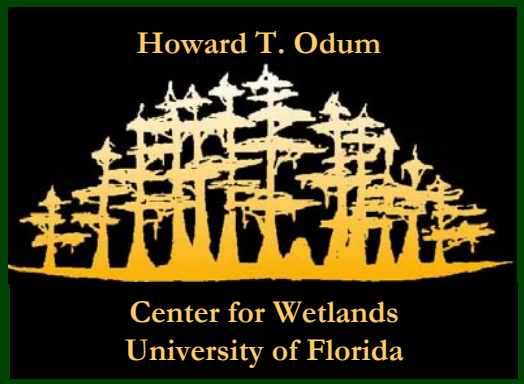
UMAM

Uniform Mitigation Assessment Method

TRAINING MANUAL

Web-based training manual for
Chapter 62-345, FAC for Wetlands Permitting



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Instructions

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Web-based Training Manual

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Forward

This manual was developed to assist in the implementation of Chapter 62-345, Florida Administrative Code, *Uniform Mitigation Assessment Method* (UMAM*).*

Since 1998, The University of Florida Howard T. Odum Center for Wetlands (UF-CFW), through funding from the Florida Department of Environmental Protection (FDEP) under contract #WM-683, has collected a variety of data, such as data on the community composition of the algal, macrophyte, macroinvertebrate assemblages, as well as water and soil parameters, from over 200 herbaceous and forested wetlands (n=75 and n=142, respectively) throughout Florida. The sample wetlands were exposed to a variety of impacts and embedded in an array of land uses, ranging from reference to silviculture, agriculture, and urban (the latter for forested wetlands only). Using data collected during the past six years, the UF-CFW has developed a number of tools that can assist permitting personnel and consultants in the implementation of the UMAM.

This manual is designed to be used as a guide in completing Parts I and II of the UMAM by providing step-by-step instructions for gathering and compiling the information for Parts I and II, and providing examples of attributes identified in the UMAM rule.

Acknowledgments

This manual is the result of much time, effort and cooperation among many individuals from several agencies. In addition to the principal authors of the manual, Russel Frydenborg, Connie Bersok, Erica Hernandez, and Richard Butgereit of the FDEP assisted in all aspects of manual creation, including coordinating and participating in site visits, tool development, and manual editing. Richard Butgereit was especially valuable in incorporating the manual's information into the Department's ERAtools and ERAonline applications.

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Acknowledgments (continued)

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Introduction

The intent of this manual is to aid in the assessment of wetlands and other surface waters, as well as upland mitigation areas, with regards to the use of Chapter 62-345, Florida Administrative Code, *Uniform Mitigation Assessment Method* (UMAM). This manual cannot address every question that may arise in the use of the rule, and thus it is not designed as a substitute.

This training manual provides examples and a standardized procedure for assessing the functions provided by wetlands and other surface waters, the amount that those functions are reduced by a proposed impact, and the amount of mitigation required to offset those losses. This manual does not address questions regarding the appropriateness of the type of mitigation proposed, nor whether the impact or mitigation activities meet other criteria for issuance of a permit. For those questions, please refer to the Environmental Resource Permit or Wetland Resource Permit guidelines.

This manual is to be used in conjunction with, and does not take place of, the rule. For a copy of the complete rule and to download the forms, please visit:
http://www.dep.state.fl.us/water/wetlands/erp/forms.htm

Background and Overview of UMAM

In response to a request by the Florida state legislature in 1999 to "study mitigation options…implemented from 1994 to the present and…consider the effectiveness and costs of the current mitigation options in offsetting adverse effects to wetlands and wetland functions" (Section 373.414(18)(b), F.S., 1999), the Office of Program Policy Analysis and Governmental Accountability (OPPAGA) submitted a report in 2000 (Report No. 99-40) highlighting some of the shortcomings of the current mitigation process. In particular, while the State could track the acreage of wetland loss and the acreage of mitigation, the report concluded that this information was not sufficient to ensure the replacement of wetland function resulting from wetland impacts. The recommendation of developing of a state wide wetland assessment method became law in 2000. In the past few years the Florida Department of Environmental Protection (FDEP) and the water management districts (WMDs) have worked closely to developed the Uniform Mitigation Assessment Method (UMAM) rule (Chapter 62-345, F.A.C.), which became effective in February 2004.

The UMAM is designed to assess any type of impact and mitigation, including the preservation, enhancement, restoration, and creation of wetlands, as well as the evaluation and use of mitigation banks, and it provides a framework for statewide standardized wetland assessment across community type and assessor. The assessment area is evaluated based on two main parts, a qualitative description and a quantification of the assessment area. For the latter section, sites are evaluated in three categories, scored numerically on a scale from 0 to 10 (where 10 indicates a minimally impaired system). The first category, Location and Landscape Support, examines the ecological context within which the system operates. The second examines the Water Environment, including rapid inference of hydrologic alteration and water quality impairment, while the third focuses on Community Structure and more specifically Vegetation and Structural Habitat, for areas with plant cover, and Benthic and Sessile Communities, for areas with a submerged benthic community.

Definitions

62-345.200 Definitions. (as of June, 2005 – please refer to the rule for updated versions)

(1) "Assessment area" means all or part of a wetland or surface water impact site, or a mitigation site, that is sufficiently homogeneous in character, impact, or mitigation benefits to be assessed as a single unit.
(2) "Reviewing agency" means the Florida Department of Environmental Protection, or any water management district, local government or other governmental agency required by subsection 373.414(18), F.S., to use this methodology.
(3) "Ecological value" means the value of functions performed by uplands, wetlands, and other surface waters to the abundance, diversity, and habitats of fish, wildlife, and listed species. Included are functions such as providing cover and refuge; breeding, nesting, denning, and nursery areas; corridors for wildlife movement; food chain support; natural water storage, natural flow attenuation, and water quality improvement which enhances fish, wildlife, and listed species utilization.
(4) "Impact site" means wetlands and other surface waters as delineated pursuant to Chapter 62-340, F.A.C., that would be impacted by the project. Uplands shall not be included as part of the impact site.
(5) "Indicators" means physical, chemical, or biological indications of wetland or other surface waters function.
(6) "Invasive Exotic" for purposes of this rule means animal species that are outside of their natural range or zone of dispersal and have or are able to form self-sustaining and expanding populations in communities in which they did not previously occur, and those plant species listed in the Florida Exotic Pest Plant Council's 2001 List of Invasive Species Category I and II, which is incorporated by reference herein, and may be found on the Internet at www.fleppc.org or by writing to the Bureau of Beaches and Wetland Resources, Department of Environmental Protection, 2600 Blair Stone Road, MS 2500, Tallahassee, FL 32399-2400.
(7) "Listed species" means those animal species that are endangered, threatened, or of special concern and are listed in Rules 68A-27.003, 68A-27.004, and 68A-27.005, F.A.C., and those plant species listed in 50 Code of Federal Regulations 17.12, when such plants are located in a wetland or other surface water.
(8) "Mitigation credit" or "credit" means a standard unit of measure which represents the increase in ecological value resulting from restoration, enhancement, preservation, or creation activities.
(9) "Mitigation site" means wetlands and other surface waters as delineated pursuant to Chapter 62-340, F.A.C., or uplands, that are proposed to be created, restored, enhanced, or preserved by the mitigation project.
(10) "With impact assessment" means the reasonably anticipated outcome at an assessment area assuming the proposed impact is conducted.
(11) "With mitigation assessment" means the outcome at an assessment area assuming the proposed mitigation is successfully conducted.
(12) "Without preservation assessment" means the reasonably anticipated outcome at an assessment area assuming the area is not preserved.
Specific Authority 373.026(7), 373.043, 373.414(9), (18) FS. Law Implemented 373.414(18) FS. History–New 2-2-04.

Definitions (continued)

Additional Definitions specific to the Training Manual

(1) Reference Standard Wetland: a wetland that is considered good quality and is surrounded by natural land uses, with no external anthropogenic influences.

(2) Frame of Reference: a frame of reference is used as a benchmark for comparing the historical or expected functions of an assessment area with the current functions

Methodology

The methodology section of this training manual is subdivided into two modules:

1. Office module

In the office module we provide sources and reference materials that may be used to compile information for Part I - Qualitative Characterization (62-345.400, FAC).

2. Field module

The field module provides a description of the site visit protocol and detailed step-by-step instructions and examples for compiling Part II – Assessment and Scoring (62-345.500, FAC) and evaluating each attribute identified in the rule for the three categories:

Location and Landscape Support,
Water Environment, and
Community Structure.

