is subject to the limits, conditions, and locations of work shown in the
20 attached drawings, and is also subject to the attached General Conditions and Specific Conditions, which
21 are a binding part of this permit. You are advised to read and understand these drawings and conditions
22 prior to commencing the authorized activities, and to ensure the work is conducted in conformance with
23 all the terms, conditions, and drawings. If you are utilizing a contractor, the contractor also should read
24 and understand these drawings and conditions prior to commencing the authorized activities. Failure to
25 comply with all drawings and conditions shall constitute grounds for revocation of the permit and
26 appropriate enforcement action. Operation of the facility is not authorized except when determined to
27 be in conformance with all applicable rules and with the general and specific conditions of this permit,
28 as specifically described below.
29

30 PROJECT DESCRIPTION:

31

32 The Wekiva River Mitigation Bank (WRMB) was established on June 1, 2005 on a 1,611 acre site adjacent
33 to the Rock Springs Run State Reserve. This major modification of the WRMB permit eliminates 65 acres
34 from the northern portion of the bank for the Wekiva Parkway Right of Way (ROW). The modified
35 project is designed to restore and enhance native communities and water quality south of the ROW by
36 removing cattle and restoring pasture areas to natural communities, by removing fill _roads and
37 restoring the footprint to natural communities, by preserving a headwater hydric hammock, by treating
38 and managing exotic and nuisance vegetation, and by implementing a long-term management program,
39 including prescribed fires. The project will enhance, restore and preserve hydric hammock, mesic
40 flatwood, depression marsh and wet prairie communities and may be used as mitigation for future
41 impacts to wetlands typical of these historic or disturbed systems within the service area. The work is to
42 be conducted in three implementation phases and is allowed a total of 258.24 potential mitigation bank
43 credits.
44

45 PROJECT LOCATION:

46

47 The proposed bank site is in Sections 23-26 and Sections 35-36, Township 19 South, Range 28 East, Lake
48 County, south of State Road 46, about 8 miles east of Mount Dora (Figure 1), Class III waters. The service

1 area includes portions of Lake, Volusia, Seminole, Marion, Putnam and Orange Counties (Figure 2). The
2 bank is bordered on three sides by Rock Springs Run State Reserve.

3
4 GENERAL CONDITIONS:
5

- 6 1. All activities shall be implemented as set forth in the plans, specifications and performance
7 criteria as approved by this permit. Any deviation from the permitted activity and the conditions
8 for undertaking that activity shall constitute a violation of this permit.
9
- 10 2. This permit or a copy thereof complete with all conditions, attachments, exhibits and
11 modifications, shall be kept at the work site of the permitted activity. The complete permit shall
12 be available for review at the work site upon request by Department staff. The permittee shall
13 require the contractor to review the complete permit prior to commencement of the activity
14 authorized by this permit.
15
- 16 3. Activities approved by this permit shall be conducted in a manner which does not cause
17 violations of state water quality standards.
18
- 19 4. Prior to and during construction, the permittee shall implement and maintain all erosion and
20 sediment control measures (best management practices) required to retain sediment on-site
21 and to prevent violations of state water quality standards. All practices must be in accordance
22 with the guidelines and specifications in Chapter 6 of the Florida Land Development Manual: A
23 Guide to Sound Land and Water Management (Florida Department of Environmental Regulation
24 1988), unless a project specific erosion and sediment control plan is approved as part of the
25 permit, in which case the practices must be in accordance with the plan. If site specific
26 conditions require additional measures during any phase of construction or operation to
27 prevent erosion or control sediment, beyond those specified in the erosion and sediment
28 control plan, the permittee shall implement additional best management practices as necessary,
29 in accordance with the specifications in chapter 6 of the Florida Land Development Manual: A
30 guide to Sound Land and Water Management (Florida Department of Environmental Regulation
31 1988). The permittee shall correct any erosion or shoaling that causes adverse impacts to the
32 water resources.
33
- 34 5. Stabilization measures shall be initiated for erosion and sediment control on disturbed areas as
35 soon as practicable in portions of the site where construction activities have temporarily or
36 permanently ceased, but in no case more than 7 days after the construction activity in that
37 portion of the site has temporarily or permanently ceased.
38
- 39 6. At least 48 hours prior to commencement of activity authorized by this permit, the permittee
40 shall submit to the Department an 11Environmental Resource Permit Construction

Commencement notice (Form No. 62-343.900(3), F.A.C.) indicating the actual start date and the expected completion date.

7. When the duration of construction will exceed one year, the permittee shall submit construction status reports to the Department on an annual basis utilizing an "Annual Status Report Form" notice (Form 62-343.900(4), F.A.C.). These forms shall be submitted during June of each year.

8. For those systems which will be operated or maintained by an entity which will require an easement or deed restriction in order to provide that entity with the authority necessary to operate or maintain the system, such easement or deed restriction, together with any other final operation or maintenance documents as are required by subsections 7.1.1 through 7.1.4 of the Applicant's Handbook: Management and Storage of Surface Waters, must be submitted to the Department for approval. Documents meeting the requirements set forth in these subsections of the Applicant's Handbook will be approved. Deed restrictions, easements and other operation and maintenance documents which require recordation either with the Secretary of State or the Clerk of the Circuit Court must be so recorded prior to lot or unit sales with the project served by the system, or upon completion of construction of the system whichever occurs first. For those systems which are proposed to be maintained by county or municipal entities, final operation and maintenance documents must be received by the Department when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final documents referenced in this paragraph will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system.

9. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located with the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of that phase or portion of the system to a local government or other responsible entity.

10. Within 30 days after completion of construction of the permitted system, or independent portion of the system, the permittee shall submit a written statement of completion and certification by a registered professional engineer or other appropriate individual as authorized by law, utilizing "Environmental Resource Permit As-Built Certification by a Registered Professional" (Form No. 62-343.900(5), F.A.C.) supplied with this permit. When the completed system differs substantially from the permitted plans, any substantial deviations shall be noted and explained and two copies of as-built drawings submitted to the Department. Submittal of the completed form shall serve to notify the Department that the system is ready for inspection. The statement of completion and certification shall be based on on-site observation of construction (conducted by the registered professional engineer, or other appropriate individual as authorized by law, or under his or her direct supervision) or review of as-built drawings for

the purpose of determining if the work was completed in compliance with approved plans and specifications. As-built drawings shall be the permitted drawings revised to reflect any changes made during construction. Both the original and any revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or record drawing. All surveyed dimensions and elevations shall be certified by a registered surveyor. The following information, at a minimum, shall be verified on the as-built drawings:

- a. Dimensions and elevations of all discharge structures including all weirs, slots, gates, pumps, pipes, and oil and grease skimmers;
- b. Locations, dimensions, and elevations of all filter, exfiltration, or underdrain systems including cleanout, pipes, connections to control structures, and points of discharge to the receiving waters;
- c. Dimensions, elevations, contours, or cross-sections of all treatment storage areas sufficient to determine stage-storage relationships of the storage area and the permanent pool depth and volume below the control elevation for normally wet systems, when appropriate;
- d. Dimensions, elevations, contours, final grades, or cross-sections of the system to determine flow directions and conveyance of runoff to the treatment system;
- e. Dimensions, elevations, contours, final grades, or cross-sections of all conveyance systems utilized to convey off-site runoff around the system;
- f. Existing water elevation(s) and the date determined; and
- g. Elevation and location of benchmark(s) for the survey.

11. The operation phase of this permit shall not become effective until the permittee has complied with the requirements of the condition in paragraphs (9 and 10) above, the Department determines the system to be in compliance with the permitted plans, and the entity approved by the Department in accordance with subsections 7.1.1 through 7.1.4 of the Applicant's Handbook: Management and Storage of Surface Waters, accepts responsibility for operation and maintenance of the system. The permit may not be transferred to such an approved operation and maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the Department, the permittee shall request transfer of the permit to the responsible approved operation and maintenance entity, if different from the permittee. Until the permit is transferred pursuant to section 7.1 of the Applicant's Handbook: Management and Storage of Surface Waters, and Section 62-343.10(1)(d), F.A.C., the permittee shall be liable for compliance with the terms of the permit.

12. Should any other regulatory agency require changes to the permitted system, the permittee shall provide written notification to the Department of the changes prior to implementation so that a determination can be made whether a permit modification is required.

13. This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and chapter 40C-4 or chapter 40C-40, F.A.C.

1 14. The permittee is hereby advised that section 253.77, F.S., states that a person may not
2 commence any excavation, construction, or other activity involving the use of sovereign or other
3 lands of the state, the title to which is vested in the Board of Trustees of the Internal
4 Improvement Trust Fund without obtaining the required lease, license, easement, or other form
5 of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining
6 any necessary authorizations from the Board of Trustees prior to commencing activity on
7 sovereignty lands or other state-owned lands.

8
9 15. The permittee shall hold and save the Department harmless from any and all damages, claims or
10 liabilities which may arise by reason of the activities authorized by the permit or any use of the
11 permitted system.

12
13 16. Any delineation of the extent of a wetland or other surface water submitted as part of the
14 permit application, including plans or other supporting documentation, shall not be considered
15 specifically approved unless a specific condition of this permit or a formal determination under
16 section 373.421(2), F.S., provides otherwise.

17
18 17. The permittee shall notify the Department in writing within 30 days of any sale, conveyance, or
19 other transfer of ownership or control of the permitted system or the real property at which the
20 permitted system is located. All transfers of ownership or transfers of a permit are subject to the
21 requirements of section 62-343.130, F.A.C. The permittee transferring the permit shall remain
22 liable for any corrective actions that may be required as a result of any permit violations prior to
23 any such sale, conveyance, or other transfer.

24
25 18. Upon reasonable notice to the permittee, Department authorized staff with proper
26 identification shall have permission to enter, inspect, sample and test the system to insure
27 conformity with the plans and specifications approved by the permit.

28
29 19. If historical or archaeological artifacts are discovered at any time on the project site, the
30 permittee shall immediately notify the Department.

31
32 20. The permittee shall immediately notify the Department in writing of any previously submitted
33 information that is later discovered to be inaccurate.

34
35 SPECIFIC CONDITIONS: Please note that some specific conditions may further define or substitute for
36 some of the requirements of the general conditions listed above.

37 1. The permittee is hereby advised that Florida law states: 11 No person shall commence any
38 excavation, construction, or other activity involving the use of sovereign or other lands of the
39 state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund or
40 the Department of Environmental Protection under Chapter 253, until such person has received

from the Board of Trustees of the Internal Improvement Trust Fund the required lease, license, easement, or other form of consent authorizing the proposed use." Pursuant to Florida Administrative Code Rule 18-14, if such work is done without consent, or if a person otherwise damages state land or products of state land, the Board of Trustees may levy administrative fines of up to \$10,000 per offense.

2. If historical or archaeological artifacts, such as Indian canoes, are discovered at any time within the project site the permittee shall immediately notify the District Office and the Bureau of Historic Preservation, Division of Historical Resources headquarters at (800) 847- 7278, R. A. Gray Building, 500 S. Bronaugh St., Tallahassee, Florida 32399-0250.

Commencement requirements

3. At least 48 hours prior to commencement of work authorized by this permit, the permittee shall notify the Department of Environmental Protection, Mitigation Banking Section, Submerged Lands and Environmental Resources, Coordination Program, 2600 Blair Stone Road, MS 2500, Tallahassee, FL 32399-2400.
4. Unless otherwise specified, all reports and other information required for this permit shall be submitted to the Florida Department of Environmental Protection, Mitigation Banking Section, Submerged Lands and Environmental Resources, Coordination Program, 2600 Blair Stone Road, MS 2500, Tallahassee, Florida 32399-2400..
5. The permittee shall not commence any land grading or modifications to the surface water management system authorized by this permit until the following requirements are completed:
 - a. The conservation easement is required to be re-surveyed and re-recorded to excise the additional portion of the Wekiva Parkway right-of-way;
 - b. A qualified mitigation supervisor is retained as required in Specific Condition 7; and
 - c. Applicant is in compliance with Specific Condition 9 regarding documentation for financial assurance.
6. Phasing. This mitigation bank permit is to be implemented in three phases within eight polygons labeled IP, 1E, 1R (collectively Polygon 1), 2, SP, SE, 6, and 8, as shown in Figure 3. Once construction or implementation has been initiated in any phase, the permittee shall complete all implementation and long-term management requirements for that phase. Credit releases for each phase are detailed in Specific Condition 19.
 - a. Phase I is the preservation of the entire bank site in its current condition through the filing of a conservation easement in accordance with Specific Condition 8, the execution of financial assurance (Specific Condition 9), and implementation of perpetual management responsibilities (Specific Condition 26) for Polygon 1 (1,176 acre hydric hammock).
 - b. Phase II is the construction and enhancement activities in Polygons 1E, 1R, and 2 (basically the fill-road removal and hydrologic enhancements). These Phase II

1 construction activities, detailed in Specific Conditions 10, 11a and 11b, will be
2 completed prior to any credit release from that phase. Credits will be released for this
3 phase after financial assurance is provided, in accordance with Specific Condition 9.

- 4 c. Phase III is the restoration of the southern farm fields and ponds to mesic flatwoods
5 with areas of emergent marsh (Polygon 5E), enhancements of transitional areas
6 (Polygons 6 and 8), and management of property north of the parkway ROW (Polygon
7 5P) in accordance with Specific Condition 8. Restoration activities detailed in Specific
8 Condition 11.c. for Phase III will be completed prior to any credit release from this
9 phase, and credits will be released only when financial assurance is provided (Specific
10 Condition 9).
11

12 This mitigation bank permit shall automatically expire five years from the date of issuance if the
13 permittee has not filed the conservation easement in accordance with the permit requirements
14 or has not obtained an extension for start of restoration construction under DEP Rule 62-
15 343.110(1)(c) F.A.C. Except as provided above, this mitigation bank permit shall be perpetual
16 unless revoked or modified.
17

- 18 7. Project Oversight. Prior to commencement of any construction or enhancement activities, the
19 permittee shall retain a qualified mitigation supervisor (QMS) to oversee all aspects of
20 mitigation bank site implementation, management, monitoring, and corrective actions in this
21 permit until final success criteria are met.

- 22 a. The QMS shall have the responsibility to ensure that the mitigation bank work is
23 conducted in accordance with the permit.
24 b. Not less than 30 days prior to commencing any construction and/or eradication
25 activities authorized in this permit, the permittee shall submit the name of the QMS
26 retained to oversee the mitigation work and provide supporting documentation
27 demonstrating that the QMS is qualified to oversee this work. The QMS must be
28 approved by the Department prior to commencement of the mitigation bank work.
29 c. Within 30 days of the discharge of any approved QMS, the permittee shall submit the
30 name and supporting documentation of a new QMS to the Department for its review
31 and approval.
32 d. The permittee shall have the approved QMS review the conditions of this permit that
33 pertain to environmental improvement. The purpose of this review is to ascertain
34 whether any criteria need to be modified to ensure ecological success. If the
35 Department concurs that any proposed modifications would improve the likelihood of
36 mitigation success, these changes shall be incorporated into this permit as a
37 modification.

- 38 8. Protection and Preservation. Prior to any credit releases or modifications to surface water
39 management systems, the Wekiva River Mitigation Bank property was preserved and protected
40 via a conservation easement. That conservation easement shall remain in full force and effect.
41 However, the CE will need to be resurveyed to reflect the final alignment of the Wekiva Parkway
42 right-of-way, and shall be re-recorded, using the updated boundary, within 120 days of the date
43 of this modification.
44

Any deviation of management activities within the conservation easement area not directly supporting the achievement or maintenance of the ecological goals set forth in Specific Condition 22, shall require a modification of this permit.

The conservation easement is well located and adequately conveys water flow across the road while also facilitating access between the central and eastern farm fields. Therefore no degradation in hydrology has resulted from this easement. Therefore the credit assessments and calculated impacts will not need to be altered for this modification.

Within the conservation easement boundary, there are several areas that are not included in the credit assessment and are not intended to be ecologically enhanced from current condition (except for exotic vegetation control). These areas include:

- a. The western road and its access to be maintained for land management activities,
- b. Two half-acre sites in Polygon 5P and a 2 acres site in Polygon 6 – Enhanced Mesic Flatwoods, including buildings (identified in the file) will also be maintained for equipment storage and management,
- c. The portion of the conservation easement to be removed from the bank boundary for the Wekiva Parkway ROW in accordance with this major modification of the permit and the conditions of the attached conservation easement, and
- d. The two areas north of the ROW (Polygon 5P) to be managed and maintained consistent with the conservation easement, this condition and Attachment B.

In addition, a limited amount of hunting will be allowed. Hunting will be limited as follows:

- a. No vehicles shall be allowed except on the raining management roadway;
- b. A property owner shall be present onsite during any hunting, except for feral hogs;
- c. Only “surplus” game, as determined annually by Florida Fish and Wildlife Commission (FFWC) for this site, may be hunted;
- d. All other applicable FFWC regulations are observed.

9. Financial Assurance. The permittee has provided the Department with the financial responsibility mechanisms required by Rule 62- 342.700 F.A.C., for all phases in accordance with the table below. Using the appropriate forms in 62-342.900,F.A.C., financial assurance for implementation were provided by a Letter of Credit or performance bond payable into a contemporaneously established stand-by trust, and financial assurance for perpetual management was established with cash deposits into a trust fund established for that purpose. The amount of required financial assurance for any phase was based on 110% of the cost estimates for all remaining implementation requirements for that phase, and on the principle required to generate the estimated annual costs for perpetual management of the phase at an assumed average rate of return of 6% per annum. These estimates are shown, by polygon, in Attachment A of this permit.

The cost-estimates in Attachment A shall be reviewed and adjusted as needed by the banker on a minimum of two-year intervals, and appropriate financial responsibility adjustments shall be made, in accordance with Rule 62-342.700 (11) F.A.C. Prior to the determination of final success

1 in accordance with Specific Condition 22, the long-term management trust fund shall be fully
2 funded in cash.

3 The Department may draw upon the financial mechanisms required for the bank when the
4 permittee has materially failed to comply with the terms and conditions of the permit and
5 continues to be in noncompliance after thirty (30) days written notice has been provided to and
6 received by the permittee.

7 The interest earned from the principal deposited in the perpetual management trust may be
8 withdrawn for use by the permittee or Department-authorized operating entity for long-term
9 management purposes once the mitigation bank has been determined to have attained success
10 criteria and received the final credit release. Cash disbursements by the trustee shall be made at
11 the written direction of the Department. Disbursement requests may be made by permittee on
12 an annual basis, and shall be supported by receipts of permitted management requirements in
13 accordance with standard invoicing and accounting practices. Within thirty (30) days of receipt
14 of the fully documented Department-approved request, the Department shall authorize the
15 trustee to provide payment directly to the permittee or operating entity.

16 **Mitigation Activities:** Figure 3 shows the existing community types and configuration, and the
17 polygons that identify units used for credit evaluation, mitigation plans and ultimate success
18 criteria. The mitigation activities are schematically represented in Figure 4 and detailed in
19 Attachment B and Specific Conditions 10-15. The goal of the mitigation plan is to establish native
20 wetland and upland habitats in the existing pasture and enhance the southern areas to result in
21 the community configuration shown in Figure 5. These goals are detailed in Attachment B, the
22 Mitigation Plan.

23 10. Construction. The engineering details for the construction elements of the project (hydrology
24 enhancement) are presented in the attached "Construction Drawings for the Wekiva River
25 Mitigation Bank" drawings (Figure 6 in 11 Sheets plus cover page).

- 26 a. The central and eastern fill roads and culverts within Polygon 1 will be removed, as
27 shown in Sheets 3-5 of 11. The fill will be excavated to adjacent natural grade or, when
28 apparent, to the native soils. Fill material will be placed in adjacent borrow or erosion
29 areas identified by the QMS or removed to an upland staging area. Care will be taken to
30 leave a surface area that has appropriate soils for colonization by native plants and that
31 blends seamlessly with the surrounding areas.
- 32 b. A new elevated road and installation of culverts/LWC in Polygon 2 were implemented.
33 A total of 12 low water crossings will be constructed and 36 culverts will be installed.
34 The placement and number of crossings and culverts was determined using a hydrologic
35 model developed for the site, and are shown in the construction drawings. However,
36 de minimus adjustments may be made during construction depending on exact field
37 conditions.
- 38 c. There are two existing artesian wells/ springs that will be restored in accordance with
39 the St. Johns River Water Management District guidance for plugging artesian wells.
- 40 d. Best Management Practices for turbidity and runoff control will be used at all
41 construction areas, and any open ground will be stabilized within 30 days.

- 1 e. At the completion of the construction work and prior to the release of credits associated
2 with construction activities, as-built certifications, prepared by the Engineer of Record
3 licensed in the State of Florida consistent with General Condition 10, shall be submitted
4 to document the road removal and low water crossings and culvert installation.
5 Additionally, this submittal shall be accompanied by a written statement from the QMS
6 summarizing the construction activities and testifying that, within his/ her supervision,
7 those activities were conducted in accordance with permit drawings and conditions or
8 indicating why, when, and where any construction plans were altered.
- 9 11. Vegetation restoration. In the preservation hammock (1P) and wet prairie enhancement areas
10 (8), no additional planting or seeding is expected to be necessary to establish healthy native
11 vegetation. However, in the dirt road restoration (1R), the hammock enhancement (1E) and the
12 pasture restoration areas (5E), it is expected that additional planting or seeding will be required
13 to ensure that native vegetation is established. Prior to any required planting or seeding, the
14 areas shall first be inspected by the QMS and any planting contractors to ensure that the
15 elevations, site preparation and soils are appropriate for the proposed vegetation, and to
16 determine whether any modifications to the permitted construction or planting plans are
17 warranted.
- 18 a. Dirt road restoration - During excavation, care will be taken to remove all of the fill
19 material and preserve and blend the native soils with adjacent native soil, such that the
20 excavated area's surface will have appropriate soils with adjacent appropriate
21 groundcover seed source. Thus, no groundcover plantings are expected to be necessary.
22 However, trees will be planted in the graded area to ensure a density and diversity
23 similar to the adjacent hammock in accordance with Figure 6 and Attachment B.
- 24 b. Hammock enhancement - Within Polygon 1E, the QMS will direct supplemental tree
25 planting to be conducted, as necessary, to restore the appropriate diversity and density
26 of hammock trees to ensure the success criteria for hydric hammock in Specific
27 Condition 22. Groundcover enhancement is anticipated to be met through natural
28 recruitment.
- 29 c. Mesic flatwoods restoration - The southern portion of the pasture (Polygon 5E) and the
30 transitional flatwoods will be restored to native and transitional flatwoods communities
31 by a process known as direct seeding for the ground cover, as described in Attachment
32 C. The first step in this restoration involves the eradication of the groundcover
33 (predominantly bahia and other pasture grasses) and the removal of inappropriate or
34 exotic trees and shrubs with herbicidal treatments. The thorough treatment of the
35 pasture grasses may take two or more growing seasons, during which time appropriate
36 donor sites will be prepared for optimal seed harvest. Seeds will then be harvested from
37 the donor sites and transferred directly to the prepared pasture. This process shall be
38 conducted by a professional with documented experience and success with direct
39 seeding technique for flatwoods communities, and in strict accordance with the
40 methods described in Attachment C. The first attempt at restoration did not succeed;
41 therefore the Corrective Action Plan was implemented (see Attachment J).
- 42
43 Prior to the release of credits associated with the completion of this restoration plan,
44 the permittee shall submit a report documenting the completion of the direct seeding

and planting. The report will summarize the activities and dates of each step of the process and include pictures that demonstrate the completion and sprouting of the seeded groundcover.

12. Exotic, nuisance and inappropriate vegetation control. Other than the pasture grasses, invasive exotic and nuisance vegetation is not currently a significant problem at this site. However, site visits have indicated isolated occurrences of air potato vine, climbing fern and other invasive exotic plant species. Additionally, the graded areas will provide disturbed substrates that are more subject to invasive, exotic species. Therefore, the site will be surveyed for invasive exotic or nuisance vegetation and treated by appropriate measures including herbicide application and/ or physical removal in accordance with Specific Condition 26. Non-target species shall be protected using best management practices. Exotic and nuisance species control will be conducted under the direction of the QMS. The most current, effective, and ecologically safe methods shall be used for treatment of exotic/ nuisance species.

Transitional flatwoods and marsh/ wet prairie enhancement areas (Polygons 6 and 8) require elimination of inappropriate densities of woody shrub and pine. The QMS shall oversee the eradication and/ or removal of select individuals in accordance with Attachment B to ensure the success criteria for these community enhancement areas are met.

13. Fire Management Plan: Prescribed fire is required to maintain the mesic flatwoods and wet prairie communities. It is the goal of the mitigation and management plans to conduct prescribed burns within the property, generally progressing from north to south. A fire management plan was approved on February 19, 2015. The fire management plan has been added to the Permit as Attachment K. Fire will be used to manage and maintain the transition from flatwoods to hydric hammock. The QMS in consultation with experienced fire managers will determine when the restored vegetation can successfully carry and recover after fire. Until this time, brush and weed management shall be conducted with herbicide or physical removal to maintain criteria. Within 6 months prior to conducting a prescribed fire on the property, the permittee shall submit for Department review and approval a fire plan, developed in consultation with Rock Springs Run State Reserve managers, that details the frequency, timing, conditions, and responsible parties to ensure the long-term maintenance of these natural communities.

14. Site Security: Access to the site shall be restricted by a series of locked gates at all access points and fencing at the property perimeter with signs that say "Wekiva River Mitigation Bank - No Trespassing - Environmentally Sensitive Lands". Maintenance and inspection of security issues shall be conducted pursuant to Special Condition 25. Except as necessary to implement the mitigation plan, no vehicles are permitted in wetlands on the site.

15. Work schedule: The Wekiva River Mitigation Bank is to be implemented in phases according to the sequence of activities outlined in the following timetable. The dates provided are estimates and are subject to weather, availability of plant material, and on- site conditions.

Sequence and Estimated Timetable for Construction and Implementation

Phase	Activity	Project Dates
Phase 1	File Conservation Easement over entire bank area	summer 2005
	Establish Financial Assurance for Long-Term Management of Polygon 1	summer 2005
	Appoint QMS/Monitor and manage conservation easement	summer 2005
Phase II	Roadway and culvert removal	summer-fall 2009
	Install culverts and low-water crossings	summer-fall 2009
	Cap artesian wells	fall-winter 2009
	Submit as-built documentation	winter 2010
	Establish financial assurance for remaining implementation of Phase II	winter 2010
	Establish financial assurance for perpetual management of Polygon 2	winter 2010
	Exotic vegetation monitoring and management	perpetual
Phase III	Bahia removal/site preparation	fall 2016
	Mesic Flatwoods seeding and planting	winter 2016
	Restoration completion report	spring 2017
	Treat exotic and inappropriate vegetation in polygons 6 and 8	winter 2016
	Establish financial assurance for remaining implementation of Phase III	winter 2016
	Establish perpetual management assurance of Polygons 5, 6, 8	winter 2016
	Conduct controlled burn / implement fire management program	fall 2017
Whole Bank-All Phases	Annual Monitoring and Maintenance	
	First Annual Monitoring Report (1 yr after restoration completion report)	~fall 2011
	Second Annual Monitoring and Report	~fall 2012
	Third Annual Monitoring and Report	~fall 2013
	Fourth Annual Monitoring and Report	~fall 2014
	Fifth Annual Monitoring and Report - etc., as necessary	~fall 2015
	Conduct prescribed burn and demonstrate Final Success	~fall 2016

Banking Operations

16. As specified in Rule 62-342.470(6) F.A.C., if at any time the bank is not in material compliance with the terms of this permit, no mitigation credits may be released or withdrawn. Mitigation credits shall again be available if the permittee comes back into compliance.

17. Assessment of Credits: As a result of proposed mitigation activities in all phases, the Wekiva River Mitigation Bank has the potential to earn a total of 255 forested freshwater and 3.24 herbaceous freshwater mitigation credits at final success. Credits were assessed using the Uniform Mitigation Assessment Method (UMAM), Chapter 62- 345, F.A.C., which includes the assessment of time-lag and risk. An explanation of the credit assessment is provided in Attachment D. These credits will be released incrementally and by phase, as detailed in Specific Condition 19.
18. Ledger: In order to track credit releases and withdrawals, and in accordance with Ch.62-342.470, F.A.C., a ledger shall be kept indicating all potential, released, withdrawn and available credits. The current ledger is attached as Attachment E.
19. Credit Release Schedule: The release of credits is based on the phasing and completion of specified restoration activities and attainment of bank-wide interim and final success criteria. The table below identifies each potential credit release and provides the specific conditions that detail the criteria required for the release. All credits are allocated and released as "freshwater herbaceous," which includes the wet prairie, and as "freshwater forested," which includes hydric hammock wetlands, in proportion with potential credits (1.25% herbaceous, 98.75% forested). No credits shall be released for interim or final success until implementation activities in Phases I, II and III are satisfactorily completed.

Credit Release Activity	% Release	Est. Timetable	Credits	Sp. Conditions
Initial Credit Release-Phase I File Conservation Easement for whole bank site and Financial Assurance for Polygon 1	25%	3 months post issuance	97.53*	6, 8, 9, 14 and 26
Construction Credit Releases				
Phase II - Remove road, plant, install low-water crossings and culverts	10%	-1 year after major modification	No release (25.82*toward 32.97)	6, 10, 11a&b, 12
Phase III - Flatwoods restoration	15%	-2 years after	Release 31.6 (7.15*toward 32.97)	6, 11c, 12
Interim Success Attainment				
Annual monitoring indicating trending to success **	10% per year for 4 years	1-5 years post restoration	25.8/yr [total-103.2]	23
Full Success Attainment	Remaining, -10%	-5-6 years after	25.91	13 and 22
Total	100%		258.24	

* 97.53 credits have been released based upon 25% of the original credit evaluation of 390.12 potential credits, whereas, 25% of the modified 258.24 credit assessment is 64.56. Thus, the difference (32.97 credits) will be accounted for within the modified release schedule (indicated in parentheses above), therefore, the next release will be at the completion of Phase III work.

**Specific Condition 23 defines interim success criteria, which is expected to be met on an annual basis; however, for any year that does not demonstrate progression toward success and attainment of interim criteria, no credits will be released, and the release schedule will be extended for another year.

1 Whenever a credit release activity has been successfully completed in accordance with the appropriate
2 Specific Conditions, the permittee shall submit a minor modification request (with fee), along with
3 supporting documentation, for the release of the appropriate number of credits. This request shall be
4 made in writing to the FDEP, Submerged Lands and Environmental Resources Coordination Program.
5 The Department shall review the documentation, conduct a site visit to determine if the documentation
6 is representative of on-site conditions, and perform a compliance review of the permit, prior to the
7 issuance or denial of the minor modification to release credits. An updated ledger indicating the
8 additional available credits shall be attached to the minor modification.

9
10 20. Mitigation Credit Withdrawal: Withdrawal of the mitigation bank credits as mitigation for
11 wetland impacts shall be accomplished through a minor modification of this permit. Modification
12 requests for credit withdrawal shall not require a fee. Modification requests shall be made in
13 writing to the FDEP, Submerged Lands and Environmental Resources Coordination Program.
14 Minor modification requests shall only be submitted by the bank permittee. The modification
15 request shall include:

- 16 a. A complete list of all Department or Water Management District permits (or other
17 applicable regulatory actions) that require mitigation credits from the WRMB,
- 18 b. The permit number, issue date and environmental permit processor/reviewer,
- 19 c. Identification of the number and type of wetland credits required under each of these
20 permits.

