WETLAND ASSESSMENT PROCEDURE (WAP) INSTRUCTION MANUAL (2004 VERSION)

1.0. INTRODUCTION

This instruction manual is designed to guide the user through the steps necessary to prepare a wetland for monitoring and to perform the periodic evaluations that make up the Wetland Assessment Procedure (WAP). The WAP was originally developed in 2000 as part of the Environmental Management Plan (EMP) – a plan used to manage the Central System wellfields included in Tampa Bay Water's Consolidated Water Use Permit. This instruction manual constitutes the first revision of the original WAP, and replaces Attachments C through F of the EMP (March 4, 2000).

Note that certain words and phrases used throughout this manual (presented in bold type) are defined in Appendix C. Abbreviated definitions are sometimes included within the text of this instruction manual, but the user should review the more detailed definition of terms in Appendix C. Please be aware that some definitions have been modified for the WAP and may deviate from generic definitions.

The objective of the WAP is to collect information on vegetation, **hydrology**, soils, and other pertinent variables in monitored wetlands to accurately characterize the ongoing biological condition and health of each wetland. This information will be used for a variety of water management purposes, including wellfield operations, the development of minimum flows and levels, and the assessment of recovery in areas that have experienced historic hydrologic and biologic degradation due to ground-water withdrawals. It is important to understand that although the WAP seeks to document and monitor many aspects of wetland health, its focus is on wetland health effects caused by hydrologic changes due to ground-water withdrawals. Many wetlands are also subject to negative health impacts caused by surrounding land management and drainage practices, encroaching development, cattle operations, **exotic plant** species introduction, disease, and other variables, but the WAP attempts to focus on biologic impacts caused by the hydrologic impacts of ground-water withdrawals.

The results of the WAP include health assessment scores, data collection, observations, and other general information. One critical aspect of the procedure is the written documentation requested to explain various decisions made by the evaluator, as well as a written, ongoing history of each site. The written comments are intended to document the evaluators logic in deriving scores, provide a basis for ongoing quality control (as well as future correction of errors), and provide the evaluator the ability to document potentially important wetland health-related observations that may not be fully included in the current procedure. Therefore, it is important to realize that the written comments and history are essential products of the WAP, and should not be considered optional.

An attempt has been made to make the following instructions as comprehensive as possible. However, if an evaluator finds a situation that is apparently not included in these instructions, the situation should be documented, and the documentation forwarded as soon as possible to the SWFWMD for clarification or resolution before long-term decisions are made.

2.0. DATA REPORTING AND FORMATS

2.1. Documentation of site installation

All currently monitored wetlands on which the WAP will be implemented shall be assessed for conformity to the revised methodology. If the existing **WAP Transect**, reference elevations, appropriate field markers, and other requirements of this methodology are determined to meet the requirements of the revised WAP methodology, documentation of the established monitoring site shall be submitted to the SWFWMD in either electronic or paper report format for review. If the existing field installation needs to be changed to meet the requirements of the revised methodology, the new **WAP Transect** and related components should be installed, and the documentation of the work shall be submitted to the SWFWMD in either electronic or paper report format for review. All documentation should be received by June 30, 2005. Please see Appendices F and G for detailed lists of the information that should be included in the submittal. Information in the reports should include the following:

a) The wetland history
b) All reference elevations associated with the **WAP Transect**, including **historic normal pool**, **historic wetland edge**, **NP-6**, hydric soils elevations, elevations related to well construction information, and staff elevations (including ground elevation and any appropriate conversions to NGVD). The benchmarks used for all measurements should be clearly documented by name or number (i.e., survey markers, **staff gages**, etc.)
c) Any necessary locations for all of the reference elevation markers or locations.
d) Available documentation of well and staff gage installations.
e) A narrative on how **historic normal pool** and **historic wetland ed**ge were determined, including any necessary intermediate surveyed elevations (such as biologic indicators, **saw palmetto fringe**, etc.).
f) A narrative of why the **WAP Transect** was chosen, and map of its location (including GPS coordinates)

Any future changes to the site installation should be fully documented and reported to the SWFWMD with the Annual Reports.

2.2. WAP data reporting

All data and information collected as part of the WAP must be recorded into a mutually compatible electronic format and submitted to the SWFWMD as part of the Annual Reports listed under Section 13A of the Consolidated Wellfield Water Use Permit (#20011771.000). The construction of the electronic format shall be decided in conjunction with the Permittee no later than September 1, 2004. This format shall be used for all WAP reporting events beginning with Water Year 2004. All field sheets and supporting notes used to construct the electronic database should be readily available upon request.

2.3. Locational data reporting

The Permittee shall provide locational data (i.e., section, township, and range, and latitude and longitude) to 0.01 seconds, within 30 days of installation of monitoring wells and **staff gages**. Also, well construction data i.e., depth, diameter, screened interval, and Chapter 40D-3 permit number shall be submitted with the locational data.

2.4. Water level data reporting

Pursuant to Condition 9.D.3 of the Consolidated Water Use Permit, EMP monitor well and **staff gage** water level data shall be submitted to the SWFWMD by the 15th of each month. Water level measurements shall take place twice monthly, with measurements for a given point occurring during the same weeks of each successive month. The staff gages shall be scaled in one-tenth foot increments and shall be placed in the **wetland interior**. Water levels shall be reported to the Permits Data Section (using SWFWMD forms) on or before the 15th day of the following month. All water level measurement sites shall be surveyed so that measured levels are relative to NGVD within three years of issuance of this permit. Should water levels recede so as not to allow the gage to be read, the Permittee shall properly install and survey an additional staff gage or well within 30 days of such an occurrence. Monitored surface-water and wetland sites that go dry shall be equipped with an appropriately constructed surficial aquifer monitor well placed near the **staff gage**, capable of measuring below ground-water levels down to the applicable underlying confinement layer.

3.0. ACTIVITIES TO BE PERFORMED FOR INITIAL WETLAND SETUP

3.1. Historical Assessment

A history of the wetland should be established (referred to as the "wetland history" throughout this document). The wetland history should include an initial evaluation on the status of the wetland condition based on several factors, which may include 1) study of **historical** aerial photography, 2) interviews with previous evaluators, 3) review of previous studies in the area, and 4) initial field visits to the wetland (including documentation of long-term biologic indicators of past hydrologic conditions). The purpose of the **historical** assessment is to provide information on the wetland condition, **historical** stresses, and potential existing stresses in the area. The wetland history should be included in the database and periodically updated (see Section 4.0 below). See Appendix F for a detailed list of information that should be included in the wetland history.

3.2. WAP Transect Selection and Setup

Once a wetland is chosen for monitoring, the following steps are necessary to establish the **WAP Transect**. Unless the **WAP Transect** needs to be moved or reestablished, this process should only need to be performed once. See Appendix G for a detailed list of information that should be included in the documentation of the transect setup.

WAP Transect selection. All vegetation assessments will be conducted along a **WAP Transect**. The **WAP Transect** is a straight line from the **historic wetland edge** to the **wetland interior**, and should be chosen such that it provides the best opportunity to fully assess all aspects of the wetland, including the **transition zone** (see below). Practical considerations, such as access issues, existing disturbance, minimizing vegetation disturbances while monitoring, and lines of sight, should be taken into account when choosing a **WAP Transect** as well. If a **wetland well**, **upland well**, and/or a **staff gage** have been previously established, consideration should be given to including their location in the **WAP Transect** centerline. If wells and/or a **staff gage** have not been established, they should be installed as close to the **WAP Transect** centerline as possible.

The area to be assessed from the **WAP Transect** will be referred to as the **Assessment Area**. The width of the **Assessment Area** will be the visual range of the wetland from the **WAP Transect** centerline, or at least ten meters in width, which ever is greater. The **Assessment Area** also includes

the visual range of the wetland, or at least ten meters, beyond the wetland interior. Where the visual range from the **WAP Transect** is greater than ten meters, however, the assessments should not exceed the distance in which species can accurately be identified. In wetland systems such as cypress marshes, the entire wetland should be evaluated as one system with appropriate comments that detail the wetland's **zonation** etc.

Establishment of Historic Normal Pool and other reference points. Once a **WAP Transect** is chosen, the **historic normal pool** and **historic wetland edge** need to be established. Appendix D contains the definitions and procedures necessary to make these determinations. Once these elevations are determined, the elevation six-inches below **historic normal pool** (**NP-6**) should be established along the **WAP Transect**. This elevation will be used to mark the boundary between the **transition zone** and the **deep zone** of the wetland. Note that the **NP-6** elevation may not coincide with existing vegetational indicators of the **transition zone/deep zone** boundary due to impacts to the wetland, or possible short-term natural fluctuations. The **NP-6** elevation must be permanently marked for future reference. If possible, markers should be also placed at the **historic wetland edge**, as well as the **wetland interior**. The **staff gage** can serve as the **wetland interior** marker if it is placed appropriately. All three points should also be recorded using the Geographic Positioning System (GPS), and documented with detailed notes, for future reference.

If the **transition zone** of the wetland is very narrow, an assessment of the **transition zone** may not be practical or appropriate. **The transition zone** can be narrow naturally, it can become narrow due to disturbance by surrounding land use activities, or it can have become narrow due to **subsidence** in the wetland. If possible, the **WAP Transect** should be chosen in a portion of the wetland with a **transition zone** that is wide enough for adequate monitoring. However, if no such area exists, or if an existing **WAP Transect** has a narrow **transition zone**, and the assessor determines that the value of the maintaining the existing **WAP Transect** outweighs the value of moving the **WAP Transect**, the **transition zone** should not be monitored. In this case, **NA** (not applicable) should be chosen for all **transition zone** evaluations, and an explanatory comment should be included in the field sheet. Additionally, the wetland history should explain any permanent decision not to assess the **transition zone**. A **transition zone** that is too narrow for practical evaluation is generally considered to be one meter or less in width (from the **historic wetland edge** to the **NP-6** elevation), but the determination of whether or not a **transition zone** is too narrow for evaluation is a decision of the assessor (subject to SWFWMD consensus).

In very shallow wetland systems, it may not be possible to establish an **NP-6** elevation (i.e., the wetland has no **deep zone**). In these cases, the entire wetland should be assessed as a **transition zone**, and the **deep zone** evaluations should be marked **NA** (not applicable). As above, the associated comments and updated wetland history should explain and support the decision.

The **WAP Transect** and supporting elevations should be fully documented once established, and the documentation should be forwarded to the SWFWMD. Based on the documentation and specific wetland situation, an on-site verification may be required. If the **WAP Transect** needs to be moved during the course of wetland monitoring, all appropriate elevations should be re-established, and the information on the new **WAP Transect** must be submitted to the SWFWMD.

4.0. ACTIVITIES TO BE PERFORMED AT LEAST EVERY FIVE YEARS

4.1. Soils Assessment

To be performed by soil scientist. The delineation of hydric soils within the wetland will be determined as set forth by the USDA Natural Resources Conservation Service and the Florida Association of Environmental Soil Scientists (Carlisle and Hurt, 2000) and will be performed at least every five years by a qualified soil scientist. When practical, the hydric soils delineation should be marked with an iron rebar topped with a suitable diameter PVC pipe, painted blue, and clearly marked with the date of hydric soils determination. Any marking alternatives should be done such that anyone can relocate the exact point of soils delineation (e.g., documentation of distance and direction of the hydric soil indicator from some monument such as a tree, well or other unrelated stake, and GPS location). In wetlands where hydric soil indicators are absent, determine the depth to seasonal high saturation at the edge of the wetland. Notes on which indicator was used to set the hydric soils delineation, the individual performing the delineation, as well as survey notes should be added to the wetland history.

To be performed by the environmental scientist. The environmental scientist should perform a thorough assessment of the condition of the soils. Any significant findings should be added to the wetland history.

The assessor should attempt to walk the entire wetland, looking for signs of soil **oxidation** or general **subsidence**. Indications of the spatial distribution and depth of **oxidation** or **subsidence** should be documented. The following should be used as guidance:

- Substantial soil **subsidence/oxidation**: This condition occurs when **subsidence** greater than or equal to six inches is observed.
- Moderate soil **subsidence/oxidation**: This condition occurs when **subsidence** greater than two inches but less than six inches is observed.
- Little or no evidence of soil **subsidence/oxidation**: This condition occurs when **subsidence** less than two inches is observed, and when no other evidence of oxidized conditions is apparent.

See Appendix C for more details.

4.2. Wetland History Update

Update the original wetland history with any significant new observations based on the semi-annual evaluations, soils assessments, and other information. The evaluator is encouraged to update the wetland history on a frequent basis, but at least every five years. See Appendix F for a detailed list of information that should be included in the wetland history.

5.0. ACTIVITIES TO BE PERFORMED SEMI-ANNUALLY

The following information must be collected semi-annually during the early summer (May/June) and fall (September/October) seasons. All of the data must be entered into an approved electronic data

base. A form for use in data collection in the field is provided in Appendix B. The following describes the information to be collected during the semi-annual evaluations.