Office Module

The office module describes step by step procedures for completing

Part 1 - Qualitative Characterization

Office Module ~ Part 1: Qualitative Characterization

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):

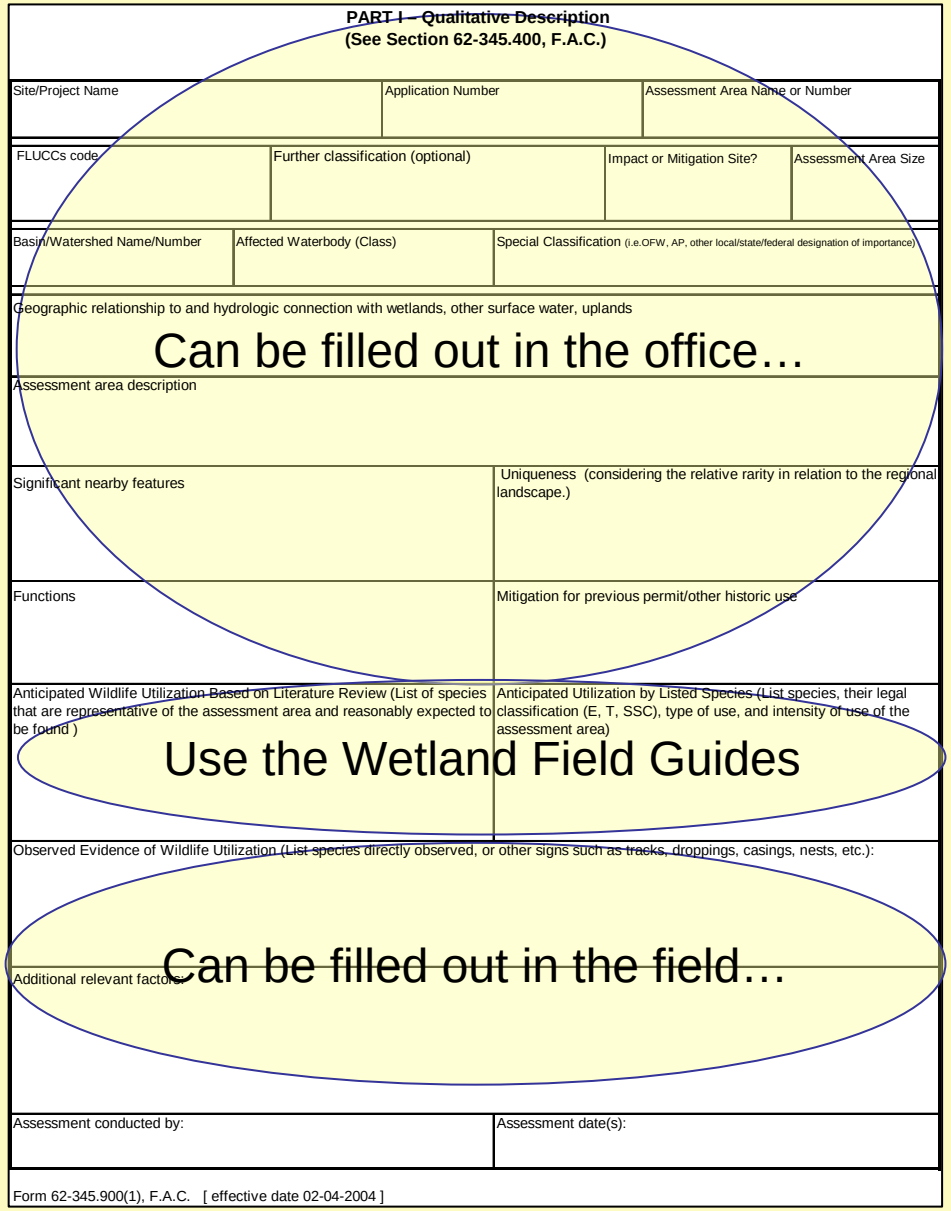
Form 62-345.900(1), F.A.C. [effective date 02-04-2004]

An impact or mitigation assessment area must be described with sufficient detail to provide a **frame of reference** for the type of community being evaluated and to identify the functions that will be evaluated. Part I must be completed before scoring the assessment area in Part II, since this frame of reference will be used to determine the degree to which the assessment area provides those functions and the amount of function lost or gained by the project.

Much of the information in Part I can be compiled in the office using ERAtools or ERAonline and aerial photographs, topographic and other maps, scientific literature, technical reports, and similar information. Other portions however, should be completed during the site visit, such as the "Assessment Area Description" and "Observed Evidence of Wildlife Utilization."

The wetland field guides contain detailed descriptions and reference information for wetlands classified by FLUCCS code.

Office Module ~ Part 1: Qualitative Characterization (continued)



PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Can be filled out in the office…

Assessment area description

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Use the Wetland Field Guides

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Can be filled out in the field…

Additional relevant factors:

Assessment conducted by:	Assessment date(s):

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Office work with the ERAtools or ERAonline will provide much of the information for the first part of the form. Using aerial photos, land use/land cover maps and other resources, become as familiar with the site as possible noting uniqueness of the site and significant surrounding features. Provide a brief overview description of the assessment area.

The wetland field guides will be helpful in filling out the anticipated wildlife utilization and utilization by listed species.

The last two sections of UMAM Part I are best filled out in the field during the field visit.

Office Module ~ Part 1: Qualitative Characterization (continued)

Steps for completing Part 1…

1. Review permit application and identify the assessment areas (proposed wetland/surface water impact area(s) and proposed mitigation area(s).

2. Compile information for Part I - Qualitative Characterization, as follows:

   - Use the ERAtools to obtain the following information for the assessment area and surrounding areas :
     - FLUCCS code (level 3) for ecological communities and land cover
     - Size of Assessment area
     - Basin/watershed name/number
     - Water bodies and their classification
     - Maps and aerial photos of the assessment area and surrounding area
     - Wetland field guides
   - Print aerial maps (100 meter and 1 mile buffer) of assessment area and locate possible sampling sites based on surrounding landscape and land uses, vegetation signature within sampling area, and size of assessment area.

3. Complete the office portions of Part 1 - Qualitative Characterization for each type of assessment area identified.

Prior to going to the field…

1. Obtain regionalized weather data

Office Module ~ Part 1: Qualitative Characterization (continued)

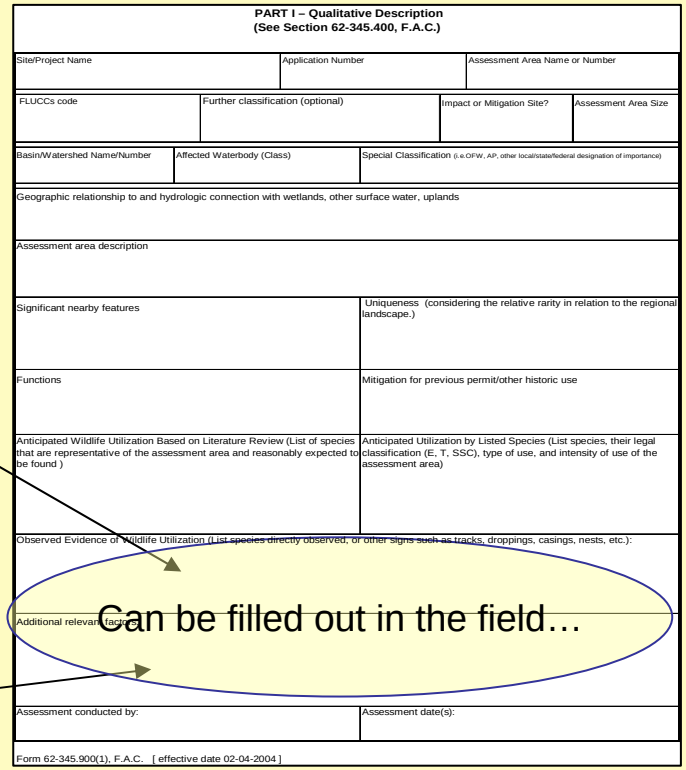
In the Field…

The last two sections of Part I, can be completed in the field:

Observed Evidence of Wildlife Utilization
Additional Relevant Factors

Observed Evidence of Wildlife Utilization ~ List species directly observed or other signs such as tracks, droppings, casings, nests, burrows, etc.

Additional Relevant Factors ~ Some additional factors may be identified in the office, for instance administrative actions by local governments that affect the site. Others may become evident upon a site visit, i.e., changes in surrounding land use since the most recent aerial photographs.



PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number	
FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands			
Assessment area description			
Significant nearby features		Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Functions		Mitigation for previous permit/other historic use	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):			
Additional relevant factors:			
Assessment conducted by:		Assessment date(s):	

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Can be filled out in the field…

Field Module

The field module describes step by step procedures for completing

Part II - Quantification of Assessment Area

Part II- Quantification of Assessment Area

Part II of the UMAM procedure must be conducted in the the field at the Assessment Area. In the following sections of this manual we describe a Standardized Field Protocol (SFP) and the scoring of the UMAM Part II functional assessment categories.

- **Description of a Standardized Field Protocol**
  - Direct and Secondary Impacts
- **Scoring the assessment area**
  - Part IIa. Location and Landscape Support
  - Part IIb. Water Environment
  - Part IIc. Community Structure

Part II- Quantification of Assessment Area

Steps for completing Part II…

Upon reaching the Assessment Area…

1. Review UMAM Part I - Qualitative Characterization, and make any necessary adjustments to Geographic Relationships/Hydrologic Connections, Description, and Significant Nearby Features.

2. Consult maps and aerial photographs obtained in Part I - Qualitative Characterization to verify the correct Assessment Area.

3. Consult other information obtained in Part I, such as weather data, Field Guides etc. to become familiar with conditions, species, etc. that are likely to be encountered.