21
22 Minor modification approvals for credit withdrawal shall be issued only to the bank permittee.
23 An updated credit ledger sheet shall be included by the Department as an attachment to each
24 minor modification approval for credit withdrawal.
25

26 21. Mitigation Service Area: The mitigation service area (MSA) is the geographic area within which
27 adverse impacts may be offset by the bank. The MSA for the Wekiva River Mitigation Bank is
28 depicted in Figure 2 and is generally described as lands within the Wekiva to Welaka basin,
29 including the Wekiva River Nested basin, and small portions of the Southern Ocklawaha River
30 and Canaveral Marshes to Wekiva basins, (14% and <5%, respectively) . The MSA includes
31 portions of Lake, Volusia, Seminole, Marion, Putnam and Orange Counties.

32 Success Criteria

33 22. Final Success: The bank shall be deemed successful when all of the following criteria have
34 been met after a period of at least one (1) full year without intervention in the form of
35 replanting of desirable vegetation or nuisance and invasive exotic vegetation control, beyond
36 what is reasonable long term maintenance. The bank shall enhance or restore an estimated
37 acreage of the following community types within the associated polygons:
38
39
40
41
42

Community ^a	Associated Polygon (s)	Acres
Hydric Hammock	Polygon 1R, Polygon 1E, Polygon 1P, and Polygon 2	1,256.6
Restored Mesic Flatwoods	Polygon 5E	165.6
Enhanced Mesic Flatwoods	Polygon 6	81.7
Wet Prairie	Polygon 8	12.2

^a See Attachment F for community description text.

The proposed mitigation plan was developed using historical aerial photographs, soils maps, hydrologic computer modeling, and existing condition data and observations. As such, the expectation of actual area for each type of system is approximate. The ultimate goal of the plan is to restore the mosaic of native/ historic habitat communities that demonstrate natural and sustainable, functioning ecosystem attributes. This concept shall override the specific acreage values in this permit.

A. Community Requirements:

Hydric Hammock

1. Approximately 1,256.6 acres (Polygon 1R, 1E, 1P, and 2) shall be enhanced by hydrologic improvement and preserved as hydric hammock, as described in Attachment F and documented by monitoring and ground and aerial photography.
2. Non-nuisance, native wetland ground, shrub, and tree species are healthy and exhibiting the cover and diversity typical of the habitat as described in Attachment F or other scientific literature, such as found in Florida Natural Areas Inventory natural community descriptions.
3. The plants are reproducing naturally, either by normal, healthy vegetative spread (in ways that would be normal for each wetland species) or through seedling establishment, growth, and survival.
4. There shall be at least 20 trees per 600 linear feet of the excavated roadway that are at least 6 feet tall and have a 3 foot diameter healthy canopy or greater.
5. Trees planted within Polygon 1E are at least 6 feet tall and have a 3 foot diameter healthy canopy or greater.

Polygon 5 Restored Mesic Flatwoods

1. Approximately 165.6 acres (Polygon 5E) shall be restored to Polygon 5 Restored Mesic Flatwoods communities, as described in Attachment F, and documented by monitoring data and ground and aerial photography.
2. All respective communities are trending toward their community success criteria, as supported by monitoring data and ground photography, and verified by an on-site inspection by FDEP.
3. At a minimum, the herbaceous ground cover shall obtain the following standards of mesic flatwoods community (Polygon 5E1):
 - Year 1: An average of at least 15% cover with non-nuisance vegetation, of which 20% or more shall be graminoid species.
 - Year 2: An average of at least 20% cover with non-nuisance vegetation, of which 30% or more shall be graminoid species.
 - Year 3: An average of at least 25% cover with non-nuisance vegetation, of which 40% or more shall be graminoid species.

- 1 -Year 4: An average of at least 30% cover with non-nuisance vegetation, of which 50% or
2 more shall be graminoid species.
- 3 4. At a minimum, the herbaceous ground cover of mesic flatwoods (Polygon 5E2) shall obtain:
- 4 -Year 1: An average of at least 25% cover with non-nuisance vegetation, of which 10% or
5 more shall be graminoid species.
- 6 -Years 2 and 3: An average of at least 35% cover with non-nuisance vegetation, or which
7 15% or more shall be graminoid species.
- 8 -Year 4: An average of at least 40% cover with non-nuisance vegetation, of which 20% or
9 more shall be graminoid species.
- 10 5. Invasive exotic vegetation is less than 2% per acre.

11

12 Polygon 6 Enhanced Mesic Flatwoods

- 13 1. Approximately 81.7 acres (Polygon 6 – Enhanced Mesic Flatwoods) shall be enhanced to
14 mesic pine flatwoods community, as described in Attachment F, and documented by
15 qualitative monitoring observations and ground and aerial photography.
- 16 2. Non-nuisance, native flatwoods ground, shrub, and tree species are healthy and exhibiting
17 the cover and diversity typical of the habitat as described in Attachment F, or other scientific
18 literature, such as found in Florida Natural Areas Inventory natural community descriptions.
- 19 3. The plants are reproducing naturally, either by normal, healthy vegetative spread (in ways
20 that would be normal for each wetland species) or through seedling establishment, growth
21 and survival.
- 22 4. At least one prescribed fire has been conducted that covers at least 70% of this polygon, and
23 community demonstrates positive response (growth and seeding, as appropriate) following
24 prescribed fire.

25 Wet Prairie

- 26 1. Approximately 12.2 acres (Polygon 8) shall be restored or enhanced to jurisdictional wet
27 prairie/ marsh mosaic habitats as described in Attachment F and documented by monitoring
28 data and ground and aerial photography.
- 29 2. Herbaceous cover of species listed in Plant List in Attachment F, and excluding all woody
30 shrub species as well as open water areas, shall be 75% or greater. Woody shrub species
31 shall exhibit no greater than 10% cover.
- 32 3. The plants are reproducing naturally, either by normal, healthy vegetative spread (in ways
33 that would be normal for each wetland species) or through seedling establishment, growth
34 and survival.
- 35 4. Pond pine population and densities have been reduced to 60 trees per acre or less.
- 36 5. At least one prescribed fire has been conducted that covers at least 70% of this polygon, and
37 community demonstrates positive response (growth and seeding, as appropriate) following
38 prescribed fire.
- 39
- 40 B. Hydrology: All of the roadway removal and associated earthwork areas in the bank are
41 stabilized at grade, with no ridges or swales that block or conduct flow, and no erosion is
42 apparent. The low water crossing areas are effective in recreating sheet flow drainage
43 characteristics within the site, culverts are providing increased hydrologic connectivity with no

- 1 signs of erosion or piping, and these structures have required no repairs beyond minor
 2 maintenance specified in Specific Condition 26 for at least three (3) years.
- 3 C. Functional Assessment: The Sponsor and the MBRT shall inspect the site and, utilizing the
 4 monitoring data and reports conduct a UMAM assessment to determine that all polygons have
 5 reached (or, for polygons that were assessed a time lag factor, are expected to reach) the "with
 6 bank" scores, as shown in Attachment D, that were used to determine the potential credits for
 7 the bank.
- 8 D. Nuisance species: Nuisance and invasive exotic species are limited to 5% or less cover/acre, of
 9 which invasive exotic species are limited to 1% or less cover/acre. Invasive exotic vegetation
 10 species are those listed by the Florida Exotic Pest Plant Council as "EPPC Category I" Invasive
 11 species.
- 12 E. Compliance: The permittee has conducted all mitigation, monitoring, inspection and
 13 maintenance activities as required, submitted all required reports and fully funded the
 14 perpetual management trust fund to the satisfaction of the Department.
- 15
- 16 23. Interim Release Criteria: Prior to achieving the final success criteria described in Specific
 17 Condition 22 above, and in order to qualify for the "Interim Success Attainment" credits
 18 associated with the release schedule in Specific Condition 19, the standards that must be
 19 attained are:
- 20 a. All respective communities are trending toward their community success criteria, as
 21 supported by monitoring data and ground photography, and verified by an on-site
 22 inspection by FDEP.
- 23 b. At a minimum, the herbaceous ground cover shall obtain the following standard of
 24 mesic flatwoods community (Polygon 5E1):
- 25 -Year 1: An average of at least 15% cover with non-nuisance vegetation, of
 26 which 20% or more shall be graminoid species.
- 27 -Year 2: An average of at least 20% cover with non-nuisance vegetation, of
 28 which 30% or more shall be graminoid species.
- 29 -Year 3: An average of at least 25% cover with non-nuisance vegetation, of
 30 which 40% or more shall be graminoid species.
- 31 -Year 4: An average of at least 30% cover with non-nuisance vegetation, of
 32 which 50% or more shall be graminoid species.
- 33 c. At a minimum, the herbaceous ground cover of mesic flatwoods (Polygon 5E2) shall
 34 obtain:
- 35 -Year 1: An average of at least 25% cover with non-nuisance vegetation, of
 36 which 10% or more shall be graminoid species.
- 37 -Years 2 and 3: An average of at least 35% cover with non-nuisance vegetation,
 38 of which 15% or more shall be graminoid species.
- 39 -Year 4: An average of at least 40% cover with non-nuisance vegetation, of
 40 which 20% or more shall be graminoid species.
- 41 To meet the interim criteria the invasive exotic vegetation shall be less than 10% per acre in
 42 Polygon 5E.
- 43

- 1 a. At a minimum, the herbaceous ground cover in Polygon 6- Enhanced Mesic Flatwoods
2 shall attain the following standards:
3 -Year 1: An average of at least 10 species from the list of desirable species and
4 at least 25% cover with non-nuisance vegetation, of which 10% or more shall be
5 graminoid species.
6 -Years 2 and 3: An average of at least 15 species from the list of desirable
7 species and at least 35% cover with non-nuisance vegetation, of which 15% or more
8 shall be graminoid species.
9 -Year 4: An average of at least 20 species from the list of desirable species and
10 at least 40 % cover with non-nuisance vegetation, of which 20% or more shall be
11 graminoid species.
12 b. Invasive exotic vegetation is less than 2% per acre.
13 c. The bank is in compliance with the terms of this permit.

14 **Maintenance and Monitoring Provisions**

15 24. Turbidity Monitoring: Best management practices for the control of turbidity and erosion shall
16 be implemented during all work on site. Prior to the start of any construction activity, all dredge
17 and fill areas for that activity shall be delimited by erosion control and/ or turbidity barriers. To
18 ensure that water quality standards are not violated, erosion and turbidity control measures
19 shall be inspected regularly, and turbidity monitored as described below until construction work
20 has been completed and stabilized.

21
22 All construction activities shall be conducted in accordance with state and federal NPDES
23 regulations as set forth in Section 403.0885, F.S., Chapter 62-621.300(4), E.A.C. and an approved
24 Stormwater Pollution Prevention Plan (SWPPP).

25
26 The following measures shall be taken by the permittee whenever construction activities result
27 in turbidity levels within waters of the state surrounding the project site that exceed state water
28 quality standards pursuant to Rule 62-302, F.A.C.:

- 29 a. Immediately cease all work contributing to the exceedance of the water quality
30 standard.
31 b. Modify the work procedures that were responsible for the exceedance, install more
32 turbidity control if necessary, and repair any non-functioning turbidity containment
33 devices.
34 c. Notify the Office, 850-245-8474, and the Central District office, 407-893-3987, within 24
35 hours of the time the exceedance is first detected.

36 Turbidity monitoring shall be conducted daily using a portable turbidimeter whenever there is
37 discharge to Waters of the State. The background monitoring site shall be placed upstream of
38 the influence of the discharge. Compliance monitoring sites shall be within 10 feet of the
39 discharge or turbidity curtain, and within any visible plume. Turbidity monitoring data shall be
40 compiled and submitted to the Department on a monthly basis. It is the responsibility of the
41 permittee to quickly rectify any problems found and to inform the Department by phone, FAX or
42 e-mail (with follow-up written memo) of any violations of water quality standards.

- 1 25. Inspections: The permittee shall contact inspections to include the following elements.
2 Inspections shall be conducted semi-annually in perpetuity and beginning after the conservation
3 easement is filed. Inspection field sheets shall be submitted with the semi-annual status reports
4 (Specific Condition 28) and summarized in the annual reports (Specific Condition 29). These
5 inspections will be for the specific purpose of identifying any problems or issues and resolving
6 these as part of bank management and maintenance activities. At a minimum, the following
7 items shall be reviewed during inspections.
- 8 a. Construction: During the phased implementation, the QMS shall inspect for and provide
9 remediation for any ecological degradation of the site. Further, the QMS shall oversee
10 all mitigation activities (construction, planting, burning, and exotic removal), inspect
11 construction area, and ensure that all procedures are being applied to optimize
12 ecological enhancement and to not degrade wetland or surface water resources. After
13 implementation, the permittee shall continue to regularly inspect structures and
14 planted areas for maintenance needs. The efficacy of the activities and structures and
15 any remedial actions planned or conducted shall be reported.
 - 16 b. Security: Inspection for security shall include signs, fences, and gates associated with the
17 site, and notations of any unauthorized use or vandalism shall be reported and
18 corrected. The condition and efficacy of the security feature and any remedial actions
19 planned or conducted shall be reported.
 - 20 c. Exotic Vegetation: During all inspections and monitoring site visits, any occurrence of
21 invasive exotic vegetation within the initiated phases should be noted for follow-up
22 treatment and reported.
- 23 26. Management and Maintenance: The wetlands are expected to be self-sustaining once the
24 native communities are re—established and hydrology enhanced by road removal or low water
25 crossings and culverts. During the phased implementation, current management practices may
26 continue provided that they do not cause environmental degradation of the site; however, once
27 a phase is initiated, all land management activities shall support the restoration and
28 enhancement of the site to attain and maintain natural communities and success criteria.
29 Inspections, monitoring data and the QMS's professional judgement will dictate the type and
30 frequency of management and maintenance activities during implementation. Maintenance
31 activities after success shall continue in perpetuity. The Long-term Management Plan is
32 described in Attachment G. In addition, bank maintenance activities shall include, at a
33 minimum:
- 34 a. Conducting semi-annual inspections and treatment of exotic vegetation for the first year
35 following initial treatments in any phase, with annual treatments thereafter, as needed;
 - 36 b. Removing feral/ exotic terrestrial animals such as feral hogs;
 - 37 c. Seeding or planting supplemental wetland vegetation as necessary to maintain the
38 wetland functions and values;
 - 39 d. Maintaining low water crossings and culvert structures to repair washout or weakened
40 areas, and remove debris; and
 - 41 e. Conducting prescribed burns, using certified personnel and approved methodologies
42 and in accordance with Specific Condition 13.

43 When the bank has been determined to be successful in accordance with Specific Condition 22
44 and the long-term management trust fund is fully funded, the permittee may transfer the

property, fee simple, and the permit, along with the long-term management trust fund to an appropriate land manager, such as the Rock Springs Run State Reserve. The permittee may retain the property and permit after success determination until its credits are transferred, however, they will be responsible for the long-term management until the permit, fee-simple property and fully funded trust fund are transferred.

27. Monitoring: Monitoring for success shall be initiated within each phase as construction activities are completed for the phase and continue until the bank, or any phase thereof, is determined to be successful. The Department has reviewed and approved the monitoring plan in Attachment H which includes:

- a. Semi-annual qualitative community and structure monitoring;
- b. Annual quantitative vegetation monitoring;
- c. Photographic data; and
- d. Qualitative wildlife monitoring.

This plan has been determined to be substantively adequate to evaluate progress toward restoration goals, identify potential roadblocks that may hamper attaining those goals, provide opportunities for scientific assessment of wetland functions and processes, and ultimately demonstrate that the Bank's success criteria have been met. However, in order to accommodate any changes necessitated by other permitting conditions and/or operational restriction, the permittee shall submit, for the Department's written approval, a final monitoring plan 60 days prior to conducting monitoring for this permit. This plan shall include the following attributes for each of the major sampling parameters (hydrology, vegetation cover including nuisance and exotic species, plant community acreage and composition, and wildlife utilization):

- a. Figures showing all sampling locations;
- b. A table indicating all sampling frequencies and/or dates;
- c. A detailed description of all sampling methods to be utilized;
- d. Samples of field sheets and data tables;
- e. Photographic information.

In addition, this Monitoring Plan shall include a section detailing the proposed analyses and reporting that will be conducted using the collected data. This section shall include:

- a. Proposed reporting format;
- b. Sample data summary tables and graphs;
- c. Proposed analytical assessments and discussion contents; and
- d. A success/progress assessment

28. Progress Reports: Beginning the first July or January after permit issuance and every six months thereafter until final success determination, the permittee shall submit semi-annual status reports or letter containing the following information for each phase within the bank:

- a. Dates permitted construction or other mitigation activities were conducted or as anticipated;
- b. Brief description and extent of work completed since the previous report or since permit was issued;
- c. Site plan indicating areas where work has been completed;

- 1 d. A description of any problems encountered and solutions undertaken;
- 2 e. A brief description of the work and/or site management activities the permittee
- 3 anticipates commencing, continuing or completing in the next six months;
- 4 f. Site management undertaken, including type of management activities and dates each
- 5 activity was undertaken; and
- 6 g. A summary of the inspection conducted pursuant to Specific Condition 25, including the
- 7 dates of each site inspection.
- 8 29. Annual Reports: The Annual Report is a summary of the yearly quantitative and qualitative
- 9 monitoring for success and an assessment of the degree to which the bank, or any phase
- 10 thereof, is attaining success. This report shall be submitted within 45 days after completion of
- 11 the vegetation monitoring and shall be prepared according to the format required and approved
- 12 in accordance with Specific Condition 27. This report shall be submitted by the end of January
- 13 each year until the site has been determined to be successful. The Annual Report that requests
- 14 a determination of final success in accordance with Specific Condition 22 shall also include the
- 15 following information:
- 16 a. A summary of all the previous Annual Reports, including, as appropriate, timeline
- 17 graphics;
- 18 b. A list of each success criteria and documentation of how and when it was attained;
- 19 c. A notation of problems encountered in attaining the success criteria and how the
- 20 problems were solved, and a notation of any exceptionally successful activity;
- 21 d. A summary of compliance and/or enforcement submittals or actions during the
- 22 implementation of the bank; and
- 23 e. Any other information helpful for the continued success of the mitigation.
- 24 30. Compliance: Whenever the permittee submits a request for a credit release, the permittee shall
- 25 prepare a checklist showing all compliance activities required in this permit up to the time of the
- 26 request and indicate the dates each activity was completed.

Attachment A

Cost Estimates

Wekiva River Mitigation Bank

ATTACHMENT A - Cost Estimates

Proposed Construction Opinion of Probable Cost and Implementation Activity Schedule

Wekiva River Mitigation Bank

Polygon	Proposed Activity	Opinion of Probable Cost	Projected Date
1R	Remove ± 25,980 L.F. of existing roadway (includes removal of 15 existing culverts) Off-site removal and disposal of excavated fill material Earthwork associated with East and West Spring Restoration Removal of existing wells and appurtenant piping Installation of 16 - 24" Φ A.B.S. culverts Installation of ± 1,900 L.F. Low Water Crossing (incl. crushed rock, crushed stone and labor) Tree planting (30' on center @ \$12.50/tree) Monitoring and Management - Quarterly qualitative observation and semi-annual reporting - Eradication of nuisance and invasive/exotic vegetation species	\$193,680 \$161,274 \$5,000 \$7,000 \$25,600 \$32,570 \$21,000 \$4,000* \$2,800*	6/09 - 10/09
1E	No Construction (N/A) Monitoring and Management - Semi-annual qualitative observation and semi-annual reporting - Eradication of nuisance and invasive/exotic vegetation species	 \$2,400* \$1,000*	-
1P	No Construction (N/A) Monitoring and Management - Long-term costs	- -	-
2	Remove ± 750 L.F. of existing roadway (includes removal of 3 existing culverts) Off-site removal and disposal of excavated fill material Installation of 8 - 24" Φ A.B.S. culverts Installation of ± 525 L.F. Low Water Crossing (including crushed rock, crushed stone and labor) Monitoring and Management - Quarterly qualitative observation and semi-annual reporting - Eradication of nuisance and invasive/exotic vegetation species	\$5,700 \$3,966 \$12,800 \$9,690 \$2,600* \$1,200*	6/09 - 8/09

**Proposed Construction Opinion of Probable Cost
and Implementation Activity Schedule (cont'd.)**

Wekiva River Mitigation Bank

Polygon	Proposed Activity	Opinion of Probable Cost	Projected Date
5	Construction of Sandhill/Flatwoods Restoration Habitat: - Bahia removal - Planting of target vegetation species Monitoring and Management - Semi-annual quantitative and qualitative observation and semi-annual reporting - Eradication of nuisance and invasive/exotic vegetation species	\$86,200 \$7,000* \$4,000*	07/16 – 2/17
6	Construction of Mesic Flatwoods Enhancement and Restoration: - Bahia removal - Supplemental planting of desirable vegetation species Monitoring and Management - Semi-annual quantitative and qualitative observation and semi-annual reporting - Eradication of nuisance and invasive/exotic vegetation species	\$163,350 \$6,500* \$2,500*	3/09 – 7/10
8	Construct Marsh/Wet Prairie Enhancement: - Thinning of pond pine - Vegetation material of supplemental planting of target species Monitoring and Management - Quarterly qualitative observation and semi-annual reporting - Eradication of nuisance and invasive/exotic vegetation species	\$5,074 \$4,000* \$2,000*	2/09 – 10/09
Subtotal:		\$772,904	-
10% contingency		\$77,290.40	-
TOTAL COST		\$850,194.40	-

* Since construction activities are to be completed prior to credit release, only these costs (monitoring and management) plus 10% will require financial assurance

ATTACHMENT A (con't) - Annualized Perpetual Management Costs

Wekiva River Mitigation Bank

Polygon	Activity	Performance/Replacement Costs +10%	Annualized Costs +10%
1	Replace 16 ABS culverts	\$34,500 (@ 20 yrs.)	\$1,750
	Repair/maintenance of 6 Low Water Crossings (± 700 L.F.)	\$3,400 (@ 3yrs.)	\$1,150
	Access roadway maintenance	\$1,00	\$1,000
	Herbicide invasive exotic/nuisance vegetation	\$3,000	\$3,000
2	Replace 8 ABS culverts	\$26,700 (@ 20 yrs.)	\$1,350
	Repair/maintenance of 3 Low Water Crossings (± 525 L.F.)	\$2,100 (@ 3 yrs.)	\$700
	Access roadway maintenance	\$550	\$550
	Herbicide invasive exotic/nuisance vegetation	\$1,500	\$1,500
5	Herbicide invasive exotic/nuisance vegetation	\$6,500	\$6,500
	Fire Management Program	\$2,800 (@ 5 yrs.)	\$550
6	Herbicide invasive exotic/nuisance vegetation	\$2,500	\$2,400
	Fire Management Program (as appropriate)	\$2,250 (@ 5 yrs.)	\$450
8	Repair/maintenance of 1 Low Water Crossing (± 1,200 L.F.)	\$4,800 (@ 3 yrs.)	\$1,600
	Herbicide invasive exotic/nuisance vegetation	\$800	\$800
	Fire Management Program	\$3,500 (@ 5 yrs.)	\$700
Total Annualized 110% Cost			\$24,000

Attachment B

Mitigation Plan

ATTACHMENT B - Mitigation Plan

Both historic and current activities within the Wekiva River Mitigation Bank (WRMB) project site have resulted in varying degrees of adverse impact to onsite communities. In response, the proposed WRMB Mitigation Plan incorporates a variety of hydrologic and vegetation habitat improvement activities. For convenience, specific information for each activity has been provided herein as both narrative text and is presented in accordance with individual polygon habitat types.

Polygon 1R - Hydric Hammock Restoration

Proposed mitigation activities within Polygon 1R (within the parent Polygon 1) habitat area include the removal, in its entirety, of the internal roadway structure (approximately 25,980 L.F.). This activity will result in the immediate restoration of historic hydrologic regimes throughout the Polygon 1R boundary (± 14.1 acres). Excavation of the roadway structure will be accomplished by removal of the existing material to a point consistent with adjacent topographic elevations. In areas along the roadway that have adjacent borrow ditches, roadway material will be placed into the swale in order to re-establish native/historic elevations. Excess material removed from the roadway will be disposed of on existing upland areas located in the northern portion of the site. Existing culverts will be removed and transported to a temporary upland Construction Staging Area located near State Road 46. Figure 6 depicts the approximate area and length of roadway and culvert removal.

In addition to roadway removal, supplemental tree species will be planted within the restoration area in accordance with WRMB Construction Drawings. Trees species will be randomly planted at approximately 30-foot intervals (i.e. On-Center) within the removed roadway area, and may include the following:

Polygon 1R Tree Planting Schedule

Species		Number of Individuals
Common Name	Scientific Name	
Swamp Bay	<i>Magnolia virginiana</i>	420
Bald Cypress	<i>Taxodium distichum</i>	420
American Elm	<i>Ulmus americana</i>	420
Red Maple	<i>Acer rubrum</i>	420
TOTAL		1,680

In association with roadway removal within Polygon 1R, as well as restoration of native/historic hydrology where access roadways are proposed to remain, hydrologic enhancement of approximately 296.4 acres will result within Polygon 1E (a portion of the parent Polygon 1). The area of Polygon 1E enhancement (i.e. the 296.4 acres) was calculated by including a band width of 300 feet adjacent to Polygon 1R, or where additional roadway hydrologic improvement structures have been proposed (Figure 6). These hydrologic improvements associated with remaining access roadway features include the installation of culverts and low water crossings.

Within the Polygon 1E area, it may also be necessary to provide for supplemental planting of trees where required densities do not currently exist. The species to be provided, if necessary would be similar to those proposed for Polygon 1R, and would be planted approximately 30-foot On-Centers.

As a result of existing roadway structure removal and proposed hydrologic regime improvements (i.e. the installation of culverts and low water crossings), hydrologic enhancement will be immediately established. The design and location of these hydrologic enhancement features were developed during the hydrologic computer analyses process, where the WRMB Hydrologic Model was conducted.

The WRMB Hydrologic Model predicts the approximate size, number, and location of the proposed hydrologic enhancement structures. In separate documentation, WRMB Construction Drawings provide detail information regarding the proposed design, location, and implementation of these structures. Field adjustments may be required during the construction and implementation of the enhancement activities in order to provide the most effective and appropriate location for each structure. These adjustments will be directed by the Engineer.

Polygon 1P - Hydric Hammock Preservation

Within the remaining portion of the parent Polygon 1 habitat area (i.e. areas not previously included within Polygon 1R and Polygon 1E), Polygon 1P contains approximately 865.9 acres. Since Polygon 1P is a preservation area, no structural improvements have been proposed. Consequently, the cessation of harvest activities as well as the implementation of long term management will result in a desirable and sustainable habitat structure within Polygon 1P.

Polygon 2 - Hydric Hammock Enhancement

The existing internal roadway structure that forms the downstream boundary of Polygon 2 ($\pm$ 80.2 acres-Figure 6) will be modified to include the installation of additional culverts and low water crossings. The roadway will remain in order to provide access for long term maintenance and management activities associated with other polygon habitat areas located to the south and west of the Polygon 2 community.

The WRMB Hydrologic Model predicts the approximate size, number, and location of the proposed enhancement structures. In separate documentation, WRMB Construction Drawings provide detail information regarding the proposed design and implementation of these structures, while Figure 6 depicts their approximate location. Field adjustments may be required during the construction and implementation of the enhancement activities in order to provide the most effective and appropriate location for each structure. These adjustments will be directed by the Engineer.

Polygon 5P - Upland Preservation

The two isolated parcels lying north of the Parkway ROW are to be preserved and managed as pasture under the guidelines established in Specific Condition 8 for Phase I; i.e., they may be maintained for limited pasture or hunting use, but must continue to be treated for invasive exotic vegetation, except for bahia grass. If active grazing is discontinued, the areas shall be mowed or burned to maintain a vegetation cover that is substantially herbaceous.

Polygon 5 E- Mesic Flatwoods Restoration

Located primarily within the northern portion of the WRMB project site (Figure 6), Polygon 5E mitigation activities would include the re-establishment of native ground cover, shrub, and canopy vegetation species in several distinct areas ($\pm$ 165.6 acres). Following its completion, Polygon 5E restoration activities will provide a native/historic mesic flatwoods ecosystem that would expand the mosaic of wetland and upland habitats within the WRMB project site.

As proposed in the "Wekiva River Mitigation Bank Mesic Flatwoods Restoration Plan" (Attachment C), existing bahia grass cover will be removed, then followed by the seeding of native vegetation species throughout the polygon habitat areas. The restoration of historic mesic flatwoods habitat is intended to expand the mosaic of habitat communities within the WRMB project site. The

restored mesic flatwood communities will also result in the increased use of wildlife species as desirable foraging area is improved from its present condition.

When habitat community conditions have been successfully initiated, and qualitative monitoring observations indicate it is appropriate, the implementation of a prescribed fire management program will complete the enhancement plan.

Polygon 6 - Mesic Flatwoods Enhancement

Figure 6 illustrates the location and size (± 81.7 acres) of the several distinct habitat community areas designated for mesic flatwoods enhancement; areas entirely in the northern portion of the WRMB project site - and adjacent to Polygon 5 mesic flatwood restoration activities; and, additional areas located in the west-central portion of the site. Mesic flatwoods enhancement has been proposed as a result of adverse habitat community impacts associated with previously cleared native/historic habitat areas for use as cattle grazing and hunting fields. Continued cattle grazing activities have resulted in disturbance of both ground cover and shrub vegetation species.

Mitigation activities for this area would include the removal of undesirable vegetation species, along with the cessation of cattle access. Enhancement activities will initially focus on the removal of bahia grass (where appropriate), and the supplemental planting of shrub and canopy vegetation species. Planted shrub and canopy species will be selected based on adjacent wetland shrub and canopy habitat characteristics (species present, approximate densities, and distribution).

When habitat community conditions and qualitative monitoring observations indicate it is appropriate, the implementation of a prescribed fire management program may be implemented as soon as possible to enhancement mitigation success.

Polygon 8 - Marsh/Wet Prairie Enhancement

Polygon 8 is located in the west-central portion of the WRMB project site (Figure 6). Currently, Polygon 8 habitat composition includes a combination of remnant wet prairie, *Spartina* sp. marsh, and a sawgrass marsh (± 12.2 acres). Hydrologic conditions within Polygon 8 have been moderately affected by the construction of a roadway structure; resulting in an alteration to the timing, volume, and distribution of historic flow regimes. In particular, the absence of habitat

management within Polygon 8 has resulted in the undesirable proliferation of pond pine populations.

Proposed mitigation activities within Polygon 8 would include the manual thinning of existing pond pine, as well as the construction of an extended low water crossing (associated with Polygon 1E mitigation activities). The low water crossing will be required in response to roadway structure removal, while also provide access for management activities in surrounding and adjacent polygon habitats. This activity would allow for historic sheet flow patterns to be re-established.

Implementation of the proposed mitigation activity within Polygon 8 may also include an evaluation to be conducted in order to determine the potential need for the re-introduction of periodic prescribed fire management as soon as possible.

ATTACHMENT C – Mesic Flatwoods Restoration Plan

INTRODUCTION: The goal of the proposed WRMB Mesic Flatwoods Restoration Plan is to provide for restoration and enhancement of native/historic upland and transitional habitat communities either contiguous with those areas currently managed by the Wekiva River Basins State Park, or interior within the site itself. Upland and transitional habitat areas (Polygon 5 and Polygon 6) have been identified for restoration and enhancement, and were segregated in relation to observed topographical, soil, and adjacent community structure attributes.

Previous experience with habitat restoration indicates that natural soil variability and micro-topographic relief provide the final dispensation of habitat boundaries. Thus, restoration activities allow for overlapping community structure. Consequently, the WRMB Mesic Flatwoods Restoration Plan intends to provide for the identification of general restoration habitat polygon boundaries, while exceeding these boundaries in order for indeterminate community structure variability to occur.