WELLFIELD Identify wellfield associated with the wetland assessment (if any).

STATION ID Identify the wetland station ID (use the same ID as the Tampa Bay Water database).

HISTORIC FLUCCS CODE Identify the **historical** Florida Land Use, Cover and Forms Classification System (**FLUCCS**) code for the wetland. A table is provided in the EMP that cross-references the **FLUCCS**, Florida Natural Areas Inventory (FNAI) and SWFWMD codes.

WETLAND TYPE Identify wetland type from Appendix E that most closely represents the wetland being assessed

PERSONNEL Identify firm and person(s) conducting the wetland assessment

DATE Date (early summer or fall semi-annual wetland assessments, or other for as-needed wetland assessments).

TIME Time of arrival

GROUND PHOTOGRAPHY

Photos Photos should be taken in each cardinal direction at the **wetland well** or **staff gage** and **NP-6** stake. Optionally, if the wetland has been monitored for several years, photos should be taken at previously chosen photo points. In this case, the photo points must be clearly described in the wetland documentation and identified by accurate GPS coordinates (if possible) to assure photo views are the same for each assessment. The photography must be digital format, and the resulting electronic image files must be at least 280 dpi at an image size of 8 inches by 10 inches. Digital image files should be clearly labeled with wetland ID, photo point, cardinal direction, and date, and stored in an appropriate database.

Roll/Card Note unique identification code for memory card or other storage device.

Photo Frame # Number of each photo frame, as designated by the camera, for the direction the photo is taken. Stored memory card views should be labeled so that the photo view and date of the photo is consistent from one monitoring season to the next.

Direction Cardinal directions North = 0, East = 90, South = 180, and West = 270. Note that if the views from the cardinal directions are not indicative of the wetland, the photo-directions can be changed to best represent the wetland; however, they must be permanently designated so that the same view is taken during each assessment. Note

that the photo directions should be re-evaluated when appropriate to insure that the photos content remains useful.

WATER LEVEL

Describe water level conditions in the wetland at the time of the assessment. Water levels from existing **staff gage** should be noted, and an estimate of the percent of the wetland inundated should be mentioned. If there is no standing water in the wetland, an estimate of soil moisture or saturation, and, if possible, depth to water, should be made. Saturation can be determined by rolling a golf ball-sized ball of soil in your palm. If soil is saturated moisture will appear on the soil and in your palm. Depth to water can be estimated by the degree of soil saturation, or through the use of the **wetland well**. The goal of this evaluation is to provide a general description of water level conditions at the time of the assessment.

VEGETATION TRENDS

The following section provides direction to assess the **cover**, **composition**, and **zonation** of the most common **groundcover**, **shrub**, and **tree** species in the monitored wetland. The vegetation assessment will be conducted along the **WAP Transect** described earlier. The purpose is to assess vegetation characteristics and distribution with respect to **hydrology**. It is assumed that normal **cover** and **zonation** of species is a result of normal wetland **hydrology**. Altered **hydrology** is assumed to affect plant community **composition**, plant **zonation** (i.e., species currently occurring in different wetland **zones** than where they occurred historically) and amount of **cover** (i.e., **FACW** and **FAC** species occurring in greater abundance than they historically occurred).

Only rooted vegetation growing within the **historic wetland edge** should be included in the assessment. Vegetation growing on **hummocks**, vegetation overhanging from the uplands (such as saw palmetto), floating vegetation, or **vines** in the **canopy** that originate from outside the **historic wetland edge** should not be included in the assessment. However, comments and/or notes on any of these types of vegetation can be included in the documentation.

The ranking scales for all categories are from 1 – 5 (see details below). Assigning half points between categories is not acceptable. For all categories evaluated, a choice of 1-5 must be made, or **NA** must be chosen. The main factors in the rank chosen must be documented in the comments section. If **NA** is chosen, clearly explain the reason, and, if a permanent condition, include in the updated wetland history.

Appendix A contains the Vegetative Index (from Chapter 62-340 F.A.C), as well as an extended Vegetative Index list containing some common species not on the Vegetative Index (for reference). Chapter 62-340 F.A.C. provides several references to be used for species identification or to resolve any uncertainty about the nomenclature or taxonomy of any plant. Other useful references to be used include Wunderlin, R.P. (1997) and http://www.plantatlas.usf.edu. The Vegetative Index and Vegetative Index Extension in Appendix A should be used exclusively to assign Wetland Status for each identified species in the WAP.

GROUNDCOVER

Groundcover is defined as all woody species less than one meter in height, and all non-woody species (regardless of height), rooted in the ground. **Vines** originating from the **transition zone** or **deep zone** (but not on **hummocks**) should be considered **groundcover**.

Groundcover Species Cover Percentages

List the most common **groundcover** species that occur within each wetland **zone**, as well as all noteworthy species that may affect your overall wetland evaluation (such as **weedy** species, **exotic plants**, upland species, etc.). Also, estimate the percent **cover** of each species, and record the Wetland Status designation for each species, as per the Vegetative Index (Chapter 62-340, F.A.C) and Vegetative Index Extension in Appendix A. Each percentage should be the percent of the wetland **zone** covered by the specific species. Total Groundcover Percentage should also be estimated. Although the total of the percent **cover** of the individual species should usually approximate the Total Groundcover Percentage, because of layering, the percent **cover** for the individual species do not have to equal the Total Groundcover Percentage within the **zone**. Note that **groundcover** that is significantly disturbed by paths or trails used to enter the wetland should not be considered in the assessment.

Add any comments necessary to explain the results of the Groundcover Species Cover Percentages.

Groundcover Zonation
Indicate the category that best describes the **groundcover zonation**, and provide comments that explain the reasons for your choice. Examples of abnormal **zonation** include upland species growing on the wetland floor (not on **hummocks**). **Upland species** are abnormal in both the **transition** and **deep zones**. **FAC** species are expected in limited abundance in the **transition zone**, but not the **deep zone** (**FAC** species can be abnormal in the **transition zone** depending upon abundance and position of particular species - scientific judgment needed). **FACW** species are always considered normal in the **transition zone**, but can be abnormal in the **deep zone** depending upon abundance and position (scientific judgment needed). Expansive growth of an **OBL** (such as maidencane) in the **deep zone** could be considered abnormal, depending on the wetland history.

Ranking Scale

1. Many signs of abnormal **groundcover zonation** all through wetland
2. Many signs of abnormal **groundcover zonation** in the **transition zone** and outer **deep zone** (if no **transition zone** or no plants in **transition zone** select 2.
3. Some signs of abnormal **groundcover zonation** in the **transition zone** and outer **deep zone** (if no **transition zone** or no plants in **transition zone** select 3.
4. Some signs of abnormal **groundcover zonation** limited to the **transition zone**
5. Normal **groundcover zonation**

N/A Not enough **groundcover** to make evaluation

Add any comments necessary to explain the results of the Groundcover Zonation evaluation.

SHRUBS AND SMALL TREES
Shrubs and small trees are defined as woody species less than four centimeters **Diameter at Breast Height** (**DBH**) and greater than one meter in height. For WAP purposes, only **shrubs and small trees** rooted in the ground and not on **hummocks** will be considered in this section.

Shrub and Small Tree Species Cover Percentages (only consider plants rooted on the ground)
List the most common **shrub and small tree** species that occur within each wetland **zone**, as well as all noteworthy species that may affect your overall wetland evaluation (such as **weedy** species, **exotic plants**, upland species, etc.). Also, estimate the percent **cover** of each species, and record the Wetland Status designation for each species, as per the Vegetative Index (Chapter 62-340, F.A.C)

and Vegetative Index Extension in Appendix A. Each percentage should be the percent of the wetland **zone** covered by the individual species. Total Shrub and Small Tree Cover Percentage should also be estimated. Although the total of the percent **cover** of the individual species should usually approximate the Total Shrub and Small Tree Cover Percentage, because of layering, the percent **cover** for the individual species does not have to equal the Total Shrub and Small Tree Cover Percentage within the **zone**. If there are no **shrubs and small trees** rooted on the ground in the **transition zone** or in the **deep zone** write "None".

Add any comments necessary to explain the results of the Shrub and Small Tree Species Cover Percentages.

Shrub and Small Tree Zonation (only consider plants rooted in the ground)
Indicate the category that best describes the **shrub and small tree zonation**, and provide comments that explain the reasons for your choice. Examples of **abnormal zonation** include upland species growing on the wetland floor. **Upland species** are abnormal in both the transition and **deep zones** (scientific judgment needed if upland species are in shallow areas close to the wetland edge). **FAC** species are expected in limited abundance in the **transition zone**, but not the **deep zone** (**FAC** species can be abnormal in the **transition zone** depending upon abundance and position of particular species - scientific judgment needed). **FACW** species are always considered normal in the **transition zone**, but can be abnormal in the **deep zone** depending upon abundance and position (scientific judgment needed). Expansive growth of an **OBL** in the **deep zone** might be considered abnormal, depending on the wetland history.

Ranking Scale

1. Many signs of **abnormal shrub and small tree zonation** all through wetland
2. Many signs of **abnormal shrub and small tree zonation** in the **transition zone** and outer **deep zone** (if no **transition zone** or no plants in **transition zone** select 2)
3. Some signs of **abnormal shrub and small tree zonation** in the **transition zone** and outer **deep zone** (if no **transition zone** or no plants in **transition zone** select 3)
4. Some signs of **abnormal shrub and small tree zonation** limited to the **transition zone**
5. **Normal shrub and small tree zonation**

N/A Not enough **shrub and small tree cover** to make evaluation

Add any comments necessary to explain the results of the Shrub and Small Tree Zonation evaluation.

Stress of Appropriate Shrub and Small Tree Species (only consider plants rooted in the ground)
Indicate the category that best describes the presence of **shrub and small tree stress** for species appropriate for the wetland type. Species such as wax myrtle that are in an inappropriate **zone** within the wetland are assessed under the "inappropriate" category below. Include any standing **shrubs and small trees** that are dead.

Ranking Scale

1. >50 percent exhibit **stress**

2. 25-50 percent exhibit **stress**
3. 10-25 percent exhibit **stress**
4. 5-10 percent exhibit **stress**
5. <5 percent exhibit **stress**

N/A Not enough **cover** to make evaluation

Add any comments necessary to explain the results of the Stress of Appropriate Shrub and Small Tree Species evaluation.

Stress of Inappropriate Shrub and Small Tree Species (only consider plants rooted in the ground)

Indicate the category that best describes the presence of **shrub and small tree stress** for species not appropriate for the wetland type or that are in an inappropriate wetland **zone**. Include any standing **shrubs and small trees** that are dead**.**

Ranking Scale

1. <5 percent exhibit **stress**
2. 5-10 percent exhibit **stress**
3. 10-25 percent exhibit **stress**
4. 25-50 percent exhibit **stress**
5. >50 percent exhibit **stress**

N/A Not enough **cover** to make evaluation

Add any comments necessary to explain the results of the Stress of Inappropriate Shrub and Small Tree Species evaluation.

TREES

Trees are defined as woody species greater than four centimeters **Diameter at Breast Height** (**DBH**) and greater than one meter in height. Some non-forested wetlands such as marshes may have enough **trees** to provide useful information. The **Tree** category should be scored in Marsh and Wet Prairie systems if the evaluator believes that useful information can be obtained from scoring.

Tree Species Cover Percentages

List the most common **tree** species that occur within each wetland **zone**, as well as all noteworthy species that may affect your overall wetland evaluation (such as **weedy** species, **exotic plants**, upland species, etc.). Also, estimate the percent **cover** of each species, and record the Wetland Status designation for each species, as per the Vegetative Index (Chapter 62-340, F.A.C) and Vegetative Index Extension in Appendix A. Each percentage should be the percent of the wetland **zone** covered by the individual species. Total Tree Cover Percentage should also be estimated. Although the total of the percent **cover** of the individual species should usually approximate the Total Tree Cover Percentage, because of layering, the percent **cover** for the individual species do not have to equal the Total Tree Cover Percentage within the **zone**.

Add any comments necessary to explain the results of the Tree Species Cover Percentages.

Tree Zonation
Indicate the category that best describes the **tree zonation**, and provide comments that explain the reasons for your choice. Evaluate **tree** species encroachment (**inappropriate species** for the **zone** that it occurs). **Upland species** are abnormal in both the transition and **deep zones**. **FAC** species are expected in limited abundance in the **transition zone**, but not the **deep zone** (**FAC** species **groundcover** can be abnormal in the **transition zone** depending upon abundance and position of particular species - scientific judgment needed). **FACW** species are always considered normal in the **transition zone** but can be abnormal in the **deep zone** depending upon abundance and position (scientific judgment needed). Expansive growth of an **OBL** in the **deep zone** might be considered abnormal, depending on the wetland history.