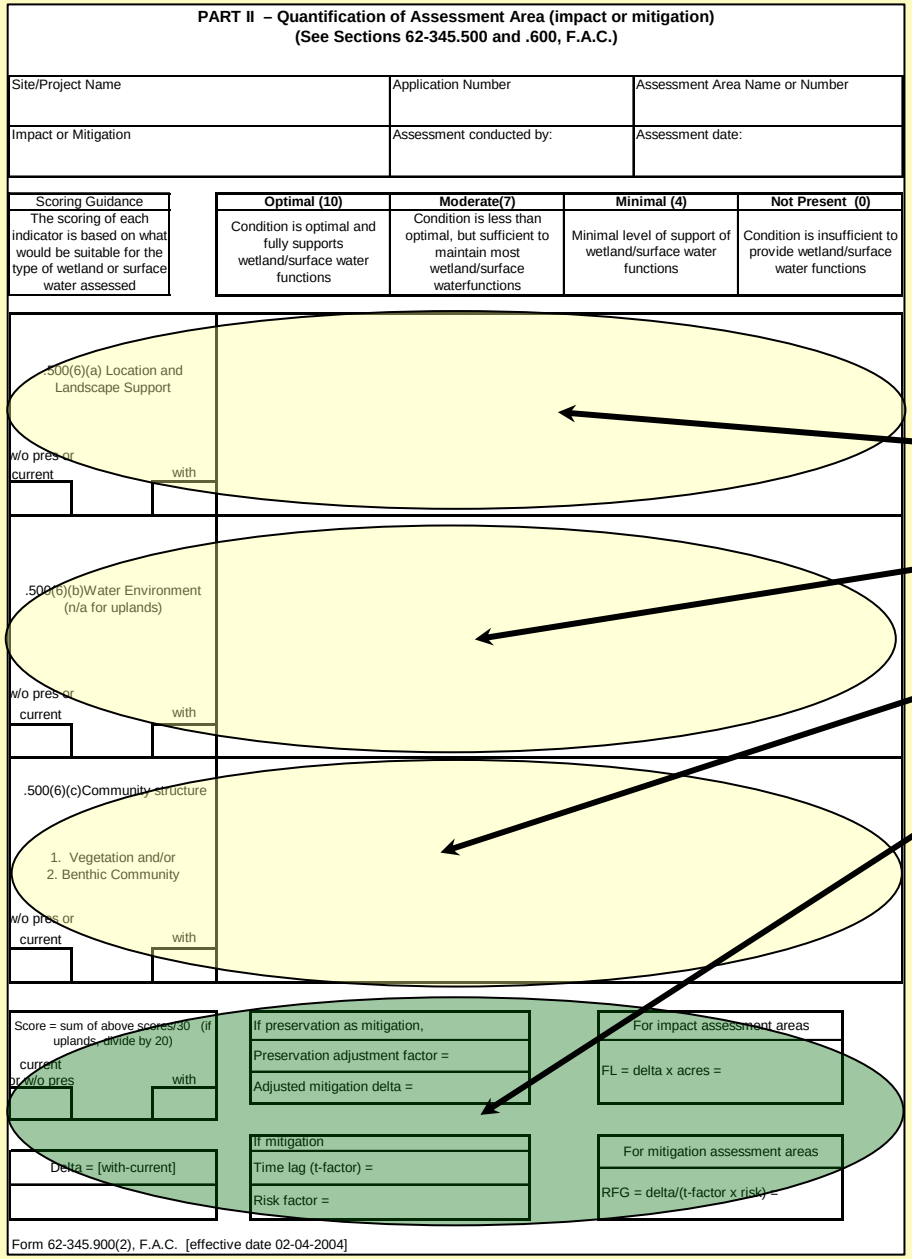
4. On aerial photographs, determine locations of wetland/water body edge and tentative locations of walking transects based on Standardized Field Protocol.

5. Conduct the Standardized Field Protocol

6. Score the three Functional Assessment Categories:
    - Location and Landscape Support
    - Water Environment
    - Community Structure

7. Calculate final overall score with adjustments.

Part II- Quantification of Assessment Area



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support

w/o pres or current | with

.500(6)(b)Water Environment (n/a for uplands)

w/o pres or current | with

.500(6)(c)Community structure

1. Vegetation and/or
2. Benthic Community

w/o pres or current | with

Score = sum of above scores/30 (if uplands, divide by 20)

current or w/o pres | with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

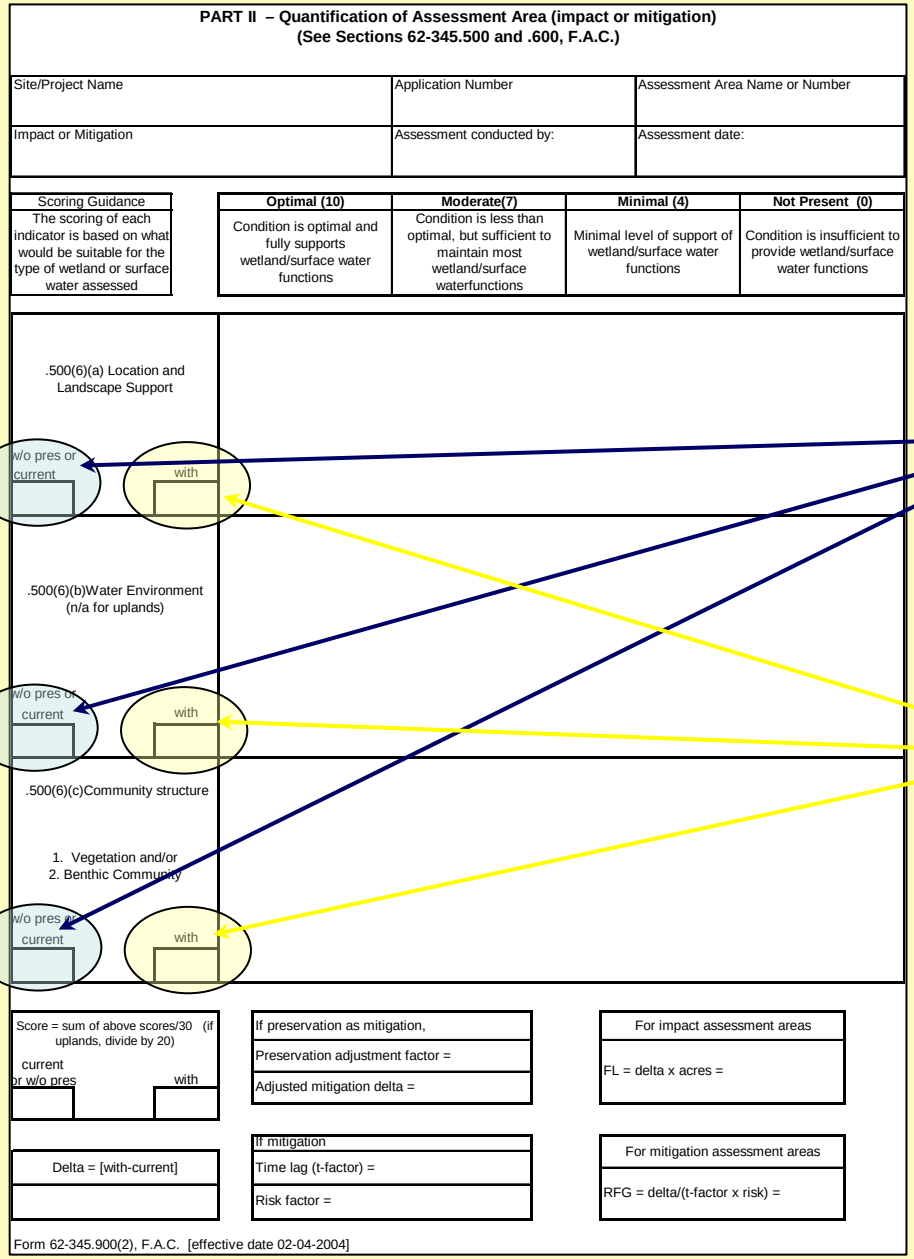
Scoring UMAM Part II…

There are three sections for scoring:

- Location and Landscape Support
- Water Environment
- Community Structure

…and a final section that is the overall score of the assessment area as well as adjustments to scoring based on preservation vs. mitigation, time lag, and risk factors.

Part II- Quantification of Assessment Area



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support

w/o pres or current | with

.500(6)(b)Water Environment (n/a for uplands)

w/o pres or current | with

.500(6)(c)Community structure

1. Vegetation and/or
2. Benthic Community

w/o pres or current | with

Score = sum of above scores/30 (if uplands, divide by 20)

current or w/o pres | with

Delta = [with-current]

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

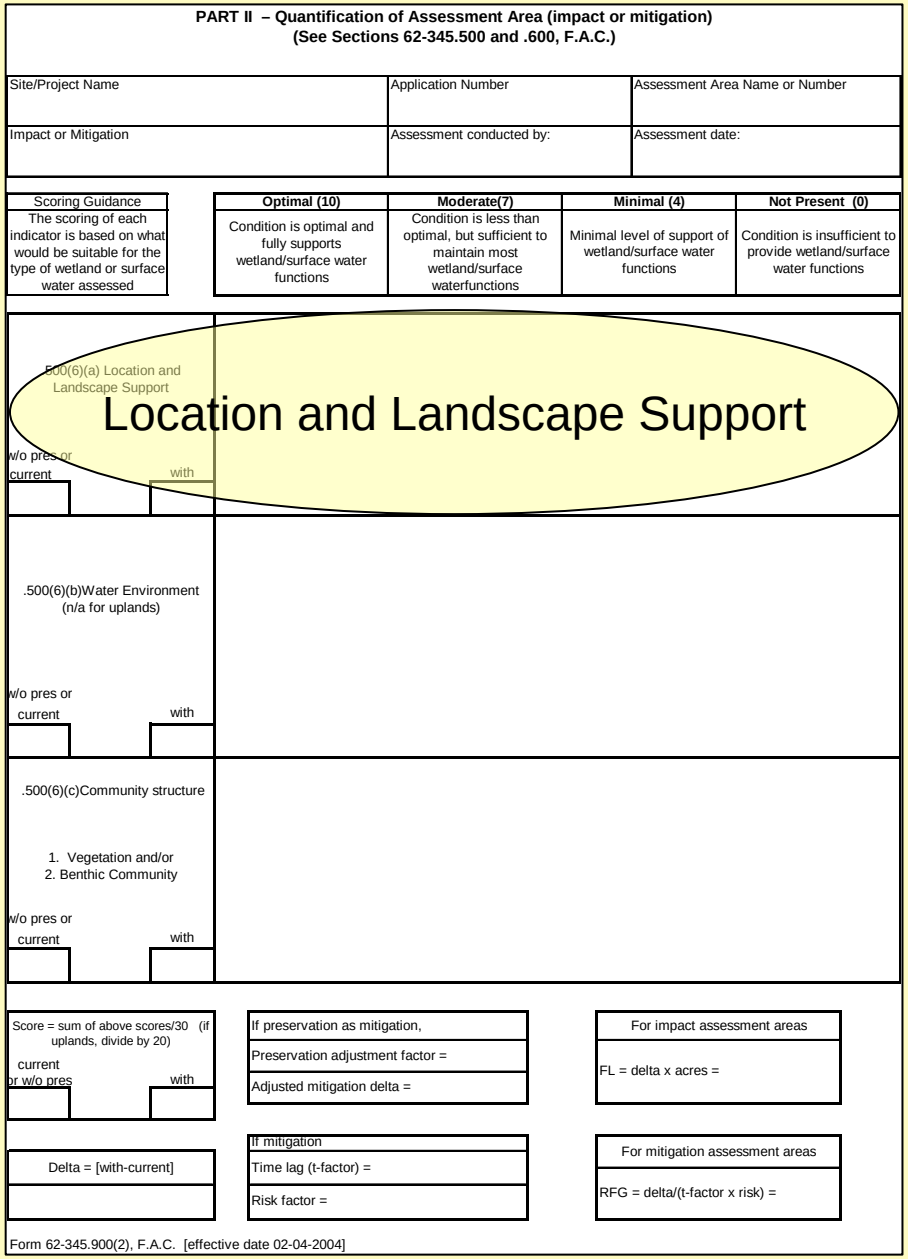
Each impact assessment and each mitigation assessment area must be evaluated under two conditions:

a) Current condition (or without preservation in the case of preservation mitigation)

and

b) "With impact" or "With mitigation" – These assessments are based on the reasonably expected outcome, which may represent an increase, decrease, or no change in value relative to the current condition.

Location and Landscape Support - 62-345.500(6)(a), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support

Location and Landscape Support

w/o pres or current | with

.500(6)(b)Water Environment (n/a for uplands)

w/o pres or current | with

.500(6)(c)Community structure

1. Vegetation and/or
2. Benthic Community

w/o pres or current | with

Score = sum of above scores/30 (if uplands, divide by 20)

current or w/o pres | with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

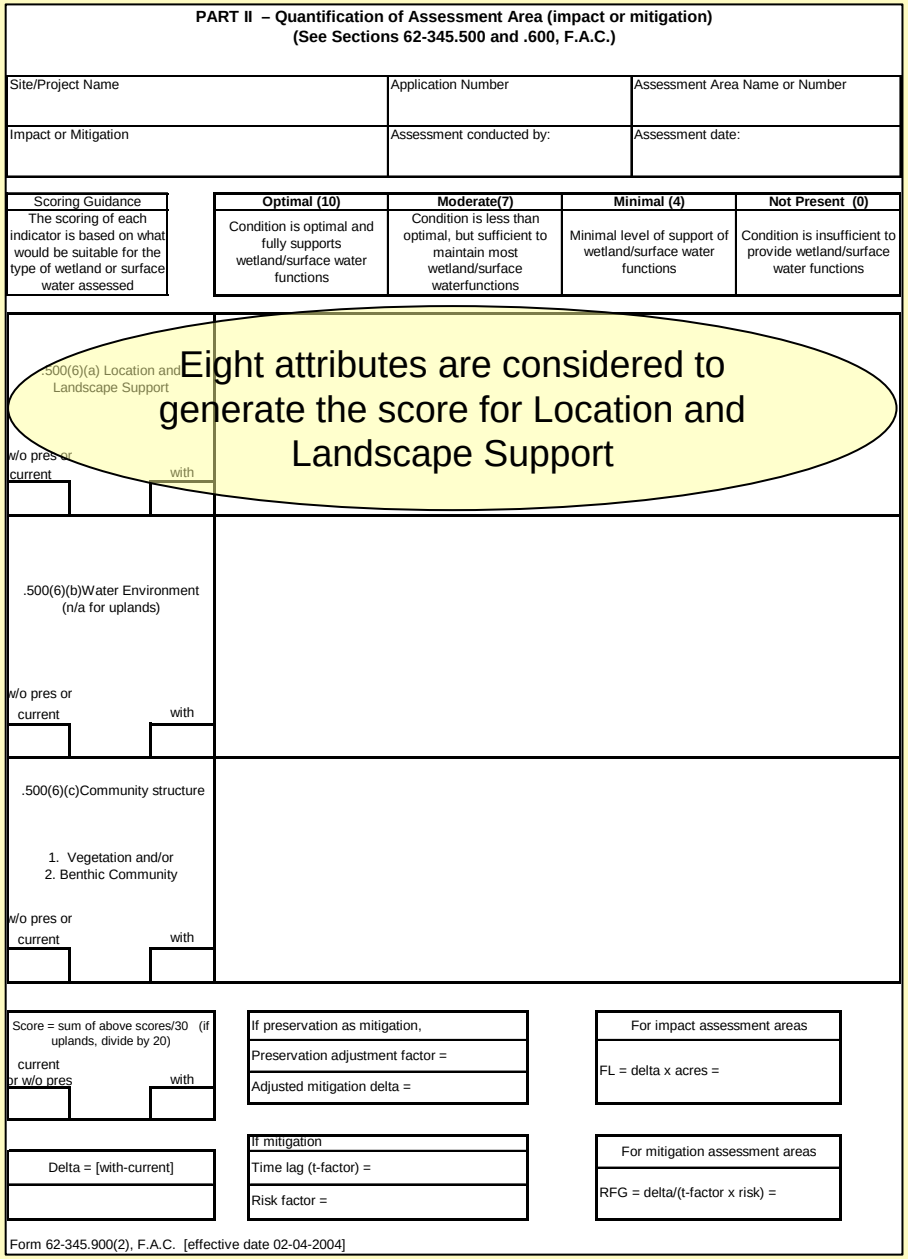
For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

The value of functions provided by an assessment area to fish and wildlife are influenced by the landscape position of the assessment area and its relationship with surrounding areas. If surrounding habitats are unavailable, poorly connected, or degraded, then the value of functions provided by the assessment area to the fish and wildlife identified in Part I is reduced. The availability, connectivity, and quality of offsite habitats, and offsite land uses which might adversely impact fish and wildlife utilizing these habitats, are factors to be considered in assessing the location of the assessment area.

Refer to section 62-345.500(6)(a), FAC of Chapter 62-345 Uniform Mitigation Assessment Method for a complete description of this indicator category.

Location and Landscape Support - 62-345.500(6)(a), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support

Eight attributes are considered to generate the score for Location and Landscape Support

w/o pres or current | with

.500(6)(b)Water Environment (n/a for uplands)

w/o pres or current | with

.500(6)(c)Community structure

1. Vegetation and/or
2. Benthic Community

w/o pres or current | with

Score = sum of above scores/30 (if uplands, divide by 20)

current or w/o pres | with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

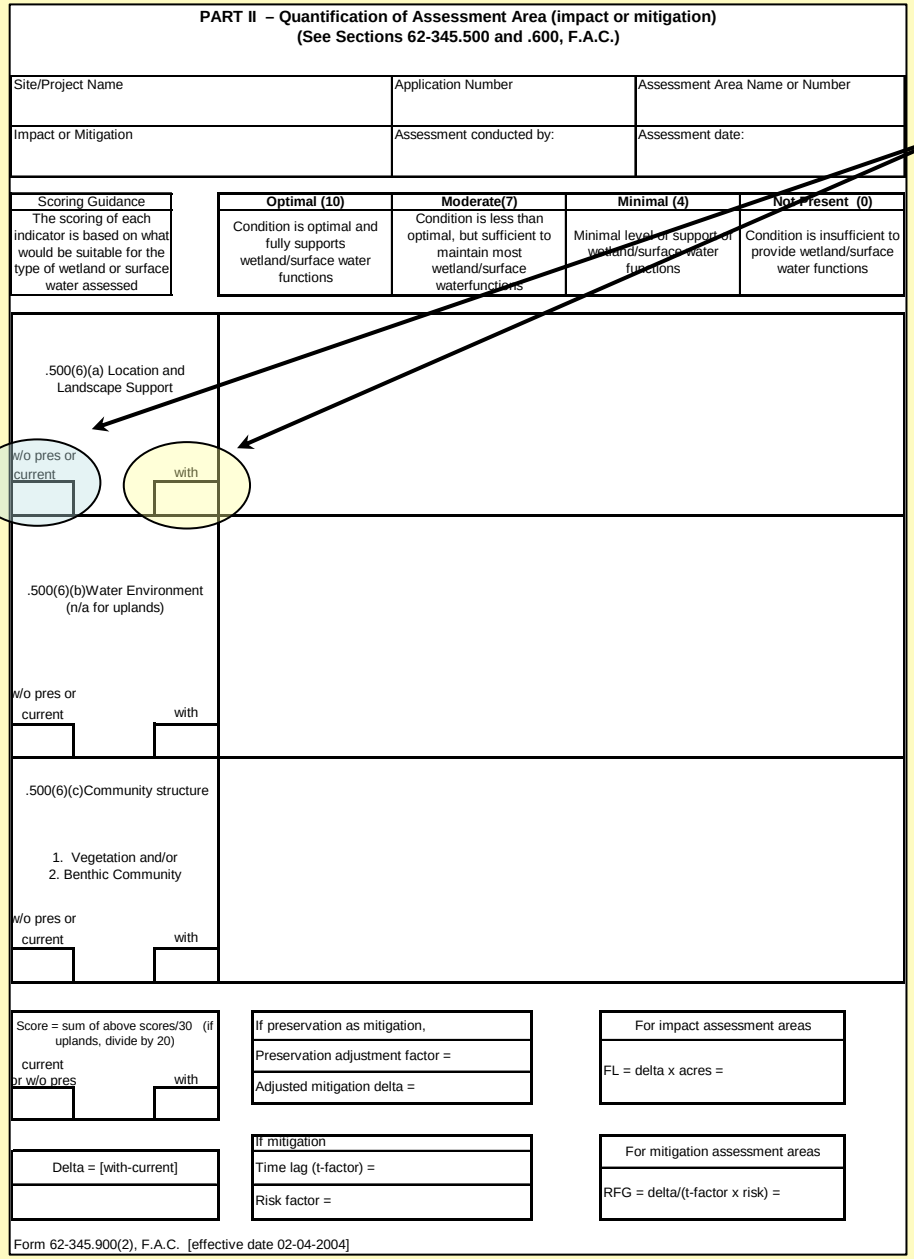
Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

Eight attributes are identified in the UMAM Rule to evaluate this category. To provide guidance, examples that depict variation in conditions for each of the attributes are included.