EXISTING SITE CONDITIONS: While many of the upland areas within the project site have been cleared of native vegetation, and have been continuously managed for cattle production as forage grass pastures or hunting parcels, there are a few areas of remnant native/historic vegetation where enhancement is proposed. The majority of the upland areas within designated Polygon 5E are dominated by bahia grass, and its eradication is one of the foremost initial goals of the upland restoration process.

The existing upland improved pasture exhibits topographic variability from gently sloping associated with the drier soils in the higher elevations, to nearly flat areas in the southern portion of the site adjacent to the large forested wetlands associated with the northern boundary of the Wekiva River Basins State Park. Historic/native vegetation associations within these areas, as evidenced from direct observation of adjacent managed communities within the Wekiva River Basins State Park, consist of an assemblage of longleaf and slash pine, saw palmetto, gallberry, fetterbush, running oak, creeping bluestem, chalky bluestem, lopsided indiagrass, pineland threeawn, switchgrass, and several native *Panicum* grasses.

Within wetter areas along the transitional area between more xeric communities, common native/historic plant species associated with this more mesic-hydric condition provides suitable habitat for cabbage palm, water oak, wax myrtle, and sand cordgrass. These habitats characteristically merge to form a transitional fringe, which has been virtually eliminated and replaced with improved pasture, containing a dynamic and fluctuating mix of mesic and hydric vegetation species.

GOALS AND OBJECTIVES: The goals of the proposed WRMB Mesic Flatwoods Restoration Plan would include various construction activities to be performed in order to achieve the following: 1) provide for restoration and enhancement of the historic/native mesic flatwood vegetation community structure and habitat conditions associated with a sustainable ecosystem; 2) conduct restoration and enhancement activities in a manner that supports and promotes greater species diversity and habitat heterogeneity; 3) restore and enhance the native/historic

connectivity and overlap of adjacent ecosystem; and, 4) control and eradication of invasive exotic/nuisance vegetation species.

Ground Strata - Elimination of the existing pasture grass and weed community is critical to the success and sustainability of the restoration and enhancement process. Due to the variety of vegetation species present, the task of continuing and reducing existing populations of invasive exotic/nuisance vegetation species may require several growing seasons prior to the achievement of success criteria. Initial herbicide application is conducted to control existing pasture grasses and weed assemblages, as well as reduce the viability of the existing undesirable seed bank. In order to determine the most effective probable treatment regime, several trial plots will be established within areas with appropriate grass and weed coverage, and will be tested for susceptibility to varying treatment scenarios. The most desirable treatment protocol will subsequently be applied to the proposed WRMB habitat restoration and enhancement project area.

An additional critical component of restoration activities involves the selection of appropriate donor sites that reflect the variability and speciation proposed for the restoration project area. Since many of the habitat community types proposed for restoration and enhancement within the WRMB project site are similar to those restored/enhanced at Reedy Creek Mitigation Bank (RCMB), it would be reasonable to select RCMB as a probable donor site. In addition, due its proximity, similarity of target habitat structure and composition, and availability of large donor areas, the Wekiva River Basins State Park may also be incorporated as another donor site. A list of probable vegetation species that may occur within the proposed donor sites is presented in Table 1.

The proposed donor sites, in conjunction with their existing management programs, will be monitored and prepared for optimum harvesting conditions. This is important since the harvesting window may be as short as three (3) weeks for some vegetation species. Harvesting the donor sites may be completed with the use of a green silage cutter operating at a rate which allows for 20 to 24 acres of donor area to be harvested per day. Since the optimum ratio of donor site acreage harvested to recipient site acreage planted is variable depending on several site-specific factors, previous experience would indicate that a ratio of approximately 3:1 may be adequate for the WRMB upland restoration project site.

Table 1

Wekiva River Mitigation Bank Mesic Flatwoods Restoration Plan
Probable Vegetation Species from Donor Sites^a

Scientific Name	Common Name	Harvest Method	
		Machine	Hand
<i>Agalinis linifolia</i>	flax-leaf false foxglove		
<i>Agalinis obtusifolia</i>			
<i>Aletris lutea</i>	yellow colicroot		X
<i>Amphicarpum muhlenbergianum</i>	blue maidencane		X
<i>Andropogon brachystachys</i>	short-spike bluestem	X	
<i>Andropogon glomeratus</i>		X	
<i>Andropogon perangustatus</i>		X	
<i>Andropogon ternaries</i>		X	
<i>Andropogon virginicus</i>		X	
<i>Aristida beyrichiana</i>	wiregrass	X	
<i>Aristida palustris</i>		X	
<i>Aristida patula</i>		X	
<i>Aristida rhizomorpha</i>			
<i>Aristida spiciformis</i>		X	
<i>Arnoglossum ovatum</i>			
<i>Asclepias connivens</i>			
<i>Asclepias lanceolata</i>			
<i>Asclepias reticulate</i>			
<i>Asclepias pedicellata</i>			
<i>Aster dumosus</i>		X	
<i>Aster reticulatus</i>	white-topped aster		X
<i>Aster tortifolius</i>		X	
<i>Bacopa caroliniana</i>			
<i>Bigelowia nudata</i>		X	
<i>Boltonia diffusa</i>			
<i>Buchnera americana</i>	blueheart		X
<i>Burmannia capitata</i>			
<i>Calapogon pallidus</i>			
<i>Carphephorus carnosus</i>	star clusters		X
<i>Carphephorus odoratissimus</i>	Florida paintbrush	X	
<i>Carphephorus paniculatus</i>	deertongue	X	
<i>Centella asiatica</i>			
<i>Chamaecrista fasciculata</i>	partridge pea		X
<i>Chaptalia tomentosa</i>			
<i>Clematis baldwinii</i>	pine hyacinth		
<i>Cnidoscolus stimulosus</i>	treadsoftly		
<i>Coelorachis rugosa</i>	wrinkled jointtail	X	

Table 1

Wekiva River Mitigation Bank Mesic Flatwoods Restoration Plan
Probable Vegetation Species from Donor Sites (Cont'd.)

Scientific Name	Common Name	Harvest Method	
		Machine	Hand
<i>Coreopsis floridana</i>	Florida tickseed	X	
<i>Coreopsis leavenworthii</i>	tickseed		X
<i>Ctenium aromaticum</i>	toothache grass	X	
<i>Dicanthelium aciculare</i>			X
<i>Dicanthelium commutatum</i>			
<i>Dicanthelium dichotomum</i>			X
<i>Dicanthelium erectifolium</i>			X
<i>Dicanthelium portoricense</i>			X
<i>Dicanthelium ensifolium</i>			
<i>Dyschoriste oblongifolia</i>	twinflor		
<i>Eleocharis geniculata</i>			
<i>Elyonurus tripsacoides</i>	balsamscale	X	
<i>Eragrostis elliottii</i>	Elliott's lovegrass	X	
<i>Eragrostis refracta</i>		X	
<i>Erigeron vernus</i>			X
<i>Eriocaulon compressum</i>	hat pins		
<i>Eriocaulon decangulare</i>	pipewort		
<i>Eriocaulon ravenelii</i>	pipewort		
<i>Eriochloa michauxii</i>	longleaf cupgrass		
<i>Eryngium yuccifolium</i>	button snakeroot	X	
<i>Eupatorium mohrii</i>			X
<i>Eupatorium capillifolium</i>	false hoarhound	X	X
<i>Eupatorium rotundifolium</i>		X	
<i>Euthamia minor</i>		X	
<i>Euthamia tenuifolia</i>			
<i>Fimbristylis puberula</i>			
<i>Fimbristylis castanea</i>			
<i>Fuirena breviseta</i>			
<i>Fuirena scirpoidea</i>	umbrella sedge	X	
<i>Gratiola hispida</i>	rough hedge-hyssop		
<i>Gratiola ramose</i>	hedge-hyssop		
<i>Habenaria floribunda</i>	tooth-pedal false rein-orchid		
<i>Helianthus radula</i>	rayless sunflower	X	
<i>Heliotropium polyphyllum</i>	heliotrope		
<i>Hieracium megacephalon</i>		X	
<i>Hypericum fasciculatum</i>	St. John's wort	X	
<i>Hypericum multilum</i>	Dwarf St. John's wort	X	

Table 1

Wekiva River Mitigation Bank Mesic Flatwoods Restoration Plan
Probable Vegetation Species from Donor Sites (Cont'd.)

Scientific Name	Common Name	Harvest Method	
		Machine	Hand
<i>Hypericum myrtifolium</i>	St. John's wort	X	
<i>Hypericum reductum</i>	St. John's wort		
<i>Hypericum tetrapetalum</i>	St. Andrew's cross	X	
<i>Hypoxis juncea</i>	yellow star grass		
<i>Hyptis alata</i>	musky mint	X	
<i>Juncus megacephalus</i>	rush		X
<i>Lachnanthes caroliniana</i>	redroot		
<i>Lachnocaulon anceps</i>	bog-buttons		
<i>Lechea torreyi</i>	piedmont pinweed		X
<i>Liatris garberi</i>	Garber's gayfeather	X	
<i>Liatris laevigata</i>	blazing star	X	
<i>Liatris spicata</i>	slender gayfeather	X	
<i>Lobelia glandulosa</i>	Glade's lobelia	X	
<i>Lobelia paludosa</i>	white swamp lobelia		
<i>Ludwigia curtissii</i>	little seedbox		
<i>Ludwigia maritime</i>	seaside primrose willow	X	
<i>Lycopodiella appressa</i>	clubmoss		
<i>Lygodesmia aphylla</i>	rose-rush		X
<i>Marshallia tenuifolia</i>	Barbara's buttons		X
<i>Mecardonia acuminata</i>	axil-flower		
<i>Melanthera nivea</i>			
<i>Mitreola petiolata</i>	miterwort		
<i>Mitreola sessilifolia</i>	miterwort		
<i>Muhlenberia capillaries</i>	pink muhly grass	X	
<i>Oxypolis filiformis</i>	water dropwort		X
<i>Panicum hemitomon</i>	maidencane		
<i>Panicum rigidulum</i>	redtop panicum	X	
<i>Panicum tenerum</i>	bluejoint panicum	X	
<i>Paspalum praecox</i>	early paspalum		X
<i>Phoebanthus grandiflorus</i>	phoebanthus	X	
<i>Piriqueta caroliniana</i>	Piriqueta		
<i>Pityopsis graminifolia</i>	silkgrass	X	
<i>Pluchea rosea</i>	rosy camphorweed		X
<i>Polygala baldunii</i>	white bachelor button		
<i>Polygala cruciata</i>	drumheads		
<i>Polygala cymosa</i>	tall pine-barren milkwort		
<i>Polygala grandiflora</i>	showy milkwort		

Table 1

Wekiva River Mitigation Bank Mesic Flatwoods Restoration Plan
Probable Vegetation Species from Donor Sites (Cont'd.)

Scientific Name	Common Name	Harvest Method	
		Machine	Hand
<i>Polygala incarnata</i>	procession flower		
<i>Polygala lutea</i>	bog bachelor button		
<i>Polygala ramosa</i>	low pine-barren milkwort		
<i>Polygala rugelii</i>	yellow bachelor's button		
<i>Polygala setacea</i>	coastal plain milkwort		
<i>Pterocaulon pycnostachyum</i>	blackroot		X
<i>Rhexia nashii</i>	meadow beauty		X
<i>Rhexia nuttallii</i>	Nuttall's meadow beauty		
<i>Rhexia petiolata</i>	coastal plain meadow beauty		
<i>Rhynchospora baldwinii</i>	beakrush		
<i>Rhynchospora ciliaris</i>	beakrush		
<i>Rhynchospora colorata</i>	beakrush		
<i>Rhynchospora divergens</i>	beakrush		
<i>Rhynchospora fascicularis</i>	beakrush	X	
<i>Rhynchospora fernaldii</i>	beakrush		
<i>Rhynchospora filifolia</i>	beakrush		
<i>Rhynchospora harperi</i>	beakrush		
<i>Rhynchospora inundata</i>	beakrush	X	
<i>Rhynchospora latifolia</i>	beakrush		
<i>Rhynchospora microcarpa</i>	beakrush	X	
<i>Rhynchospora nitens</i>	beakrush		
<i>Rhynchospora odorata</i>	beakrush		
<i>Rhynchospora plumosa</i>	beakrush		
<i>Rhynchospora tracyi</i>	beakrush	X	
<i>Rudbeckia hirta</i>	blackeyed Susan	X	
<i>Sabatia brevifolia</i>	short-leaf rose-gentain		
<i>Sabatia grandiflora</i>	large-flower rose-gentain		
<i>Schizachyrium stoloniferum</i>	little bluestem	X	
<i>Scleria baldwinii</i>	nutrush		
<i>Scleria georgiana</i>	nutrush		
<i>Scleria hirtella</i>	nutrush		
<i>Scleria pauciflora</i>	nutrush		
<i>Scleria reticularis</i>	nutrush	X	
<i>Scleria triglomerata</i>	tall nutrush	X	
<i>Scleria verticillata</i>	nutrush		
<i>Solidago fistulosa</i>	pine-barren goldenrod	X	
<i>Solidago chapmanii</i>	Chapman's goldenrod		X

Table 1

Wekiva River Mitigation Bank Mesic Flatwoods Restoration Plan
Probable Vegetation Species from Donor Sites (Cont'd.)

Scientific Name	Common Name	Harvest Method	
		Machine	Hand
<i>Solidago stricta</i>	slender goldenrod	X	
<i>Sorghastrum secundum</i>	lopsided indianguass		X
<i>Spartina bakeri</i>	sand cordgrass	X	
<i>Sporobolus curtissii</i>	curtis's dropseed		
<i>Sporobolus junceus</i>	pineland dropseed		X
<i>Syngonanthus flavidulus</i>	bantam buttons		
<i>Tephrosia florida</i>			
<i>Xyris ambigua</i>	yellow eyed grass	X	
<i>Xyris caroliniana</i>	yellow eyed grass	X	
<i>Xyris difformis</i>	yellow eyed grass	X	
<i>Xyris elliottii</i>	yellow eyed grass	X	
<i>Xyris flufiformis</i>	yellow eyed grass		
<i>Xyris platylepis</i>	yellow eyed grass		
<i>Xyris smalliana</i>	yellow eyed grass		

* Those species identified for machine collection are those that have mature seed heads in November that may be taller than 15 inches. More species than those identified may be available at that time; however, the identified species have been observed during previous collection activities associated with RCMB habitat restoration. Many species that are not marked occur only in small quantities. Those identified for hand-collection are common species that mature earlier in the year or are shorter at seed maturity and would not be collected by the green silage chopper. A primary species marked for hand-collection is lopsided indianguass which may be available for harvest for approximately five (5) days in October.

Shrub Strata - The shrub strata will be introduced through direct-seeding and planting of containerized individuals. In the summer and fall following the direct-seeding of grasses and the herbaceous layers, some shrub species will be planted using hand held dibbles. Additional plantings will occur in mid-summer and fall in relation to seed maturation and desirable climatic conditions.

A list of probable/desirable target shrub species is provided in Table 2. Due to the variability in target habitat community structure throughout the site, the density of plants will follow guidelines established for success criteria to result in an average of shrubs per acreage to achieve success in a given target community. Appropriate species will be planted according to habitat resulting in differential concentrations in vegetation assemblages.

Table 2

**Wekiva River Mitigation Bank Mesic Flatwoods Restoration Plan
Probable/Desirable Shrub Vegetation Species**

Scientific Name	Common Name
<i>Asimina reticulata</i>	pawpaw
<i>Befaria racemosa</i>	tarflower
<i>Callicarpa americana</i>	beautyberry
<i>Gaylussacia dumosa</i>	dwarf huckleberry
<i>Gaylussacia nana</i>	dangleberry
<i>Hypericum</i> spp.	St. John's wort
<i>Ilex glabra</i>	gallberry
<i>Lyonia ferruginea</i>	rusty lyonia
<i>Lyonia fruticosa</i>	staggebush
<i>Lyonia lucida</i>	shiny lyonia
<i>Myrica cerifera</i>	wax myrtle
<i>Photinia pyriformis</i>	red chokeberry
<i>Pilophlebis rigida</i>	pennyroyal
<i>Quercus pumila</i>	running oak
<i>Rhus copallina</i>	winged sumac
<i>Rubus argutus</i>	blackberry
<i>Rubus cuneifolius</i>	sand blackberry
<i>Serenoa repens</i>	saw palmetto
<i>Vaccinium arboreum</i>	sparkleberry
<i>Vaccinium corymbosus</i>	highbush blueberry
<i>Vaccinium darrowii</i>	darrow blueberry
<i>Vaccinium myrsinites</i>	dwarf blueberry
<i>Vaccinium stamineum</i>	deerberry
<i>Viburnum nudum</i>	possum haw
<i>Viburnum obovatum</i>	Walter's viburnum

Tree Strata - Trees will be introduced by direct-seeding and planting of containerized individuals. In late summer or early fall following direct-seeding of the grasses and herbaceous layers, tree species will be planted. A list of probable target tree vegetation species is provided in Table 3.

As with shrub strata restoration and enhancement, due to the variability in target habitat community structure throughout the site, the density and composition of plants will follow guidelines established for success criteria to result in an average of trees per acreage to achieve success in a given target community. Appropriate species will be planted according to habitat resulting in differential concentrations in vegetation assemblages.

Table 3

**Wekiva River Mitigation Bank Mesic Flatwoods Restoration Plan
Probable/Desirable Tree Vegetation Species**

Scientific Name	Common Name
<i>Acer rubrum</i>	red maple
<i>Gordonia lasianthus</i>	loblolly bay
<i>Ilex cassine</i>	dahoon holly
<i>Liquidambar styraciflua</i>	sweetgum
<i>Magnolia virginiana</i>	sweetbay
<i>Persea palustris</i>	swamp bay
<i>Pinus elliottii</i>	slash pine
<i>Pinus palustris</i>	longleaf pine
<i>Quercus chapmanii</i>	Chapman's oak
<i>Quercus geminate</i>	sand live oak
<i>Quercus minima</i>	dwarf live oak
<i>Quercus myrtifolia</i>	myrtle oak
<i>Quercus nigra</i>	water oak
<i>Taxodium distichum</i>	bald cypress
<i>Nyssa aquatica</i>	black gum
<i>Ulmus americana</i>	American elm
<i>Sabal Palmetto</i>	cabbage palm

Plant Stock - All containerized plant species will be selected and grown from seed sources within 50 miles of the WRMB project site. Propagation material will be collected from the variety of ecotones within a given habitat (i.e. xeric, mesic, and hydric flatwoods). Additionally, mycorrhizae inoculation will be conducted if the assemblage has not been retained in the existing soils. All containerized individuals will be grown in 6" X 6" containers. This may allow for a deeper root zone once planted, and may also increase post-planting viability.

The groundcover seeding and tree installation shall be conducted at a season that optimizes the plants' growth and survival

RESTORATION TECHNIQUES:

Site Preparation and Bahia Removal - Following the removal of cattle, wax myrtle as well as other undesirable shrub and tree species within target restoration and enhancement areas, will be removed by manual extraction. The abandoned pasture area may then be herbicided for the removal of bahia grass and other invasive exotic/nuisance vegetation species by applying glyphosate at a rate of 5 quarts per acre. The operator of the herbicide equipment will possess the knowledge of avoiding desirable native/historic vegetation species, and may subsequently be able to

selectively retain desirable species that may have otherwise been eliminated. This may result in an increase in early vegetation species diversity and abundance. Open areas of the site will be treated using a boom system of herbicide application, while the boom width and vehicle size may be reduced for areas between existing desirable trees and around the edges of the designated upland restoration site.

Spot-treatment of herbicide will be introduced approximately two (2) weeks following the initial large-scale herbicide application activity, in order to recover areas that may have been missed during the original application activities. Repeated disking of the targeted upland restoration area will be conducted to further reduce and stress remaining bahia grass and/or other undesirable vegetation. Following the final disking of the site, a 4-foot diameter iron roller filled with water will be rolled throughout areas of extensive Bahia grass removal. Approximately 2 to 3 weeks prior to seeding activities, a final glyphosate application using a 3% solution will be applied to individual areas using a backpack sprayer where appropriate. Proposed herbicide mixtures may contain Round-Up Ultra™ and a blue dye for marking purposes.

Harvesting Donor Sites (RCMB and Wekiva River Basins State Park) - Harvest areas will consist of habitats within the RCMB and Wekiva River Basins State Park sites that possess desirable native/historic target community structures. Since the donor sites may contain similar and adjacent habitat associations, each area of distinct habitat will be harvested in order to increase the possibility of vegetation viability. The donor sites are routinely burned in the late spring or early summer in order to initiate wiregrass seed production, as well as provide for suitable pyrogenic community structure.

Both donor site prescribed fire management programs also reduce the height of the shrub and saw palmetto (*Serenoa repens*) strata. Green silage cutters will be used harvest vegetation materials above a 12 to 16 inch height, which should also include the seed stems of wiregrass, other desirable native grasses, sedges, forbs, and other vegetation materials such as saw palmetto frond tips. The collection of the harvested vegetation material will be accomplished by blowing the material into an attached wagon to be transported and dumped at the seeding site. The depth of the deposited vegetation material is not to exceed 12 inches in order to prevent potential overheating while the material matures.

Seeding - Seeding will be accomplished using a modified sod sprigger. The sod sprigger consists of a wagon with a moving bed that pushes the harvested vegetation material forward into rotating prongs that pull the material over an opening in the bottom of the wagon. Positioned in the front of the sod sprigger is a cultipacker that creates furrows about 1 inch in depth, and behind the sprigger are cutters and rollers for covering the seed and firming the ground. A front end loader will load the material onto the wagon of the modified sod sprigger and additional hand-collected seed will be

scattered over the wagon load. Many of the areas may be seeded more than once, since the quality of the seed material may vary in response to local climatic conditions.

Hand-Collected Seed - Hand-collected seed of some species may be added to the mix to enhance the seed mix for specific ecosystems. Since some of the restoration and enhancement areas may vary in soil wetness, as may the donor sites, much of the hand-collected plant material is expected to be focused on the wetter fringe areas where equipment damage may have resulted at the donor sites. Additionally, due to vegetation structure, additional vegetation material may be hand-collected in the more upland xeric areas. Furthermore, lopsided indiagrass (*Sorghastrum secundum*) ripens and is available for harvest for only a few days in October, so this species may be hand-collected at that time within the upland restoration area of the RCMB where it is plentiful. The RCMB project site might also be implemented as a source of pioneer herbaceous species such as lovegrasses (*Eragrostis* spp.), tickseed (*Coreopsis leavenworthii*), and Mohr's eupatorium (*Eupatorium mohrii*), since these species are characteristic of mature ecosystems and also readily establish themselves to create more dense groundcover.

Approximately 2 to 3 pounds of hand-collected seed mix may be sown per acre in addition to the mechanically-harvested vegetation material. The hand-collected seed material can reasonably be expected to vary in cleanliness and purity, and should not be considered by total weight but a fraction thereof. For example, leaves and other structural vegetation components would be included in much of the hand-collected material. Consequently, vegetation species listed in Table 1 are intended to include the probable species composition of hand-collected vegetation material, while acknowledging that all hand-collected material may not germinate.

Invasive Exotic and Nuisance Native Weedy Species Control - It is the intention of initial site preparation activities to significantly minimize the occurrence of bahia grass, but some germination of bahia can be expected due to the collective seed bank that is present. Prior to upland restoration activities, these areas will be monitored and spot-herbicide using backpack sprayers with glyphosate (Round-Up Ultra™). During the second growing season any observed invasive exotic/nuisance weedy species will be spot-herbicide using Plateau™ in order to minimize the presence of undesirable vegetation. The combination of these methods has been proven as a successful means for achieving desirable upland restoration characteristics as evidenced at the RCMB project site.

Although not apparent at this time, dog fennel (*Eupatorium capillifolium*), a native weedy species, may become prevalent throughout the upland restoration activities following the initial construction phase. This occurrence was experienced at RCMB, and the presence of dog fennel in the historic seed bank could not be foreseen. While it is

questionable how long dog fennel might persist with desirable native species competition and whether it is necessary to control it, the minimization of dog fennel will be an important focus of the WRMB Habitat Restoration Plan. This may be accomplished by backpack herbicide application of glyphosate (Round-Up Ultra™). Further control of dog fennel may also be achieved once the prescribed fire management program is initiated.

Prescribed Fire Management Program - The re-introduction of fire into the ecology of the WRMB habitat restoration and enhancement sites is an important restoration feature where target pyrogenic habitat community structure is dependent on fire. Equally as important is the fact that the introduction of fire regimes too early in the restoration process may result in more ecological harm than benefit. A premature fire regime can cause undue stress and may result in reduced success in establishing robust vegetation assemblages. It will be essential to allow planted communities the opportunity to develop root biomass and spread in a natural and timely manner. Unless soil nutrient levels are high and nutrient mining is necessary an initial burn will not be conducted. As the restoration areas develop, fire will be introduced once vegetation has had adequate time to establish sufficient root biomass and thus sustain the stress of fire without reductions in viability.

Once the determination has been made that restoration and/or enhancement areas may be capable of sustaining the introduction of fire, a Wekiva River Mitigation Bank prescribed fire management program will be initiated.

Monitoring and Reporting - Both quantitative and qualitative monitoring has been proposed for the restoration and enhancement habitat areas within the WRMB site. Consequently, in compliance with the approved WRMB Monitoring Plan, all monitoring and reporting of habitat restoration and enhancement activities will be in accordance with those approved procedures and protocols.

Attachment D

Credit Assessment

ATTACHMENT D - Credit Assessment

Wekiva River Mitigation Bank - UMAM Assessment - December 4, 2008																
ASSESSMENT AREA NUMBER	MITIGATION CATEGORY	AREA (acres)	SCORE						UMAM W/OUT MIT.	UMAM WITH MIT.	DELTA	TIME LAG	P FACTOR	RISK	RFG	CREDIT
			LOCATION AND LANDSCAPE		WATER ENVIRONMENT		COMMUNITY STRUCTURE									
			W/OUT or CUR.*	WITH MIT.	W/OUT or CUR.*	WITH MIT.	W/OUT or CUR.*	WITH MIT.								
1R	Mixed Forested Wetland Restoration	14.10	0.00	9.00	0.00	10.00	0.00	10.00	0.00	0.97	0.97	1.46		1.00	0.66	9.34
1E	Mixed Forested Wetland Enhancement	296.43	8.00	9.00	7.00	10.00	7.00	10.00	0.73	0.97	0.23	1.00		1.00	0.23	69.17
1P	Mixed Forested Wetland Preservation	865.87	8.00	9.00	9.00	10.00	7.00	10.00	0.80	0.97	0.17	1.00	0.70	1.00	0.12	101.02
2	Mixed Forested Wetland Enhancement	80.24	7.00	8.00	7.00	8.00	8.00	10.00	0.73	0.87	0.13	1.10		1.00	0.12	9.73
5E	Upland Sandhill Restoration	165.58	4.00	8.00	n/a	n/a	3.00	9.00	0.35	0.85	0.50	1.14		1.50	0.29	48.42
5P	Upland Sandhill Restoration	x30	4.00	4.00	n/a	n/a	3.00	3.00	0.35	0.35	0.00				0.00	0.00
6	Mesic Flatwoods Enhancement	81.67	6.00	9.00	n/a	n/a	5.00	9.00	0.55	0.90	0.35	1.10		1.50	0.21	17.32
8	Marsh/Wet Prairie Enhancement	12.19	7.00	10.00	8.00	10.00	7.00	10.00	0.73	1.00	0.27	1.00		1.00	0.27	3.25
TOTALS		1516.08													258.24	

Bank site also included 8.0 acres of roads and a total of 3 acres of property to remain for management purposes.

Notes:

"Current" scores based on 7-15-04 and 10-6-04 site visits and submitted materials.

"P" factor for 1P reflects the relative value of the resource balanced against the probability of long-term impact or degradation

Risk factors were assigned to the large scale restoration areas because of the increased vulnerability of newly established communities to environmental perturbations and the uncertainty of maintaining an appropriate fire regime

Time lag was assigned assuming a release schedule based on actualized environmental enhancement and the time required to attain scores beyond the final release

ATTACHMENT F - Community Descriptions & Desirable Plant Lists

Mesic Flatwoods (Polygon 5 and Polygon 6) - (synonyms: pine flatwoods, pine savannahs, pine barrens). Mesic Flatwoods are characterized as an open canopy forest of widely spaced pine trees with little or no understory but a dense ground cover of herbs and shrubs. Several variations of Mesic Flatwoods are recognized, the most common associations being longleaf pine - wiregrass - runner oak and slash pine - gallberry - saw palmetto. Other typical plants include: St. Johns-wort, dwarf huckleberry, fetterbush, dwarf wax myrtle, stagger bush, blueberry, gopher apple, tar flower, bog buttons, blackroot, false foxglove, white-topped aster, yellow-eyed grass, and cutthroat grass. Additional species lists are found in the table below.

Hydric Hammock (Polygon IR, Polygon IE, Polygon IP, and Polygon 2) - (synonyms: wetland hardwood hammock, wet hammock). Hydric Hammock is characterized as a well-developed hardwood and cabbage palm forest with a variable understory often dominated by palms and ferns. Typical plants include cabbage palm, diamond-leaf oak, red cedar, red maple, swamp bay, sweetbay, water oak, southern magnolia, wax myrtle, saw palmetto, bluestem palmetto, needle palm, poison ivy, dahoon holly, myrsine, hackberry, sweetgum, loblolly pine, Florida elm, swamp chestnut oak, American hornbeam, Walter viburnum, royal fern, peppervine, rattanvine, yellow jessamine, and Virginia creeper. Additional species lists are found in the table below.

Wet Prairie (Polygon 8) - (synonyms: sand marsh, savannah, coastal savannah, coastal prairie, pitcher plant prairie). Wet Prairie is characterized as a treeless plain with a sparse to dense ground cover of grasses and herbs, including wiregrass, toothache grass, maidencane, spikerush, and beakrush. Other typical plants include hatpins, marsh pinks, crownbeard, sundews, black-eyed susan, stargrass, white-top sedge, meadowbeauty, yellow-eyed grass, sneezeweed, sunflower, wax myrtle, pitcher plants, tickseed, St. John's wort, and panicums. Additional species lists are found in the table below.