Ranking Scale

1. Many signs of **abnormal tree zonation** all through wetland
2. Many signs of **abnormal tree zonation** in the **transition zone** and outer **deep zone**
   (if no **transition zone** or no plants in **transition zone** select 2)
3. Some signs of **abnormal tree zonation** in the **transition zone** and outer **deep zone**
   (if no **transition zone** or no **trees** in **transition zone** select 3)
4. Some signs of **abnormal tree zonation** limited to the **transition zone**
5. **Normal tree zonation**

N/A Not enough tree **cover** to make evaluation

Add any comments necessary to explain the results of the Tree Zonation evaluation.

Leaning or Dead Trees
Indicate the category that best describes the presence of leaning or dead **trees** within the entire wetland. Include **trees** that are dead on the ground or are known to have died during the period of wetland observation and are no longer in the wetland. Do not include any standing dead **trees** (include them as **stressed**) or any timbered **trees**. Restrict analysis to species appropriate for the wetland type.

Ranking Scale

1. >25 percent of **trees** dead or leaning
2. 15-25 percent **trees** dead or leaning
3. 5-15 percent of **trees** dead or leaning
4. <5 percent of **trees** dead or leaning, but inappropriate percentage for wetland type
5. Normal numbers of dead or **leaning trees** for wetland type

N/A Not enough **cover** to make evaluation

Add any comments necessary to explain the results of the Leaning or Dead **Trees** evaluation.

Canopy Stress of Appropriate Tree Species
Indicate the category that best describes the presence of **tree canopy stress**. Restrict analysis to species appropriate for the wetland type. Include any standing **trees** that are dead**.** If most of **tree** trunk is still standing consider this a dead standing **tree**.

Ranking Scale

1. >50 percent of individual **trees** exhibit **stress**
2. 25-50 percent of individual **trees** exhibit **stress**
3. 10-25 percent of individual **trees** exhibit **stress**
4. 5-10 percent of individual **trees** exhibit **stress**
5. <5 percent of individual **trees** exhibit **stress**

N/A Not enough **cover** to make evaluation

Add any comments necessary to explain the results of the Canopy Stress of Appropriate Species evaluation.

Canopy Stress of Inappropriate Tree Species

Indicate the category that best describes the presence of **tree canopy stress**. Restrict analysis to species inappropriate for the wetland type. Include any standing **trees** that are dead**.** If most of **tree** trunk is still standing consider this a dead standing **tree**.

Ranking Scale

1. <5 percent of individual **trees** exhibit **stress**
2. 5-10 percent of individual **trees** exhibit **stress**
3. 10-25 percent of individual **trees** exhibit **stress**
4. 25-50 percent of individual **trees** exhibit **stress**
5. >50 percent of individual **trees** exhibit **stress**

N/A Not enough **cover** to make evaluation

Add any comments necessary to explain the results of the Canopy Stress of Inappropriate Species evaluation.

ADDITIONAL INFORMATION

This section seeks additional information concerning the state and conditions of the wetland. Some of this information may directly relate to the hydrologic condition of the wetland, while the relationship of some information to the hydrologic condition of the wetland may be unclear. Some of the information requested may assist in the eventual interpretation of wetland health. Please answer all questions to the best of your ability based on your observations – no in-depth analysis or expertise in each issue is expected. Update the wetland history with any pertinent information, especially if the new condition appears to be permanent.

Disturbance

Check the following only if it is your considered opinion that such an **extensive** amount of physical alteration of the wetland (clearly not related to ground-water withdrawals) has occurred that you do not believe it makes sense to use the wetland data for purposes such as MFL development, recovery assessment, etc. Such impacts could include **extensive** fill, **extensive** clearing, severe fire damage, significant fragmentation by roads or other construction, etc. If this comment is checked, please fully explain, and include the explanation in the wetland history.

____ May not want to analyze/compare with other wetlands due to the **extensive** level of non-ground-water withdrawal related disturbance.

Explain in detail (include in wetland history)_____

Check the following only if it is your considered opinion that such an **extensive** amount of **subsidence** of the wetland has occurred that you do not believe it makes sense to use the wetland data for purposes such as MFL development, recovery assessment, etc. Such impacts could include severe soil loss, karstic activity that has substantially lowered the wetland bottom, etc. If this comment is checked, please fully explain, and include the explanation in the wetland history.

____ May not want to analyze/compare with other wetlands due to the **extensive** level of **subsidence**.

Explain in detail (include in wetland history)_____

Are any of the following conditions apparent and obvious?

Wetland edges have been filled or disturbed	Yes ____ No____ Not Sure _____
Excessive dumping or trash in wetland	Yes ____ No____ Not Sure _____
Hog disturbance	Yes ____ No____ Not Sure _____
Significant impact from cattle (trampling, etc.	Yes ____ No____ Not Sure _____
Vehicles driving though wetland (including bicycles)	Yes ____ No____ Not Sure _____
Insect damage	Yes ____ No____ Not Sure _____
Disease	Yes ____ No____ Not Sure _____

Comments_____

Are there signs of fire?	Yes ____ No____ Not Sure _____
Approximate year of fire?	_____Not Sure_____
Expanse of fire?	Extensive_____ Localized _____
Intensity of fire?	High _____ Low _____

Fire Comments_____

<u>Hydrology</u>

Does the wetland have **augmentation** equipment in place? Yes ___ No ___ Not Sure ___
If yes, was **augmentation** taking place at the time of your visit? Yes ___ No ___ Not Sure ___

Augmentation comments_____

Is there clear evidence of direct stormwater inflow via a ditch or other manmade conveyance?
Yes ____ No ____ Not Sure _____

Is there clear evidence of direct drainage from the wetland via ditch or other manmade conveyance?
Yes ____ No ____ Not Sure _____

Are there any other drainage activities in the area of note? Yes ____ No ____ Not Sure _____

Is there a borrow pit or retention pond in the vicinity of the wetland?
Yes ____ No ____ Not Sure _____

Drainage comments_____

Soils

Are there any new signs of soils oxidation or subsidence (since last 5-year review)?
Yes ____ No ____ Not Sure _____

Comments_____

For lakes only

Indicate the category that best describes the docks for the entire lake.

Ranking Scale

1. Docks completely out of the water.
2. Docks touching the water or with <50% of the dock over water.
3. Docks >50% over water.

Is the littoral zone stranded? Yes _____ No _____

Protected Wildlife and Plants

Note any **protected species** of plants and animals that are observed directly or can be identified by call, tracks or scat during the wetland assessment. Also include the activity noted such as nesting, foraging, feeding, mating, resting, burrowing, etc. and any additional notes or observations.

Species _____ Activity _____ Notes: _____
Species _____ Activity _____ Notes: _____
Species _____ Activity _____ Notes: _____
Species _____ Activity _____ Notes: _____

Note any **wetland dependent species** of animals that are observed directly or can be identified by call, tracks, or scat during the wetland assessment. List birds, fishes, reptiles, mammals or amphibians.

Species _____ Activity _____ Notes: _____
Species _____ Activity _____ Notes: _____
Species _____ Activity _____ Notes: _____
Species _____ Activity _____ Notes: _____

Activity codes (M = mating, F = foraging, FT = flyover/traveling, N = nesting, OT = other)

Observation codes (O = observed, S = sign [scat, tracks, call or other signs of presence])

Protected and Wetland Dependent Species Comments_____
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Recovery and Stress

- Are young **trees** (appropriate to the wetland type) starting to grow in wetland locations in a way that would suggest recovery from groundwater withdrawal stress is taking place?
  Yes ____ No ____ Not Sure _____ Not applicable_____

  Comments (include species)_____

- Are **vines** (inappropriate to the wetland type and rooted in the wetland), dropping leaves or dying in a way that would suggest recovery from groundwater withdrawal stress is taking place?
  Yes ____ No ____ Not Sure ____ Not applicable ____

  Comments (include species) _____

APPENDIX A

The Vegetative Index

Botanical Name	Common Name	Wetland Status
Abildgaardia ovata	rush, flat-spike	FACW
Acacia auriculiformis	ear-leaved acacia	FAC
Acer negundo	box-elder	FACW
Acer rubrum	maple, red	FACW
Acer saccharinum	maple, silver	OBL
Acoelorraphe wrightii	Palm, paurotis	OBL
Acrostichum spp.	leather fern	OBL
Aeschynomene indica	Joint-vetch, India	FACW
Aeschynomene pratensis	Joint-vetch, meadow	OBL
Agalinis aphylla	False-foxglove, scale-leaf	FACW
Agalinis linifolia	False-foxglove, flax-leaf	OBL
Agalinis maritima	False-foxglove, saltmarsh	OBL
Agalinis pinetorum (A. pulchella)	False-foxglove	FACW
Agalinis purpurea	False-foxglove, large purple	FACW
Agarista populifolia	hobble-bush	FACW
Agrostis stolonifera	redtop	FACW
Aletris spp.	Colic-root	FAC
Alisma subcordatum	water-plantain, subcordate	OBL
Alnus serrulata	Alder, hazel	OBL
Alopecurus carolinianus	foxtail, tufted	FAC
Alternanthera maritima	beach alternanthera	FACW - Keys only
Alternanthera paronychioides	smooth chaff-flower	FAC - Keys only
Alternanthera philoxeroides	alligator-weed	OBL
Alternanthera sessilis	alligator-weed, sessile	OBL
Amaranthus australis	Amaranth, southern	OBL
Amaranthus cannabinus	Amaranth, tidemarsh	OBL
Amaranthus floridanus	Amaranth, Florida	OBL
Ammannia spp.	Toothcup	OBL
Amorpha fruticosa	indigo-bush	FACW
Amphicarpum muhlenbergianum	blue maidencane	FACW
Amsonia rigida	slimpod, stiff	FACW
Amsonia tabernaemontana	slimpod, eastern	FACW
Anagallis pumila	pimpernel, Florida	FAC
*Andropogon arctatus (*Campbell*)*	bluestem, savannah	FAC
*Andropogon brachystachys (*Campbell*)*	bluestem, short-spike	FAC
*Andropogon gerardii (*Campbell*)*	bluestem, big	FAC
*Andropogon glomeratus (*Campbell*)*	bluestem, bushy	FACW
Andropogon liebmanii var. *pungensis (*Campbell*) (A. mohrii)*	bluestem, Mohr's	FACW
*Andropogon perangustatus (*Campbell*)*	bluestem, slim	FAC
*Andropogon virginicus (*Campbell*)*	broom-sedge	FAC
Annona glabra	Pond apple	OBL
Anthaenantia rufa	silky-scale, purple	FACW
Apteria aphylla	nodding nixie	FACW
Ardisia spp.	Marlberry	FAC
Arenaria godfreyi	stitchwort, Godfrey's	FACW

Botanical Name	Common Name	Wetland Status
Arisaema spp.	jack-in-the-pulpit; green-dragon	FACW
Aristida affinis	three-awn grass, long-leaf	OBL
Aristida purpurascens (s.l.)	three-awn grass, wand-like	FAC
Aristida rhizomophora	three-awn grass, rhizomatous	FAC
Aristida spiciformis	bottlebrush, three-awn	FAC
Aristida stricta	three-awn grass, pineland	FAC
Armoracia aquatica	Lakecress	OBL
Arnoglossum diversifolium	indian-plantain, variable-leaf	FACW
Arnoglossum ovatum	indian-plantain, egg-leaf	FACW
Arnoglossum sulcatum	indian-plantain, Georgia	OBL
Aronia arbutifolia	red chokeberry	FACW
Arundinaria gigantea	Giant cane	FACW
Arundo donax	Reed, giant	FAC
Asclepias connivens	Milkweed, large-flower	FACW
Asclepias incarnata	Milkweed, swamp	OBL
Asclepias lanceolata	Milkweed, fen-flower	OBL
Asclepias longifolia	Milkweed, long-leaf	FACW
Asclepias pedicellata	Milkweed, savannah	FACW
Asclepias perennis	Milkweed, aquatic	OBL
Asclepias rubra	Milkweed, red	OBL
Asclepias viridula	Milkweed, southern	FACW
Aster carolinianus	Aster, climbing	OBL
Aster chapmanii	Aster, savannah	FACW
Aster dumosus	Aster, bushy	FAC
Aster elliottii	Aster, Elliott's	OBL
Aster eryngiifolius	Aster, coyote-thistle	FACW
Aster lateriflorus	Aster, calico	FACW
Aster spinulosus	Aster, bog	FACW
Aster subulatus	Aster, saltmarsh	OBL
Aster tenuifolius	Aster, saltmarsh	OBL
Aster umbellatus	Aster, flat-top white	FAC
Aster vimineus	Aster, small white	FACW
Athyrium filix-femina	fern, subarctic lady	FACW
Atriplex patula	saltbush, halberd-leaf	FACW
Avicennia germinans	Mangrove, black	OBL
Axonopus spp.	carpet grass	FAC
Baccharis angustifolia	False-willow	OBL
Baccharis dioica	False-willow, broom-bush	FAC
Baccharis glomeruliflora	Groundsel tree	FAC
Baccharis halimifolia	False-willow, eastern	FAC
Bacopa spp.	water-hyssop	OBL
Balduina atropurpurea	honeycomb-head, purple	FACW
Balduina uniflora	honeycomb-head, one-flower	FACW
Bartonia spp.	Screwstem	FACW
Batis maritima	saltwort	OBL
Betula nigra	Birch, river	OBL
Bidens bipinnata	Spanish needles	U
Bidens pilosa	beggar-ticks, white	FAC
Bidens spp.	beggar-ticks	OBL
Bigelowia nudata	golden-rod, rayless	FACW