- Support to wildlife by outside habitats
- Invasive exotics or other invasive plant species in proximity of the assessment area
- Wildlife access to and from outside – distance and barriers
- Functions that benefit fish and wildlife downstream – distance or barriers
- Impacts of land uses outside assessment area to fish and wildlife
- Benefits to downstream or other hydrologically connected areas
- Benefits to downstream habitats from discharges
- Protection of wetland functions by upland mitigation assessment areas

Be aware that not all attributes are applicable to all assessment areas and in some cases, some attributes may be more relevant than others.

Location and Landscape Support - 62-345.500(6)(a), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support

w/o pres or current | with

.500(6)(b)Water Environment (n/a for uplands)

w/o pres or current | with

.500(6)(c)Community structure

1. Vegetation and/or
2. Benthic Community

w/o pres or current | with

Score = sum of above scores/30 (if uplands, divide by 20)

current or w/o pres | with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

The final score for the Location and Landscape Support category is a reflection of the overall condition of an assessment area, taking into consideration all applicable attributes (do not score each attribute and average them in the end, but rather think of this in terms of what final score best fits the overall conditions of the assessment area). Any whole number score between 0-10 may be used.

The rule lists descriptors of attributes for 4 categories of scores as guidance:

- A score of (10) means the assessment area is ideally located and the surrounding landscape provides full opportunity for the assessment area to perform beneficial functions at an optimal level.
- A score of (7) means that, compared to the ideal location, the location of the assessment area limits its opportunity to perform beneficial functions to 70% of the optimal ecological value.
- A score of (4) means that, compared to the ideal location, the assessment area location limits its opportunity to perform beneficial functions to 40% of the optimal ecological value.
- A score of (0) means that the location of the assessment area provides no habitat support for wildlife utilizing the assessment area and no opportunity for the assessment area to provide benefits to fish and wildlife outside the assessment area.

A Summary Worksheet for **Location and Landscape Support** is included to help in the field assessment scoring.

Water Environment - 62-345.500(6)(b), FAC

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

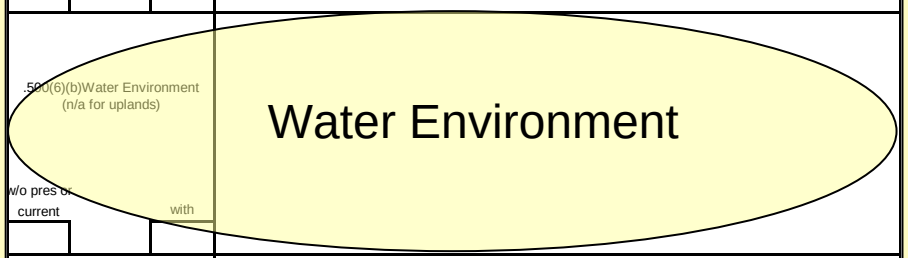
For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

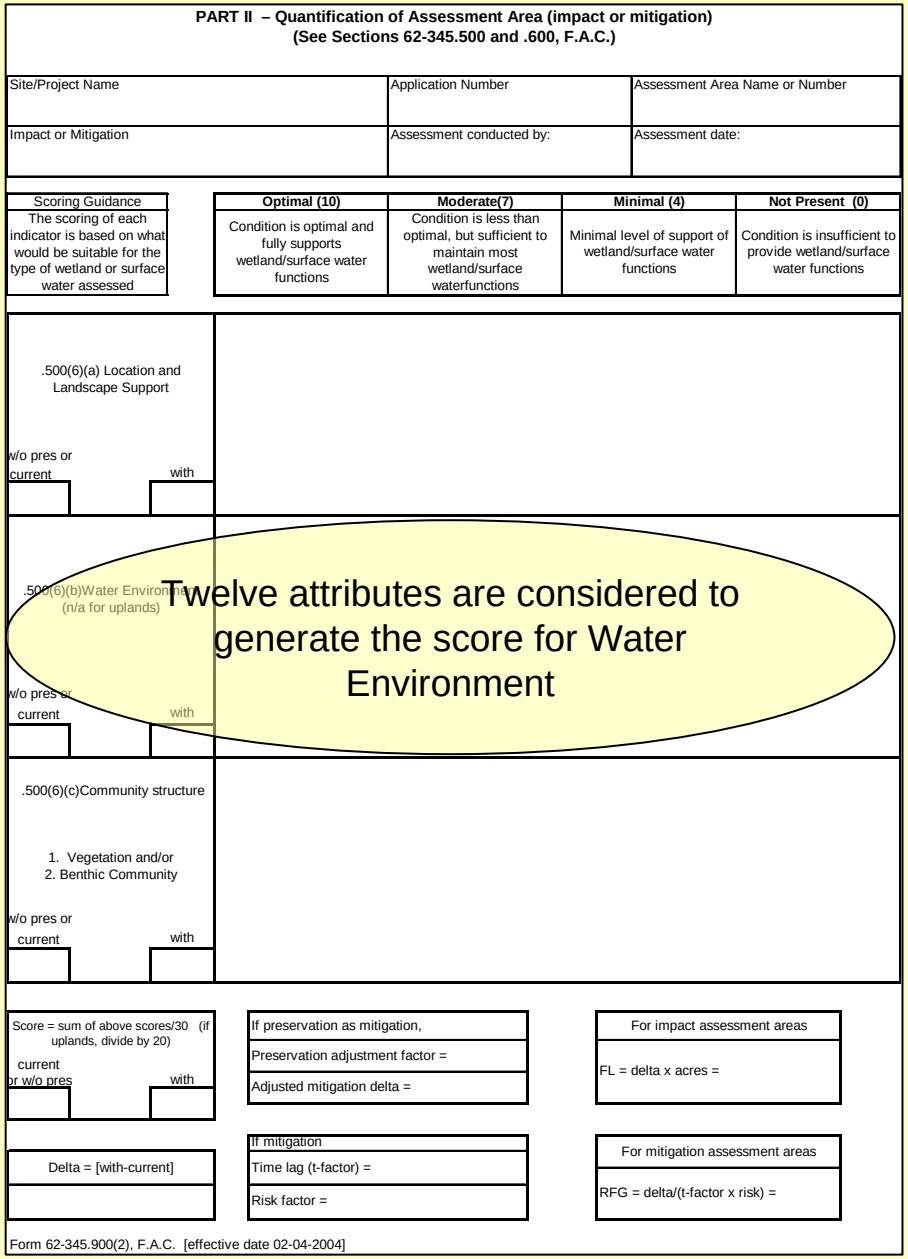
Form 62-345.900(2), F.A.C. [effective date 02-04-2004]



The quantity of water in an assessment area, including the timing, frequency, depth and duration of inundation or saturation, flow characteristics, and the quality of that water, may facilitate or preclude its ability to perform certain functions and may benefit or adversely impact its capacity to support certain wildlife. If the water environment is degraded, then the value of functions provided by the assessment area to the fish and wildlife identified in Part I is reduced.

Refer to section 62-345.500(6)(b), FAC of Chapter 62-345 Uniform Mitigation Assessment Method for a complete description of this indicator category.