Table F-1: Community Vegetation Species

Herbaceous Species – Mesic Flatwoods

Scientific Name	Common Name
<i>Aletris lutea</i>	yellow colicroot
<i>Amphicarpum muhlenbergianum</i>	blue maidencane
<i>Andropogon brachystachys</i>	short-spike bluestem
<i>Andropogon glomeratus</i>	
<i>Andropogon perangustatus</i>	
<i>Andropogon ternarius</i>	
<i>Andropogon virginicus</i>	
<i>Aristida beyrichiana</i>	wiregrass
<i>Aristida palustris</i>	
<i>Aristida patula</i>	
<i>Aristida rhizomorpha</i>	
<i>Aristida spiciformis</i>	
<i>Aster dumosus</i>	
<i>Aster tortifolius</i>	
<i>Buchnera americana</i>	blueheart
<i>Burmania capitata</i>	
<i>Carphephorus odoratissimus</i>	Florida paintbrush
<i>Carphephorus paniculatus</i>	deertongue
<i>Chamaecrista fasciculata</i>	partridge pea
<i>Clematis baldwinii</i>	pine hyacinth
<i>Cnidioscolus stimulosus</i>	treadsoftly
<i>Coelorachis rugosa</i>	wrinkled jointtail
<i>Coreopsis floridana</i>	Florida tickseed
<i>Coreopsis leavenworthii</i>	tickseed
<i>Dicanthelium commutatum</i>	
<i>Dicanthelium ensifolium</i>	
<i>Elyonurus tripsacoides</i>	balsamscale
<i>Eragrostis elliottii</i>	Elliott's lovegrass
<i>Eragrostis refracta</i>	
<i>Erigeron quercifolius</i>	
<i>Eupatorium capillifolium</i>	false hoarhound
<i>Euthamia minor</i>	
<i>Euthamia tenuifolia</i>	
<i>Gratiola hispida</i>	rough hedge-hyssop
<i>Helianthus radula</i>	rayless sunflower
<i>Heliotropium polyphyllum</i>	heliotrope
<i>Hieracium megacephalon</i>	
<i>Hypericum cumulicola</i>	scrub St. John's wort
<i>Hypericum drummondii</i>	Drummond's St. John's wort
<i>Hypericum reductum</i>	St. John's wort
<i>Hypoxis juncea</i>	yellow star grass
<i>Lechea torreyi</i>	piedmont pinweed
<i>Liatris gracilis</i>	Garber's gayfeather
<i>Liatris spicata</i>	slender gayfeather
<i>Ludwigia curtissii</i>	little seedbox
<i>Lycopodiella appressa</i>	clubmoss
<i>Lygodesmia aphylla</i>	rose-rush
<i>Mitreola angustifolia</i>	miterwort
<i>Muhlenberia capillaries</i>	pink muhly grass
<i>Paspalum setaceum</i>	thin paspalum
<i>Phoebanthus grandiflorus</i>	phoebanthus
<i>Piriqueta caroliniana</i>	Piriqueta

<i>Pityopsis graminifolia</i>	silkgrass
<i>Pterocaulon pycnostachyum</i>	blackroot
<i>Rudbeckia hirta</i>	blackeyed Susan
<i>Schizachyrium stoloniferum</i>	little bluestem
<i>Solidago canadensis</i>	Canada goldenrod
<i>Solidago rugosa</i>	wrinkled goldenrod
<i>Sorghastrum secundum</i>	lopsided indiagrass
<i>Tephrosia florida</i>	
<i>Bigelovia nudata</i>	
<i>Carphephorus odoratissimus</i>	Florida paintbrush
<i>Carphephorus paniculatus</i>	deertongue
<i>Chamaecrista fasciculata</i>	partridge pea
<i>Chaptalia tomentosa</i>	
<i>Clematis baldwinii</i>	pine hyacinth
<i>Coreopsis floridana</i>	Florida tickseed
<i>Coreopsis leavenworthii</i>	tickseed
<i>Dyschoriste oblongifolia</i>	twinflower
<i>Eragrostis elliottii</i>	Elliott's lovegrass
<i>Eragrostis refracta</i>	
<i>Erigeron quercifolius</i>	
<i>Eryngium yuccifolium</i>	button snakeroot
<i>Eupatorium capillifolium</i>	false hoarhound
<i>Euthamia minor</i>	
<i>Euthamia tenuifolia</i>	
<i>Gratiola hispida</i>	rough hedge-hyssop
<i>Heliotropium polyphyllum</i>	heliotrope
<i>Hypoxis juncea</i>	yellow star grass
<i>Panicum rigidulum</i>	redtop panicum
<i>Panicum tenerum</i>	bluejoint panicum
<i>Paspalum sp.</i>	paspalum
<i>Phoebanthus grandiflorus</i>	phoebanthus
<i>Pteridium aquilinum</i>	bracken fern
<i>Solidago fistulosa</i>	pine-barren goldenrod
<i>Solidago stricta</i>	slender goldenrod
<i>Spartina bakeri</i>	sand cordgrass
<i>Syngonanthus flavidulus</i>	bantam buttons

Shrub Species – Mesic Flatwoods

Scientific Name	Common Name
<i>Asimina reticulata</i>	pawpaw
<i>Befaria racemosa</i>	tarflower
<i>Callicarpa americana</i>	beautyberry
<i>Hypericum</i> spp.	St. John's wort
<i>Lyonia ferruginea</i>	rusty lyonia
<i>Lyonia fruticosa</i>	staggerbush
<i>Myrica cerifera</i>	wax myrtle
<i>Photinia pyriformis</i>	red chokeberry
<i>Ptilophlebis rigida</i>	pennyroyal
<i>Quercus pumila</i>	running oak
<i>Rhus copallina</i>	winged sumac
<i>Rubus argutus</i>	blackberry
<i>Rubus cuneifolius</i>	sand blackberry
<i>Serenoa repens</i>	saw palmetto
<i>Vaccinium arboreum</i>	sparkleberry
<i>Vaccinium darrowii</i>	darrow blueberry
<i>Vaccinium myrsinites</i>	dwarf blueberry
<i>Vaccinium stamineum</i>	deerberry
<i>Viburnum nudum</i>	possum haw
<i>Viburnum obovatum</i>	Walter's viburnum
<i>Callicarpa americana</i>	beautyberry
<i>Ilex glabra</i>	gallberry
<i>Lyonia ligustrina</i>	he-huckleberry
<i>Myrica cerifera</i>	wax myrtle
<i>Serenoa repens</i>	saw palmetto
<i>Vaccinium arboreum</i>	sparkleberry

Tree Species – Mesic Flatwoods

Scientific Name	Common Name
<i>Pinus palustris</i>	longleaf pine
<i>Quercus chapmanii</i>	Chapman's oak
<i>Quercus geminate</i>	sand live oak
<i>Quercus minima</i>	dwarf live oak
<i>Quercus myrtifolia</i>	myrtle oak
<i>Sabal Palmetto</i>	cabbage palm
<i>Acer rubrum</i>	red maple
<i>Liquidambar styraciflua</i>	sweetgum
<i>Pinus palustris</i>	longleaf pine
<i>Pinus serotina</i>	pond pine
<i>Quercus chapmanii</i>	Chapman's oak
<i>Quercus geminate</i>	sand live oak
<i>Quercus minima</i>	dwarf live oak
<i>Quercus myrtifolia</i>	myrtle oak
<i>Sabal palmetto</i>	cabbage palm

Herbaceous Species – Hydric Hammock

Scientific Name	Common Name
<i>Asclepias connivens</i>	
<i>Asclepias lanceolata</i>	
<i>Asclepias reticulata</i>	
<i>Asclepias pedicellata</i>	
<i>Bacopa caroliniana</i>	
<i>Blechnum serrulatum</i>	Swamp fern
<i>Carphephorus odoratissimus</i>	Florida paintbrush
<i>Carphephorus paniculatus</i>	deertongue
<i>Centella asiatica</i>	
<i>Dicanthelium commutatum</i>	
<i>Dicanthelium dichotomum</i>	
<i>Eragrostis elliottii</i>	Elliott's lovegrass
<i>Eragrostis refracta</i>	
<i>Gratiola hispida</i>	rough hedge-hyssop
<i>Gratiola ramosa</i>	hedge-hyssop
<i>Habenaria floribunda</i>	tooth-pedal false rein-orchid
<i>Lobelia glandulosa</i>	Glade's lobelia
<i>Lobelia paludosa</i>	white swamp lobelia
<i>Melanthera nivea</i>	
<i>Mitreola petiolata</i>	miterwort
<i>Mitreola sessilifolia</i>	miterwort
<i>Nephrolepis</i> spp.	Boston ferns
<i>Osmunda cinnamomea</i>	cinnamon fern
<i>Osmunda regalis</i>	royal fern
<i>Oxypholis filiformis</i>	water dropwort
<i>Panicum hemitomon</i>	maiden cane
<i>Panicum rigidulum</i>	redtop panicum
<i>Rhynchospora baldwinii</i>	beakrush
<i>Rhynchospora ciliaris</i>	beakrush
<i>Rhynchospora colorata</i>	beakrush
<i>Rhynchospora divergens</i>	beakrush
<i>Rhynchospora fascicularis</i>	beakrush
<i>Rhynchospora fernaldii</i>	beakrush
<i>Rhynchospora filifolia</i>	beakrush
<i>Rhynchospora harperi</i>	beakrush
<i>Rhynchospora inundata</i>	beakrush
<i>Rhynchospora latifolia</i>	beakrush
<i>Rhynchospora microcarpa</i>	beakrush
<i>Rhynchospora nitens</i>	beakrush
<i>Rhynchospora odorata</i>	beakrush
<i>Rhynchospora plumosa</i>	beakrush
<i>Rhynchospora tracyi</i>	beakrush
<i>Saururus cernuus</i>	lizard's tail
<i>Woodwardia areolata</i>	netted chain fern
<i>Woodwardia virginica</i>	Virginia chain fern
<i>Xyris ambigua</i>	yellow eyed grass
<i>Xyris caroliniana</i>	yellow eyed grass
<i>Xyris difformis</i>	yellow eyed grass
<i>Xyris elliottii</i>	yellow eyed grass
<i>Xyris fluffiformis</i>	yellow eyed grass
<i>Xyris platylepis</i>	yellow eyed grass
<i>Xyris smalliana</i>	yellow eyed grass

Shrub Species – Hydric Hammock

Scientific Name	Common Name
<i>Callicarpa americana</i>	beautyberry
<i>Gaylussacia dumosa</i>	dwarf huckleberry
<i>Ilex glabra</i>	gallberry
<i>Itea virginica</i>	Virginia willow
<i>Lyonia fruiticosa</i>	staggerbush
<i>Lyonia lucida</i>	shiny lyonia
<i>Myrica cerifera</i>	wax myrtle
<i>Rhapidophyllum hystrix</i>	needle palm
<i>Serenoa repens</i>	saw palmetto
<i>Vaccinium arboreum</i>	sparkleberry
<i>Vaccinium corymbosus</i>	highbush blueberry
<i>Viburnum nudum</i>	possum haw
<i>Viburnum obovatum</i>	Walter's viburnum

Tree Species – Hydric Hammock

Scientific Name	Common Name
<i>Acer rubrum</i>	red maple
<i>Gordonia lasianthus</i>	loblolly bay
<i>Ilex cassine</i>	dahoon holly
<i>Liquidambar styraciflua</i>	sweetgum
<i>Magnolia virginiana</i>	sweetbay
<i>Persea palustris</i>	swamp bay
<i>Pinus elliotii</i>	slash pine
<i>Quercus myrtifolia</i>	myrtle oak
<i>Quercus nigra</i>	water oak
<i>Nyssa aquatica</i>	black gum
<i>Taxodium distichum</i>	bald cypress
<i>Ulmus americana</i>	American elm
<i>Sabal Palmetto</i>	cabbage palm

Herbaceous Species – Wet Prairie

Scientific Name	Common Name
<i>Agalinis linifolia</i>	flax-leaf false foxglove
<i>Agalinis obtusifolia</i>	
<i>Aletris lutea</i>	yellow colicroot
<i>Amphicarpum muhlenbergianum</i>	blue maidencane
<i>Andropogon glomeratus</i>	
<i>Aristida beyrichiana</i>	wiregrass
<i>Aristida palustris</i>	
<i>Aristida patula</i>	
<i>Aristida rhizomorpha</i>	
<i>Aristida spiciformis</i>	
<i>Arnoglossum ovatum</i>	
<i>Asclepias connivens</i>	
<i>Asclepias lanceolata</i>	
<i>Asclepias reticulata</i>	
<i>Asclepias pedicellata</i>	
<i>Aster dumosus</i>	
<i>Aster reticulatus</i>	white-topped aster
<i>Aster tortifolius</i>	
<i>Bacopa caroliniana</i>	
<i>Bigelovia nudata</i>	
<i>Boltonia diffusa</i>	
<i>Calamagrostis pallidus</i>	
<i>Carphephorus carnosus</i>	star clusters
<i>Carphephorus odoratissimus</i>	Florida paintbrush
<i>Carphephorus paniculatus</i>	deertongue
<i>Centella asiatica</i>	
<i>Chaptalia tomentosa</i>	
<i>Dicanthelium aciculare</i>	
<i>Dicanthelium dichotomum</i>	
<i>Dicanthelium erectifolium</i>	
<i>Dicanthelium ensifolium</i>	
<i>Eleocharis geniculata</i>	
<i>Erigeron vernus</i>	
<i>Eriocaulon compressum</i>	hat pins
<i>Eriocaulon decangulare</i>	pipewort
<i>Eriocaulon ravenelii</i>	pipewort
<i>Eriochloa michauxii</i>	longleaf cupgrass
<i>Eryngium yuccifolium</i>	button snakeroot
<i>Fimbristylis puberula</i>	
<i>Fimbristylis castanea</i>	
<i>Fuirena breviseta</i>	
<i>Fuirena scirpoides</i>	umbrella sedge
<i>Gratiola pilosa</i>	shaggy hedge-hyssop
<i>Habenaria floribunda</i>	tooth-pedal false rein-orchid
<i>Helianthus radula</i>	rayless sunflower
<i>Hypericum fasciculatum</i>	St. John's wort
<i>Hypericum multilum</i>	Dwarf St. John's wort
<i>Hypericum myrtifolium</i>	St. John's wort
<i>Hypericum tetrapetalum</i>	St. Andrew's cross
<i>Hyptis alata</i>	musky mint
<i>Juncus megacephalus</i>	rush
<i>Lachnanthes caroliniana</i>	redroot
<i>Lachnocaulon anceps</i>	bog-buttons
<i>Liatris garberi</i>	Garber's gayfeather
<i>Lobelia glandulosa</i>	Glade's lobelia

<i>Lobelia paludosa</i>	white swamp lobelia
<i>Ludwigia repens</i>	red ludwigia
<i>Marshallia tenuifolia</i>	Barbara's buttons
<i>Mecardonia acuminata</i>	axil-flower
<i>Mitreola petiolata</i>	miterwort
<i>Mitreola sessilifolia</i>	miterwort
<i>Oxypholis filiformis</i>	water dropwort
<i>Panicum hemitomon</i>	maidencane
<i>Panicum rigidulum</i>	redtop panicum
<i>Pluchea rosea</i>	rosy camphorweed
<i>Polygala baldwinii</i>	white bachelor button
<i>Polygala cruciata</i>	drumheads
<i>Polygala cymosa</i>	tall pine-barren milkwort
<i>Polygala grandiflora</i>	showy milkwort
<i>Polygala incarnata</i>	procession flower
<i>Polygala lutea</i>	bog bachelor button
<i>Polygala ramosa</i>	low pine-barren milkwort
<i>Polygala rugelii</i>	yellow bachelor's button
<i>Polygala setacea</i>	coastal plain milkwort
<i>Rhexia marshallii</i>	meadow beauty
<i>Rhexia nuttallii</i>	Nuttall's meadow beauty
<i>Rhexia petiolata</i>	coastal plain meadow beauty
<i>Rhynchospora baldwinii</i>	beakrush
<i>Rhynchospora ciliaris</i>	beakrush
<i>Rhynchospora colorata</i>	beakrush
<i>Rhynchospora divergens</i>	beakrush
<i>Rhynchospora fascicularis</i>	beakrush
<i>Rhynchospora fernaldii</i>	beakrush
<i>Rhynchospora filifolia</i>	beakrush
<i>Rhynchospora harperi</i>	beakrush
<i>Rhynchospora inundata</i>	beakrush
<i>Rhynchospora latifolia</i>	beakrush
<i>Rhynchospora microcarpa</i>	beakrush
<i>Rhynchospora nitens</i>	beakrush
<i>Rhynchospora odorata</i>	beakrush
<i>Rhynchospora plumosa</i>	beakrush
<i>Rhynchospora tracyi</i>	beakrush
<i>Rudbeckia hirta</i>	blackeyed Susan
<i>Sabatia brevifolia</i>	short-leaf rose-gentain
<i>Sabatia grandiflora</i>	large-flower rose-gentain
<i>Scleria baldwinii</i>	nutrush
<i>Scleria georgiana</i>	nutrush
<i>Scleria hirtella</i>	nutrush
<i>Scleria pauciflora</i>	nutrush
<i>Scleria reticularis</i>	nutrush
<i>Scleria triglomerata</i>	tall nutrush
<i>Scleria verticillata</i>	nutrush
<i>Solidago fistulosa</i>	pine-barren goldenrod
<i>Solidago stricta</i>	slender goldenrod
<i>Spartina bakeri</i>	sand cordgrass
<i>Syngonanthus flavidulus</i>	bantam buttons
<i>Xyris</i> spp.	yellow eyed grasses

Shrub Species - Wet Prairie

Scientific Name	Common Name
<i>Hypericum</i> spp.	St. John's wort
<i>Ilex glabra</i>	gallberry
<i>Lyonia ferruginea</i>	rusty lyonia
<i>Myrica cerifera</i>	wax myrtle
<i>Serenoa repens</i>	saw palmetto

ATTACHMENT G- MANAGEMENT PLAN

Following mitigation bank implementation (i.e. construction and achievement of success criteria), long term management activities must be initiated to ensure continued and appropriate performance of the on-site ecological improvements. The Wekiva River Mitigation Bank (WRMB) Long Term Management Plan is summarized in the table below, followed by more detailed management activities and concerns.

Table G-1 – Proposed Long Term Management Requirements

Polygon Designation	Community Description	Long Term Management Requirements
1R	Hydric Hammock Restoration	Semi-annual monitoring for invasive exotic and nuisance vegetation species presence (manual and/or herbicide application). Supplemental planting, as necessary.
1E	Hydric Hammock Enhancement	Semi-annual monitoring of low water crossing and culvert structures. Semi-annual monitoring for invasive exotic and nuisance vegetation species presence (manual removal and/or herbicide application). Supplemental planting, as necessary.
1P	Hydric Hammock Preservation	Semi-annual monitoring for invasive exotic and nuisance vegetation species presence (manual removal and/or herbicide application). Semi-annual monitoring and maintenance of perimeter fencing.
2	Hydric Hammock Enhancement	Semi-annual monitoring and maintenance, as necessary, of low water crossing and culvert structures. Semi-annual monitoring for invasive exotic and nuisance vegetation species presence (manual removal and/or herbicide application).
5E & 5P	Mesic Flatwoods Preservation and Restoration	Semi-annual monitoring for invasive exotic and nuisance vegetation species presence (manual removal and/or herbicide application). Semi-annual assessment for Fire management Program.
6	Mesic Flatwoods Enhancement	Semi-annual monitoring for invasive exotic and nuisance vegetation species presence (manual removal and/or herbicide application). Semi-annual assessment for Fire Management Program.
8	Marsh/Wet Prairie Enhancement	Semi-annual monitoring for invasive exotic and nuisance vegetation species presence (manual removal and/or herbicide application). Semi-annual assessment for Fire Management Program.

Construction: Site access for portions of the Wekiva River Basins Park and for the WRMB site will be through the existing fill road traversing the northern portion of the site and then basically traveling along the western boundary of the site. Several hydrologic enhancements in the form of low water crossings and culverts will be installed along this road. The road is likely to be crossed several times a year by park or bank

personnel, and any noticeable perturbations (tree-fall, washout, blockages, etc.) would be noted and either corrected at the time or reported to the bank for follow-up maintenance. Additionally, at least twice a year, the roadway will be traveled specifically to inspect for signs of decline or potential erosion areas, low-water crossing stability and culvert blockage. Any such problems will be rectified within 30 days of inspection and reported in the semi-annual status report. With the limited usage of the roadway and the active inspection and maintenance plan, the roadway, culverts and low-water crossings are not expected to need replacement for 20 years or more.

Exotic Vegetation: Currently, other than the pasture grasses and forbs, there is minimal exotic vegetation infestation of the site, and that will be eliminated to attain success criteria. However, to maintain these criteria, during all management, monitoring and inspection activities, bank staff will be alert to any signs of exotic vegetation establishment throughout the bank, and manually or chemically treat the exotics immediately within 30 days. Additionally, at least two times per year, the site perimeters, access areas, and roadway corridors will be inspected for spot treatments. At least once per year this inspection and treatment will be extended to include the areas where roads were removed, any other hot-spots previously treated, and at least one hour of internal surveillance in areas not previously walked.

Wet prairie and mesic flatwood communities: A detailed WRMB Prescribed Fire Management Program will be developed, in consultation with Wekiva River Basins State Park staff, within 6 months after filing the conservation easement. In discussion with the park managers and the mesic flatwood restoration consultants, and if conditions allow, an initial prescribed will be conducted prior to mesic flatwood restoration activities, at least in the native communities. After seeding in the mesic flatwoods, appropriate condition and quantity of groundcover to carry a fire may not occur for several years. However, at least twice a year these communities will be assessed for the need and potential of a controlled burn. The target frequency for fire management will be at least one growing season burn per five years.

Semi-annual status reports will detail the condition of the communities relative to the need and potential for a burn, the conditions required for the next desirable burn, and the anticipated timeframe for the next burn. If a burn does not occur in the anticipated desirable timeframe, the status report will also describe the reasons for the lack of implementation of the prescribed burn.

Because these communities are characterized by a relatively open canopy and a diverse and predominantly herbaceous groundcover, a significant management goal will be the control of woody shrubs and saplings. Hopefully, frequent burns will provide adequate control; however, it may be necessary to provide some additional mechanical control in areas or times when fire is not effective to maintain success criteria. Woody cover will be assessed and reported twice per year in the status reports.

Security: The site fencing, gates and structures will be inspected semiannually for any sign of trespass or vandalism, and problems will be rectified within 30 days. Additionally, during all inspections, any signs of illegal access or dumping will be reported for remedy, and reported in the status report.

Attachment H

Monitoring Plan

Monitoring Plan

Abstract: The monitoring of the enhancement and restoration at the Wekiva River Mitigation Bank (WRMB) consists of both quantitative and qualitative monitoring. The quantitative vegetation monitoring will be conducted annually after enhancement and restoration activities are conducted, and will be submitted with credit release requests associated with interim and final success attainment. Parameters to be monitored consist of percent cover by species or grouping, and cover by exotic and nuisance species. Monitoring will also contain information on planted tree height and stem density. Qualitative monitoring information to be included in the annual reports will consist of an overall hydrologic assessment of the wetland, an estimation of the percent cover and dominant species in each community, documentation of the presence or spread of nuisance species, wildlife utilization, and general biological integrity of each assessed community. The specific monitoring techniques to be employed in the monitoring of these wetlands are described below, and are also represented in **Table 1**.

Table 1 - Proposed Monitoring Requirements

Assessment Area Designation	Proposed Monitoring Requirements
1R	Quarterly Qualitative observation and Reporting, quantitative for credit release
1E	Semi-Annual Qualitative observation and Semi-Annual Reporting
1P	Semi-Annual Qualitative observation and Semi-Annual Reporting
2	Quarterly Qualitative observation and Semi-Annual Reporting
5E	Semi-Annual Qualitative observation and Reporting, quantitative for credit release
6	Semi-Annual Qualitative observation and Reporting, quantitative for credit release
8	Quarterly Qualitative observation and Semi-Annual Reporting

A. Quantitative Monitoring (Assessment Area 6)

Vegetation: Quantitative vegetation monitoring will occur in the spring (March through May) in the first season following restoration activities (as a baseline) and in association with each request for a determination of success level attainment. Within Assessment Area 6, quantitative vegetation data would be gathered at regular predetermined intervals along transects. For AA- 6, transects would be 50m in length with one meter square quadrats placed every 10 meters. The placement and orientation of vegetation monitoring transects at WRMB is indicated in **Figure 1** and schematic diagrams of the transects are provided within **Figure 2** and **Figure 3**. Cover class data will be collected by overhead inspection of all vegetation less than 1 meter high rooted within the quadrat by species. Cover classes will be assigned to each taxon in addition to bare ground and open water, in accordance with a modified Daubenmire (1959) scale. This scale is as follows: <1%, 1%-5%, 5%-25%, 25%-50%, 50%-75%, 75%-95% and 95%-100%. Data would be recorded directly into a Microsoft Access database on an electronic tablet in the field. To evaluate shrub and tree metrics, all transects in Assessment Area 6 will include a 30' wide belt (15' on each side of the transect tape). Each individual shrub and tree species occurrence within the belt transect will be recorded along with height in inches and diameter at breast height (if applicable).

Data Analysis: Descriptive statistics will be calculated and presented for each of the field methods including stem density and average height parameters for belt transect data, and absolute percent cover and relative percent cover in quadrats. Formulas for calculating these statistics shall be as follows:

Tree/Shrub Density (for belt transects) = $\sum S_i / \text{Area}$; Where S_i = the number of stems for a given species

Total Basal Area (reported in square feet per acre) = $(\left[\left(\frac{S_i \text{Adbh}}{2} \right)^2 / 144 \right] \times 3.14) \times S1SD / \text{Area}$;
Where $S_i \text{Adbh}$ = the average dbh of a given species in inches and $S1SD$ = the measured stem density (per acre) of the same species

Relative Percent Cover (for the groundcover stratum) = $\sum S_i / S_{\text{veg}}$

Where S_i = the % cover class value of a given species (or class of interest, such as exotic species) and S_{veg} = the sum of all vegetation cover class values (i.e. excluding bare ground, water and sphagnum moss) across a given transect. For the purposes of these calculations, the median value of each cover class (<1% = 0.5, 1%-5% = 2.5, 5%-25% = 15, 25%-50% = 37.5, 50%-75% = 62.5, 75%-95% = 80 and 95%-100% = 97.5) is used to calculate S_i and S_{veg} .

Absolute Percent Cover (for the groundcover stratum) = $\sum S_i / S_{\text{total}}$

Where S_i = the % cover class value of a given species (or class of interest, such as exotic species) and S_{total} = the sum of all ground cover class values across a given transect. For the purposes of these calculations, the median value of each cover class (<1% = 0.5, 1%-5% = 2.5, 5%-25% = 15, 25%-50% = 37.5, 50%-75% = 62.5, 75%-95% = 80 and 95%-100% = 97.5) is used to calculate S_i and S_{total} .

B. Quantitative Monitoring (Assessment Area 5E)

Vegetation: Quantitative vegetation monitoring will occur in the spring (March through May) in the first season following restoration activities (as a baseline) and in association with each request for a determination of success attainment. Within Assessment Area 5E, quantitative vegetation data would be gathered at regular predetermined intervals along transects. Four 200 foot transects (Figure 1) and 1 meter radius plots will be established within the wetland and upland portions of polygons 5E1 and 5E2 using a sub-meter Global Positioning System. Quantitative vegetation monitoring parameters will consist of:

- a) Percent cover and composition of groundcover species
- b) Percent cover and composition of shrub species
- c) Diameter at breast height (dbh) and composition of canopy and sub-canopy species
- d) Stem counts of tree seedlings and cabbage palms.

Shrub cover and groundcover class values will be assigned as the median value of a modified Daubenmire (1959) cover class range as follows: >1% = 0.5, 1-5% = 2.5, 5- 25% = 15, 25-50% = 37.5, 50-75% = 62.5, 75-95% = 85, 95-100% = 97.5.

All transects will be marked with pink flagging tape at each terminus. A 300 foot transect tape will be strung between the two transect termini at a taut/straight position for consistency. The centers of plots will be marked using PVC pipe, and two 10 meter transect tapes will be run perpendicular to each other across the center point of the plot to indicate the boundaries of the 1 meter radius plot.

The vegetation along the transects and within plots will be divided into four strata, based on FDEP 62-340.200, F.A.C. (1996) of the Florida Wetlands Delineation Manual, Delineation of the Landward Extent of Wetlands and Surface Waters. Canopy trees will be defined as those woody plants with a diameter at breast height (dbh) greater than 10 centimeters (cm) or 4 inches. The sub-canopy will consist of tree species, excluding common woody shrubs, with a dbh less than 2.5 cm (1-3.9 inches).

Through each transect, the canopy and sub-canopy trees will be sampled along five meter wide belt sections (Mueller-Dombois and Ellenberg 1974). Diameters of all canopy trees will be measured, and precise locations along each transect will be recorded in order to facilitate re-sampling, and to document mortality and recruitment. Cabbage palms (*Sabal palmetto*) will not be measured for dbh, as these trees tend to decrease in diameter with age.

C. Qualitative Monitoring (All Assessment Areas)

Vegetation: Qualitative vegetation monitoring will occur as shown in Table B-1 above for each Assessment Area habitat type. A qualitative monitoring form (**Attachment 1**) will be filled out for each pedestrian transect through each Assessment Area. The location of pedestrian transects will vary from year to year in order to cumulatively provide sufficient coverage of the Assessment Area being evaluated. A GPS track log of pedestrian transects shall be maintained in order to both illustrate and associate a qualitative form with a location; and to provide a basis for future pedestrian transects (i.e. within gaps of the GPS track log).

The condition of the vegetation, both ground cover and planted trees, wildlife use observations, and general habitat health will be qualitatively evaluated. This evaluation will consist of making observations throughout the enhanced and restored habitats and at the established monitoring transects. Notes on general health and reproductive status of vegetation, estimates of cover and dominant species, notation of recruitment of new species, the presence or spread of nuisance/exotic species, and the hydrologic condition of the enhanced and restored wetlands will be recorded on field data sheets. An evaluation will be made regarding how representative the monitoring areas are relative to the community being measured. Potential problems and appropriate solutions will be identified.

Photographic Stations: Panoramic photographs will be taken from the permanently established stations at each transect as depicted in Figure 1. Additional photographs representing typical conditions will be taken. These photographs will provide additional documentation on the conditions within the wetland.

Wildlife Utilization: During the vegetation monitoring described above, observations of wildlife utilizing the restored wetlands will be recorded. These observations will consist of direct sightings, scat, tracks, or vocalizations.

Wetland Information: Notes on hydrologic indicators, water depths, and observations of soil moisture shall be recorded on qualitative data forms.

D. Reporting

Frequency: An annual monitoring report will be prepared after the vegetation monitoring is completed and analyzed and is due by January 31 of each year. This report may also contain a section that incorporates the required "Progress Report" for the previous 6 months. Data reported and analyzed will be segregated by community type.

Results: The report will contain a listing of all sampling dates and tabulated raw data for each type of data collected. Raw data include qualitative observation forms for each Assessment Area/qualitative transect; raw quantitative data including species, stratum, native status, FDEP wetland indicator status and percent cover/height/count; and photographs. Raw data for vegetation will then be tabulated by transect for the appropriate success criteria per community. Wildlife data may be pooled, by community, from all sampling locations within each habitat type.

Analysis: An assessment of the qualitative data shall be discussed relative to its use in adaptive management, as a measure of the degree of trending toward success, and as an indicator of support for quantitative data. Analysis shall include a discussion of data relative to the criteria for each level of success in each community.

If it is noted during sampling that an established transect is not representative of site conditions, that transect may be moved to an appropriate location within the community and phase, upon approval by the Department.

For the final success determination, the report shall summarize all of the previous reports and provide information on when each habitat community attains UMAM scores proposed during the permitting process. It shall contain photographic and qualitative documentation that all community types have maintained that level of success or greater. Finally, it shall provide information useful for the continued successful management of the site.