Botanical Name	Common Name	Wetland Status
Blechnum serrulatum	swamp fern	FACW
Boehmeria cylindrica	False-nettle, small-spike	OBL
Boltonia spp.	boltonia	FACW
Borrichia spp.	sea oxeye	OBL
Brachiaria purpurascens	paragrass	FACW
Bucida buceras	gregory wood	FAC
Bumelia celastrina	bumelia, coastal	FAC
Bumelia lycioides	bumelia, buckthorn	FAC
Bumelia reclinata	Bumelia	FAC
Burmannia spp.	burmannia	OBL
Byrsonima lucida	locust-berry	FAC - Keys only
Cacalia suaveolens	indian-plantain, sweet-scent	FACW
Calamovilfa curtissii	Curtiss' reed grass	FACW
Callitriche spp.	water-starwort	OBL
Calopogon spp.	Grass-pinks	FACW
Calycocarpum lyonii	cupseed	FACW
Campanula americana	bellflower, American	FAC
Campanula floridana	bellflower	OBL
Canna spp.	canna	OBL
Canna x generalis	canna, common	FAC
Caperonia spp.	caperonia	FACW
Capparis flexuosa	caper-tree	FACW
Cardamine bulbosa	bitter-cress	OBL
Cardamine pensylvanica	spring-cress	OBL
Carex atlantica	sedge, prickly bog	OBL
Carex comosa	sedge, bearded	OBL
Carex crinita	sedge, fringed	OBL
Carex crus-corvi	sedge, raven-foot	OBL
Carex decomposita	sedge, cypress-knee	OBL
Carex elliottii	sedge, Elliott's	OBL
Carex folliculata	sedge, long	OBL
Carex gigantea	sedge, large	OBL
Carex howei	sedge, Howe's	OBL
Carex hyalinolepis	sedge, shoreline	OBL
Carex leptalea	sedge, bristly-stalk	OBL
Carex louisianica	sedge, Louisiana	OBL
Carex lupulina	sedge, hop	OBL
Carex lurida	sedge, shallow	OBL
Carex spp.	sedges	FACW
Carex stipata	sedge, stalk-grain	OBL
Carex walteriana	sedge, Walter's	OBL
Carphephorus carnosus	chaffhead, pineland	FACW
Carphephorus odoratissimus	vanilla plant	FAC
Carphephorus paniculatus	Deer-tongue	FAC
Carphephorus pseudoliatris	chaffhead, bristle-leaf	FACW
Carpinus caroliniana	hornbeam, American	FACW
Carya aquatica	hickory, water	OBL
Casuarina spp.	casuarina	FAC
Cayaponia quinqueloba	cayaponia, five-lobe	FAC
Celtis laevigata	sugar-berry; hackberry	FACW

Botanical Name	Common Name	Wetland Status
Centella asiatica	coinwort	FACW
Cephalanthus occidentalis	buttonbush	OBL
Cestrum diurnum	day jessamine	FAC
Chamaecyparis thyoides	cedar, Atlantic white	OBL
Chaptalia tomentosa	sunbonnet; pineland daisy	FACW
Chasmanthium latifolium	spanglegrass	FAC
Chasmanthium sessiliflorum	Long-leaf Chasmanthium	FAC
Chasmanthium spp.	spanglegrass	FACW
Chiococca spp.	snowberry	FAC
Chrysobalanus icaco	cocoplum	FACW
Cicuta spp.	water-hemlock	OBL
Cirsium lecontei	thistle, Leconte's	FACW
Cirsium muticum	thistle, swamp	OBL
Cirsium nuttallii	thistle, Nuttall's	FACW
Cladium spp.	sawgrass	OBL
Cleistes divaricata	rosebud	OBL
Clethra alnifolia	sweet pepper bush	FACW
Cliftonia monophylla	buckwheat-tree	FACW
Colocasia esculenta	elephant's ear	OBL
Colubrina asiatica	snakewood, Asian	FAC
Commelina erecta	dayflower, sandhill	U
Commelina spp.	dayflower	FACW
Conocarpus erectus	buttonwood	FACW
Conoclinium coelestinum	mistflower	FAC
Coreopsis falcata	tickseed, sickle	FACW
Coreopsis floridana	tickseed, Florida	FACW
Coreopsis gladiata	tickseed, southeastern	FACW
Coreopsis integrifolia	tickseed, ciliate-leaf	FACW
Coreopsis leavenworthii	tickseed, Leavenworth's	FACW
Coreopsis linifolia	tickseed, Texas	FACW
Coreopsis nudata	tickseed, Georgia	OBL
Coreopsis tripteris	tickseed, tall	FAC
Cornus amomum	dogwood, silky	OBL
Cornus foemina	dogwood, swamp	FACW
Crataegus aestivalis	mayhaw	OBL
Crataegus marshallii	Haw, parsley	FACW
Crataegus viridis	Haw, green	FACW
Crinum americanum	swamp-lily, southern	OBL
Croton elliottii	croton, Elliott's	FACW
Ctenitis submarginalis	Fern, brown-hair comb	FACW
Ctenium spp.	toothache grass	FACW
Cupaniopsis anacardioides	carrotwood	FAC
Cuphea aspera	common waxweed	FACW
Cuphea carthagenensis	waxweed, Columbia	FAC
Cyperus alternifolius	flatsedge, alternate-leaf	OBL
Cyperus articulatus	flatsedge, jointed	OBL
Cyperus cuspidatus	flatsedge, coastal-plain	FAC
Cyperus difformis	flatsedge, variable	OBL
Cyperus distinctus	flatsedge, marshland	OBL
Cyperus drummondii	flatsedge	OBL

Botanical Name	Common Name	Wetland Status
Cyperus entrerianus	flatsedge	OBL
Cyperus erythrorhizos	flatsedge, red-root	OBL
Cyperus esculentus	flatsedge	FAC
Cyperus filiculmis	flatsedge, sandhill	U
Cyperus giganteus	flatsedge	FAC
Cyperus globulosus	flatsedge, baldwin	FAC
Cyperus haspan	flatsedge, sheathed	OBL
Cyperus huarmensis	flatsedge, black knotty-root	FAC
Cyperus lanceolatus	flatsedge, epiphytic	OBL
Cyperus metzii	flatsedge	FAC
Cyperus ovularis	flatsedge	U
Cyperus papyrus	flatsedge, papyrus	OBL
Cyperus reflexus	flatsedge	U
Cyperus refractus	flatsedge	U
Cyperus retrofractus	flatsedge	U
Cyperus retrorsus	flatsedge	FAC
Cyperus rotundus	flatsedge, purple	FAC
Cyperus spp.	flatsedge	FACW
Cyperus tetragonus	flatsedge	U
Cypselea humifusa	panal	FAC
Cyrilla racemiflora	cyrilla, swamp	FAC
Decodon verticillatus	swamp-loosestrife	OBL
Dichondra caroliniensis	pony-foot	FAC
Dichromena colorata	white-top sedge, starbrush	FACW
Dichromena floridensis	white-top sedge, Everglades	FACW
Dichromena latifolia	white-top sedge, giant	OBL
Dicliptera brachiata	mudwort, wild	FACW
Digitaria pauciflora	everglades grass	FACW
Digitaria serotina	crabgrass, dwarf	FAC
Diodia virginiana	button-weed	FACW
Dionaea muscipula	Venus' flytrap	FACW
Diospyros virginiana	persimmon, common	FAC
Distichlis spicata	saltgrass, seashore	OBL
Drosera brevifolia	sundew, dwarf	FACW
Drosera capillaris	sundew, pink	FACW
Drosera filiformis	sundew, thread-leaf	OBL
Drosera intermedia	sundew, spoon-leaf	OBL
Drosera tracyi	sundew, Gulf coast	OBL
Drymaria cordata	West Indian chickweed	FAC
Dryopteris ludoviciana	shield-fern, southern	FACW
Dulichium arundinaceum	sedge, three-way	OBL
Dyschoriste humistrata	dyschoriste, swamp	FACW
Echinochloa spp.	jungle-rice; cockspur grass	FACW
Echinodorus spp.	burhead	OBL
Eclipta alba	yerba de Tajo	FACW
Eleocharis spp.	spikerush	OBL
Elyonurus tripsacoides	balsam-scale, Pan-American	FACW
Elytraria caroliniensis	scaly-stem, Carolina	FAC
Equisetum hyemale	horsetail	FACW
Eragrostis spp.	lovegrass	FAC

Botanical Name	Common Name	Wetland Status
Erechtites hieraciifolia	fireweed	FAC
Erianthus brevibarbis	plumegrass, short-beard	FACW
Erianthus giganteus	plumegrass, sugarcane	OBL
Erianthus strictus	plumegrass, narrow	OBL
Erigeron quercifolius	fleabane	FAC
Erigeron vernus	fleabane, early whitetop	FACW
Eriocaulon spp.	pipewort	OBL
Eriochloa spp.	cupgrass	FACW
Erithralis fruticosa	black torchwood	FAC
Ernodea littoralis	golden-creeper	FAC - Keys only
Eryngium aquaticum	Corn snakeroot	OBL
Eryngium baldwinii	coyote-thistle, Baldwin's	FAC
Eryngium integrifolium	coyote-thistle, blue-flower	FACW
Eryngium prostratum	coyote-thistle, creeping	FACW
Eryngium yuccifolium	rattlesnake master	FACW
Erythrodes querceticola	erythrodes, low	FACW
Eulophia alta	coco, wild	FACW
Eupatoriadelphus fistulosus	joe-pye-weed	FACW
Eupatorium leptophyllum	marsh thoroughwort	OBL
Eupatorium leucolepis	thoroughwort, white-bract	FACW
Eupatorium mikanioides	thoroughwort, semaphore	FACW
Eupatorium perfoliatum	boneset	FACW
Eupatorium spp.	thoroughworts	FAC
Euphorbia humistrata (Chamaesyce humistrata)	broomspurge, spreading	FACW
Euphorbia inundata	spurge, Florida	FACW
Euphorbia polyphylla	spurge, many-leaved	FACW
Eustachys glauca (Chloris glauca)	fingergrass, saltmarch	FACW
Eustachys petracea	fingergrass	FAC
Eustoma exaltatum	prairie-gentian	FACW
Euthamia spp.	bushy goldenrod	FAC
Evolvulus convolvuloides	evolvulus	FACW
Evolvulus sericeus	silky bindweed	FACW
Ficus aurea	fig, Florida strangler	FAC
Fimbristylis annua	fringe-rush, annual	FACW
Fimbristylis puberula	fringe-rush, Vahl's hairy	FACW
Fimbristylis spathacea	hurricane-grass	FAC
Fimbristylis spp.	fringe-rush	OBL
Flaveria bidentis	yellowtop	FAC
Flaveria floridana	yellowtop	FACW
Flaveria linearis	yellowtop	FACW
Flaveria trinervia	yellowtop	FAC
Forestiera acuminata	privet, swamp	FACW
Forestiera segregata	privet, Florida	FAC
Fothergilla gardenii	witch-alder, dwarf	FACW
Fraxinus americana	ash, white	U
Fraxinus spp.	ash	OBL
Fuirena spp.	umbrella-sedge	OBL
Galium tinctorium	bedstraw, stiff marsh	FACW
Gaylussacia dumosa	dwarf huckleberry	FAC
Gaylussacia frondosa	dangleberry	FAC