Water Environment - 62-345.500(6)(b), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Twelve attributes are considered to generate the score for Water Environment

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

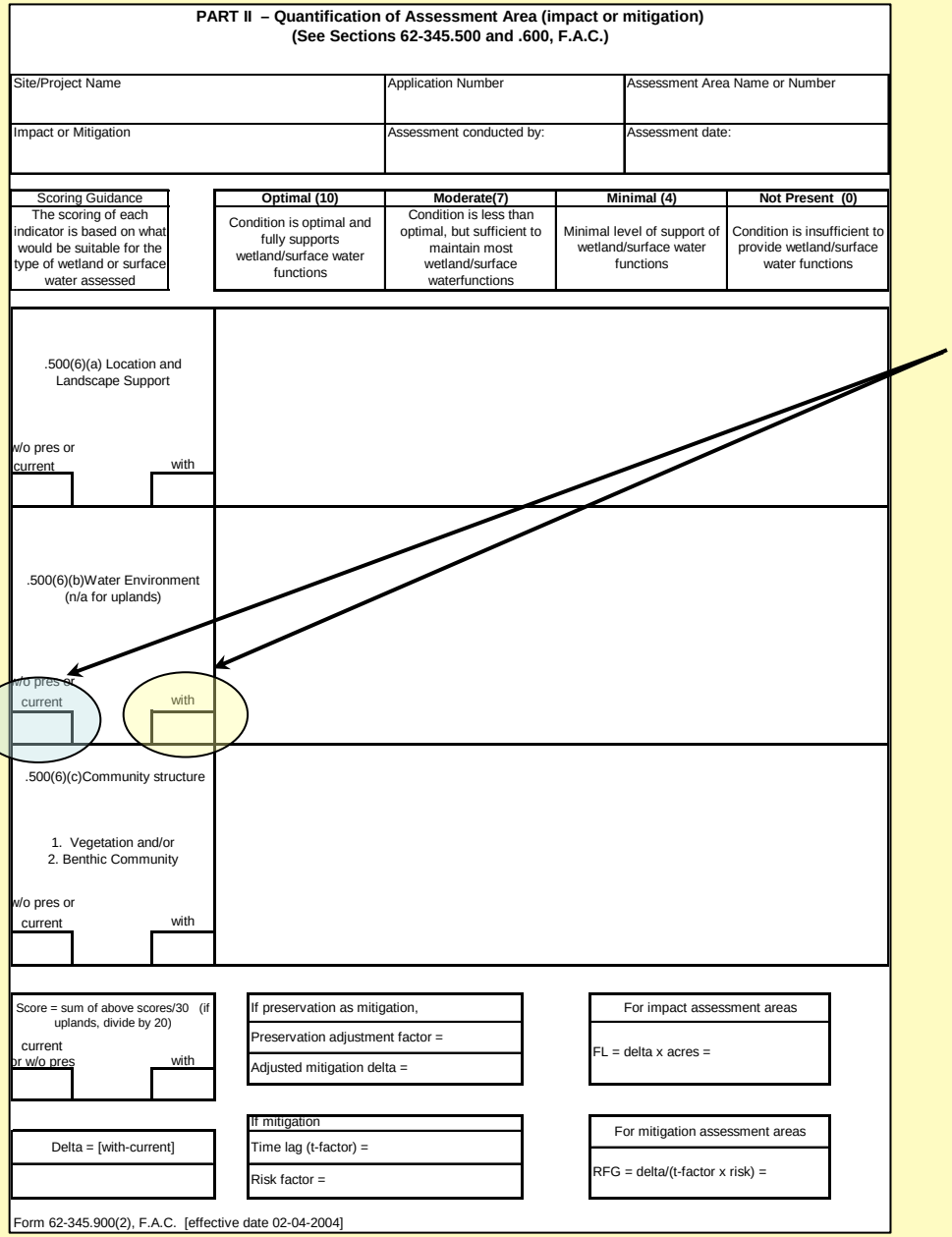
Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

Twelve attributes are identified in the UMAM Rule to evaluate this category. To provide guidance, examples that depict variation in conditions for each of the attributes are included.

- Water levels and flows
- Water level indicators
- Soil moisture
- Soil erosion or deposition
- Evidence of fire history
- Vegetation - community zonation
- Vegetation – hydrologic stress
- Use by animal species with specific hydrological requirements
- Plant community composition – species tolerant of and associated with water quality degradation or flow alteration
- Direct observation of standing water
- Existing water quality data
- Water depth, wave energy, currents and light penetration

Be aware that not all attributes are applicable to all assessment areas and in some cases, some attributes may be more relevant than others.

Water Environment - 62-345.500(6)(b), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support

w/o pres or current | with

.500(6)(b)Water Environment (n/a for uplands)

w/o pres or current | with

.500(6)(c)Community structure

1. Vegetation and/or
2. Benthic Community

w/o pres or current | with

Score = sum of above scores/30 (if uplands, divide by 20)

current or w/o pres | with

Delta = [with-current]

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

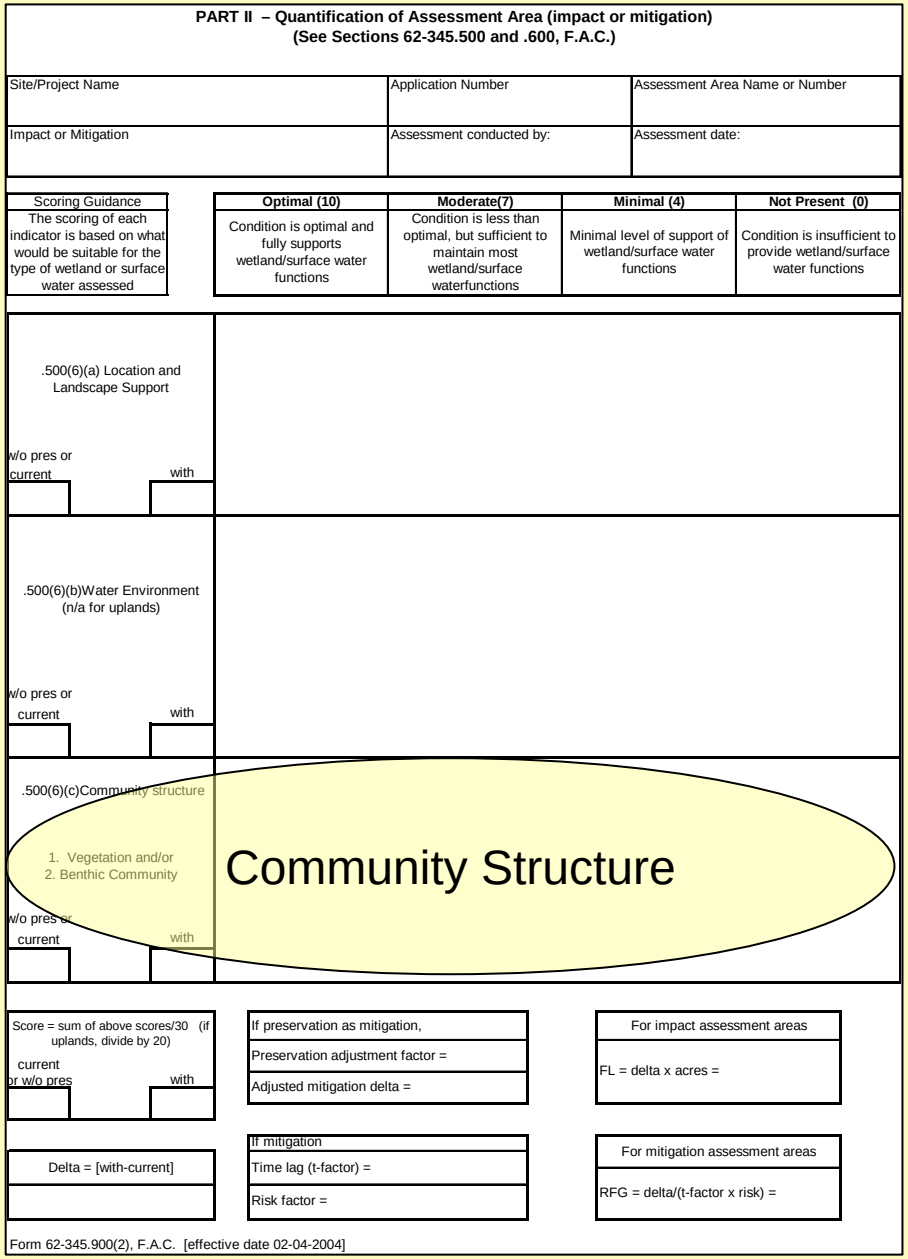
The final score for the Water Environment category is a reflection of the overall condition of an assessment area, taking into consideration all applicable attributes (do not score each attribute and average them in the end, but rather think of this in terms of what final score best fits the overall conditions of the assessment area). Any whole number score between 0-10 may be used.

The rule lists descriptors of attributes for 4 categories of scores as guidance:

- A score of (10) means that the hydrology and water quality fully supports the functions and provides benefits to fish and wildlife at optimal capacity for the assessment area.
- A score of (7) means that the hydrology and water quality supports the functions and provides benefits to fish and wildlife at 70% of the optimal capacity for the assessment area.
- A score of (4) means that the hydrology and water quality supports the functions and provides benefits to fish and wildlife at 40% of the optimal capacity for the assessment area.
- A score of (0) means that the hydrology and water quality does not support the functions and provides no benefits to fish and wildlife.

A Summary Worksheet for the **Water Environment** is included to help in the field assessment scoring.

Community Structure - 62-345.500(6)(c), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Community Structure

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

Each impact and mitigation assessment area is evaluated with regard to its characteristic community structure. In general, a wetland or other surface water is characterized either by plant cover or by open water with a submerged benthic community.

When a plant cover is present, the area is assessed using the "Vegetation and Structural Habitat" section (62-345.500(6)(c)1). Benthic communities are assessed using the "Benthic Communities" section (62-345.500(6)(c)2). If the assessment area includes both plant cover and submerged benthic communities, then both of these indicators are scored and the resulting scores will be averaged to obtain a single community score.

Refer to section 62-345.500(6)(c), FAC of Chapter 62-345 Uniform Mitigation Assessment Method for a complete description of this indicator category.