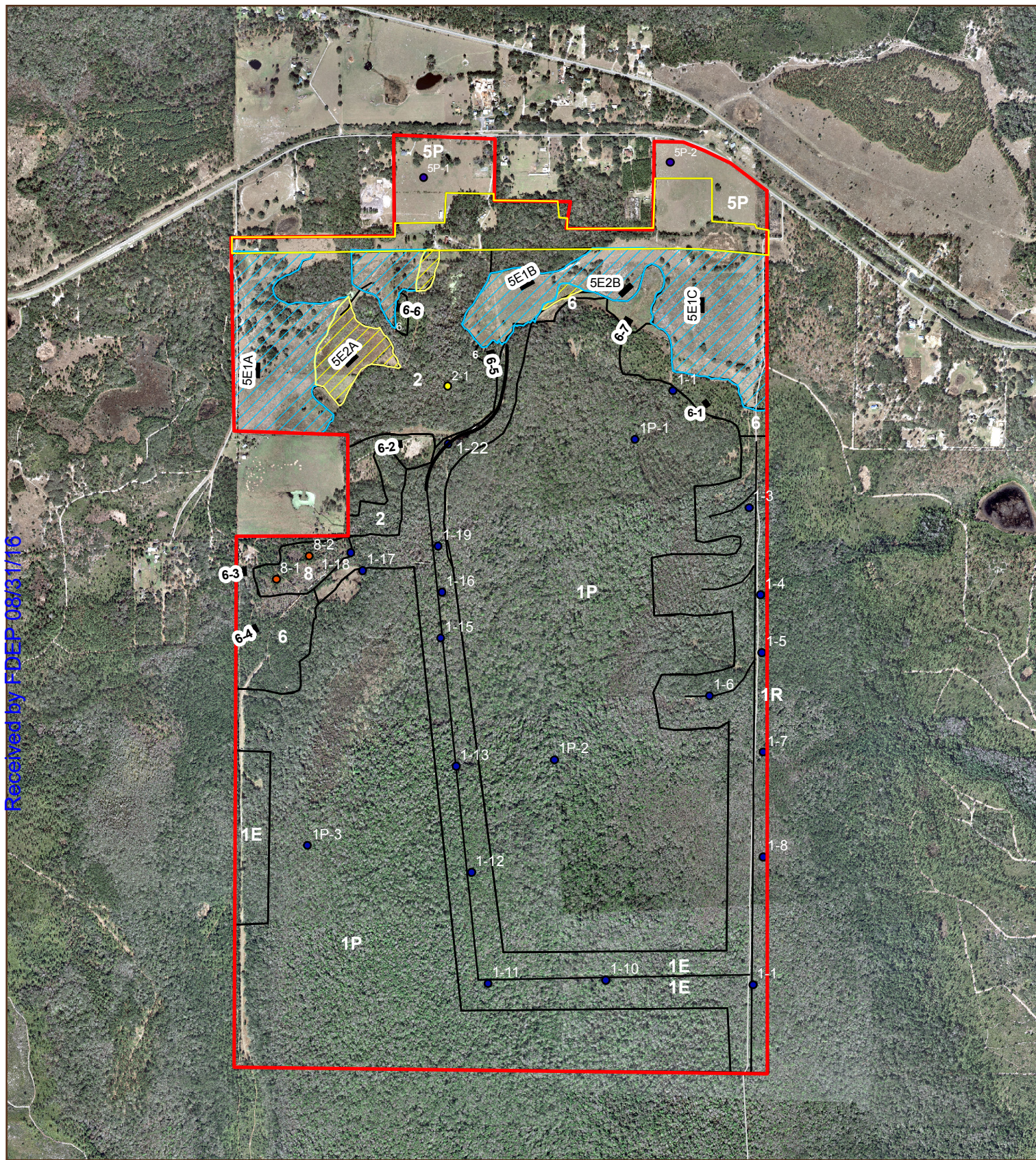


FIGURE 1
WRMB
MONITORING PLAN
2014 TRUE COLOR AERIAL
LAKE COUNTY, FLORIDA
 1 INCH = 1,700 FEET
 0 500 1,000 2,000
 Feet
 MAP SCALE IS SET FOR MAPS PRINTED ON 8.5X11 PAPER.

Legend

- Wekiva Parkway Right-of-Way Impact (+/- 65 Ac.)
- Project Boundary (+/- 1611 Ac.)
- Transects
- Assessment Area 1 cameras
- Assessment Area 5P cameras
- Assessment Area 8 cameras
- Assessment Area 2 cameras

Polygon 5E

- 5E1 (+/- 146 Ac.)
- 5E2 (+/- 19 Ac.)

EC&D
 environmental consulting & design, inc.
www.ECDFlorida.com
 2401 NE 18th Terrace Suite A Gainesville, FL 32609
 o: 352.371.4333
 363 Merryfield Ln East Palatka, FL 32131
 c: 352.339.1118
 DATA SOURCES: COUNTY, WMD, USDA/NRCS, FWCC, SFWS/NWI, FEMA, USGS/NHD&NED, FDOT, FDOT FINAL, FDEP, US CENSUS (TIGER 2008), FGDL & EC&D.
 NOTE: DATA ARE PROVIDED "AS IS." ACRES ARE APPROXIMATE & GIS DERIVED.
 PROJECTION: NAD 1983 HARN STATEPLANE FLORIDA WEST FIPS 0902 FEET

Figure 2
Monitoring Transect Diagram, Transects 5E-1, 5E-2 and 5E-4

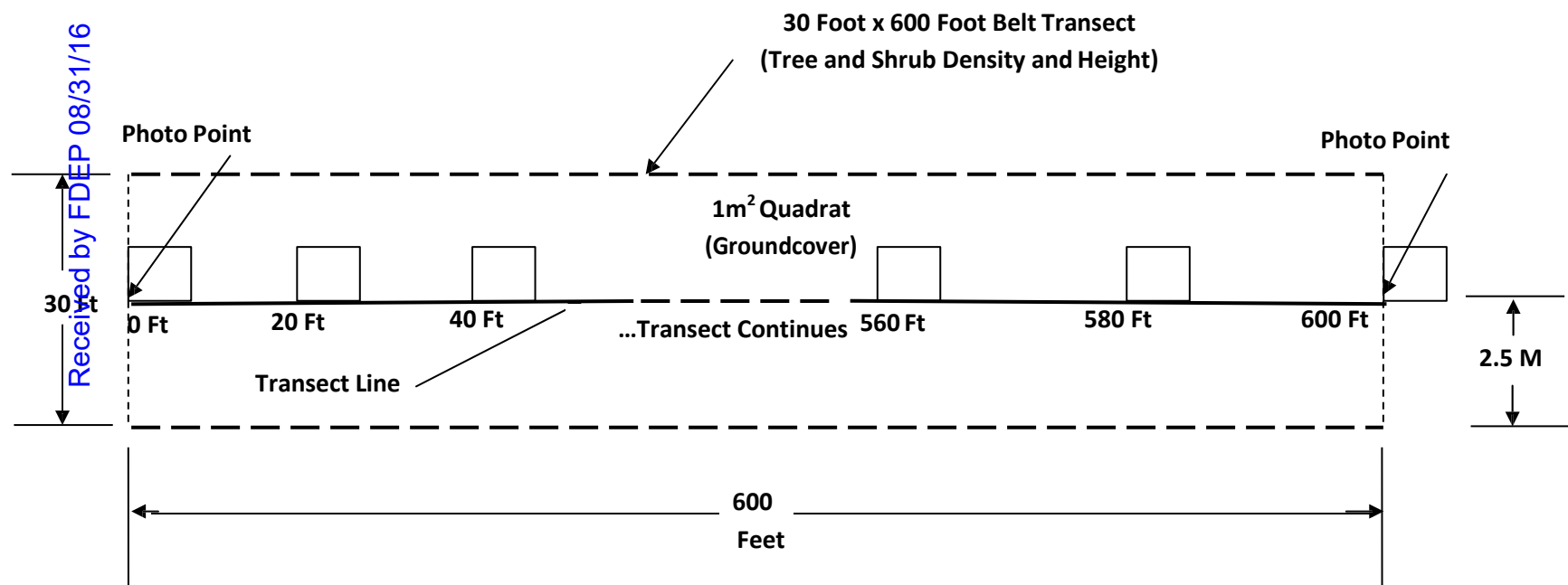
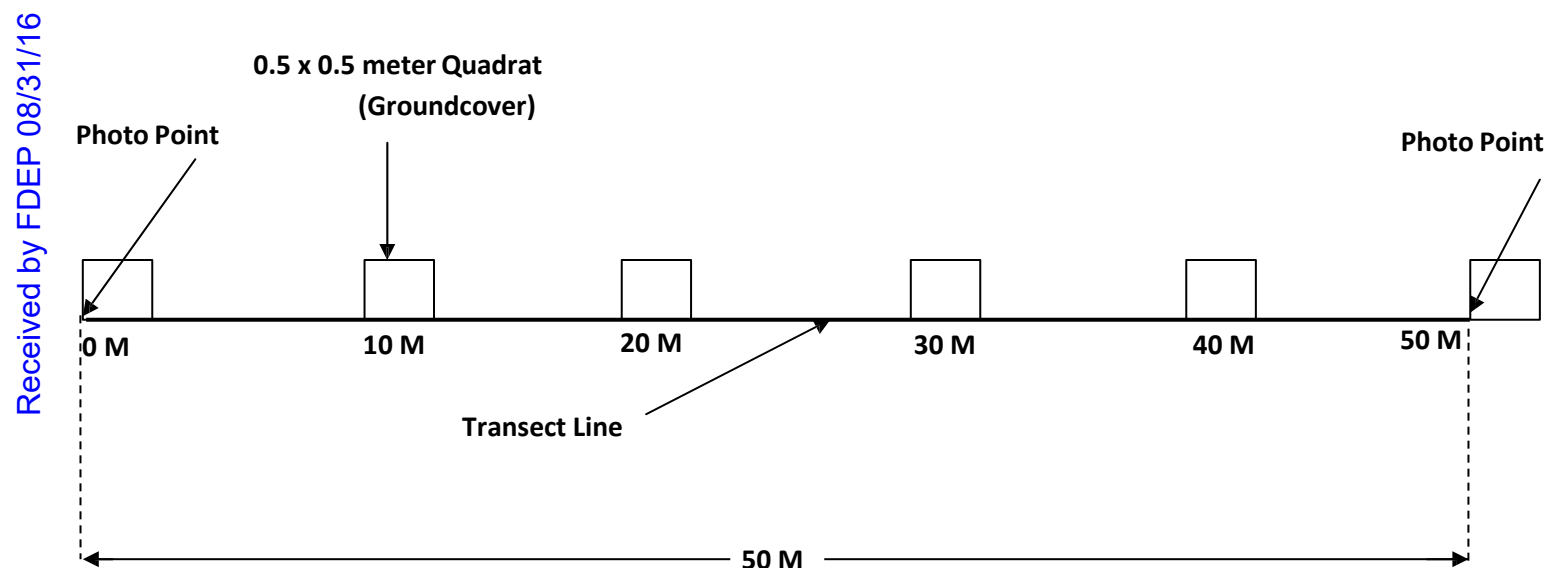


Figure 3
Monitoring Transect Diagram, Transects 6-1 through 6-7



Attachment 1
Qualitative Field Data Sheet

Wekiva River Mitigation Bank Qualitative Observation Form					
Date			Ambient Conditions		
Observers					
Location (Coordinate/Map Reference)					
Qualitative Transect ID					
Vegetation Stratum	Species	% Cover	Notes		
Canopy					
Sub-Canopy					
Shrub					
Groundcover					
% Bare Ground					
% Open Water					
Water Depth					
Hydrologic Indicators	Type	Height	Soil	Notes	
Wildlife Observations					
Signs of Hydrologic Stress, Impacts, Sedimentation etc?					
Comments					

Exhibit 2

Inspection Form for Specific Condition 25

Wekiva River Mitigation Bank Inspection Sheet (for SC 25)

Date		Ambient Conditions	
Observers			
Location (Coordinate/Map Reference)			

Construction Features	
-----------------------	--

Type			
Location (Coordinate/Map Reference)			
Structurally Intact?	Yes	No	
Functioning as Designed?	Yes	No	
Condition			
Comments			

Plantings	
-----------	--

Condition	
Height	
Comments	

Security

Fencing/Gates Secure?	Yes	No	
Condition			
Sign of Trespass	Yes	No	

Exotic Species	
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[illegible]

FIGURE 6

Construction Drawings for the Wekiva River Mitigation Bank

Prepared for:
Wekiva River Mitigation Bank, LLC
P.O. Box 340285
Orlando, FL 32854
407-481-0677

Prepared By:



Mitigation Resources

713 West Montrose Street
Clermont, FL 34711
352-404-8099 Voice
352-404-8085 FAX



Certificate of Authorization # 9275

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Date Revised: August 2016
Project Number: WRMB/16-006

List of Standard Abbreviations

Abbreviation	Abbreviated Term	Abbreviation	Abbreviated Term	Abbreviation	Abbreviated Term	Abbreviation	Abbreviated Term
A	Anchor Bolt	E	East	M	Master	S	South
AB	Abandonment	EA	Each	MAINT	Maintain or Maintenance	SD	Storm Drain
ABN	Above Finished Floor	EL	Elevation	MAX	Maximum	SE	Southwest
AFS	Above Finished Grade	ENG	Engineer	MOS	Milewest End Section	SECT	Section
AFB	Above Finished Slope	EP	Edge of Pavement	MH	Manhole	SP	Square Foot of Feet
AL	Aluminum	ESCP	Structural Reinforced Concrete Pipe	MN	Minimum	SVT	Street(s) View
ALT	Alternate	ESM	Excess	MW	Manhole	STM	Street Meters
AVE	Avenue	EST	Estimate(s)	MSC	Miscellaneous	SP	Soil Pipe
B	Baffle	EW	Each Way	MWS	Mean Water Level	SPN	Space(s)
BAF	Baffle	EXT	Existing	MPH	Miles per Hour	SPT	Support
BTM	Bottom	EXT GR	Existing Grade	N	North	SQ	Square
BS	Blumhouse or Blumhouse	EXTN	Extension	NE	Northwest	SS	Sanitary Sewer
BSM	Bench Mark	F	Feet	NEC	Not in Contract	SSS	Stainless Steel
BOC	Back of Curb	FHY	Fire Hydrant	NG	Not in Contract	ST	Street
BOT	Bottom	FB	Feet	NO	Number	STA	Station
BP	Base Plate	FB FL	Feet Floor	NOI	Not in Contract	STD	Standard
BRG	Bearing	FB GR	Feet Grade	NTS	Not to Scale	STL	Steel
C	Capacity	FL	Flow Line	NSA	Not Applicable	STR	Street
CAP	Capacity	FLTR	Filter	O	On Center	SW	Southwest
CFM	Cubic Feet per Minute	FM	Feet per Minute	OC	Over Head	SYM	Symbol
CFA	Cubic Feet per Second	FPS	Feet per Second	OHV	Over Head Wire	SW	Southwest
CV	Check Valve	FT	Foot or Feet	OJL	Official Records	SW	Southwest
CI	Center Line	FT	Foot or Feet	P	Point of Curve	T	Target
CL	Center Line	FF	Face to Face	PI	Point of Intersection	TB	Top of Beam
CLF	Chain Link Fence	G	Grade	PL	Property Line	TBM	Temporary Bench Mark
CLR	Clear or Clearance	GR	Grade	PP	Power Pole	TJL	Temporary
CLV	Corrugated Metal Pipe	H	Horizontal	PVC	Polyvinyl Chloride	TOL	Top of Lot
CMP	Compacted Metal Pipe Arch	HOPE	High-Density Polyethylene	PMT	Pavement	TOP	Top of Pavement
CMPA	Compacted Metal Pipe Arch	HOT	High-Density Polyethylene	Q	Quantity	TP	Telephone Pole
CNP	Clear Cut	HORZ	Horizontal	QTY	Quantity	TV	Television
CONC	Concrete	HWS	High Water Level	R	Radius	TYP	Typical
CONTR	Construction	HWT	High Water Table	RAO	Reinforced Concrete	T&B	Top and Bottom
CONTR	Construction	HWT	High Water Table	RCB	Reinforced Concrete Box	U	Underground
COORD	Coordinate	HWT	High Water Table	RCP	Reinforced Concrete Pipe	UL	Underground
CO	Company	HWT	High Water Table	RD	Road	ULC	Underground Telephone Cable
CY	Cubic Yard	HWT	High Water Table	REBAR	Reinforcing Steel	ULY	Utility
CMS	Center to Center	HWT	High Water Table	REIN	Reinforcement	V	Varies
CAC	Center to Center	HWT	High Water Table	REIN	Reinforcement	VEL	Velocity
D	Datum	HWT	High Water Table	REIN	Reinforcement	VERT	Vertical
DAT	Datum	HWT	High Water Table	REIN	Reinforcement	VOL	Volume
DRL	Double	HWT	High Water Table	REIN	Reinforcement	W	West
DEMO	Demolition	HWT	High Water Table	REIN	Reinforcement	WM	Water Main
DEPT	Department	HWT	High Water Table	REIN	Reinforcement	WMP	Water Main Pipe
DESC	Describe	HWT	High Water Table	REIN	Reinforcement	WMS	Water Main System
DET	Detail	HWT	High Water Table	REIN	Reinforcement	WWS	Water Main System
DM	Dimension	HWT	High Water Table	REIN	Reinforcement	WWS	Water Main System
DP	Ductile Iron Pipe	HWT	High Water Table	REIN	Reinforcement	WWS	Water Main System
DSCH	Discharge	HWT	High Water Table	REIN	Reinforcement	WWS	Water Main System
DR	Direction	HWT	High Water Table	REIN	Reinforcement	WWS	Water Main System
DN	Down	HWT	High Water Table	REIN	Reinforcement	WWS	Water Main System
DR	Drain	HWT	High Water Table	REIN	Reinforcement	WWS	Water Main System
DW	Driveway	HWT	High Water Table	REIN	Reinforcement	WWS	Water Main System
DWG	Drawing	HWT	High Water Table	REIN	Reinforcement	WWS	Water Main System

Reference Symbols

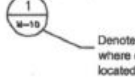
Denotes section letter identification.



Section Reference

Denotes drawing no. where section is located.

Denotes detail number identification.



Detail Reference

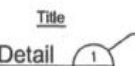
Denotes drawing no. where detail is located.

Section



Section Title

Denotes drawing no. section taken from.

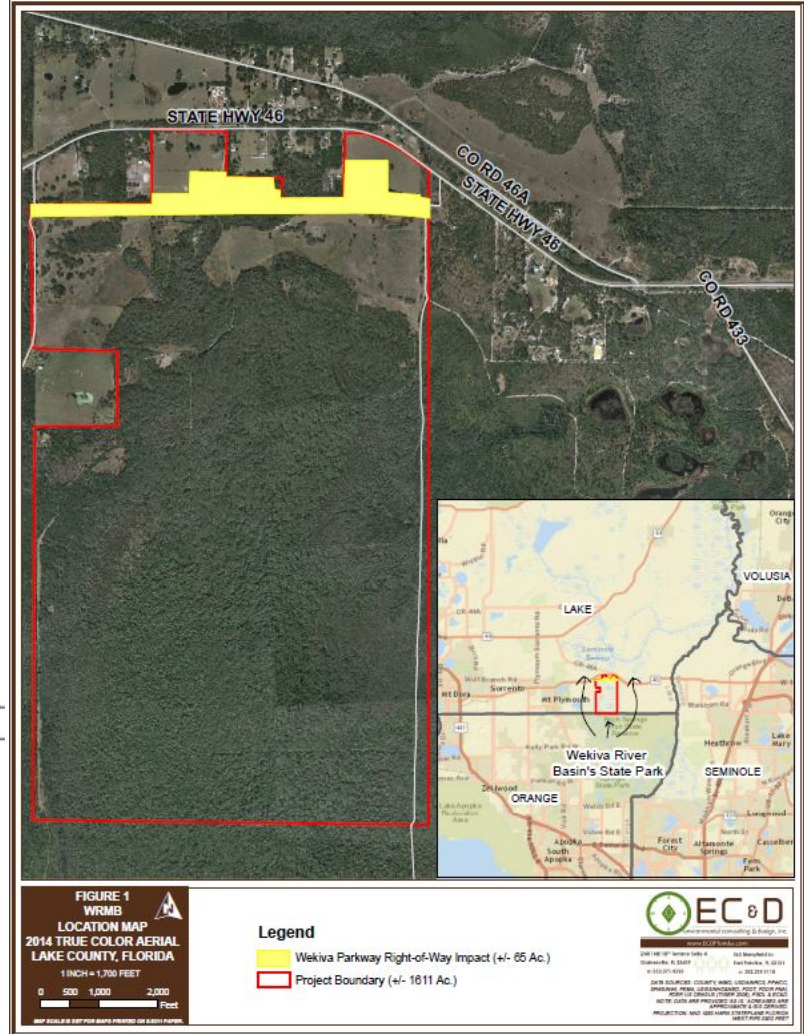


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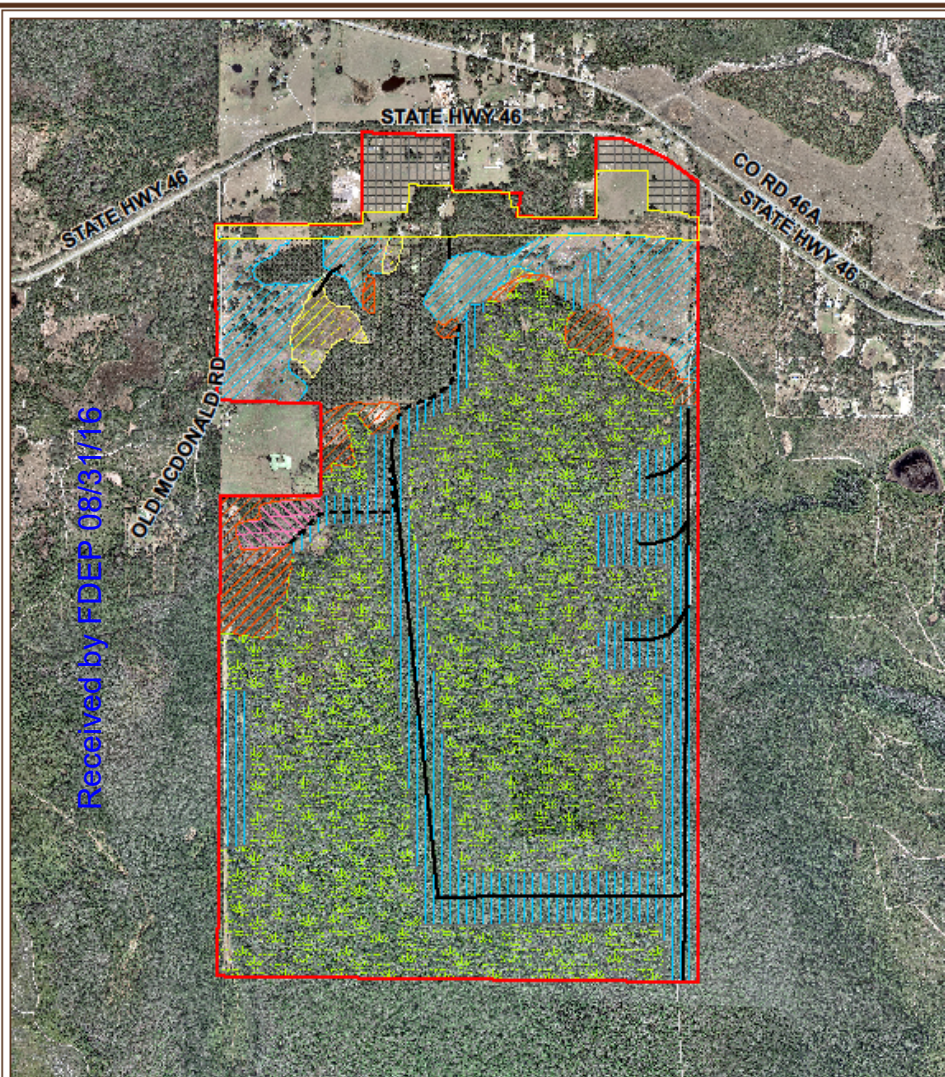
Denotes detail number identification.

Denotes drawing no. where detail is taken from.

- = Property Line
- = Right-of-Way Line
- = Control Elevation
- = Benchmark
- = Spot Elevation (Proposed)
- = Spot Elevation (Existing)
- = Proposed Contour
- = Existing Contour
- = Fence Line
- = Proposed Embankment (Down Slope in Direction of Line)
- = Existing Embankment (Down Slope in Direction of Line)
- = Proposed Surface Drainage
- = Existing Surface Drainage



Abbreviations, Legend, and Location Map



WMBS
PROPOSED POLYGON
HABITAT DESCRIPTIONS
2014 TRUE COLOR AERIAL
LAKE COUNTY, FLORIDA

1 INCH = 1,700 FEET

0 500 1,000 2,000 Feet

Legend

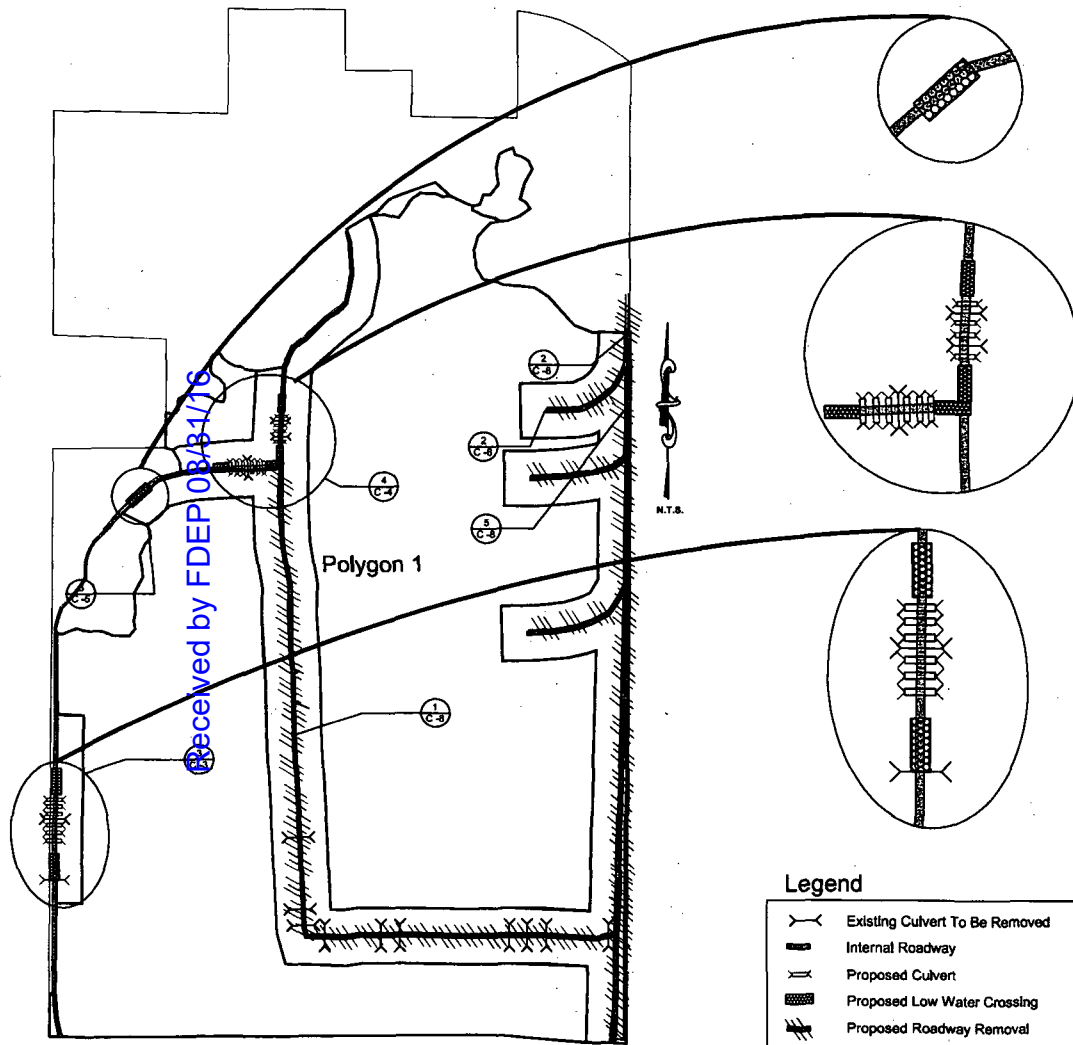
- Yellow outline: Wetland Parkway Right-of-Way Impact (+/- 65 Ac.)
- Red outline: Project Boundary (+/- 1611 Ac.)
- Black dashed line: Roadway (to Remain)
- Blue dashed line: Existing Roadway (to be Removed) (1R)
- Blue wavy line: Hydric Hammock, Hydrologic Impact (1E)
- Green wavy line: Hydric Hammock (1P)
- Blue wavy line with dots: Hydric Hammock, Tributary (2)
- Green wavy line with dots: Improved Pastures (5P)
- Orange wavy line: Mesic Flatwoods (5)
- Red wavy line: Wet Prairie (5)
- Blue wavy line with dots: Restoration Areas (SE)
- Blue wavy line with dots: SE1 (+/- 146 Ac.)
- Yellow wavy line with dots: SE2 (+/- 19 Ac.)



Notes:

1. The Contractor shall obtain all necessary permits and licenses for performing the site clearing work and shall furnish a copy of same to the Engineer prior to commencing the work. The Contractor shall comply with the requirements of the permits.
2. The Contractor shall notify all utility companies or local authorities furnishing all utilities so they can remove, relocate, disconnect, cap or plug them in order to facilitate proposed drainage improvements.
3. The Contractor shall protect all utilities and other improvements shown on these drawings and all other utilities and other improvements not shown. The Contractor shall assume all responsibility for repairs of utilities and other improvements damaged during construction and shall maintain sufficient protection to all utilities required to protect them from damage and to protect the public during construction.
4. The Contractor is responsible for the protection of all trees, structures, and utilities not marked for removal or demolition and shall promptly repair any damage as directed by the Engineer at no cost to the Owner.
5. The Contractor shall remove all trees marked for removal which includes the roots associated with the tree. The trees not marked for removal shall be protected in accordance with Lake County regulations.
6. The Contractor shall remove all unsalvageable materials and yard waste from the site immediately and dispose of it in accordance with all applicable Federal, State, and Local regulations.
7. Elevations shown herein are based on U.S.G.S. Quadrangle Map (Sanford SW, Florida 1965; Photoinspected 1970) and site survey from Advanced Land Survey and Mapping, Inc. (2002)
8. All materials, equipment, services, etc. used in the development of this site shall meet and conform to all O.S.H.A. requirements.
9. All dewatering costs associated with construction shall be included as part of the construction bid costs. It is the Contractor's responsibility to implement the necessary erosion control measures to prevent turbid water from being discharged downstream.
10. The Contractor shall protect all utilities and other improvements shown on these plans and all other utilities and other improvements not shown. The Contractor shall be responsible for all repairs of utilities and other improvements damaged during construction as directed by the Engineer, at no additional cost to the Owner, and shall maintain sufficient protection to all utilities required to protect them from damage and to protect the public during construction.
11. The Contractor shall notify all utility companies which may have their utilities within the construction areas to locate their facilities in the field forty-eight (48) hours prior to beginning construction.
12. The Contractor must install and maintain grass, seed and mulch, or sod on exposed slopes within 48 hours of completed final grades, and any other time as necessary to prevent erosion, sedimentation or turbid discharges to any downstream water body, wetland, or offsite property. Sodding on slopes 3:1 and steeper shall be staked.
13. The Contractor shall be responsible for the project complying with applicable state water quality standards during construction as specified in the specifications and permits. All water and wind erosion shall be minimized as defined in the specifications and permits. The specifications provide only a minimum requirement for erosion and sedimentation control. It is the contractor's responsibility to implement control measures not shown in specifications. All costs associated with turbidity control and sediment stabilization shall be borne by the Contractor.
14. The Contractor, at his own expense, shall also operate and maintain erosion and sediment control devices and structures in accordance with the regulations set forth in the National Pollution Discharge Elimination (NPDES) as shown in the Stormwater Pollution Prevention Plan (SWP3) for this site.
15. The Contractor shall sod all areas disturbed by construction with Bahia sod unless otherwise stated in the landscaping plans by others.
16. The Contractor shall take all measures necessary to control turbidity including, but not limited to, the installation of turbidity barriers at all locations where the possibility of transferring suspended solids into the receiving water body exists due to the proposed work. Turbidity barriers must be maintained at all locations until construction is completed and disturbed soil areas are stabilized. The Contractor shall also be responsible for removing the barriers. At no time shall there be any offsite discharge which violates the water quality standards in Chapters 17-302 and 17-4, Florida Administrative Code.
17. All notes provided herein shall be applicable throughout these construction drawings, unless otherwise specified.