Botanical Name	Common Name	Wetland Status
Gaylussacia mosieri	woolly-berry	FACW
Gentiana spp.	gentian	FACW
Gleditsia aquatica	water-locust	OBL
Gleditsia triacanthos	honey-locust	FACW
Glyceria striata	fowl mannagrass	OBL
Gordonia lasianthus	Bay, loblolly	FACW
Gratiola hispida	hyssop, hispid	FAC
Gratiola spp.	hedgehyssop	FACW
Guapira discolor	blolly	FAC - Keys only
Habenaria spp.	Rein orchid	FACW
Halesia diptera	silver-bell	FACW
Harperocallis flava	Harper's beauty	FACW
Hartwrightia floridana	hartwrightia, Florida	FACW
Hedychium coronarium	ginger	FACW
Helenium amarum	sneezeweed, pasture	FAC
Helenium spp.	sneezeweed	FACW
Helianthus agrestis	sunflower, southeastern	FACW
Helianthus angustifolius	sunflower, swamp	FACW
Helianthus carnosus	sunflower, lakeside	FACW
Helianthus floridanus	sunflower, Florida	FAC
Helianthus heterophyllus	sunflower, wetland	FACW
Helianthus simulans	sunflower, muck	FACW
Heliotropium curassavicum	heliotrope, seaside	FAC
Heliotropium polyphyllum	heliotrope	FAC
Heliotropium procumbens	heliotrope, four-spike	FACW
Hemicarpha spp.	dwarf-bullrush	FACW
Heteranthera reniformis	mud-plantain, kidney-leaf	OBL
Hibiscus aculeatus	rosemallow	FACW
Hibiscus coccineus	rosemallow, scarlet	OBL
Hibiscus grandiflorus	rosemallow, swamp	OBL
Hibiscus laevis	rosemallow, halberd-leaf	OBL
Hibiscus moscheutos	rosemallow, swamp	OBL
Hibiscus tiliaceus	rosemallow, sea	FAC
Hydrochloa caroliniensis	watergrass	OBL
Hydrocleis nymphoides	water-poppy	OBL
Hydrocotyle ranunculoides	pennywort, floating	OBL
Hydrocotyle spp.	pennywort	FACW
Hydrolea spp.	false-fiddle-leaf	OBL
Hygrophila spp.	hygrophila	OBL
Hymenachne amplexicaulis	trompetilla	OBL
Hymenocallis spp.	spider-lily	OBL
Hypericum chapmanii	St. John's-wort, Chapman's	OBL
Hypericum cumulicola	St. John's-wort, scrub	U
Hypericum drummondii	St. John's-wort, Drummond's	U
Hypericum edisonianum	St. John's-wort, Edison's	OBL
Hypericum fasciculatum	St. John's-wort, marsh	OBL
Hypericum gentianoides	pineweed	U
Hypericum hypericoides	St. Andrew's cross	FAC
Hypericum lissophloeus	St. John's-wort, smooth-bark	OBL
Hypericum microsepalum	St. John's-wort, small-sepal	U

Botanical Name	Common Name	Wetland Status
Hypericum nitidum	St. John's-wort, Carolina	OBL
Hypericum prolificum	St. John's-wort, shrubby	U
Hypericum punctatum	St. John's-wort, dotted	U
Hypericum reductum	St. John's-wort, Atlantic	U
Hypericum spp.	St. John's-wort	FACW
Hypericum tetrapetalum	St. John's-wort, four-petal	FAC
Hypolepis repens	fern, bead	FACW
Hypoxis spp.	stargrasses, yellow	FACW
Hyptis alata	musky mint	FACW
Ilex amelanchier	holly, sarvis	OBL
Ilex cassine	holly, dahoon	OBL
Ilex coriacea	holly, bay-gall	FACW
Ilex decidua	holly, deciduous	FACW
Ilex myrtifolia	holly, myrtle	OBL
Ilex opaca var. *opaca*	American holly	FAC
Ilex verticillata	winterberry	OBL
Ilex vomitoria	yaupon holly	FAC
Illicium floridanum	anise, Florida	OBL
Illicium parviflorum	Star anise	FACW
Impatiens capensis	touch-me-not, spotted	OBL
Iris spp.	Iris	OBL
Iris verna	dwarf iris	U
Isoetes spp.	quillwort	OBL
Itea virginica	virginia willow	OBL
Iva frutescens	marsh elder	OBL
Iva microcephala	little marsh elder	FACW
Jacquinia keyensis	joewood	FAC
Juncus marginatus	rush	FAC
Juncus spp.	rush	OBL
Juncus tenuis	rush	FAC
Justicia brandegeana	shrimp plant	U
Justicia spp.	water-willow	OBL
Kalmia latifolia	laurel, mountain	FACW
Kosteletzkya pentasperma	mallow, coastal	FAC
Kosteletzkya virginica	mallow, seashore	OBL
Lachnanthes caroliniana	redroot	FAC
Lachnocaulon anceps	bogbutton, white-head	FACW
Lachnocaulon beyrichianum	bogbutton, southern	FACW
Lachnocaulon digynum	bogbutton, pineland	OBL
Lachnocaulon engleri	bogbutton, Engler's	OBL
Lachnocaulon minus	bogbutton, Small's	OBL
Laguncularia racemosa	mangrove, white	OBL
Laportea canadensis	wood-nettle, Canada	FACW
Leersia spp.	cutgrass	OBL
Leitneria floridana	corkwood	OBL
Leptochloa spp.	sprangle-top	FACW
Leptochloa virgata	sprangle-top, tropic	FAC
Leucothoe spp.	dog-hobble	FACW
Liatris garberi	gayfeather, garber's	FACW
Liatris gracilis	blazing star	FAC

Botanical Name	Common Name	Wetland Status
Liatris spicata	gayfeather, spiked	FAC
Lilaeopsis spp.	lilaeopsis	OBL
Lilium catesbaei	Lily, southern red	FAC
Lilium iridollae	Lily, panhandle	OBL
Limnobium spongia	frogbit	OBL
Limnophila spp.	marshweed	OBL
Limonium carolinianum	Sea-lavender	OBL
Lindera benzoin	spicebush, northern	FACW
Lindera melissaefolia	spicebush, southern	OBL
Lindernia crustacea	false-pimpernel, Malayan	FAC
Lindernia spp.	false-pimpernel	FACW
Linum carteri	flax, Carter's	FACW
Linum floridanum	flax, Florida yellow	FAC
Linum medium	flax, stiff yellow	FAC
Linum striatum	flax, ridged yellow	FACW
Linum westii	flax, West's	OBL
Liparis elata (L. nervosa)	liparis, tall	OBL
Lipocarpha spp.	lipocarpha	FACW
Liquidambar styraciflua	sweetgum	FACW
Liriodendron tulipifera	tulip tree	FACW
Listera spp.	twayblade	FACW
Litsea aestivalis	pondspice	OBL
Lobelia cardinalis	flower, cardinal	OBL
Lobelia floridana	lobelia, Florida	OBL
Lobelia spp.	lobelia	FACW
Lophiola americana	golden-crest	FACW
Ludwigia hirtella	seedbox, hairy	FACW
Ludwigia maritima	seedbox, seaside	FACW
Ludwigia spp.	ludwigia; water-primrose	OBL
Ludwigia suffruticosa	seedbox, headed	FACW
Ludwigia virgata	seedbox, savanna	FACW
Lycium carolinianum	Christmas berry	OBL
Lycopodium spp.	clubmoss	FACW
Lycopus spp.	bugleweed	OBL
Lyonia ligustrina	maleberry	FAC
Lyonia lucida	fetter-bush	FACW
Lyonia mariana	fetter-bush	FACW
Lysimachia spp.	loosestrife	OBL
Lythrum spp.	marsh loosestrife	OBL
Macbridea spp.	birds-in-a-nest	FACW
Macranthera flammea	flameflower	OBL
Magnolia virginiana var. *australis*	magnolia, sweetbay	OBL
Malaxis spicata	adder's-mouth, Florida	OBL
Manilkara bahamensis	wild dilly	FAC - Keys only
Manisuris cylindrica	jointgrass, pitted	FAC
Manisuris spp.	jointgrass	FACW
Marshallia graminifolia	barbara's-buttons, grass-leaf	FACW
Marshallia tenuifolia	barbara's-buttons, slim-leaf	FACW
Maxillaria crassifolia	orchid, hidden	OBL
Maytenus phyllanthoides	Florida mayten	FAC

Botanical Name	Common Name	Wetland Status
Mecardonia spp.	mecardonia	FACW
Melaleuca quinquenervia	punk tree	FAC
Melanthera nivea	squarestem	FACW
Melanthium virginicum	bunchflower, Virginia	OBL
Melochia corchorifolia	chocolate-weed	FAC
Metopium toxiferum	poison wood	FAC
Micranthemum spp.	baby tears	OBL
Micromeria brownei (Satureja brownei)	savory, Brown's	OBL
Mimosa pigra	mimosa, black	FAC
Mimulus alatus	monkey-flower	OBL
Mitreola spp.	hornpod	FACW
Monanthochloe littoralis	keygrass	OBL
Morinda royoc	Keys rhubarb	FACW - Keys only
Morus rubra	mulberry, red	FAC
Muhlenbergia capillaris	muhly grass	OBL
Muhlenbergia expansa	cutover muhly	FAC
Muhlenbergia schreberi	nimblewill	FACW
Murdannia spp.	dewflower	FAC
Myosurus minimus	mouse-tail, tiny	FAC
Myrica cerifera	bayberry, southern	FAC
Myrica heterophylla	bayberry, evergreen	FACW
Myrica inodora	bayberry, odorless	FACW
Myrsine guianensis	myrsine, guiana	FAC
Nasturtium spp.	water-cress	OBL
Nelumbo spp.	water-lotus	OBL
Nemastylis floridana	pleatleaf, fall-flowering	FACW
Nemophila aphylla	baby-blue-eyes, small-flower	FACW
Nephrolepis spp.	sword ferns	FAC
Neyraudia reynaudiana	reed, silk	FAC
Nuphar luteum	cow-lily, yellow	OBL
Nymphaea spp.	water-lily	OBL
Nymphoides spp.	floating-hearts	OBL
Nyssa aquatica	tupelo, water	OBL
Nyssa ogeche	tupelo, ogeechee	OBL
Nyssa sylvatica var. *biflora*	tupelo, swamp	OBL
Oldenlandia spp.	bluets, water	FACW
Onoclea sensibilis	fern, sensitive	FACW
Oplismenus setarius	grass, woods	FAC
Orontium aquaticum	golden club	OBL
Oryza sativa	rice, cultivated	FAC
Osmunda cinnamomea	fern, cinnamon	FACW
Osmunda regalis	fern, royal	OBL
Oxypolis spp.	water drop-wort	OBL
Panicum abscissum (Hall)	cut-throat grass	FACW
Panicum anceps	panicum, beaked	FAC
Panicum commutatum	panicum	FAC
Panicum dichotomiflorum	panicum, fall	FACW
Panicum dichotomum	panicum	FACW
Panicum ensifolium	panic grass	OBL
Panicum erectifolium	witchgrass, erect-leaf	OBL

Botanical Name	Common Name	Wetland Status
Panicum gymnocarpon	panicum, savannah	OBL
Panicum hemitomon	maiden-cane	OBL
Panicum hians	panicum, gaping	FAC
Panicum longifolium	panicum, tall thin	OBL
Panicum pinetorum	panicum	FACW
Panicum repens	grass, torpedo	FACW
Panicum rigidulum	panicum, red-top	FACW
Panicum scabriusculum	panicum, woolly	OBL
Panicum scoparium	panicum	FACW
Panicum spretum	panicum	FACW
Panicum strigosum	panicum	FAC
Panicum tenerum	panicum, bluejoint	OBL
Panicum tenue	panicum	FAC
Panicum verrucosum	panicum, warty	FACW
Panicum virgatum	switchgrass	FACW
Parietaria spp.	pellitory	FAC
Parnassia spp.	grass-of-parnassus	OBL
Paspalidium geminatum	water panicum	OBL
Paspalum acuminatum	paspalum, brook	FACW
Paspalum boscianum	paspalum, bull	FACW
Paspalum conjugatum	paspalum, sour	FAC
Paspalum dilatatum	dallisgrass	FAC
Paspalum dissectum	paspalum, mudbank	OBL
Paspalum distichum	paspalum, joint	OBL
Paspalum fimbriatum	paspalum, Panama	FAC
Paspalum floridanum	paspalum, Florida	FACW
Paspalum laeve	paspalum, field	FACW
Paspalum monostachyum	paspalum, gulf	OBL
Paspalum plicatulum	paspalum, brown-seed	FAC
Paspalum praecox	paspalum, early	OBL
Paspalum pubiflorum	paspalum, hairy-seed	FACW
Paspalum repens	paspalum, water	OBL
Paspalum setaceum	paspalum, thin	FAC
Paspalum urvillei	grass, vasey	FAC
Pavonia spicata	mangrove mallow	FACW
Peltandra spp.	arum; spoon flower	OBL
Pennisetum purpureum	elephant ear grass	FAC
Penthorum sedoides	ditch stonecrop	OBL
Pentodon pentandrus	pentodon, Hall's	OBL
Persea palustris	bay, swamp	OBL
Phalaris spp.	grass, canary	FAC
Philoxerus vermicularis	silverhead	FACW
Phragmites australis	reed, common	OBL
Phyla spp.	frog-fruit	FAC
Phyllanthus caroliniensis	leaf-flower, Carolina	FACW
Phyllanthus liebmannianus	leaf-flower, Florida	FACW
Phyllanthus urinaria	leaf-flower, water	FAC
Physostegia godfreyi	dragon-head, Godfrey's	OBL
Physostegia leptophylla	dragon-head, slender-leaf	OBL
Physostegia purpurea	dragon-head, purple	FACW