Community Structure - 62-345.500(6)(c), FAC

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Ten attributes are considered to generate the score for "Vegetation and Structural Habitat"

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

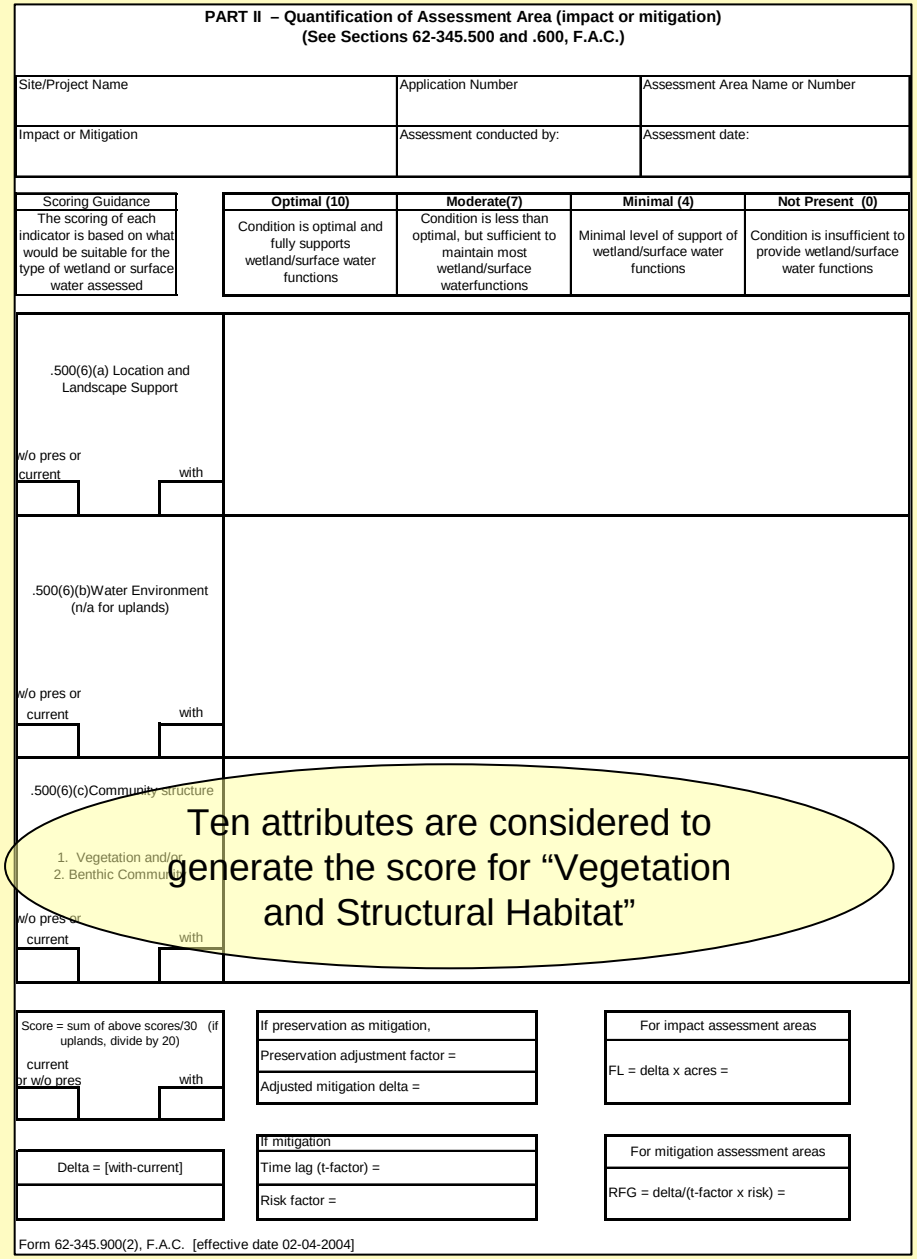
For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

1. Vegetation and Structural Habitat

The presence, abundance, health, condition, appropriateness, and distribution of plant communities in surface waters, wetlands, and uplands can be used as indicators to determine the degree to which the functions of the community type are provided. Human activities such as groundwater withdrawal, ditching, and diking or the construction of conveyance canals, or other permanent structures such as seawalls in an aquatic system can permanently damage vegetation and structural habitat. Environmental factors such as excessive rainfall, drought, and fire can have temporary short-term impacts on vegetation. If the community structure is degraded, then the value of functions provided by the assessment area to the fish and wildlife identified in Part I is reduced.

Community Structure - 62-345.500(6)(c), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Ten attributes are considered to generate the score for "Vegetation and Structural Habitat"

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

1. Vegetation and Structural Habitat
(continued)

Ten attributes are identified in the UMAM Rule to evaluate the "Vegetation and Structural Habitat" section of this category. To provide guidance, examples are given that depict variation in conditions for each of the attributes.

- Plant species in the canopy, shrub, or ground stratum
- Invasive exotics or other invasive plant species
- Regeneration & recruitment
- Age & size distribution
- Density and quality of coarse woody debris, snag, den, and cavity
- Plant condition
- Land management practices
- Topographic features such as refugia ponds, creek channels, flats or hummocks
- Siltation or algal growth in submerged aquatic plant communities
- Upland mitigation area - level of habitat and support for fish and wildlife in the associated wetlands or surface waters

Be aware that not all attributes are applicable to all assessment areas and in some cases, some attributes may be more relevant than others.

Community Structure - 62-345.500(6)(c), FAC

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

Delta = [with-current]

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

1. Vegetation and Structural Habitat
(continued)

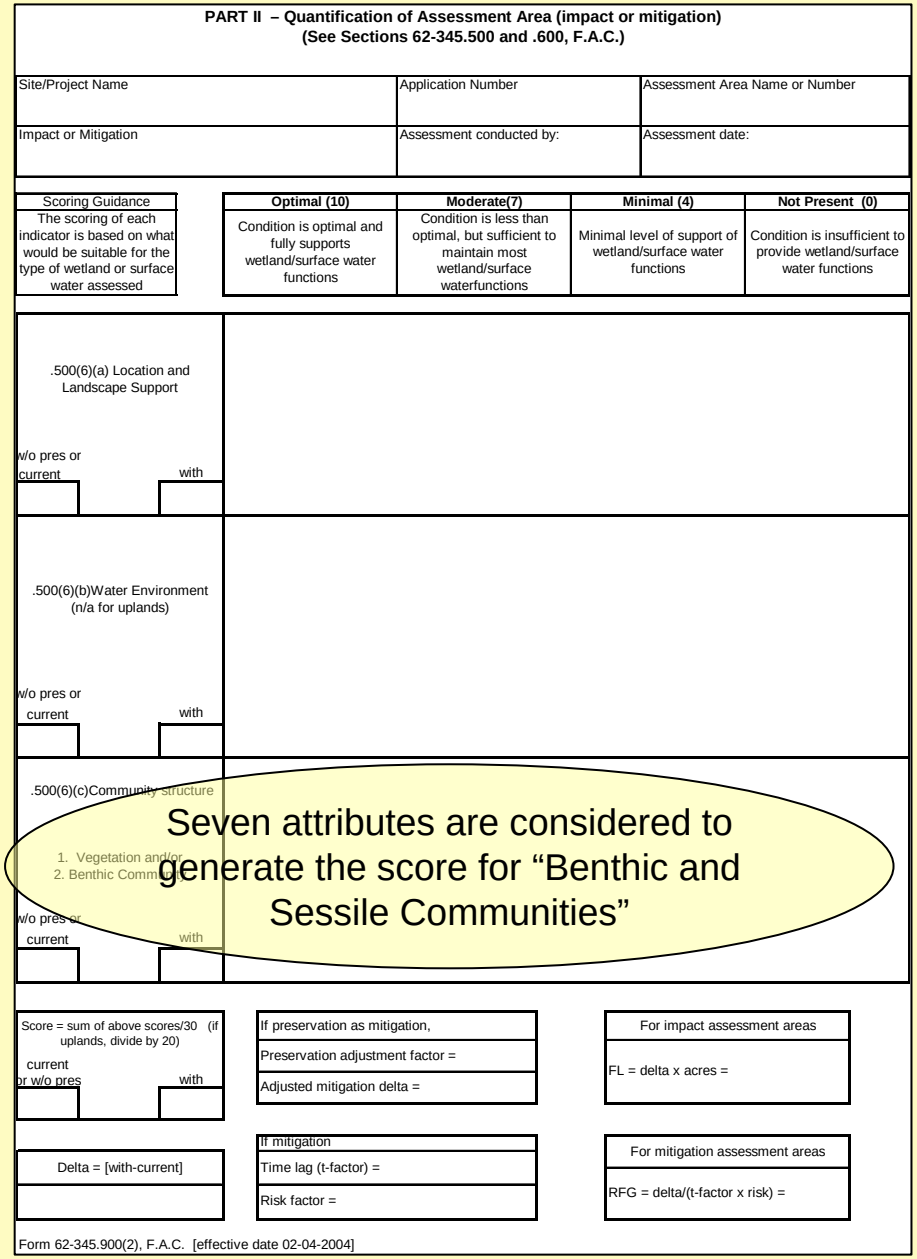
The final score for the Community Structure – Vegetation and Structural Habitat category is a reflection of the overall condition of an assessment area, taking into consideration all applicable attributes (do not score each attribute and average them in the end, but rather think of this in terms of what final score best fits the overall conditions of the assessment area). Any whole number score between 0-10 may be used that best represents the level of function of the assessment area.

The rule lists descriptors of attributes for 4 categories of scores as guidance:

- A score of (10) means that the vegetation community and physical structure provide conditions which support an optimal level of function to benefit fish and wildlife utilizing the assessment area as listed in Part I.
- A score of (7) means that the level of function provided by plant community and physical structure is limited to 70% of the optimal level.
- A score of (4) means that the level of function provided by the plant community and physical structure is limited to 40% of the optimal level.
- A score of (0) means that the vegetation communities and structural habitat do not provide functions to benefit fish and wildlife.

A Summary Worksheet for **Vegetation and Structural Habitat** is included to help in the field assessment scoring.