Proposed Polygon Habitat Descriptions



Legend

- Existing Culvert To Be Removed
- Internal Roadway
- Proposed Culvert
- Proposed Low Water Crossing
- Proposed Roadway Removal

Polygon 1 (Parent Tract)

Notes:

- Contractor to remove all existing culverts and transfer material to designated Construction Staging Area to be determined by Engineer.
- Contractor to remove all roadway material, and place material on site as directed by Engineer.
- All soil material removed from roadway structure shall be protected from erosion and sedimentation in accordance with BMP provisions and details. (see Sheet 10 of 10)
- Where applicable, Contractor shall place roadway material into adjacent borrow ditch.
- Contractor to assure finished elevations are consistent with adjacent native topography.
- Location of low water crossings to be provided to Contractor by Engineer following field location survey prior to construction activities.

Construction Inventory

Activity	Approximate Quantity
Culvert Removal	± 15 Culverts (material varies)
Roadway Removal	± 25,980 L.F. ± 47,735 C.Y. (assumes 20' X 3' roadway cross section)
Proposed Culvert Installation	6 - 24"Ø ABS Culverts @ 23.00 ft. NGVD (See Sheet 4 of 10.) 10 - 24"Ø ABS Culverts @ 23.15 ft., NGVD (See Sheet 5 of 10.)
Proposed Low Water Crossing Construction	1 - 1,200 L.G. @ 24.00 NGVD (see Sheet 6 of 10.) 2 - 150 L.F. @ 23.55 ft., NGVD (see Sheet 4 of 10.) 2 - 75 L.F. @ 24.00 ft., NGVD (see Sheet 5 of 10.) 2 - 125 L.F. @ 24.00 ft., NGVD (see Sheet 5 of 10.) ± 700 L.F. } Roadway Removal ± 1,230 C.Y. } ± 122 C.Y. crushed granite ± 112 C.Y. crushed stone (No. 57)



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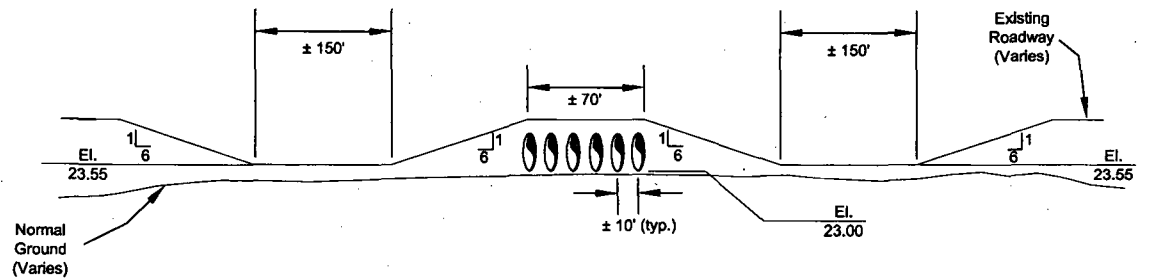
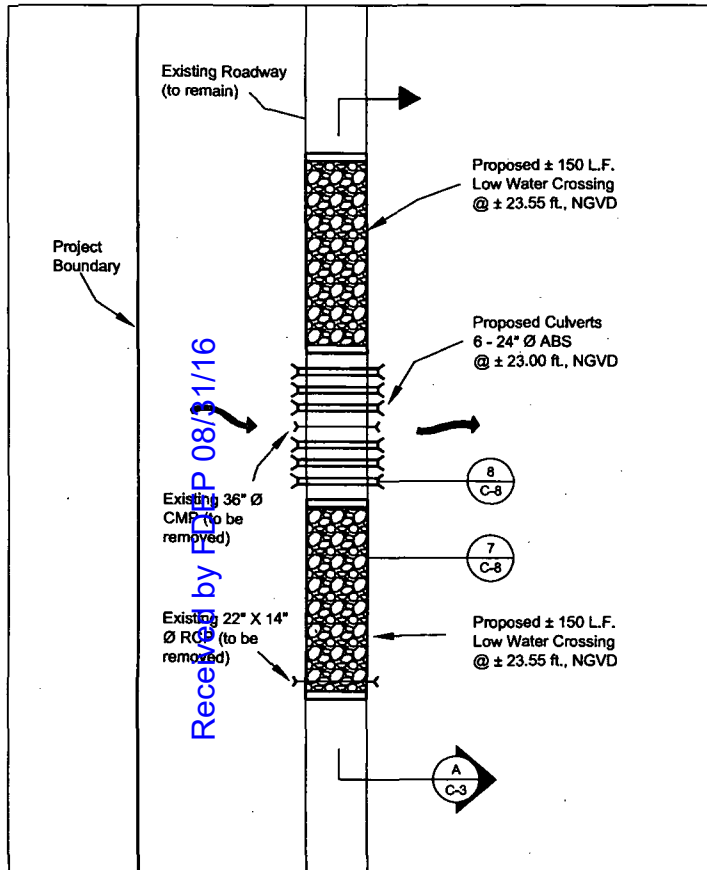
Polygon 1 Proposed Construction Activities

Project No. WRMB/011/02

Scale
Not to Scale

Sheet 3 of 10

C-2



Notes:

1. Location of proposed culverts and low water crossings to be provided by Engineer following field survey.
2. Invert of culverts and low water crossings subject to change in response to adjacent native topographic conditions.
3. Contractor to match inverts with adjacent topography as directed by Engineer.

Section

Scale: N.T.S.



Detail

Scale: N.T.S.



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Polygon 1 Construction Activity Detail

Project No. WRMB/011/02

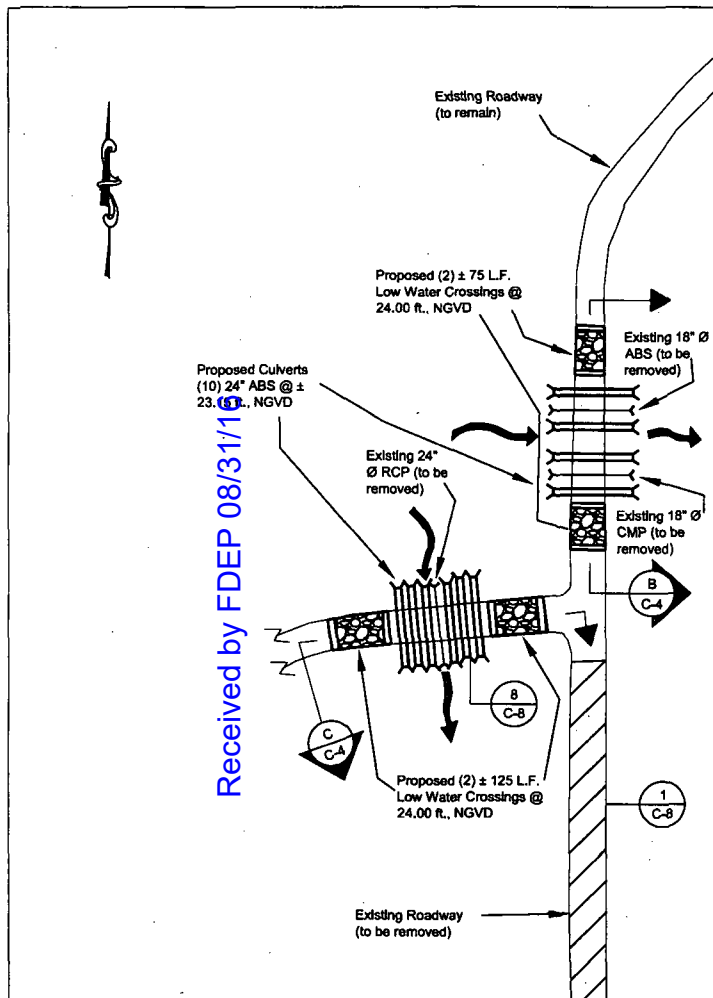
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Sheet 4 of 10

C-3

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Detail
Scale: N.T.S.



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Designed By	tfo 8/04
Drawn By	kmo 8/04
Checked By	
Approved By	

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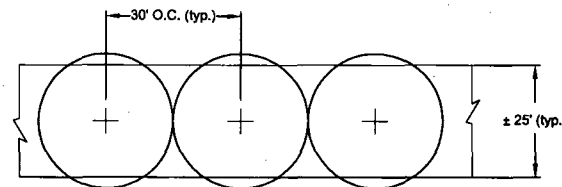
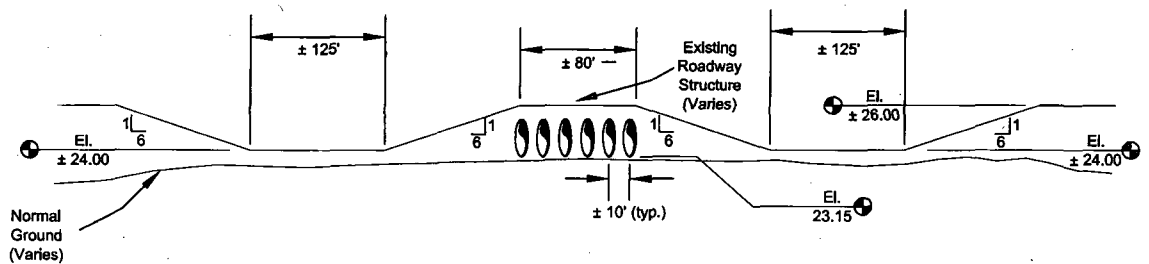
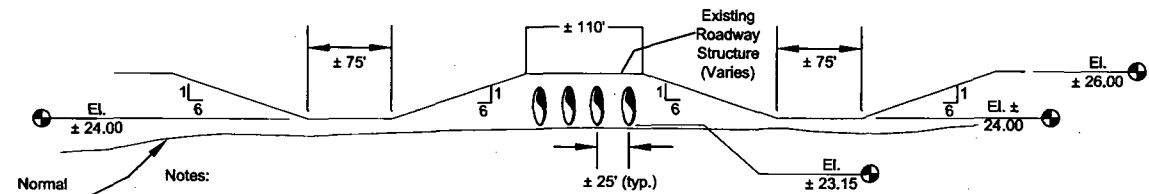
Polygon 1 Construction Activity Detail

Project No. WRMB/011/02

Scale
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Sheet 5 of 10

C-4



Notes:

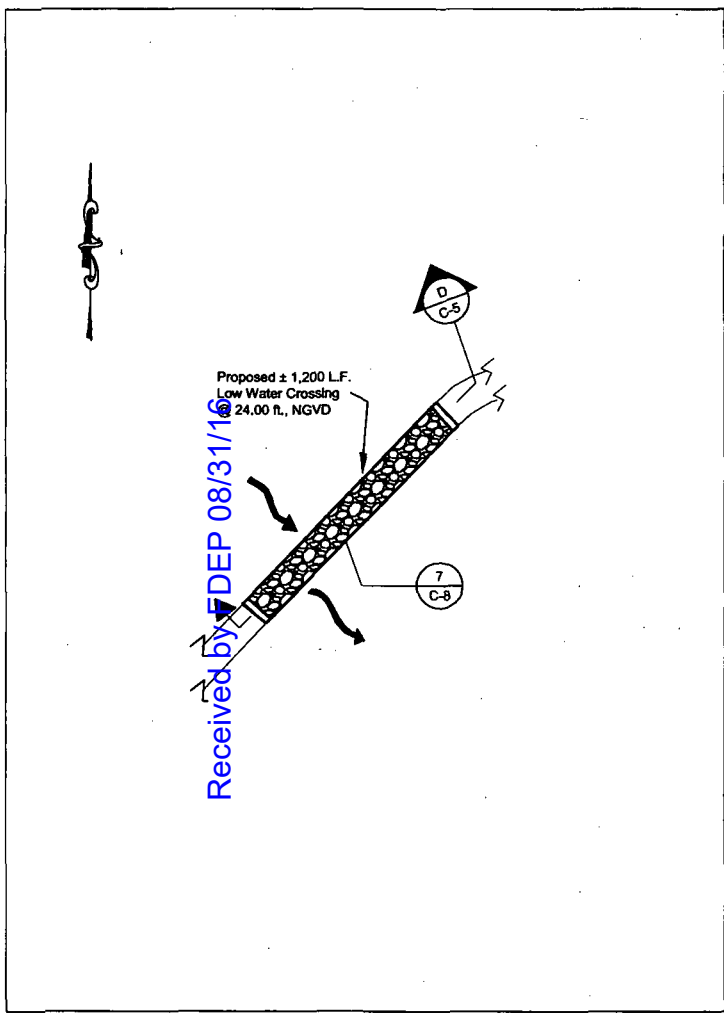
1. Trees to be placed at 30' O.C. within roadway removal area.
2. Trees to be planted in accordance with specification (Sheet 10 of 10).

Section Polygon 1R Planting Plan (Within Roadway Removal Area)
Scale: N.T.S.

Polygon 1R Tree Planting Schedule

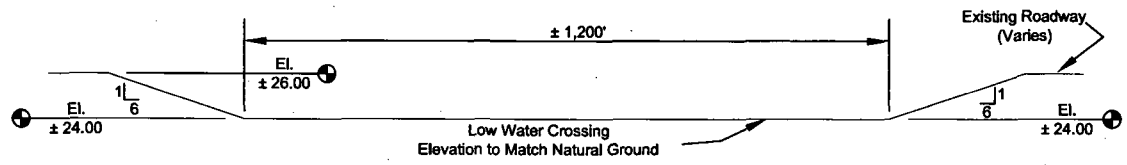
Species		Number of Individuals
Common Name	Scientific Name	
Swamp Bay	<i>Magnolia virginiana</i>	420
Bald Cypress	<i>Taxodium distichum</i>	420
American Elm	<i>Ulmus americana</i>	420
Red Maple	<i>Acer rubrum</i>	420
Total		1,680

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Detail
Scale: N.T.S.

6
C-2



Notes:

1. Location of proposed low water crossing to be provided by Engineer following field survey.
2. Invert of low water crossing subject to change in response to adjacent native topographic conditions.
3. Contractor to match inverts with adjacent topography as directed by Engineer.

Section
Scale: N.T.S.

D
C-5



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Designed By	tfo 8/04
Drawn By	kmo 8/04
Checked By	
Approved By	

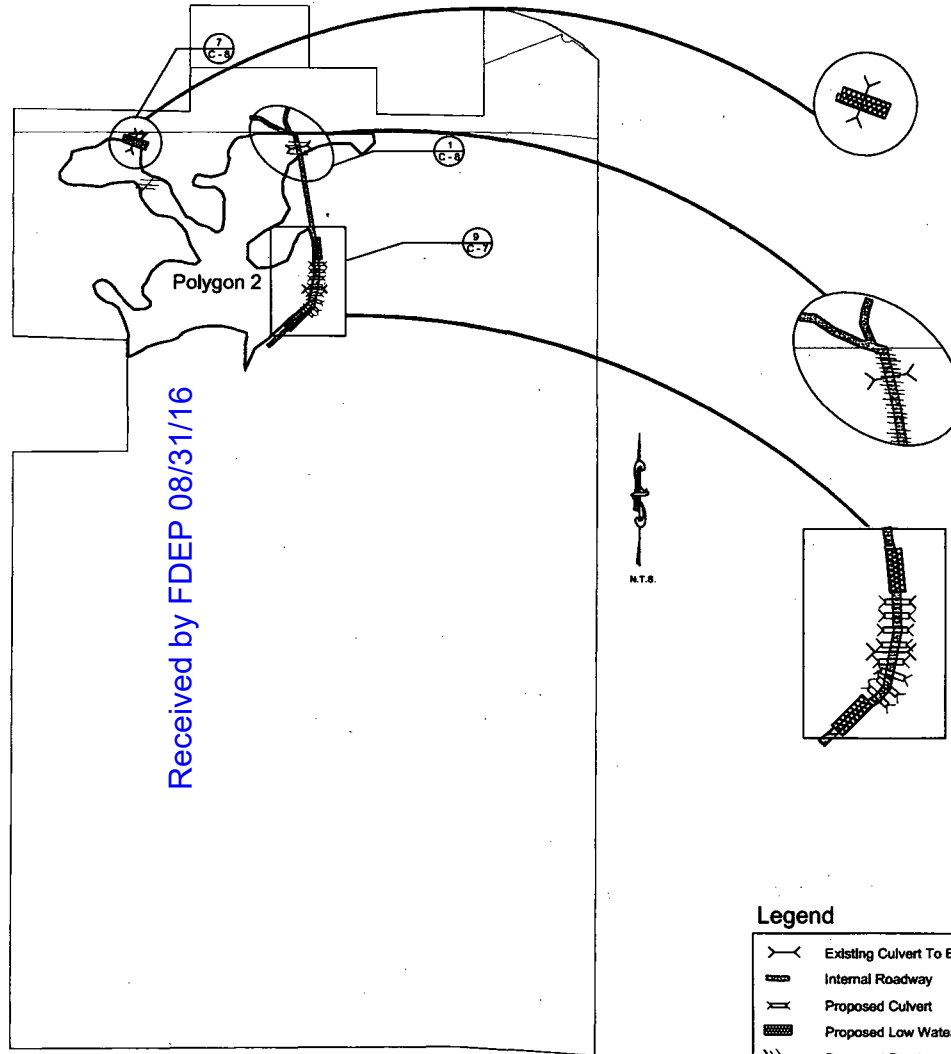
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Polygon 1 Construction Activity Detail

Project No. WRMB/011/02	
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Sheet 6 of 10	C-5

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Polygon 2

Notes:

1. Contractor to remove all existing culverts and transfer material to designated Construction Staging Area to be determined by Engineer.
2. Contractor to remove all roadway material as designated within low water crossings and other roadway material on site as directed by Engineer.
3. All soil material removed from roadway structure shall be protected from erosion and sedimentation in accordance with BMP provisions and details (see Sheet 10 of 10.)
4. Where applicable, Contractor shall place roadway material into adjacent borrow ditch.
5. Contractor to assure finished elevations are consistent with adjacent native topography.

Construction Inventory

Activity	Approximate Quantity
Culvert Removal	± 3 Culverts (material varies)
Proposed Culvert Installation	4 - 24" Ø ABS @ 23.00 ft., NGVD (see Sheet 8 of 10.) 4 - 24" Ø ABS @ 23.50 ft., NGVD (see sheet 8 of 10.)
Proposed Low Water Crossing Construction	1 - 300 L.F. @ 23.00 ft., NGVD (see Sheet 8 of 10.) 1 - 150 L.F. @ 23.50 ft., NGVD (see Sheet 8 of 10.) 1 - 75 L.F. @ 27.30 ft., NGVD ± 650 L.F. } Roadway Removal ± 1,445 C.Y. ± 35 C.Y. crushed granite ± 32 C.Y. crushed stone (No. 57)

Legend

	Existing Culvert To Be Removed
	Internal Roadway
	Proposed Culvert
	Proposed Low Water Crossing
	Proposed Roadway Removal



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Drawn By	kmo 8/04
Checked By	
Approved By	

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Polygon 2 Proposed Construction Activities

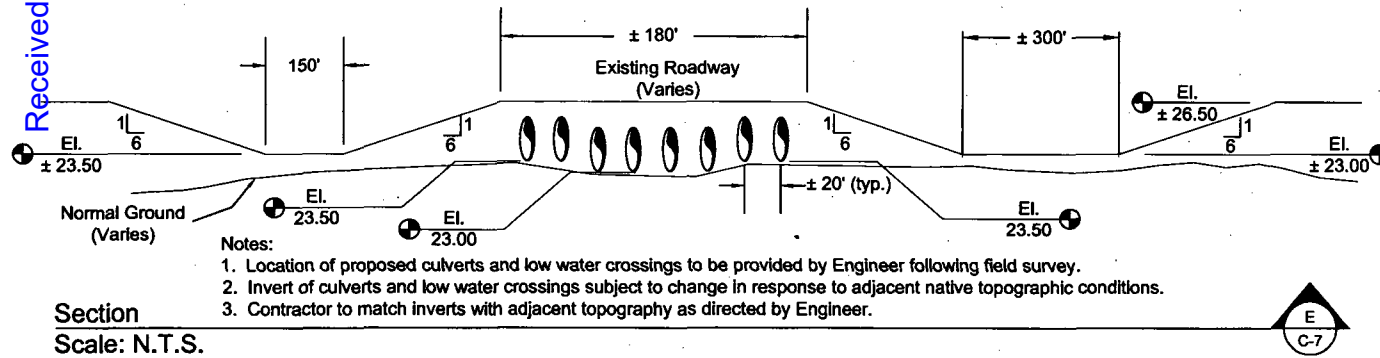
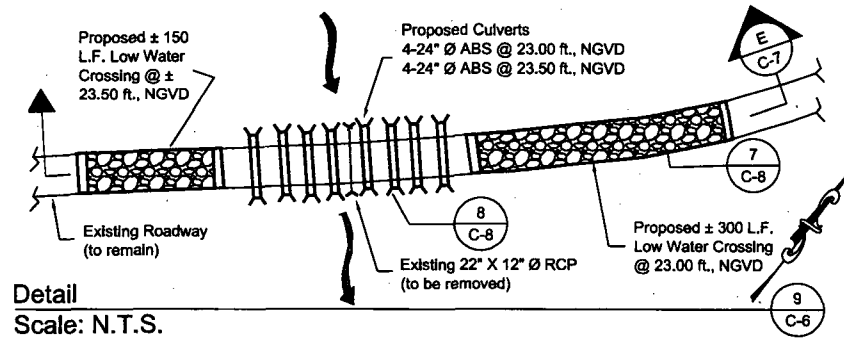
Project No. WRMB/011/02

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Sheet 7 of 10

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Drawn By	lmo 8/04
Checked By	
Approved By	

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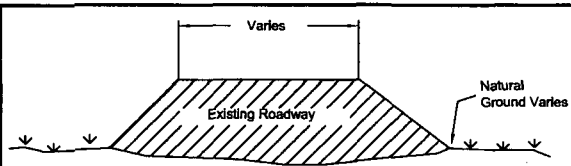
Polygon 2 Construction Activity Detail

Project No. WRMB/011/02

Scale
Not to Scale

Sheet 8 of 10

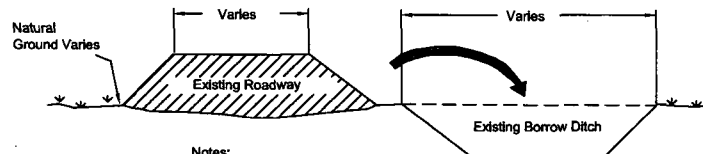
C-7



- Notes:
1. Contractor to remove existing roadway material, in its entirety.
 2. Roadway material to be removed until adjacent natural ground elevation is matched.
 3. Existing roadway structure cross section varies throughout.
 4. Contractor to place removed roadway material on approved upland site, as directed by Engineer.

Detail Existing Roadway Removal (typ.)

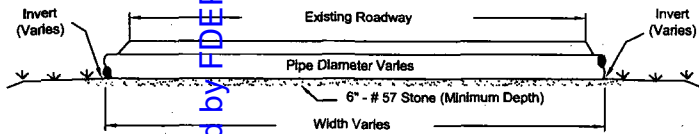
Scale: N.T.S.



- Notes:
1. Contractor to remove existing roadway material, in its entirety.
 2. Roadway material to be removed until adjacent natural ground elevation is matched.
 3. Existing roadway structure and borrow ditch cross sections vary throughout site.
 4. Contractor to fill existing borrow ditch until adjacent natural ground elevation is matched.
 5. Contractor to compact soil to 95% maximum density (AASHTO T180.)
 6. Should excess material be encountered, Contractor to place removed roadway material on approved upland site, as directed by Engineer.

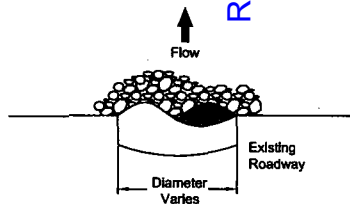
Detail Roadway Removal with Adjacent Borrow Ditch Fill (Typ.)

Scale: N.T.S.



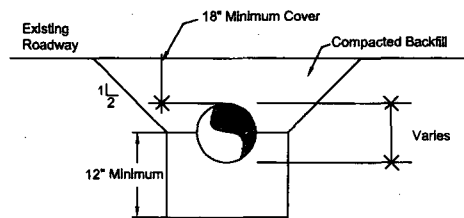
Typical Culvert Cross Section

Scale: N.T.S.



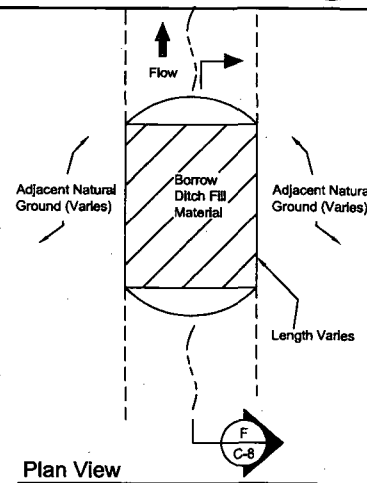
Culvert Discharge Detail (Typ.)

Scale: N.T.S.



Detail Culvert Installation (Typ.)

Scale: N.T.S.

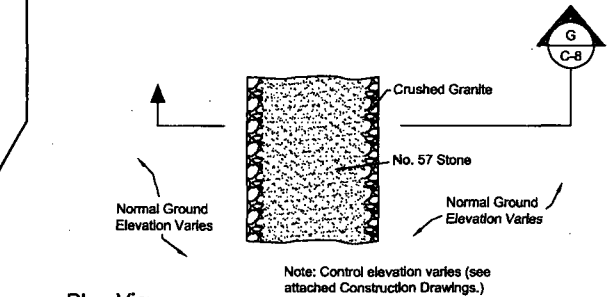


Plan View

Scale: N.T.S.

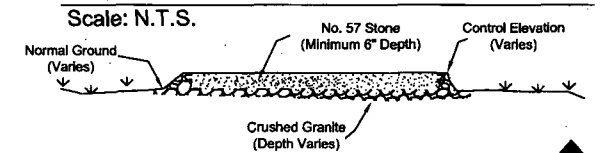
Detail

Scale: N.T.S.



Plan View

Scale: N.T.S.

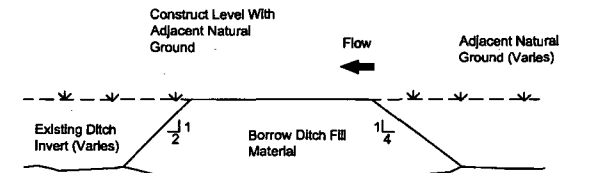


Section

Scale: N.T.S.

Detail Low Water Crossing (Typ.)

Scale: N.T.S.



Section

Scale: N.T.S.

- Notes:
1. Height and width of each proposed ditch block varies with field conditions.
 2. Fill material for each ditch block to be derived from acceptable source by Contractor.
 3. Ditch block to be compacted to 95% maximum density (AASHTO T180.)

Detail Borrow Ditch Fill Construction (Typ.)

Scale: N.T.S.



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					Approved By	
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Construction Details

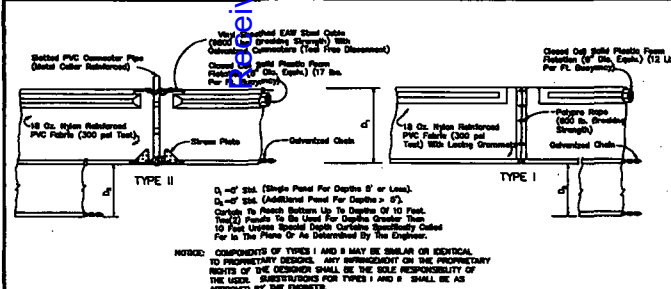
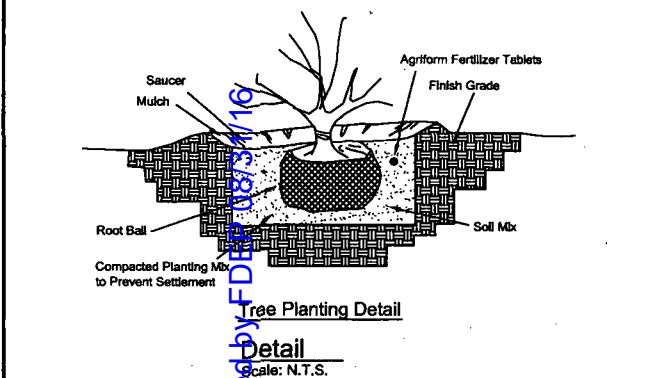
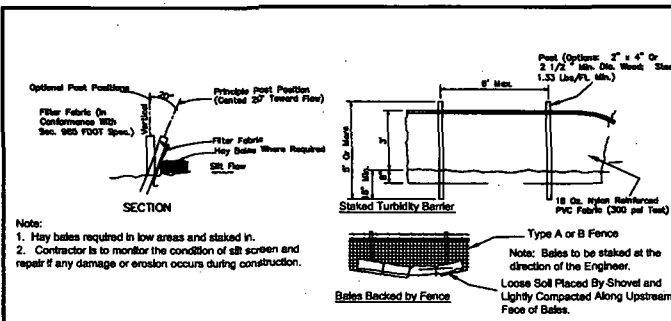
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Sheet 9 of 10

C-8



FOOT TURBIDITY BARRIERS
AS PER 1992 FOOT BOOK # 103



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Specifications

General Requirements

1. **Scope**
Work under this contract includes the furnishing of all labor, materials, equipment and incidentals necessary to construct the site improvements as shown on the plans and specified herein, complete, tested and ready for service.

All labor, materials, and methods of construction shall be in strict accordance with the minimum engineering and construction standards adopted by Lake County and the construction plans. Where conflicts or omissions exist, Lake County's standards shall dictate. Substitutions and deviations from plans and specifications shall be permitted only when written approval has been issued by the Engineer.

2. Pre-Construction Meeting

It shall be the responsibility of the Contractor to call for, arrange and coordinate a pre construction conference prior to the start of the project. This meeting shall be attended by representatives of the Owner, the Engineer, the Contractor, and regulatory agency representatives. The purpose of this meeting is to outline the construction methods and scheduling.

3. Safety and Health Regulations

The Contractor shall, at all times, conduct his work as to ensure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the work, and to protect persons from injury and to avoid property damage. Adequate lighting, signs, barricades and guards, as required, shall be placed and maintained during the progress of the work.

All equipment and materials furnished and installed under this Contract shall comply with the requirements of the Department of Labor, Occupational Safety and Health Administration, Occupational Safety and Health Standards, and Occupational Safety and Health Regulations for Construction.

4. Surveys

The Owner's Engineer or Surveyor will furnish horizontal and vertical control necessary to layout the work in an orderly workmanlike manner.

Horizontal Control furnished by the Engineer shall consist of adequately marked concrete control. Vertical Control will consist of bench marks established within the limits of the work.

The Contractor shall maintain and preserve all stakes and marks established by the Owner's Engineer or Surveyor and should stakes or marks be destroyed or damaged, said stakes or marks shall be replaced by the Engineer at the expense of the Contractor.

5. Subsurface Information

No subsurface information provided.

6. Existing Utility Location

Existing utilities and facilities are shown on the drawings only for the convenience of all parties concerned and were established without guarantee as to their accuracy or completeness or location. Prior to performing any work, the Contractor shall determine, by site inspection, or otherwise, all pertinent data concerning the existing utilities, base structure and facilities, including the request to each utility agency to advise him of the location of their facilities in the work vicinity.