Botanical Name	Common Name	Wetland Status
Physostegia virginiana	dragon-head, false	FACW
Pieris phillyreifolia	fetter-bush, climbing	FACW
Pilea spp.	clearweed	FACW
Pinckneya bracteata (P. pubens)	fever-tree	OBL
Pinguicula spp.	butterwort	OBL
Pinus glabra	pine, spruce	FACW
Pinus serotina	pine, pond	FACW
Piriqueta caroliniana	piriqueta	FAC
Pisonia rotundata	pisonia	FAC - Keys only
Pithecellobium keyense	blackbead	FAC - Keys only
Pithecellobium unguis-cati	catclaw	FAC - Keys only
Planera aquatica	planer tree	OBL
Platanthera spp.	orchid, fringed	OBL
Platanus occidentalis	sycamore	FACW
Pleea tenuifolia	rush-featherling	OBL
Pluchea spp.	camphor-weed	FACW
Pogonia ophioglossoides	pogonia, rose	OBL
Polygala cymosa	milkwort, tall	OBL
Polygala leptostachys	milkwort, sandhill	U
Polygala lewtonii	milkwort, scrub	U
Polygala polygama	milkwort, racemed	U
Polygala spp.	milkwort	FACW
Polygala verticillata	milkwort, whorled	U
Polygonum argyrocoleon	smartweed, silversheath	U
Polygonum spp.	smartweed	OBL
Polygonum virginianum	jumpseed	FACW
Polypogon spp.	grass, rabbit-foot	FAC
Polypremum procumbens	rustweed	FAC
Pontederia cordata	pickerelweed	OBL
Ponthieva racemosa	shadow-witch	FACW
Populus deltoides	cottonwood, eastern	FACW
Populus heterophylla	cottonwood, swamp	OBL
Proserpinaca spp.	mermaid-weed	OBL
Psidium cattleianun	guava, strawberry	FAC
Psilocarya spp.	baldrush	OBL
Psychotria spp.	wild coffee	FAC
Pteris tripartita	brake, giant	FACW
Ptilimnium capillaceum	mock bishop-weed	FACW
Pycnanthemum nudum	mountain-mint, coastal-plain	FACW
Quercus laurifolia	oak, laurel	FACW
Quercus lyrata	oak, overcup	OBL
Quercus michauxii	oak, swamp chestnut	FACW
Quercus nigra	oak, water	FACW
Quercus pagoda	oak, cherry-bark	FACW
Quercus phellos	oak, willow	FACW
Randia aculeata	box briar	FAC - Keys only
Ranunculus spp.	butter-cup	FACW
Reimarochloa oligostachya	grass, Florida reimar	FACW
Reynosia septentrionalis	darling plum	FAC - Keys only
Rhapidophyllum hystrix	palm, needle	FACW

Botanical Name	Common Name	Wetland Status
Rhexia parviflora	meadow-beauty, white	OBL
Rhexia salicifolia	meadow-beauty, panhandle	OBL
Rhexia spp.	meadow-beauty	FACW
Rhizophora	mangle mangrove, red	OBL
Rhododendron viscosum	azalea, swamp	FACW
Rhodomyrtus tomentosus	downy rose myrtle	FAC
Rhynchospora cephalantha	beakrush, clustered	OBL
Rhynchospora chapmanii	beakrush, Chapman's	OBL
Rhynchospora corniculata	beakrush, short-bristle	OBL
Rhynchospora decurrens	beakrush, swamp-forest	OBL
Rhynchospora divergens	beakrush, spreading	OBL
Rhynchospora grayi	beakrush, Gray's	U
Rhynchospora harperi	beakrush, Harper's	OBL
Rhynchospora intermedia	beakrush, pinebarren	U
Rhynchospora inundata	beakrush, horned	OBL
Rhynchospora macra	beakrush, large	OBL
Rhynchospora megalocarpa	beakrush, giant-fruited	U
Rhynchospora microcarpa	beakrush, southern	OBL
Rhynchospora miliacea	beakrush, millet	OBL
Rhynchospora mixta	beakrush, mingled	OBL
Rhynchospora oligantha	beakrush, few-flower	OBL
Rhynchospora spp.	beakrush	FACW
Rhynchospora stenophylla	beakrush, Chapman's	OBL
Rhynchospora tracyi	beakrush, Tracy's	OBL
Rorippa spp.	yellow-cress	OBL
Rosa palustris	rose, swamp	OBL
Rotala ramosior	toothcup	OBL
Roystonea spp.	palm, royal	FACW
Rubus spp.	blackberries	FAC
Rudbeckia fulgida	coneflower, orange	FACW
Rudbeckia graminifolia	coneflower, grass-leaf	FACW
Rudbeckia laciniata	coneflower, cut-leaf	FACW
Rudbeckia mohrii	coneflower, Mohr's	OBL
Rudbeckia nitida	coneflower, shiny	FACW
Ruellia brittoniana	wild-petunia, Britton's	FAC
Ruellia caroliniensis	wild-petunia	FAC
Ruellia noctiflora	wild-petunia, night-flowering	FACW
Rumex spp.	dock	FACW
Sabal minor	palmetto, dwarf	FACW
Sabal palmetto	palm, cabbage	FAC
Sabatia bartramii	rose-gentian, Bartram's	OBL
Sabatia calycina	rose-gentian, coast	OBL
Sabatia dodecandra	rose-gentian, large	OBL
Sabatia spp.	rose-gentian	FACW
Sacciolepis indica	grass, glenwood	FAC
Sacciolepis striata	cupscale, American	OBL
Sachsia polycephala	sachsia	FACW
Sagittaria spp.	arrowhead	OBL
Salicornia spp.	glasswort	OBL
Salix spp.	willow	OBL

Botanical Name	Common Name	Wetland Status
Sambucus canadensis	elderberry	FAC
Samolus spp.	pimpernel, water	OBL
Sapium sebiferum	tallow-tree, Chinese	FAC
Sarracenia minor	pitcher-plant, hooded	FACW
Sarracenia spp.	pitcher-plant	OBL
Saururus cernuus	lizard's tail	OBL
Schinus terebinthifolius	pepper-tree, Brazilian	FAC
Schizachyrium spp.	bluestem	FAC
Schoenolirion croceum	sunny bells	FACW
Schoenolirion elliottii	sunny bells	FACW
Schoenus nigricans	black-sedge	FACW
Scirpus spp.	bulrush	OBL
Scleria spp.	nutrush	FACW
Sclerolepis uniflora	hardscale, one-flower	FACW
Scoparia dulcis	sweet broom	FAC
Scutellaria floridana	skullcap	FAC
Scutellaria integrifolia	skullcap, rough	FAC
Scutellaria lateriflora	skullcap, blue	OBL
Scutellaria racemosa	skullcap	OBL
Sebastiana fruticosa	sebastian-bush, gulf	FAC
Selaginella apoda	spike-moss, meadow	FACW
Senecio aureus	ragwort, golden	OBL
Senecio glabellus	butterweed	OBL
Sesbania spp.	rattle-bush	FAC
Sesuvium spp.	sea-purslane	FACW
Setaria geniculata	grass, bristle	FAC
Setaria magna	foxtail	OBL
Seymeria cassioides	black senna	FAC
Sisyrinchium atlanticum	blue-eye-grass, eastern	FACW
Sisyrinchium capillare	blue-eye-grass	FACW
Sisyrinchium mucronatum	blue-eye-grass, Michaux's	FACW
Sium suave	water-parsnip	OBL
Solanum bahamense	canker-berry	FACW
Solanum erianthum	nightshade, shrub	FACW
Solidago elliottii	golden-rod, Elliott's	OBL
Solidago fistulosa	golden-rod, marsh	FACW
Solidago leavenworthii	golden-rod, leavenworth's	FACW
Solidago patula	golden-rod, rough-leaf	OBL
Solidago rugosa	golden-rod, wrinkled	FAC
Solidago sempervirens	golden-rod, seaside	FACW
Solidago stricta	golden-rod, willow-leaf	FACW
Sophora tomentosa	coast sophora	FACW
Sparganium americanum	burreed	OBL
Spartina alterniflora	cordgrass, saltmarsh	OBL
Spartina bakeri	cordgrass, sand	FACW
Spartina cynosuroides	cordgrass, big	OBL
Spartina patens	cordgrass, saltmeadow	FACW
Spartina spartinae	cordgrass, gulf	OBL
Spergularia marina	sandspurry, saltmarsh	OBL
Spermacoce glabra	button-plant, smooth	FACW

Botanical Name	Common Name	Wetland Status
Sphagnum spp.	sphagnum moss	OBL
Sphenoclea zeylandica	chicken-spike	FACW
Sphenopholis pennsylvanica	wedgescale, swamp	OBL
Sphenostigma coelestinum	ixia, Bartram's	FACW
Spigelia loganioides	pink-root	FACW
Spilanthes americana	spotflower, creeping	FACW
Spiranthes spp.	ladies'-tresses	FACW
Sporobolus floridanus	dropseed, Florida	FACW
Sporobolus virginicus	dropseed, seashore	OBL
Stachys lythroides	hedgenettle	OBL
Staphylea trifolia	bladdernut, American	FACW
Stenandrium floridanum	stenandrium	FACW
Stenanthium gramineum	feather-bells, eastern	FACW
Stillingia aquatica	corkwood	OBL
Stillingia sylvatica var. *tenuis*	queen's-delight, marsh	FAC
Stipa avenacioides	grass, Florida needle	FACW
Stokesia laevis	stokesia	FACW
Strumpfia maritima	strumpfia	FACW - Keys only
Styrax americana	snowbell; storax	OBL
Suaeda spp.	sea-blite	OBL
Suriana maritima	bay-cedar	FAC
Syngonanthus flavidulus	bantam-buttons	FACW
Syzygium spp.	Java plum	FAC
Taxodium ascendens	cypress, pond	OBL
Taxodium distichum	cypress, bald	OBL
Teucrium canadense	germander, American	FACW
Thalia geniculata	thalia; fire flag	OBL
Thalictrum spp.	meadow-rue	FACW
Thelypteris spp.	shield fern	FACW
Thespesia populnea	seaside mahoe	FAC
Thrinax radiata	Florida thatch palm	FAC - Keys only
Tilia americana	American basswood	FACW
Tofieldia racemosa	false-asphodel, coastal	OBL
Toxicodendron vernix	poison sumac	FACW
Trachelospermum difforme	climbing-dogbane	FACW
Tradescantia fluminensis	trailing spiderwort	FAC
Trema spp.	trema	FAC
Trepocarpus aethusae	trepocarpus, aethusa-like	FACW
Triadenum spp.	St. John's-wort, marsh	OBL
Trianthema portulacastrum	horse-purslane	FACW
Tridens ambiguus	tridens, savannah	FACW
Tridens strictus	tridens, long-spike	FACW
Triglochin striata	arrow-grass	OBL
Triphora spp.	pogonias, nodding	FACW
Tripsacum dactyloides	grass, eastern gama	FAC
Typha spp.	cattail	OBL
Ulmus rubra	elm, slippery	U
Ulmus spp.	elm	FACW
Urechites lutea	allamanda, wild	FACW
Utricularia spp.	bladderwort	OBL

Botanical Name	Common Name	Wetland Status
Uvularia floridana	bellwort, Florida	FACW
Vaccinium corymbosum	blueberry, highbush	FACW
Vaccinium elliottii	blueberry, Elliott	FAC
Verbena scabra	vervain, sandpaper	FACW
Verbesina chapmanii	crownbeard, Chapman's	FACW
Verbesina heterophylla	crownbeard, diverse-leaf	FACW
Verbesina virginica	crownbeard, white	FAC
Vernonia angustifolia	ironweed, narrow-leaf	U
Vernonia spp.	ironweed	FACW
Veronica anagallis-aquatica	speedwell, water	OBL
Veronicastrum virginicum	culver's-root	FACW
Viburnum dentatum	arrow-wood	FACW
Viburnum nudum	viburnum, possum-haw	FACW
Viburnum obovatum	viburnum, walter	FACW
Vicia acutifolia	vetch, four-leaf	FACW
Vicia floridana	vetch, Florida	FACW
Vicia ocalensis	vetch, Ocala	OBL
Viola affinis	violet, Leconte's	FACW
Viola esculenta	violet, edible	FACW
Viola lanceolata	violet, lance-leaf	OBL
Viola primulifolia	violet, primrose-leaf	FACW
Websteria confervoides	water-meal	OBL
Wedelia trilobata	creeping ox-eye	FAC
Woodwardia aereolata	chainfern	OBL
Woodwardia virginica	chainfern	FACW
Xanthorhiza simplicissima	yellow-root, shrubby	FACW
Xanthosoma sagittifolium	elephant ear	FACW
Xyris caroliniana	yellow-eyed grass, Carolina	FACW
Xyris jupicai	yellow-eyed grass, tropical	FACW
Xyris spp.	yellow-eyed grass	OBL
Yeatesia viridiflora	yeatesia, green-flower	FACW
Zephyranthes atamasco	lily, atamasco	FACW
Zigadenus densus	crow poison	FACW
Zigadenus glaberrimus	deathcamas, atlantic	FACW
Zizania aquatica	Wildrice	OBL
Zizaniopsis miliacea	Wildrice, southern	OBL

The Vegetative Index Extension

The following species are often found in wetlands in the Hillsborough, Pasco, and Pinellas County area, but are not included in the Vegetative Index of Chapter 62-340, F.A.C. The following table states the wetland status of each species as per the following reference:

National list of plant species that occur in wetlands: Southeast Region (Region 2). Reed, P.B., Jr. 1988. U.S. Fish and Wildlife Service Biological Rep. 88(26.3).
(http://wetlands.fws.gov/bha/download/1988/region2.txt)

Botanical Name	Common Name	Wetland Status	Notes
Ampelopsis arborea	Peppervine	FAC	
Berchemia scandens	Rattan vine	FACW	
Campsis radicans	Trumpet creeper	FAC	
Paederia foetida	Skunkvine	FACU	Exotic
Smilax bona-nox	Saw greenbrier	FAC	
Smilax glauca	Cat greenbrier	FAC	
Smilax laurifolia	Bamboo vine	FACW	
Smilax pumila	Sarsaparilla vine	----	No designation
Smilax rotundifolia	Roundleaf greenbrier	FAC	
Smilax walteri	Coral greenbrier	OBL	
Toxicodendron radicans	Eastern poison ivy	FAC	
Vitis aestivalis	Summer grape	FAC	
Vitis cinerea	Graybark grape	FAC	
Vitis rotundifolia	Muscadine	FAC	
Vitis shuttleworthii	Calloose grape	FAC	
Vitis vulpina	Frost grape	FAC	

APPENDIX B

Wetland Assessment Procedure (WAP) Field Form

(To be added)

APPENDIX C

Definition of Wetland Assessment Procedure (WAP) Terms

Appropriate Species
Used to describe **shrub, small tree** and **tree stress** of plant species that are characteristic of the wetland type being assessed or plant species that are located in a wetland **zone** where they would normally be expected. See the definition of **Inappropriate Species**. Whether a species is considered an Appropriate Species or an **Inappropriate Species** can depend in part on knowledge of what species have existed in an individual wetland historically.