The Contractor shall be completely responsible for the relocation, as required, of existing utilities and structures with such work accomplished at no additional cost to the Owner. The Owner and Engineer will assume no liability for damages sustained or costs incurred because of the Contractor's operations in the vicinity of existing utilities or structures. The Contractor shall schedule his work in such a manner that he is not delayed by the utility companies relocating or supporting their utilities. No compensation shall be made for such loss of time.

The Contractor must carefully protect from disturbance of injury, all monument, stakes, and bench marks, and shall not excavate nearer than five feet to any of them until they have been removed, witnessed or otherwise disposed of by the Engineer.

The Contractor shall notify all utility companies which may have their utilities within the construction areas to locate their facilities in the field forty-eight (48) hours prior to beginning construction.

7. Salvage Material

Unless otherwise stated herein or noted on the drawings, all materials salvaged under this contract, shall become the property of the Owner. Salvaged materials may not be reused in the work except upon written approval of the Engineer. All salvaged materials not reused shall be turned over to the Owner of removed from the site of work.

8. Electricity

All electric current required by the Contractor shall be furnished at his own expense. All temporary connections for electricity shall be subject to the approval of the Power Company. In the event the electricity is made available by the Owner, the Contractor shall, at his own expense, install a meter to determine the amount of current used by him and such electricity will be paid for by, or charged to the Contractor at prevailing rates or at reasonable rates as determined by the Owner. All temporary lines will be furnished, installed, connected and maintained by the Contractor in a workmanlike manner, satisfactory to the Engineer and shall be removed by the Contractor in like manner at his expense prior to completion of the construction.

9. Material Approval

All materials furnished by the Contractor shall be new and as specified and shown on the drawings. The Contractor shall, if required, furnish satisfactory evidence for the approval of the Engineer, as to the kind and quality of materials. Before beginning work, the Contractor shall advise and shall obtain the approval of the Engineer, in writing, for any optional materials allowable under the various headings which he proposed to use.

10. Mobilization

The work specified in this section consists of the preparatory work and operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site, and for the establishment of temporary offices, buildings, safety equipment and first aid supplies, sanitary and other provisions as required by these specifications and local and state laws and regulations. The costs of insurance and any other reconstruction expense necessary for the start of work, excluding any construction materials, shall be included.

11. Special Considerations

All work under this contract shall be performed with minimal interruption of operation to the existing facilities. Where it is necessary to make corrections to or changes in existing facilities, the required interruption shall be kept to a minimum.

12. Traffic Regulation

A. General

The work under this Contract shall be in strict accordance with the following codes and standards:

B. Traffic and Vehicular Access

Major Roads and Streets: No major roads or streets shall be blocked to traffic without adequate detour facilities for a period of more than 30 minutes or as directed by the governing authority.

C. Construction in Other than State Highway Right-of-Way

Construction within right-of-way other than State Highway shall be made in full compliance with all requirements of the Florida Department of Transportation and to the satisfaction of the local governing bodies. All necessary barricades, detours, lights and other protective measures shall be provided for the protection of both pedestrian and vehicular traffic.

13. Site and Miscellaneous Restoration

The Contractor shall repair and replace all existing structures, pavement, driveways, paved areas, curbs and gutters, sidewalks, shrubbery, groves, trees, utility poles, utility pipelines, conduits, cables, drains, catch basins, flagstones, rocks, gravel or stabilized areas or driveways and including all underground obstructions not specifically named herein which may be damaged or destroyed as a result of construction operations under this Contract. This item shall be included in the bid.

14. Pavement Restoration

The Contractor shall repair or replace all pavement or partial pavement damaged or destroyed during or as a result of construction operations under this contract. The repair or replacement shall be equal to or better than the condition of the pavement existing at the time of bidding and shall be required to match the original surface material and original grade unless otherwise specified or shown on the plans. The repair shall conform to applicable City, County, or State requirements for pavement repair.

15. Tests

The Contractor shall pay for all required tests, unless otherwise specified. Generally, tests will be compression and density tests, quality tests and concrete quality tests (cylinder, breaks, or Marshall stability). On asphaltic concrete, the manufacturer's or supplier's certificate that the material meets the requirements of the specifications will be accepted subject to verification by Owner's Engineer of test methods used.

16. Clean-Up

The Contractor shall keep the construction site free of rubbish and waste materials and restore to their original conditions those portions of the site not designated for alterations by the Contract Documents. Clean-up and restoration shall be accomplished on a minimum of nuisance and interference to the residents and workers in the area. The Contractor shall also remove, when no longer needed all temporary structures and equipment used in his operations. It is the intent of this specification that the construction area of those other areas not designated for alteration by the Contract Documents shall be restored to an equal or better condition than originally existed.

17. Record Drawings

The Contractor shall maintain, during the progress of the project, accurate records of all features of the Contract. A set of drawings will be provided by the Contractor, to be kept at the job site, for this purpose. Promptly after completion of any portion of the work provided, as paid for in this Contract, the Contractor shall deliver to the Engineer the drawings with accurate notations recorded thereon as necessary to revise the drawings to an as-built condition. The Contractor will be held responsible for the accuracy of such data and shall bear any costs incurred as a result of incorrect data furnished by him.

The project shall not be considered to be in substantial completion until record drawings have been submitted and accepted by the Engineer. Prior to final payment the record drawings shall be revised by the Contractor to reflect any changes which have occurred since the substantial completion submittal and eight (8) sets submitted to the Engineer. The Contractor shall also provide the Owner with four (4) sets of completed As-Built drawings reflecting actual elevations, locations, inverts, etc. of all construction activities.

Specifications for Site Work

1. The Engineer shall be notified in writing of the proposed date of the beginning of construction of the site improvements. Any time that work is to stop for a period of time in excess of two (2) working days, the Owner shall be notified of such interruption.

2. All private and public property affected by this work shall be restored to a condition equal to or better than existed before commencing construction work, unless specifically exempted by the Plans. Cost to be incidental to other construction and no extra compensation to be allowed.

3. Embankment (fill) in open spaces shall be compacted to 95% of max. density (AASHTO T-180).

Site Grading, Paving, Drainage and Clearing

1. Site Clearing

The excavation area shall be cleared and grubbed to remove all roots, branches, rocks, etc. At no time shall construction, clearing or work take place outside of the property boundary except as shown within these construction plans. Should any work be performed "offsite", which includes the removal of any trees, the contractor shall replace the tree, etc. at a ratio of 5:1 (for each inch diameter of tree removed, 5 inches shall be replaced).

2. Site Grading

The site shall be brought to the elevations shown on the drawings. If there is excess excavation, the contractor shall stock pile on site.

3. Roadway Earthwork

Earthwork for roads shall conform to the provisions of the local regulatory agency.

4. Street Markers

Street markers shall meet Florida Department of Transportation Specifications and shall be installed as designated on the plans.

Workmanship

1. Excavated Material

Where stockpiling of excavated material is required, the Contractor shall be responsible for obtaining the sites to be used and shall maintain his operations to provide for natural drainage and not present an unsightly appearance.

B. Material Disposal

Excess, unsuitable, or cleared and grubbed material, resulting from the utility installation, shall be immediately removed from the work site and disposed of at location(s) approved by the Owner and Engineer. Excess excavated material shall be spread on the disposal site and graded in a manner to drain property and not disturb existing drainage conditions, as approved by the Engineer. Disposal of cleared and grubbed materials shall comply with City and/or County requirements as to burning or deposit at designated landfill site(s).

C. Borrow

Should there be insufficient satisfactory material from the excavations to meet the requirements for fill material, borrow shall be obtained from pits secured by the Contractor and approved by the Owner and the Engineer.

D. Dewatering

Utilities shall be laid "in the dry", unless otherwise approved. Trench excavations may be dewatered by using one or more of the following methods: well point system, sumps with pumps or other method(s) as approved by the Owner and Engineer. Dewatering systems shall be utilized in accordance with good standard practice and must be efficient enough to lower the water level in advance of the excavation and maintain it continuously to keep the bottom and sides firm and dry. If the material encountered at grade is suitable for the passage of water without destroying the sides, sumps may be provided at intervals with pumps used to lower the water level by taking their suction from said pumps. Discharge from dewatering shall be disposed of in such a manner that it will not interfere with the normal drainage of the area in which the work is being performed, create a public nuisance, or from ponding.

It is the Contractor's responsibility to secure all necessary permits required for dewatering. Permits should include, but not be limited to, a St. Johns River Water Management District Consumptive Use Permit if the dewatering thresholds are exceeded.

The operations shall not cause injury to any portion of the work completed, or in progress, or to the surface of streets, or to private property. The proposed dewatering method(s) and schedule shall be coordinated with and approved by the Owner and the Engineer and other necessary Regulatory Agencies prior to construction. Additionally, where private property will be involved, advance permission shall be obtained by the Contractor.

Erosion and Sedimentation BMP Details and Typical Specifications

Project No. WRMB/011/02
Scale Not to Scale
Sheet 10 of 10
C-9

Not valid for construction
unless signed in this
block.

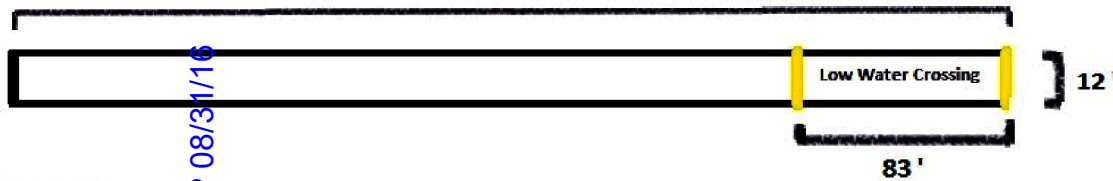
Name	Date
Designed By	to 9/04
Drawn By	lmo 9/04
Checked By	
Approved By	
CADD File:	sh1010/08

Date

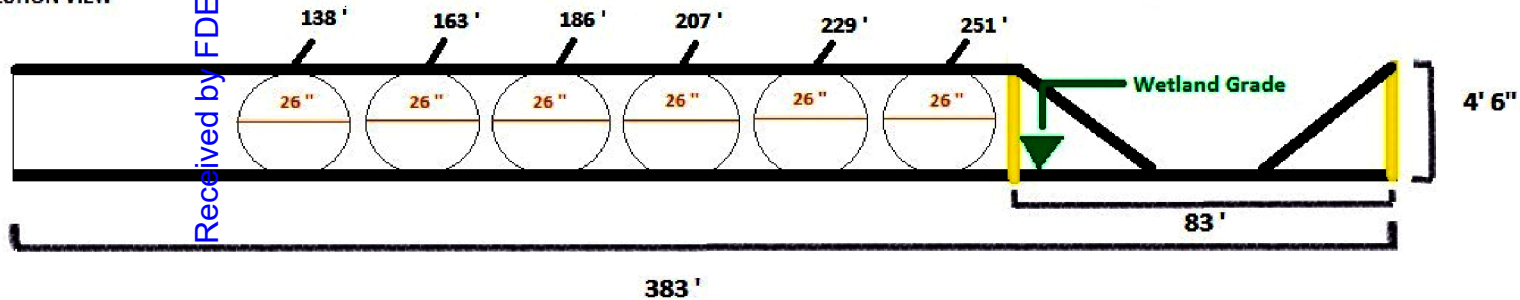
**ADDENDUM
WRMB
LOW WATER CROSSING
2014 TRUE COLOR AERIAL
LAKE COUNTY, FLORIDA**

PLAN VIEW

383'



SECTION VIEW



****IMAGE NOT TO SCALE**

MAP SCALE IS SET FOR MAPS PRINTED ON 8.5X11 PAPER.



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o: 352.371.4333
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DATA SOURCES: COUNTY, WMD, USDA/NRCS, FWCC, SFWS/NWI, FEMA, USGS/NHD&NED, FDOT, FDOT FINAL, FDEP, US CENSUS (TIGER 2008), FGDL & EC&D.
NOTE: DATA ARE PROVIDED 'AS IS.' ACREAGES ARE APPROXIMATE & GIS DERIVED.
PROJECTION: NAD 1983 HARN STATEPLANE FLORIDA WEST FIPS 0902 FEET

From: [Will Mahler](#)
To: [Wilson, Matthew S.](#)
Subject: RE: Wekiva River MB Modification Submittal (2 of 3)
Date: Wednesday, August 31, 2016 4:50:59 PM
Attachments: [ATTACHMENT J, Wekiva River 5e Corrective.pdf](#)

2 of 3

From: Will Mahler
Sent: Wednesday, August 31, 2016 4:47 PM
To: 'Matthew.S.Wilson@dep.state.fl.us' <Matthew.S.Wilson@dep.state.fl.us>
Subject: Wekiva River MB Modification Submittal (1 of 3)

Matt,

I tried using the DEP portal but I could not get past the "Manage Project Site" section where it wanted me to search for the site. I tried searching using multiple parameters but it would process for several minutes and I would have to try again. So, I am hoping I can pass all these files through an email. There should be 3 emails, 12 files total. Please let me know if you do not get them all.

This should be considered our official submittal (not a draft). If you have any questions regarding what we submitted or need additional info, please don't hesitate to contact me.

Will Mahler, M.S.
Environmental Scientist
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Wekiva River Mitigation Bank

Permit Attachment J: Polygon 5E Corrective Action Plan

**Florida Department of Environmental Protection
(FDEP) Environmental Resource Permit Number
0234803-001**

Prepared for:

Wekiva River Mitigation Bank, LLC

and

Florida Department of Environmental Protection

Prepared By:



August 2016

Permit Attachment J: Polygon 5E Corrective Action Plan

Wekiva River Mitigation Bank

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Figure 1: Mitigation Work Plan

Figure 2: Monitoring Locations

Figure 3: Plan View and Cross Section – New Road

Received by FDEP 08/31/16

1.0 PROJECT GOALS AND OBJECTIVES

The Wekiva River Mitigation Bank (WRMB) was established on June 1, 2005, on a 1,611 acre site, adjacent to the Rock Springs Run State Reserve (Florida Department of Environmental Protection (FDEP) Permit no. 0234803-000). In 2008, a major modification of the WRMB permit eliminated 65 acres from the northern portion of the bank for the Wekiva Parkway Right-of-Way (ROW) (FDEP Permit No. 0234803-001). The modified project was designed to restore and enhance native communities and water quality south of the ROW by:

- removing cattle and restoring pasture areas to natural communities,
- removing fill roads and restoring the footprint to natural communities,
- preserving a headwater hydric hammock, and
- treating and managing exotic and nuisance vegetation while implementing a long-term management program, including prescribed fires.

The project (as initially permitted) enhanced, restored, and preserved hydric hammock, mesic flatwood, depression marsh and wet prairie communities. The initial work was to be conducted in three implementation phases and was allowed a total of 258.24 potential mitigation bank credits.

On April 29, 2015, the FDEP conducted an inspection of the bank to ascertain compliance with the initial permit. Non-compliance issues were found to be associated with Polygon 5E, along with the unauthorized construction of a road and Low Water Crossing (LWC). In Polygon 5E (Mesic Flatwood Restoration Area), the original Environmental Resource Permit (ERP) characterized this area as improved pasture that was to be restored as native Mesic Flatwood. Environmental Consulting & Design, Inc. (EC&D), was retained by the bank sponsor in February 2016 to reassess area 5E, and to develop a plan to ensure the future success of the restoration. To that end, EC&D is submitting this revised restoration plan. It includes success criteria based upon minor revisions to the language of the original permit, and revised monitoring criteria. For the unauthorized road and LWC construction, EC&D has included in this report a cross section and plan view of the area that is based upon field measurements collected June 23, 2016. Also included are As-Built surveys of the road, conducted by other agencies.

2.0 PROJECT LOCATION

The proposed bank site is in Sections 23-26 and Sections 35-36, Township 19 South, Range 28 East, Lake County, south of State Road 46, about 8 miles east of Mount Dora, Class III waters. The service area includes portions of Lake, Volusia, Seminole, Marion, Putnam and Orange Counties. The bank is bordered on three sides by Rock Springs Run State Reserve.

The following project goals will be achieved by the modification of permit No. 0234803-001:

- To enhance Polygon 5E1 (146 acres) by eradicating pasture grasses, re-seeding (with native grasses) and planting longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*) achieve the development of a flatwoods system;
- To enhance (by re-establishing the canopy) Polygon 5E2 (19 acres) by planting longleaf pine and slash pine;
- To bring into compliance the existing road through wetlands and LWC; and
- To re-plant the northern finger of Polygon 1E (5.9 acres) with mixed hardwoods to a density of 200 stems per acre.

3.0 PHASE III CORRECTIVE ACTION PLAN

The modified work plan for the WRMB is shown in Figure 1. The southern portion of the existing improved pasture (Polygon 5E) is divided into two community types based upon the condition of the existing vegetation. Currently, Polygon 5E1 is devoid of a native groundcover. In contrast, Polygon 5E2 has adequate native groundcover, but is deficient in the amount of trees in the canopy.

3.1 Polygon 5E1 (146 acres)

The initial prescription for this polygon will include the removal of the existing Bahia grasses (*Paspalum notatum*) and other existing pasture grasses through the combination of disking and herbicide treatments. The schedule for this activity is shown in Table 1. Once the non-native and/or invasive grasses are eradicated, the seeding contractor will install the native seed by drilling the seed at a rate of eight (8) pounds per acre. In addition to the seed, tubular grown pine trees will be installed at a density of 150 stems per acre. To enhance the survivability of the newly planted trees, the contractor will add a small amount of Terra-sorb to each planting hole and will assure that temporary irrigation is available, should it be required.

3.2 Polygon 5E2 (19 acres)

Currently, Polygon 5E2 is a mesic flatwoods with appropriate mostly native ground cover consisting of beakrush (*Rhynchospora* spp.), broomsedge (*Andropogon* spp.), goldenrod (*Solidago* spp.), blackberry (*Rubus* sp.) and maidencane (*Panicum hemitomon*). As part of the initial prescription, any areas dominated by Bahia grass or other pasture grasses will be identified and spot treated with herbicide. Although the ground cover is comprised of native species, the existing tree density is less than desirable. This revised plan includes the planting of pine at a density of 150 trees per acre.

3.3 Polygon 1E (5.9 acres)

Polygon 1E is a small finger like portion of an existing hardwood hammock. This area will be re-planted with a wetland mix of trees consisting of Red maple (*Acer rubrum*), Cypress spp., and Swamp tupelo (*Nyssa sylvatica*), at a density of 200 trees per acre.

Table 1: Restoration Schedule

Polygon	Activity	Timing
5E1	Herbicide Application	Summer 2016
	Disking	Late Summer 2016
	Herbicide Application	Late Fall/Winter 2016
	Seeding	Winter 2016
	Tree Planting	Winter 2016/2017
5E2	Herbicide (selective application)	Summer 2016
	Tree Planting	Winter 2016/2017
1E	Tree Planting	Winter 2016/2017

Source: EC&D, 2016

3.4 Planting Plan

3.4.1 Native Seeding and Sourcing (5E1, 5E2 and IE)

Polygon 5E1 will be seeded with a native Flatwoods grass mix. The species in the list shown in Table 2 will be obtained from the Florida Wildflower Seed & Plant Growers Association. The native seed will be collected in November 2016, at several approved sites in Florida.

Table 2. Native Seed Species List

<u>Common Name</u>	<u>Scientific Name</u>
Wiregrass	Aristida spp.
Blazing Star	Liatris spicata
Pineland Chaffhead	Carphephorus carnosus
Hairy Chaffhead	Carphephorus paniculatus
Florida Tickseed	Coreopsis floridana
Toothachegrass	Clenium aromaticum
Rattlesnake Master	Eryngium yuccifolium
Bottlebrush Threeawn	Aristida spiciformis
Redtop Panicgrass	Panicum rigidulum
Broom Sedge	Andropogon virginicus
Wand Goldenrod	Solidago stricta
Beaksedge	Rhynchospora spp.
Yelloweyed Grass	Xyris spp.

Source: Florida Wildflower Seed & Plant Growers Association, 2016

This species list is subject to change based on availability, and no one species will dominate more than 25% of the relative coverage. All planted species will be native to the area and appropriate for a flatwoods ecological community.

3.4.2 Native Tree Planting/Sourcing of Material

Polygons 5E1 and 5E2 will be planted with longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*) at a rate of 150 stems per acre to achieve a mesic flatwoods community structure. Longleaf pine will be the dominate canopy species. The pines will be grown at a native nursery that is located less than 20 miles from WRMB. The nursery contractor will grow the pines in tubular 50 cell pack trays that provide for the maximum ratio of tree height to root size. The trees will be installed using mechanical means, and will be planted so as to provide for non-native species maintenance between the planted materials (i.e. curved rows to allow vehicle access for herbicide applications).

3.5 Revised Monitoring Plan

3.5.1 Methods

Four 200 foot transects (Figure 2) and 1 meter radius plots will be established within the wetland and upland portions of polygons 5E1 and 5E2 using a sub-meter Global Positioning System. Quantitative vegetation monitoring parameters will consist of:

- a) percent cover and composition of groundcover species
- b) percent cover and composition of shrub species
- c) diameter at breast height (dbh) and composition of canopy and sub-canopy species
- d) stem counts of tree seedlings and cabbage palms.

Shrub cover and groundcover class values will be assigned as the median value of a modified

Daubenmire (1959) cover class range as follows: >1% = 0.5, 1-5% = 2.5, 5- 25% = 15, 25-50% = 37.5, 50-75% = 62.5, 75-95% = 85, 95-100% = 97.5.

All transects will be marked with pink flagging tape at each terminus. A 300 foot transect tape will be strung between the two transect termini at a taut/straight position for consistency. The centers of plots will be marked using PVC pipe, and two 10 meter transect tapes will be run perpendicular to each other across the center point of the plot to indicate the boundaries of the 1 meter radius plot.

The vegetation along the transects and within plots will be divided into four strata, based on FDEP 62-340.200, F.A.C. (1996) of the Florida Wetlands Delineation Manual, Delineation of the Landward Extent of Wetlands and Surface Waters. Canopy trees will be defined as those woody plants with a diameter at breast height (dbh) greater than 10 centimeters (cm) or 4 inches. The sub-canopy will consist of tree species, excluding common woody shrubs, with a dbh less than 2.5 cm (1-3.9 inches).

Through each transect, the canopy and sub-canopy trees will be sampled along five meter wide belt sections (Mueller-Dombois and Ellenberg 1974). Diameters of all canopy trees will be measured, and precise locations along each transect will be recorded in order to facilitate re-sampling, and to document mortality and recruitment. Cabbage palms (*Sabal palmetto*) will not be measured for dbh, as these trees tend to decrease in diameter with age.

3.6 Success Criteria

To qualify for the "Interim Success Attainment" credits, the standards in 5E that must be obtained are:

- 1) All respective communities are trending toward their community success criteria, as supported by monitoring data and ground photography, and verified by an on-site inspection by FDEP.
- 2) At a minimum, the herbaceous ground cover shall obtain the following standards of pine flatwoods community (Polygon 5E1):
 - a. Year 1: An average of at least 15% cover with non-nuisance vegetation, of which 20% or more shall be graminoid species.
 - b. Year 2: An average of at least 20% cover with non-nuisance vegetation, of which 30% or more shall be graminoid species.
 - c. Year 3: An average of at least 25% cover with non-nuisance vegetation, of which 40% or more shall be graminoid species.
 - d. Year 4: An average of at least 30% cover with non-nuisance vegetation, of which 50% or more shall be graminoid species.
- 3) At a minimum, the herbaceous ground cover of mesic flatwoods (Polygon 5E2) shall obtain:
 - a. Year 1: An average of at least 25% cover with non-nuisance vegetation, of which 10% or more shall be graminoid species.
 - b. Years 2 and 3: An average of at least 35% cover with non-nuisance vegetation, of which 15% or more shall be graminoid species.
 - c. Year 4: An average of at least 40% cover with non-nuisance vegetation, of which 20 % or more shall be graminoid species.

- 3) Final success: The bank shall meet final success when all of the previous criteria have been met after a period of at least one full year; this without intervention in the form of replanting desirable vegetation, or nuisance and invasive exotic vegetation control, beyond what is reasonable long term maintenance.
- 4) Invasive exotic vegetation is less than 2% per acre.

3.7 Existing Credit Release Schedule

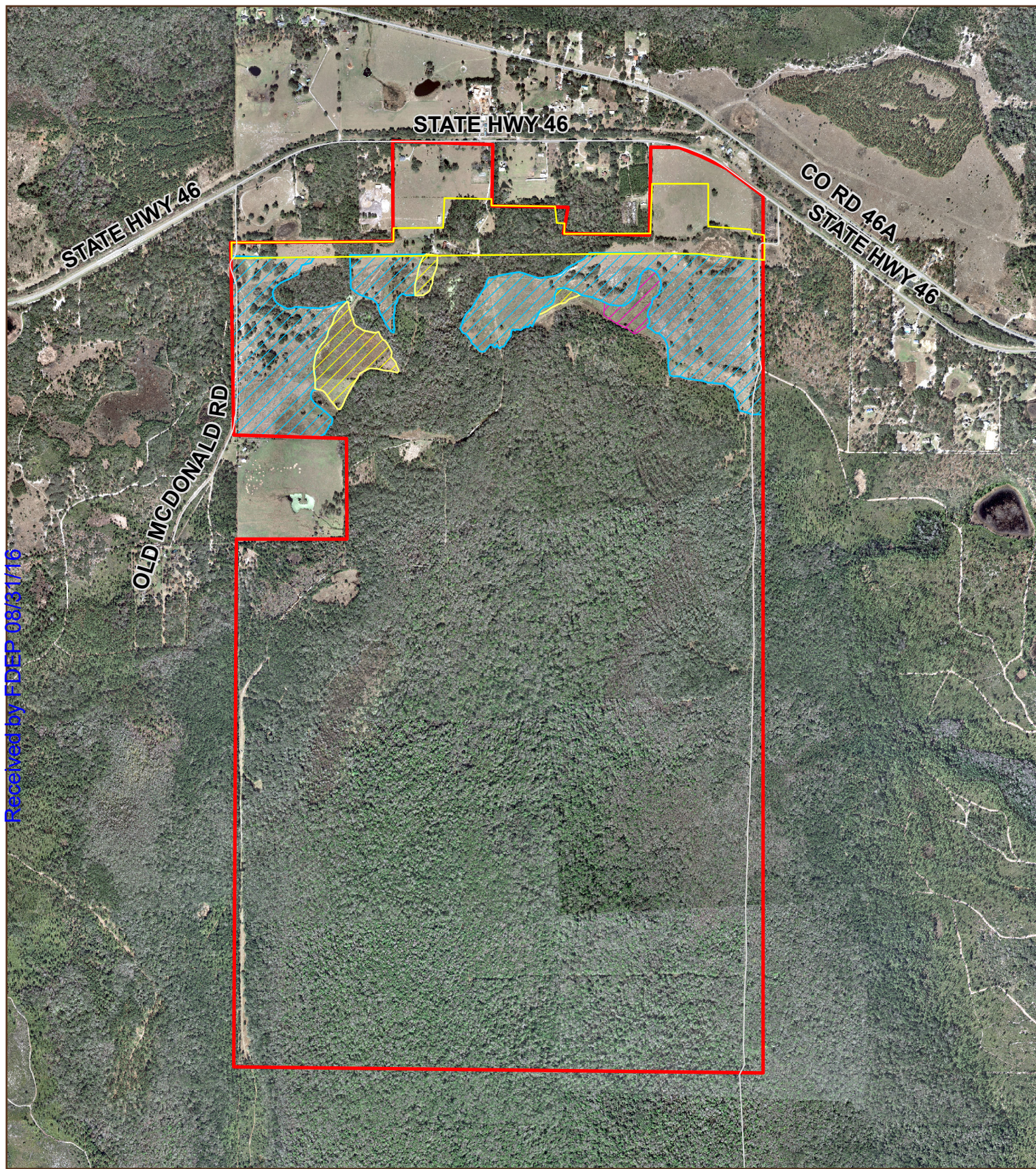
<u>Interim Success Attainment:</u> Annual monitoring indicating trending toward success	10% per year for 4 years	1-5 years post restoration	25.8/year (total 103.2)
<u>Full Success Attainment</u>	Remaining ~10%	~5-6 years after restoration	25.91

Source: EC&D, 2016/FDEP Permit No. 0234803-000

3.8 New Road and Low Water Crossing

The existing forest road was relocated in 2015 to the area shown in Figure 1, which resulted from the purchase of ROW by the Florida Department of Transportation. The new road was created from an existing farm road that was established before the bank was permitted. The banker improved the existing road by adding fill, installing six 26 inch plastic culverts, and a section that is acting as a Low Water Crossing. A sketch of the road in cross section and in plan view is shown in Figure 3.

Figures



Received by FDEP 08/31/16

FIGURE 1
WRMB
MITIGATION PLAN
2014 TRUE COLOR AERIAL
LAKE COUNTY, FLORIDA
1 INCH = 1,700 FEET

Legend

- Wekiva Parkway Right-of-Way Impact (+/- 65 Ac.)
- Project Boundary (+/- 1611 Ac.)

Restoration Areas (5E)

Activity

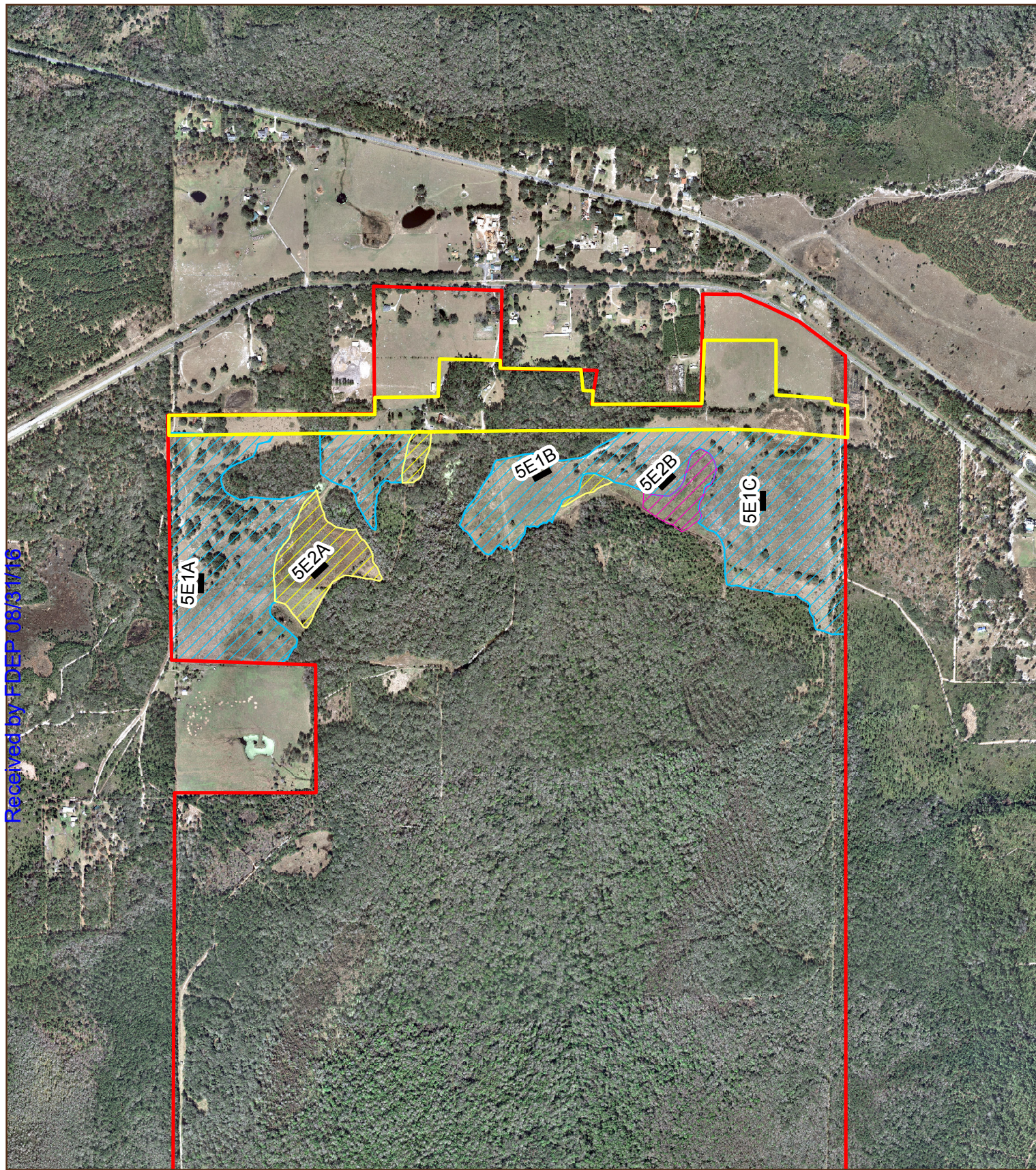
- 5E1 Mesic Flatwoods (+/- 146 Ac.)
- 5E2 Mesic Flatwoods (+/- 19 Ac.)
- 1E - MIXED HARDWOOD PLANTING (100 stems/Ac.) (+/- 5.9 Ac.)



2401 NE 18th Terrace Suite A 363 Merryfield Ln
Gainesville, FL 32609 East Palatka, FL 32131
o: 352.371.4333 c: 352.339.1118

DATA SOURCES: COUNTY WMD, USDA/NRCS, FFWCC, SFWS/NWI, FEMA, USGS/NHD&NED, FDOT, FDOT FINAL, FDEP US CENSUS (TIGER 2008), FGDL & EC&D.
NOTE: DATA ARE PROVIDED "AS IS." AREAS ARE APPROXIMATE & GIS DERIVED.
PROJECTION: NAD 1983 HARN STATEPLANE FLORIDA WEST FIPS 0902 FEET

MAP SCALE IS SET FOR MAPS PRINTED ON 8.5X11 PAPER.



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FIGURE 2
WRMB
MONITORING LOCATIONS
2014 TRUE COLOR AERIAL
LAKE COUNTY, FLORIDA
 1 INCH = 1,300 FEET
 0 500 1,000 2,000 Feet
 MAP SCALE IS SET FOR MAPS PRINTED ON 8.5X11 PAPER.

- Legend**
- Transects
 - Wekiva Parkway Right-of-Way Impact (+/- 65 Ac.)
 - Project Boundary (+/- 1611 Ac.)
- Restoration Areas**
- Activity**
- 5E1 (+/- 146 Ac.)
 - 1E - MIXED HARDWOOD PLANTING (100 stems/Ac.) (+/- 5.9 Ac.)
 - 5E2 (+/- 19 Ac.)

EC & D
 environmental consulting & design, inc.
www.ECDFlorida.com

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 PROJECTION: NAD 1983 HARN STATEPLANE FLORIDA WEST FIPS 0902 FEET

FIGURE 3
WRMB
LOW WATER CROSSING
LAKE COUNTY, FLORIDA

PLAN VIEW

383'

Low Water Crossing

12'

83'

SECTION VIEW

138'

163'

186'

207'

229'

251'

26"

26"

26"

26"

26"

26"

Wetland Grade

4' 6"

83'

383'

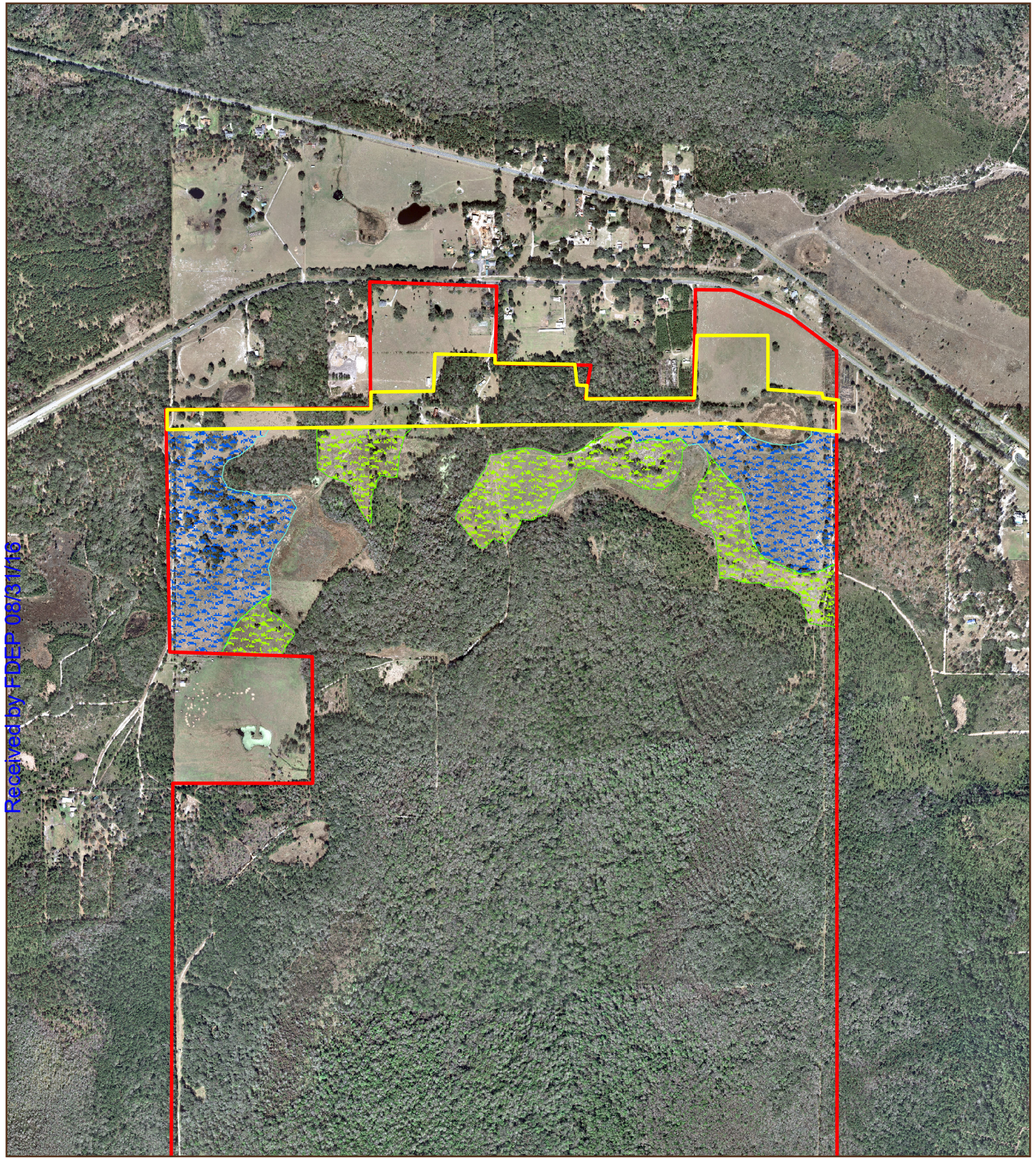
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FIGURE 4
WRMB
PLANTING LOCATIONS
2014 TRUE COLOR AERIAL
LAKE COUNTY, FLORIDA

1 INCH = 1,300 FEET



MAP SCALE IS SET FOR MAPS PRINTED ON 8.5X11 PAPER.

Legend

- Wekiva Parkway Right-of-Way Impact (+/- 65 Ac.)
- Project Boundary (+/- 1611 Ac.)
- Slash Pine Planting (+/- 62 Ac.)
- Longleaf Pine Planting (+/- 81 Ac.)



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o: 352.371.4333 c: 352.339.1118

DATA SOURCES: COUNTY, WMD, USDA/NRCS, FWCC,
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WEST FIPS 0902 FEET

From: [Will Mahler](#)
To: [Wilson, Matthew S.](#)
Subject: RE: Wekiva River MB Modification Submittal (3 of 3)
Date: Wednesday, August 31, 2016 4:52:47 PM
Attachments: [ATTACHMENT K. burn plan.pdf](#)

3 of 3

From: Will Mahler
Sent: Wednesday, August 31, 2016 4:49 PM
To: 'Matthew.S.Wilson@dep.state.fl.us' <Matthew.S.Wilson@dep.state.fl.us>
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Sent: Wednesday, August 31, 2016 4:47 PM
To: 'Matthew.S.Wilson@dep.state.fl.us' <Matthew.S.Wilson@dep.state.fl.us>
Subject: Wekiva River MB Modification Submittal (1 of 3)

Matt,

I tried using the DEP portal but I could not get past the "Manage Project Site" section where it wanted me to search for the site. I tried searching using multiple parameters but it would process for several minutes and I would have to try again. So, I am hoping I can pass all these files through an email. There should be 3 emails, 12 files total. Please let me know if you do not get them all.

This should be considered our official submittal (not a draft). If you have any questions regarding what we submitted or need additional info, please don't hesitate to contact me.

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Attachment K

Fire Management Plan

Wekiva River Mitigation Bank Prescribed Fire Management Plan

Following Wekiva River Mitigation Bank (WRMB) implementation (i.e. Conservation Easement recordation), prescribed fire will be applied to all fire-dependent natural communities with the following regimes – pine flatwoods (1-8 years), freshwater marsh/wet prairie (1-3 years), and mesic flatwoods (1-3 years). The hydric hammock communities would likely burn at the edges, but low intensity fires may periodically carry into portions of the hydric hammock. All fires would abide by the following criteria:

- All fires will be conducted by a state-certified prescribed burner using state-sanctioned burn prescriptions and smoke management plans;
- Initial fires will be applied during the non-growing season to reduce fuel loads and subsequently shift to early growing season/growing season to kill woody species (oaks, maples, etc.) and foster seeding of fire-dependent species, particularly wiregrass (*Aristida stricta*) and other herbaceous species;
- Prescribed fire will be applied within the recommended regimes above, or more often as conditions allow under the direction of the Qualified Mitigation Supervisor (QMS);
- Growing season fire is preferred, but non-growing season can be used periodically as conditions (drought, flooding) dictate to increase burning opportunities/flexibility;
- Prescribed fire will be a tool to attain success criteria, but may be coupled with mechanical means as directed by the QMS;
- Prescribed fire will be deemed successful when it carries through 70% or more of the targeted community/burn unit; and,
- Woody species reduction and herbaceous cover increases will be documented as detailed in the monitoring plan.

Prescribed fire will be the primary initial and long-term management tool to attain/perpetuate success criteria within the fire dependant natural communities. The proposed schedule of fire events are included within the context of other enhancement activities as follows (within five (5) years):

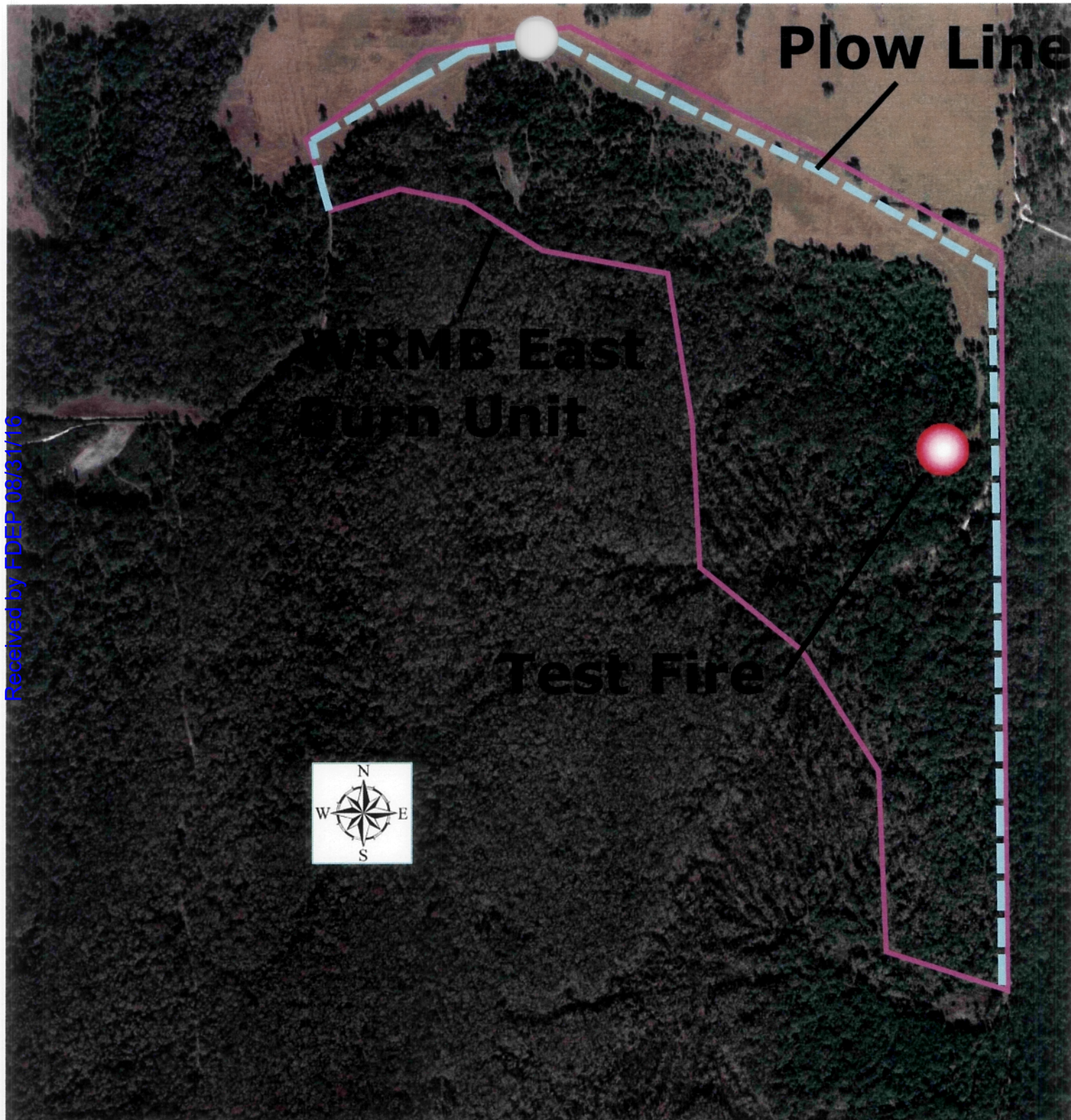
- Initial non-growing season fire;
- Evaluation of success by QMS;
- Second fire, early growing season – growing season;
- Evaluation of success by QMS;

- Continue seeding program as necessary, based on direction of QMS;
- Third fire, early growing season; and,
- Continue seeding program as necessary, based on direction of QMS and the amount of successful regeneration of herbaceous cover.

The WRMB has been divided into two burn units (East and West) to facilitate safe and practical prescribed fire management. Burn prescriptions for these two burn units are attached.

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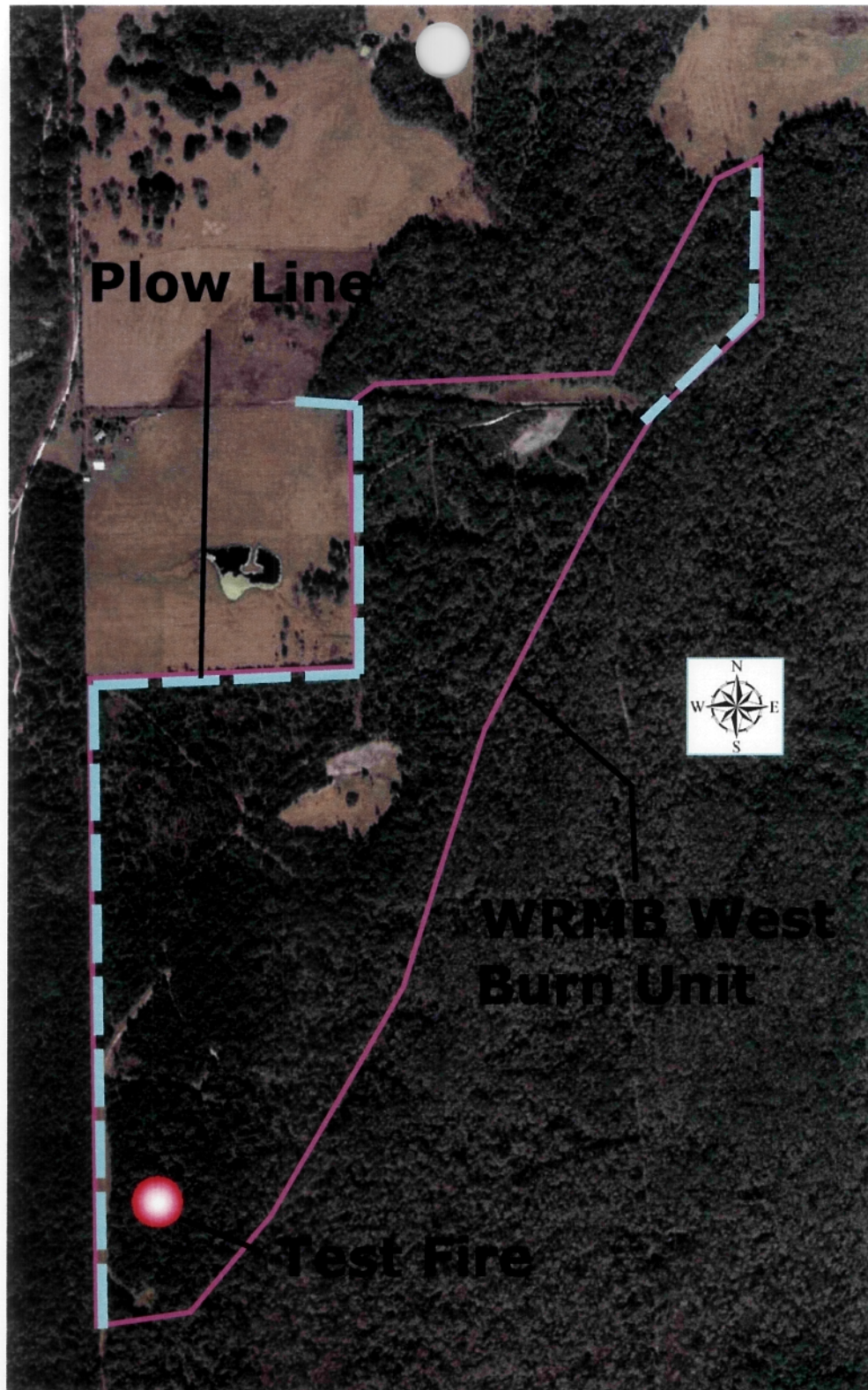


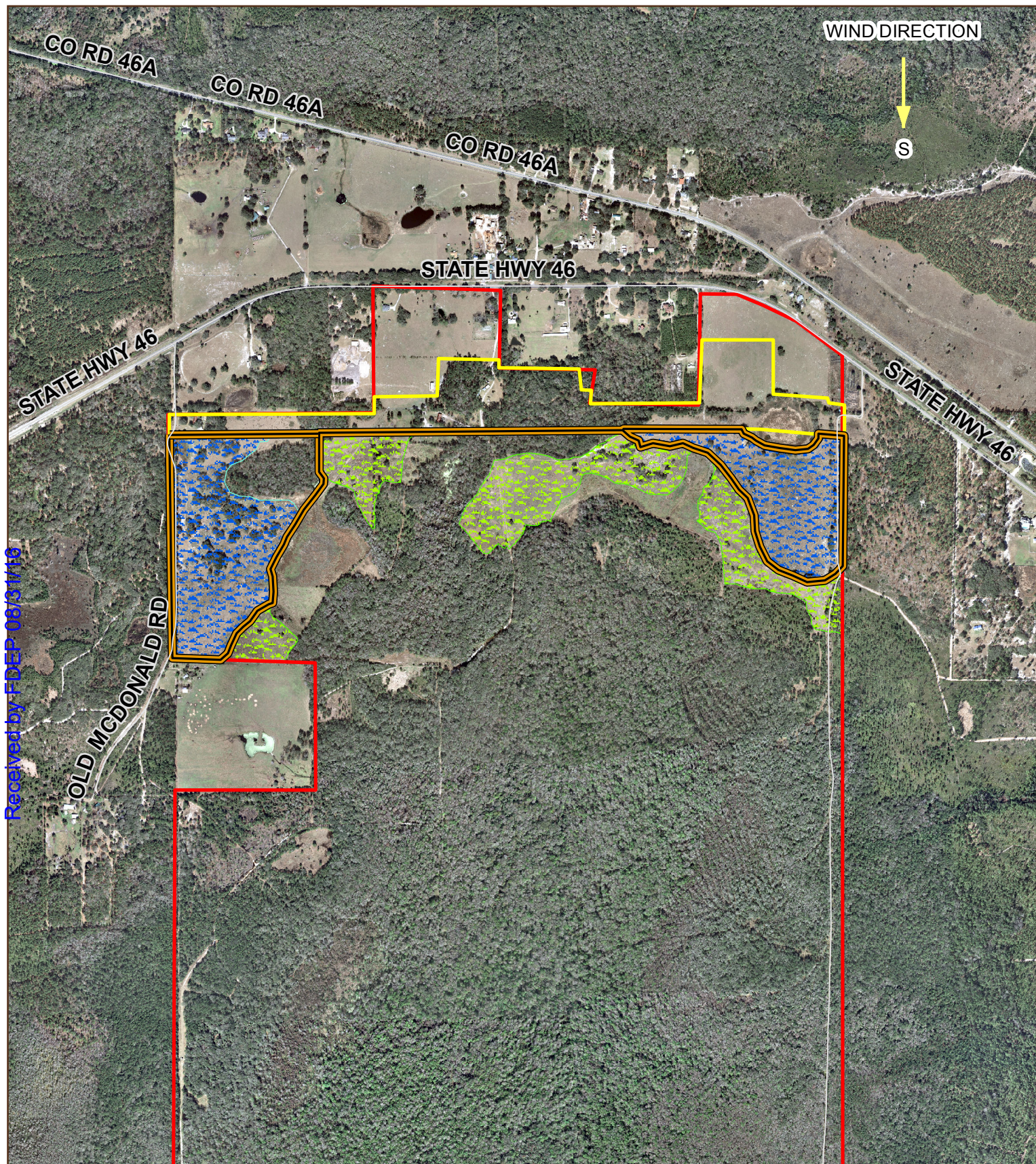
Plow Line

WRMB East
Burn Unit

Test Fire







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FIGURE 1
WRMB
BURN PLAN
2014 TRUE COLOR AERIAL
LAKE COUNTY, FLORIDA
1 INCH = 1,300 FEET

Legend

- Fire Break Line
- Wekiva Parkway Right-of-Way Impact (+/- 65 Ac.)
- Project Boundary (+/- 1611 Ac.)
- Slash Pine Planting (+/- 62 Ac.)
- Longleaf Pine Planting (+/- 81 Ac.)



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Gainesville, FL 32609 East Palatka, FL 32131
o: 352.371.4333 c: 352.339.1118

DATA SOURCES: COUNTY, WMD, USDA/NRCS, FWCC, SFWS/NWI, FEMA, USGS/NHD&NED, FDOT, FDOT FINAL, FDEP, US CENSUS (TIGER 2008), FGDL & EC&D.
NOTE: DATA ARE PROVIDED "AS IS." ACRES ARE APPROXIMATE & GIS DERIVED.
PROJECTION: NAD 1983 HARN STATEPLANE FLORIDA WEST FIPS 0902 FEET

MAP SCALE IS SET FOR MAPS PRINTED ON 8.5X11 PAPER.



Charles H. Bronson
Commissioner

Florida Department of Agriculture and Consumer Services
Division of Forestry

PRESCRIBED BURNING PLAN
(P r e s c r i p t i o n)



Use Fire
Wisely

Forestry District: Withlacoochee		Authorization Number:	
Landowner: Wekiva River Mitigation Bank			
Address: 713 West Montrose Street, Suite B Clermont, Florida 34711		Telephone Number: (352)404-9099 ext:	
- LOCATION -			
County: Lake	Section 25 & 26	Township 19S	Range 28E
Latitude		Longitude	
Deg: 28	Min: 48	Sec: 50	Deg: 81
			Min: 28
			Sec: 45
Acres to Burn: ± 90		Distance to Plow: 8,600	Previous Burn Date: Winter 2006
Stand Description: Pine flatwoods with saw palmetto/gallberry understory – transitions to wet flatwoods in south.			
Overstory Type: Pines (longleaf and pond) with sweetgum and bay		Understory Type: saw palmetto and gallberry	Height to Bottom of Crown: varies from 15 -25 feet
Fuel Description: 1- 100 hour fuels w/ palmetto and gallberry shrubs		Fuel Model: 7	Topography and Soil: Sandy hills with 2%-5% slopes
Purpose of the Burn: Ecological – upland enhancement management		Burn Objectives: Maximize burn area and encourage pyrogenic herbaceous community. Some canopy mortality acceptable.	
Firing Techniques & Ignition Methods: Black lines and stripping			
Personnel Needs: PPE, water		Equipment Needs: drip torches, plow, water truck	
Maximum Crown Scorch Acceptable: N/A		Passed Smoke Screening System: ☒ YES ☐ NO	
List Possible Smoke-Sensitive Areas: Single family homes and S.R. 46 to north of site – should not be an issue due to prescribed wind direction (i.e. NE to NW).			
Special Precautions: Need for extensive fire lines to be plowed on east and north side of unit to prevent spotting into Wekiva River Basins State Park (east).			
Adjacent Landowners to Notify: Wekiva River Basins State Park – coordinate burn schedules and provide assistance.			

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WEATHER FACTORS	PREFERRED	ACTUAL
Surface Winds	5-20 (ENE to NW)	
Transport Winds	> 9 mph	
Minimum Mixing Height	> 1700 ft.	
Dispersion Index (DAY)	> 35	
Dispersion Index (NIGHT)	> 3	
Maximum Temperature	90	
Minimum Relative Humidity	35	
Fine Fuel Moisture	> 7% (fine fuel)	
Rate of Spread	<1,000 ft/hr	
Starting Time	9:00 am	
Burn Technique	Black line and Strip	
Flame Length	25 ft.	
MONITORING & EVALUATION PROCEDURES		
PRE-BURN	BURN	POST BURN
Check for fine fuel moisture	Observe wind direction and speed, relative humidity	Annual monitoring to assess pyrogenic species composition
Days Since Rain:	Date Burned:	Distance Plowed:
BURN CHECK LIST		
FIRE BOSS: Check each item to indicate compliance. ☐ All prescription requisites met (preparation and day of burn). ☐ Authorization obtained. ☐ Adjacent landowners notified within past seven days of plan to burn. ☐ Local contacts made day of burn to advise (FHP, SO, Fire Dept., media, etc.) ☐ Smoke screening performed and documented. ☐ All equipment required on scene and fully operational. ☐ Each crew member has proper personal gear and clothing. ☐ Low Visibility Risk Index checked. ☐ Smoke on the Highway signs in place, if needed. ☐ Test burn performed and fire behavior within expectations.		
CREW BRIEFING		
☐ Objectives of burn. ☐ Exact area of burn. ☐ Hazards discussed (volatile fuels, spotting potential, weak points in perimeter lines, terrain features, etc.). ☐ Crew Assignments made. ☐ Ignition technique and pattern. Holding method(s). ☐ Location of extra equipment, fuel, water, vehicle keys. ☐ Authority and communications. ☐ Contingencies covered including escape routes or procedures. ☐ Sources of nearest assistance. Nearest phone and emergency numbers. ☐ Special instructions regarding smoke management, contact with the public and others. ☐ Questions. ☐ Crew members given opportunity to decline participation (is there anything that is going to prevent full physical performance?).		
Prescription Done by: Tom Odom		Certification Number: Pending
Title: President – Mitigation Resources, L.L.C.		Date:
CERTIFIED BURN MANAGER SIGNATURE: N/A		



Charles H. Bronson
Commissioner

Florida Department of Agriculture and Consumer Services
Division of Forestry

PRESCRIBED BURNING PLAN
(P r e s c r i p t i o n)



Use Fire
Wisely

Forestry District: Withlacoochee		Authorization Number:	
Landowner: Wekiva River Mitigation Bank			
Address: 713 West Montrose Street, Suite B Clermont, Florida 34711		Telephone Number: (352)404-9099 ext:	
- LOCATION -			
County: Lake	Section	Township	Range
	26	19S	28E
Latitude		Longitude	
Deg: 28	Min: 48	Sec: 40	Deg: 81
		Min: 29	Sec: 30
Acres to Burn: ± 120		Distance to Plow: 6,050	Previous Burn Date: Unknown
Stand Description: Pine flatwoods with dense understory vegetation (groundcover to shrubs) – transitions to wet flatwoods in east.			
Overstory Type: Pines (longleaf and pond) with sweetgum and bay		Understory Type: saw palmetto, and dense shrubs	Height to Bottom of Crown: varies from 20 -40 feet
Fuel Description: 1- 1000 hour fuels w/ palmetto and dense shrubs (Heavy Fuel Load)		Fuel Model: 4	Topography and Soil: Flatwoods & Transitional Wet Flatwoods 0%-2% slopes
Purpose of the Burn: Ecological – upland/transitional enhancement management		Burn Objectives: Maximize burn area and encourage pyrogenic herbaceous community. Some canopy mortality acceptable.	
Firing Techniques & Ignition Methods: Black lines and stripping			
Personnel Needs: PPE, water		Equipment Needs: drip torches, plow, water truck	
Maximum Crown Scorch Acceptable: N/A		Passed Smoke Screening System: ☒ YES ☐ NO	
List Possible Smoke-Sensitive Areas: Single family homes and S.R. 46 to north of site – should not be an issue due to prescribed wind direction (i.e. NW to W).			
Special Precautions: Need for extensive fire lines to be plowed on west and north side of unit to prevent spread into Wekiva River Basins State Park (east). Lack of burn history: CAUTION – Heavy Fuel Load! Need DOF Supervision, Heavy Plow and Water Truck.			
Adjacent Landowners to Notify: Wekiva River Basins State Park – coordinate burn schedules and provide assistance.			

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WEATHER FACTORS	PREFERRED	ACTUAL
Surface Winds	5-20 (NW to W)	
Transport Winds	> 9 mph	
Minimum Mixing Height	> 1700 ft.	
Dispersion Index (DAY)	> 35	
Dispersion Index (NIGHT)	> 3	
Maximum Temperature	90	
Minimum Relative Humidity	35	
Fine Fuel Moisture	> 7% (fine fuel)	
Rate of Spread	<1,000 ft/hr	
Starting Time	9:00 am	
Burn Technique	Black line and Strip	
Flame Length	35 ft.	
MONITORING & EVALUATION PROCEDURES		
PRE-BURN	BURN	POST BURN
Check for fine fuel moisture	Observe wind direction and speed, relative humidity	Annual monitoring to assess pyrogenic species composition
Days Since Rain:	Date Burned:	Distance Plowed:
BURN CHECK LIST		
FIRE BOSS: Check each item to indicate compliance. ☐ All prescription requisites met (preparation and day of burn). ☐ Authorization obtained. ☐ Adjacent landowners notified within past seven days of plan to burn. ☐ Local contacts made day of burn to advise (FHP, SO, Fire Dept., media, etc.) ☐ Smoke screening performed and documented. ☐ All equipment required on scene and fully operational. ☐ Each crew member has proper personal gear and clothing. ☐ Low Visibility Risk Index checked. ☐ Smoke on the Highway signs in place, if needed. ☐ Test burn performed and fire behavior within expectations.		
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