Assemblage
Vegetative community composed of several to many different species of plants that assemble together in response to specific site conditions and the presence of seed.

Assessment Area
The area to be assessed from the **WAP Transect**. The width of the Assessment Area will be the visual range of the wetland from the **WAP Transect** centerline, or at least ten meters in width, which ever is greater. The Assessment Area also includes the visual range of the wetland, or at least ten meters, beyond the wetland interior. Where the visual range from the **WAP Transect** is greater than ten meters, however, the assessments should not exceed the distance in which species can accurately be identified.

Augmentation
The procedure or practice of artificially adding freshwater to a surface-water body. Augmentation can be done as part of a mitigation measure or can be part of an overall aesthetic or functional hydrologic plan to increase the amount of water that a wetland or water body receives. Augmentation can be derived from various water sources, including ground water, storm water, or water diverted from surface flows.

Canopy
The top layer of the forest. The definition further qualifies canopy species as woody plants or palms with a main trunk at least ten centimeters in diameter at a point 1.4 meters (4.5 feet) above the base of the tree (**Diameter at Breast Height** (**DBH**)). If the **tree** is on a slope, the **DBH** is measured from the mid-point of the base of the tree on the slope. Cabbage palms are considered canopy only when greater than six meters in height. **Vines** are not considered as canopy species (F.A.C. Section 62-340.200).

Composition
The **assemblage** of plant species that occur within a plant community or plant community **zone**. For the WAP, composition is defined as the species that make up the different **strata** in a wetland **zone**. The strata include **tree**, **shrub**, and **groundcover** species (if present).

Cover
The area of ground covered by the vertical projection of the aerial parts of plants of one or more species.

Deep Zone

The lower portion of the **WAP Transect** extending from the **NP-6** marker to the **wetland interior**. The deep zone has the longest hydroperiod and the greatest depth of either of the zones found in a wetland.

Diameter at Breast Height (DBH)
The diameter of a plant's trunk or main stem at a height of 1.4 meters (4.5 feet) above ground.

Exotic plant
A plant not indigenous to Florida.

Extensive
A description used to characterize the categories of Disturbance, Drainage or Fire that indicates that greater than 50% of the assessed portion of the wetland (as determined from the **WAP Transect**) has been influenced. (See definition of **localized**).

FAC plants (Facultative)
Species of plants that are so widespread in their distribution as to render them inappropriate for indicating inundation or soil saturation. Specifically included are **exotic plants** with a **weedy** distribution (F.A.C. Section 62-340.200).

FACW plants (Facultative Wet)
Species of plants that under natural conditions typically exhibit their maximum **cover** in areas subject to surface water inundation and/or soil saturation, but can also be found in uplands (F.A.C. Section 62-340.200).

Floating Plant
Any plant not rooted in the ground.

FLUCCS
The Florida Land Use Cover Classification System. A standardized numeric code developed by the Florida Department of Transportation for the classification of land use and plant communities. The code is used to identify natural and manmade land features using numbers codes (levels). Typically three or four digit numbers are used. A manual with descriptions of each code is available to assist with classifications.

For the WAP, Level III FLUCCS code is used to identify wetland types.

Groundcover
All woody species less than one meter in height, and all non-woody species (regardless of height), rooted in the ground. Groundcover is the lower most of the three strata of vegetation. For the WAP, *Eupatorium* spp., *Typha* spp., and *Rubus* spp., and certain other species generally thought of as herbaceous even though greater than one meter will only be assessed as groundcover.

Historic
Characteristics assumed to be indicators of non-impacted or pre-impacted conditions. Historical wetland characteristics occur because of decades of normal ecological conditions.

Historic Normal Pool
The **normal pool** elevation of a wetland that formed under non-impacted natural or unaltered conditions. Historic normal pool can be determined from those **normal pool**

indicators that change only extremely slowly with the absence of surface water. See Appendix D for details on establishing historic normal pool.

Historic Wetland Edge
The boundary between wetland and upland vegetation and soils formed under non-impacted natural or unaltered conditions. The historic wetland edge is the landward edge of the **WAP Transect** and the landward edge of the **transition zone**. The assessment of the transition zone begins at the wetland edge. See Appendix D for details on establishing historic wetland edge.

Hummock
A raised substrate (at or above the mean high water) in a wetland generally comprised of congregated root masses associated with **trees**, **shrubs** or some species of **groundcover** such as ferns. Hummocks can also include old tree bases and stumps that have been subsequently colonized by vegetation other than or including the species comprising the majority of plant matter that constitutes the hummock. Hummocks are associated with plant growth in frequently inundated wetlands, and are not part of the wetland floor.

Hydrology
The properties that deal with the distribution and circulation of water within a wetland or upland/wetland system.

Inappropriate Species
Used to describe **shrub, small tree** and **tree stress** of plant species that are not characteristic of the wetland type being assessed, or plant species that are located in a wetland **zone** where they would normally not be expected. See the definition of A**ppropriate Species**. Whether a species is considered an **Appropriate Species** or an Inappropriate Species can depend in part on knowledge of what species have existed in an individual wetland historically.

Localized
A description used to characterize the categories of Disturbance, Drainage and Fire where less than 50% of the assessed portion of the wetland (as determined from the **WAP Transect**) has been influenced. (See definition of **extensive**)

Leaning Trees
Trees that are generally at a 30-degree angle (or greater) from vertical due to uprooting or loss of support. The reasons for leaning trees are many and varied, and include soil **subsidence** where the soil support for trees roots has been impacted to the point that a tree cannot stand, or wind throw due to severe storm events.

Normal Pool
A water level elevation based on consideration of biological indicators of sustained inundation, utilizing reasonable scientific judgment. See Appendix D for a discussion of these biological indicators.

NP-6
The elevation six inches below **historic normal pool**. The NP-6 represents the boundary between the **transition zone** and the **deep zone** of the wetland.

OBL plants (Obligate)
Species of plants that under natural conditions are only found or achieve their greatest abundance in an area that is subject to frequent or continuous surface-water inundation and/or soil saturation. Included in this category are the littoral plants and emergent aquatics, such as *Nymphaea* spp. (water lilies), *Nelumbo* spp. (lotus), and *Nuphar luteum* (spatterdock). . Some OBL plant species can be observed in upland, especially under a controlled environment.

As defined by the USACE, OBL species are those plants that occur almost always (estimated probably > 99%) in wetlands under natural conditions (USACE 1987).

Oxidation
A condition in which organics in the soils react with free oxygen. The result of soil oxidation is loss of organic constituents and possible lowering of the soil surface. The lowering of the soil surface is also called **subsidence**.

Fire within a wetland causes rapid oxidation. Fire, under dry conditions, can burn organic soils causing soil oxidation and/or soil **subsidence**. When oxidation is recorded, special care to determine signs of fire and other environmental conditions should be noted.

Protected Species
Species that include both flora and fauna that have some degree of protection under the law by local, State, and Federal agencies. Official lists have been developed for these species.

> Federally Protected Flora and Fauna Species are listed by:
> U.S. Fish and Wildlife Service (Endangered or Threatened Species). 50 CFR 17 (animals) and 50 CFR 23 (plants)
> http://endangered.fws.gov/wildlife.htm#species
>
> State Protected Fauna Species are listed by:
> Florida Game and Freshwater Fish Commission (Endangered, Threatened Species and Species of Special Concern) Rules 3927.003-.005, Florida Administrative Code (F.A.C.)
> http://fac.dos.state.fl.us/faconline/chapter68.pdf
>
> Florida State Protected Flora Species are list by:
> The Florida Department of Agriculture & Consumer Services (Endangered, Threatened Species and Commercially Exploited). Chapter 5B-40 F.A.C.
> http://fac.dos.state.fl.us/faconline/chapter05.pdf

Saw Palmetto Fringe
The rooted base of saw palmetto (*Serenoa repens)* nearest the wetland edge.

Shrubs and Small Trees
Woody plants greater than one meter in height and less than four centimeters **DBH** are considered shrubs and small trees. Shrubs usually have multiple permanent stems. When greater than one meter in height, *Hypericum* spp. and *Ilex glabra* are considered shrubs. Wax myrtle, *Lyonia* spp. and other woody plants with multiple stems that are greater than one meter tall are assessed as shrub and small trees. Cabbage palms with trunks greater than one meter tall but less than six meters are considered shrubs.

Staff Gage

A water level measuring device used to measure above-ground surface water levels in a wetland. The staff gage is normally placed in a **deep zone** of the wetland, preferably in the **wetland interior**.

Strata
The defined layers of the vegetation community found within an ecosystem **zone**. Each wetland system can contain any and all of the three following strata: **Groundcover**, **Shrubs and Small Trees**, and **Trees**.

Stress
A physiological condition of a plant, as a result of external or internal conditions, which inhibits the normal growth and functions of the plant. Stressful conditions can include too much water, or too little water. Stress can occur over short or long periods of time. Severe stress to a plant can result in plant death (for the WAP, dead standing **shrubs and small trees** and **trees** should be considered stressed).

Indications of physiologic stress manifested during the growing season (generally during March - September) include: reduced numbers of leaves on stems/branches (a sparsely vegetated appearance), chlorosis of leaf tissue (a pale green, yellow or red/brown hue), leaf wilting (curling at edges, drooping of normally erect leaf tissue), or abscission (leaf drop). In addition, late leaf-out at the onset of the growing season (delayed onset of growth) or premature senescence of leaves prior to the fall may be indicators of stress.

As guidance for the WAP, stress can be caused by a variety of reasons aside from water stress. The assessor should look for other factors that may be contributing to the observed stress indicators (i.e., excessive flooding of less tolerant species, insect damage, disease, fire stress, frost damage, mechanical injury/damage to bark or root systems). Suspicion of non-water related stress should be discussed in comments.

Subsidence
The lowering of the soil levels caused by a variety of mechanisms, including **oxidation**, compaction, and karst activity (sinkholes). Subsidence is evident when the lowering of soil can be measured as a decrease in the soil volume and soil structure. Soil subsidence in wetlands can occur in highly organic soils that have experienced long periods of depressed water levels. In forested wetlands, subsidence often results in tree root exposure. In non-forested wetlands, subsidence is often evident by the appearance of soil fissures. In various types of wetlands, cattle trampling and karst activity can cause subsidence, which is apparent as soil slumping between **trees** or abnormal lowering of the wetland soil surface levels.

Transition Zone
The upper portion of the **WAP Transect** extending from the **historic wetland edge** to the **NP-6** marker. The transitional zone contains one vegetation community, or an arbitrary grouping of more than one vegetation community, with a shorter hydroperiod than the **deep zone**.

Trees
Woody plants that are greater than or equal to one meter in height and greater than or equal to four centimeters **DBH** are considered trees. Wax myrtle, *Lyonia* spp. and other woody plants with multiple stems that are greater than one meter tall are assessed as **shrub and small trees**. Cabbage palms with trunks greater than one meter tall but less than six meters are considered **shrubs**.

Note that trees that are greater than or equal to four centimeters **DBH** and less than ten centimeters **DBH** are considered the sub-canopy, and trees greater than or equal to ten centimeters **DBH** are considered the tree **canopy**

Trees, Small
Woody tree species greater than one meter and less than four centimeters **DBH**. The size class is the same as **shrubs** and is intended to specify tree species at the sapling stage. Wax myrtle, *Lyonia* spp. and other woody plants with multiple stems that are greater than one meter tall are assessed as **shrub and small trees**. Cabbage palms with trunks greater than one meter but less than six meters are considered **shrubs**.

U Plants (Upland)
Species that under natural conditions are only found or achieve their greatest abundance in an area that is considered upland. Note that all species not listed in the Vegetative Index or Vegetative Index Extension in Appendix A should be considered upland species.

Upland Well
A surficial aquifer monitor well installed outside of the **historic wetland edge**, as required by the EMP. Some monitored wetlands do not have upland wells due to practical considerations (such as land management conflicts, private land access problems, etc.), or have a surficial aquifer monitor well installed in the **transition zone**, which substitutes for the upland well. All monitor wells require a construction permit from the SWFWMD, must be drilled by a licensed well driller, and should be constructed using the standards set forth in Chapter 40D-2, FAC. All monitor wells should fully penetrate the surficial aquifer underlying and in connection with the monitored wetland (as per the judgment of a professional geologist or engineer).

Vines
Vines are linear woody or non-woody vegetation that utilizes the tree **canopy**, sub-canopy, or **shrub strata**, where they exist, for physical support. Where these **strata** are not present, vines will utilize **groundcover** vegetation and the forest floor as the physical substrate for support. All vines originating from the wetland floor should be assessed as groundcover, while all others should not be included in the wetland assessment.

WAP Transect
A straight line from the **historic wetland edge** to the **wetland interior**, from which vegetative assessments in the **transition zone** and **deep zone** sections are made.

Weedy
A description of indigenous and non-indigenous species that interfere with management goals and objectives and are therefore unwanted (Randall 1997). This definition is also known by the term "natural-area weed." More generically, weed is defined by the Weed Science Society of America as "a plant growing where it is not desired." Moreover, the presence of natural-area weeds infers that conditions within that ecosystem are such that the ecosystem's typical or characteristic species are replaced with species that are not typical of the ecosystem under natural hydrological or ecological conditions.

For the WAP, only weeds growing on the ground (and not on **hummocks)** will be considered.

Wetland Delineation Line
A boundary delineating the landward extent of wetlands under the current conditions using Chapter 62-340 FAC criteria. If a wetland has experienced hydrologic or other impacts, the wetland delineation line may not correspond with the **historic wetland edge**.

Wetland Dependent Species
Wildlife species that are closely associated with wetlands. The existence of individuals of wetland dependent species is threatened if wetland function is absent or there is a significant degradation of a wetland function. Wetland water levels, the duration of water levels, and the existence of aquatic plant and animal species may affect individuals of wetland dependent species.

Wetland Interior
The deepest part(s) of a wetland.

Wetland Plant Species
Plant species that have demonstrated ability (presumably because of morphological and/or physiological adaptations and/or reproductive strategies) to achieve maturity and reproduce in an environment where all or portions of the soil within the root zone become, periodically or continuously, saturated or inundated during the growing season (Reed 1988).

Wetland Well
A surficial aquifer monitor well installed within the **deep zone** of a wetland, preferably within the **wetland interior**, as required by the EMP. All monitor wells require a construction permit from the SWFWMD, must be drilled by a licensed well driller, and should be constructed using the standards set forth in Chapter 40D-2, FAC. All monitor wells should fully penetrate the surficial aquifer underlying and in connection with the monitored wetland (as per the judgment of a professional geologist or engineer).

Zonation
The distribution of plant species within a stratum. Three vegetation strata are designated in the WAP (**groundcover**, **shrubs and small trees**, and **trees**). Environmental conditions that may influence zonation include but are not limited to variations in **hydrology**, direct physical disturbance, and fire.

Zonation, Abnormal
The occurrence of plant species that typify the upland or the **transition zone** or **deep zone** of a wetland in an inappropriate **zone** of a wetland. Abnormal zonation is a potential indicator of change (natural or not) in hydrological or ecological (i.e., fire suppression) conditions. Zonation should be assessed where the plant is rooted on the ground (plants on **hummocks** are not considered).

Indications of zonation change include:
- the occurrence of species characteristic of shallower **zones**, i.e. **FAC** species on the ground in the **deep zone**.
- vigorous colonization of the ground in the **transition zone** by **FAC** species such as *Andropogon virginicus* and *Myrica cerifera*
- colonization of the ground in the **deep zone** by ferns
- ground surface colonization of the **deep zone** by **FACW** or **U** tree species such as slash pine (*Pinus elliottii*) or laurel oak (*Quercus laurifolia*)
- colonization of the **transition zone** by pasture grasses
- expansive growth of maidencane in the **deep zone**

- shifts in the vertical elevation of vegetation **zones** in marshes

For the WAP, cabbage palm (*Sabal palmetto)* although **FAC** is not considered an example of abnormal zonation in either the transitional or **deep zone** unless historic evidence indicates otherwise.

Zonation, Normal
The occurrence of plant species that typify the **transition zone** or **deep zone** of a wetland in an appropriate **zone** of a wetland. Normal zonation is a potential indicator of natural hydrological or ecological conditions. Zonation should be assessed where the plant is rooted on the ground (plants on **hummocks** are not considered).

Zone
The areal **cover** of a similar plant **assemblage** or **composition** that experiences similar environmental conditions within an ecosystem is considered a zone. For the WAP, monitored wetlands can been divided into a maximum of two zones: **transition** and **deep zones**.

APPENDIX D

Methodology for Establishing Historic Normal Pool and Historic Wetland Edge

The **normal pool** of a wetland is an elevation datum established to standardize measured water levels and facilitate comparison among wetlands. The **normal pool** elevation is commonly used in the design of wetland storm water treatment systems (SWFWMD, 1988). This level can be consistently identified in cypress swamps based on the similar vertical locations of several indicators of inundation (Hull et al, 1989; Biological Research Associates, 1996). In wetlands where declining water levels have caused the downward migration of certain **normal pool** indicators, or if significant **subsidence** has occurred as to physically lower all or parts of the wetland, more persistent indicators of the unaltered **normal pool** elevation or other considerations must be used to establish the datum. The datum determined by the persistent, unaltered indicators, is herein referred to as **historic normal pool**.

The **historic wetland edge** is a concept developed specifically for the WAP, and refers to the boundary between wetland and upland vegetation and soils prior to any hydrologic impacts. In a wetland that has not experienced any negative hydrologic impacts, this boundary would be the **wetland delineation line**. However, in wetlands that may have experienced hydrologic impacts, other biologic indicators must be used to identify the **historic wetland edge**.

Historic normal pool and **historic wetland edge** elevations will be established at environmental monitoring sites within one year of the initiation of the monitoring program. As described below, the elevations of at least five replicate **normal pool** indicators will be established in the field based on biological or physical indicators of sustained inundation. The final **historic normal pool** elevations will be based on the median of these elevations. The **historic normal pool** and supporting indicators used to develop the elevation, as well as all other **WAP Transect**-related elevations, will be surveyed to NGVD 29 by a professional land surveyor. Together with the other information included with the establishment of a monitored wetland (see WAP Instruction Manual), the **historic normal pool** and **historic wetland edge** elevations and the information used to determine them must be fully documented, and submitted to the SWFWMD (see Appendix G). If necessary, Tampa Bay Water and the SWFWMD will perform field evaluations to verify the various elevations and **WAP Transect** choice.

When present, the preferred indicator of **historic wetland edge** is the rooted base of saw palmetto (*Serenoa repens*) immediately surrounding the wetland (referred to as the **saw palmetto fringe**). Unless the **saw palmetto fringe** is used to determine historic normal pool, there is no need to survey its elevation, but the location should be marked or otherwise clearly recorded for use as the landward edge of the **WAP Transect** and the landward edge of the **transition zone**. This indicator may not be reliable for wetlands if there is clear evidence that the **saw palmetto fringe** has been significantly altered by land management practices. In cases where the **saw palmetto fringe** has been altered, or where no **saw palmetto fringe** exists, other indicators should be used for **historic wetland edge**. Alternatives include **historic normal pool** minus 0.2 feet (Carr and others, 2004), the elevation of the base of the outermost cypress plus 0.3 feet (Carr and others, 2004), or hydric soil indicators. In these cases, the final choice will be by consensus of Tampa Bay Water and

the SWFWMD. If the wetland edge has been partially filled, the edge of the fill within the wetland should be considered the **historic wetland edge**.

Historic normal pool will be set (with final approval by the SWFWMD) by one of the following methods (in order of priority, if present). Note that the value used as **historic normal pool** should be based on the median of at least five samples (although more samples are desirable).

a. The inflection point on the buttress of cypress trees.
b. The lower limit of epiphytic bryophytes (aka moss collars) growing on cypress trees (*Taxodium* spp.).
c. The elevation of the root crown of mature specimens of fetterbush (*Lyonia lucida*) on cypress trees or **hummocks**.
d. The elevation of the rooted base of saw palmetto (*Serenoa repens*) immediately surrounding the wetland (referred to as the **saw palmetto fringe**), plus 0.2 feet (Carr and others, 2004). This indicator may not be reliable for wetlands if there is clear evidence that the **saw palmetto fringe** has been significantly altered by land management practices.
e. The ground elevation of cypress trees growing at the outside edge of the dome, plus 0.5 feet (Carr and others, 2004).
f. Indicators of hydric soil surrounding the wetland, as determined by a qualified soils scientist. This indicator may not be reliable in wetlands with evidence of significant soil **oxidation**.
g. Evidence of historic escarpment. This method may not be reliable in wetlands with clear evidence of significant filling along the wetland edge.
h. If none of the above indicators exist, a **historic normal pool** elevation should be proposed based on any form of evidence thought to be reasonable, including other biologic indicators, aerial photographic interpretation, etc.

A combination of any of the first three indicators is acceptable, as long as a minimum of five surveyed samples are used. The remaining four indicators should not be used in combination with other indicators.

If there is evidence that declining water levels have caused the downward migration of certain **normal pool** indicators, or if significant **subsidence** has occurred as to physically lower all or parts of the wetland, only the saw palmetto fringe indicators may be reliable. Several sources of information and field observation should be used to make this determination, which may include investigations of **historical** aerial photography; identification of signs of severe soil **oxidation** or compaction; obvious indications of sinkhole activity; long-term declines in **hydrology** (as observed in collected data); and changes in surveyed elevations. If the **normal pool** elevation determined by the above methods is found to be significantly below the **historic wetland edge**, it may not be representative of **historic normal pool** (Carr and others, 2004).

APPENDIX E

Wetland Type Definition

All monitored wetlands should be classified as one of the following wetland types. It is recognized that some wetlands may be difficult to classify, so the evaluator will need to use scientific judgment based on field experience. However, the classification system is for convenience and data management purposes only. In the future, the classification of wetlands or the definition of wetland types may change.

For purposes of this classification system, the term "isolated" refers to a wetland system that has no significant and regular channelized inflow. For example, some cypress wetlands may have channelized outflows to riverine systems, but since significant and regular channelized inflow is absent, they are considered isolated cypress wetlands. Systems that are not isolated by this definition will be referred to as "flow" systems.

The wetland types are:

Cypress Isolated --- Commonly known as "cypress domes", although their shape and size vary. Pond cypress is usually the dominant tree species.

Hardwood Isolated --- Commonly known as "bay swamps" or "gum swamps". Bays and gums are usually the dominant tree species.

Marsh Isolated --- Isolated wetlands with very few or no **trees**. Marshes are typically vegetated with broad-leaved herbaceous species such as pickerelweed, duck potato, water lily, and spatterdock in deeper areas, and grasses and sedges in shallower areas. Marshes are typically 1 to 3 feet in depth.

Cypress Marsh Isolated --- Isolated wetlands with well-developed cypress and marsh areas. Typically, cypress surrounds, or nearly surrounds, the deep-water marsh area. Cypress marshes should be composed of at least 20 percent cypress trees or 20 percent marsh vegetation.

Wet Prairie Isolated --- Isolated wetlands with very few or no **trees**. Typically, grasses and sedges dominate both shallow and deep-water areas of wet prairies. Wet Prairies differ from marshes in being shallower (usually <1 foot deep at the deepest point).

Cypress Continuous --- Flow systems dominated by cypress (typically bald cypress).

Hardwood Continuous --- Flow systems dominated by hardwoods (typically pop ash, elm, gum, red maple, water oak, and laurel oak)

Mixed Hardwood/Cypress Continuous --- Flow systems where a mixture of hardwoods and cypress occur and neither appears dominant.

Marsh Continuous --- Flow systems with very few or no **trees**. Marshes are typically vegetated with sawgrass and broad-leaved herbaceous species such as pickerelweed, duck potato, water lily, and spatterdock.

Lake Wetlands --- Wetlands similar to those described above but occurring contiguous to lakes.

APPENDIX F

Worksheet for Wetland History

APPENDIX G

Worksheet for Supporting Transect Information

APPENDIX H

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