Community Structure - 62-345.500(6)(c), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Communities		

Seven attributes are considered to generate the score for "Benthic and Sessile Communities"

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

2. Benthic and Sessile Communities

This indicator is intended to be used in marine or freshwater aquatic systems that are not characterized by a terrestrial or emergent plant community. These systems include live hardbottom communities, such as oyster bars and beds, reefs, and soft-bottom systems such as riverine systems.

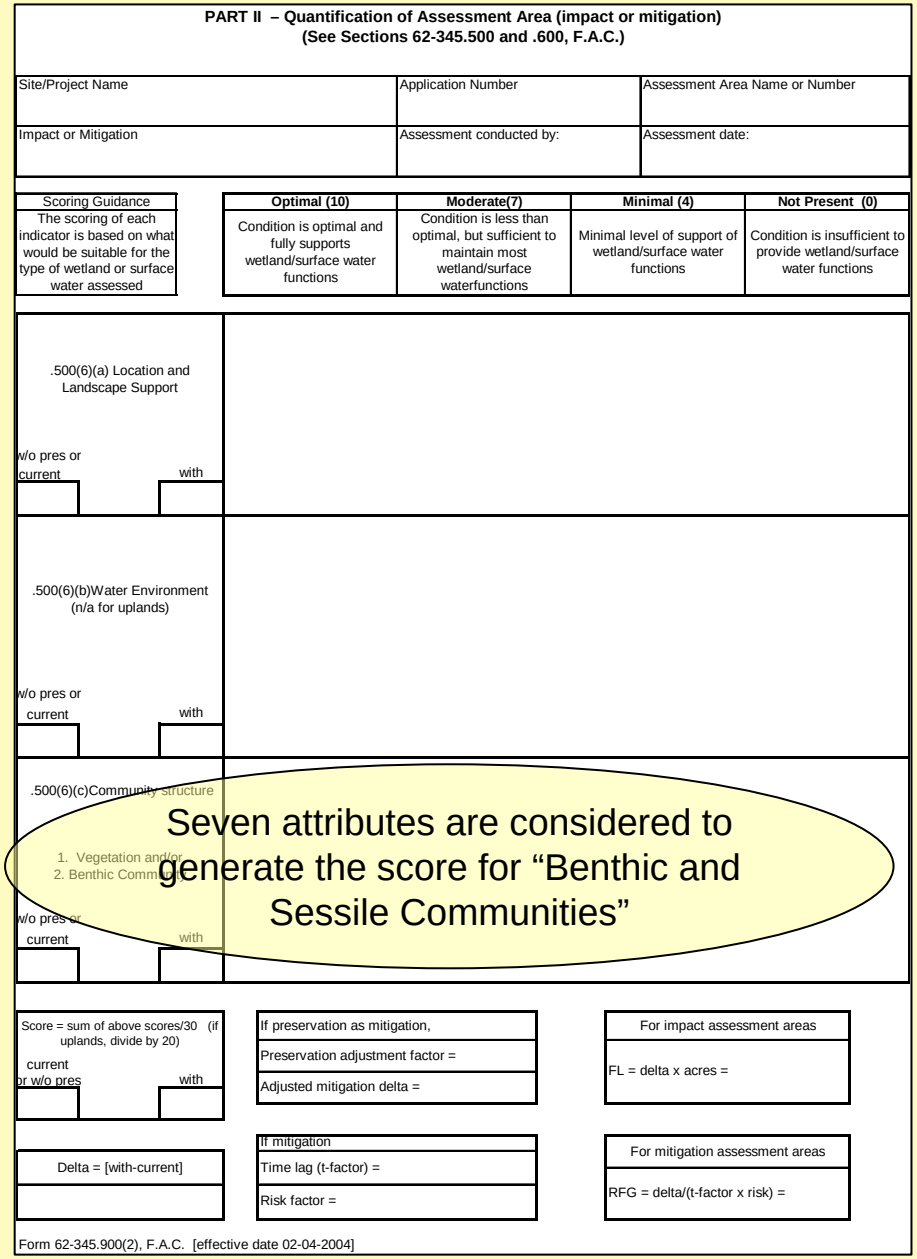
Oyster bars and beds in nearshore habitats and estuaries filter large amounts of particulate matter and provide food and habitat for a variety of species, such as boring sponges, mollusks, and polycheate worms.

The distribution and quality of coral reefs reflect a balance of water temperature, salinity, nutrients, water quality, and presence of nearby productive mangrove and seagrass communities.

Benthic infauna of soft-bottom systems stabilize the substrate, provide a food source, and serve as useful indicators of water quality.

All of these communities are susceptible to human disturbance through direct physical damage, such as dredging, filling, or boating impacts, and indirect damage through changes in water quality, currents, and sedimentation.

Community Structure - 62-345.500(6)(c), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Communities		

Seven attributes are considered to generate the score for "Benthic and Sessile Communities"

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

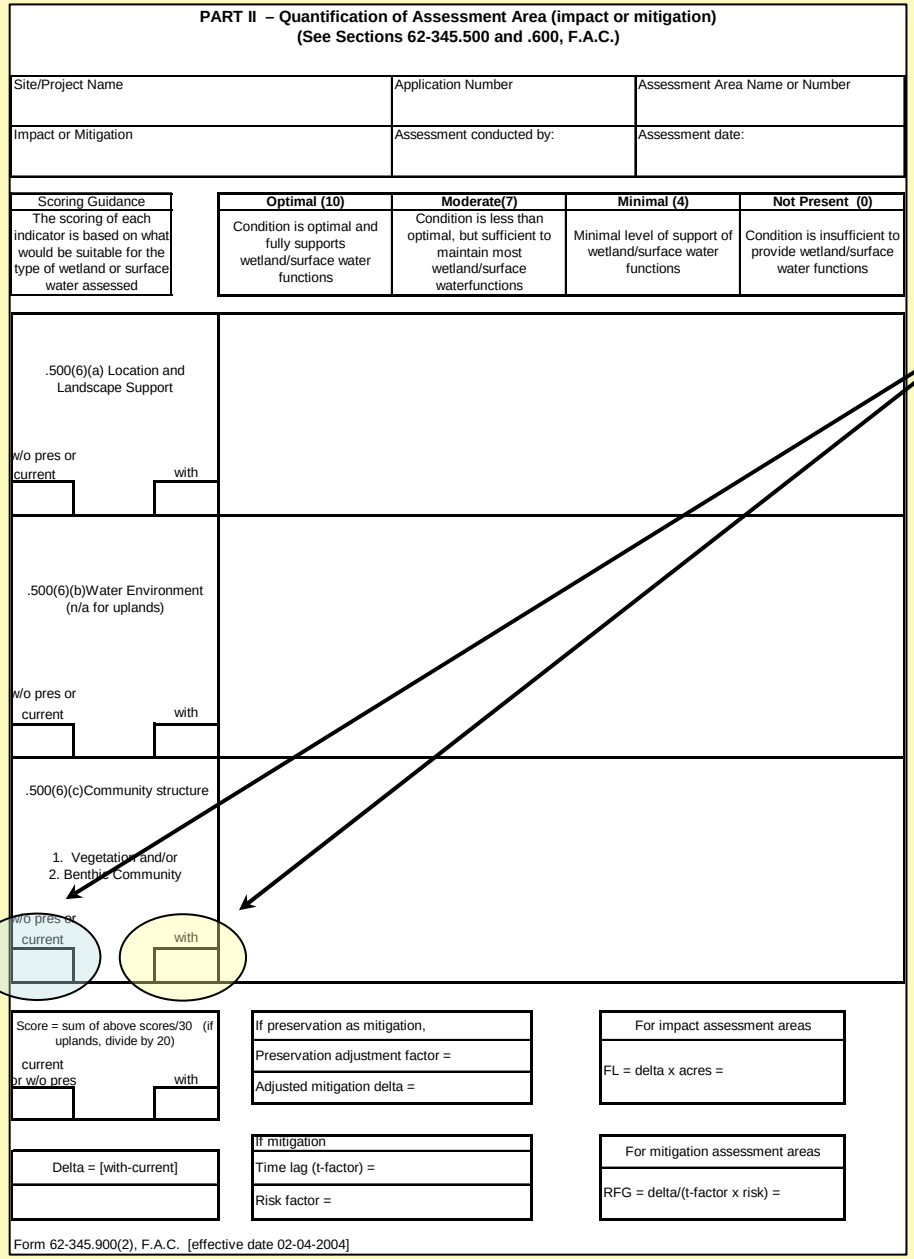
2. Benthic and Sessile Communities
(continued)

Seven attributes are identified in the UMAM Rule to evaluate the "Benthic and Sessile Communities" section of this category. To provide guidance, examples that depict variation in conditions for each of the attributes are included.

- Species number and diversity of benthic organisms
- Non-native or inappropriate species
- Regeneration, recruitment and age distribution
- Condition of appropriate species
- Structural features
- Topographic features such as relief, stability, and interstitial spaces (hardbottom and reef communities) or snags and coarse woody debris (riverine systems)
- Spawning or nesting habitats

Be aware that not all attributes are applicable to all assessment areas and in some cases, some attributes may be more relevant than others.

Community Structure - 62-345.500(6)(c), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

Delta = [with-current]

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

2. Benthic and Sessile Communities
(continued)

The final score for the Community Structure – Benthic and Sessile Communities category is a reflection of the overall condition of an assessment area, taking into consideration all applicable attributes (do not score each attribute and average them in the end, but rather think of this in terms of what final score best fits the overall conditions of the assessment area). Any whole number score between 0-10 may be used that best represents the level of function of the assessment area.

The rule lists descriptors of attributes for 4 categories of scores as guidance:

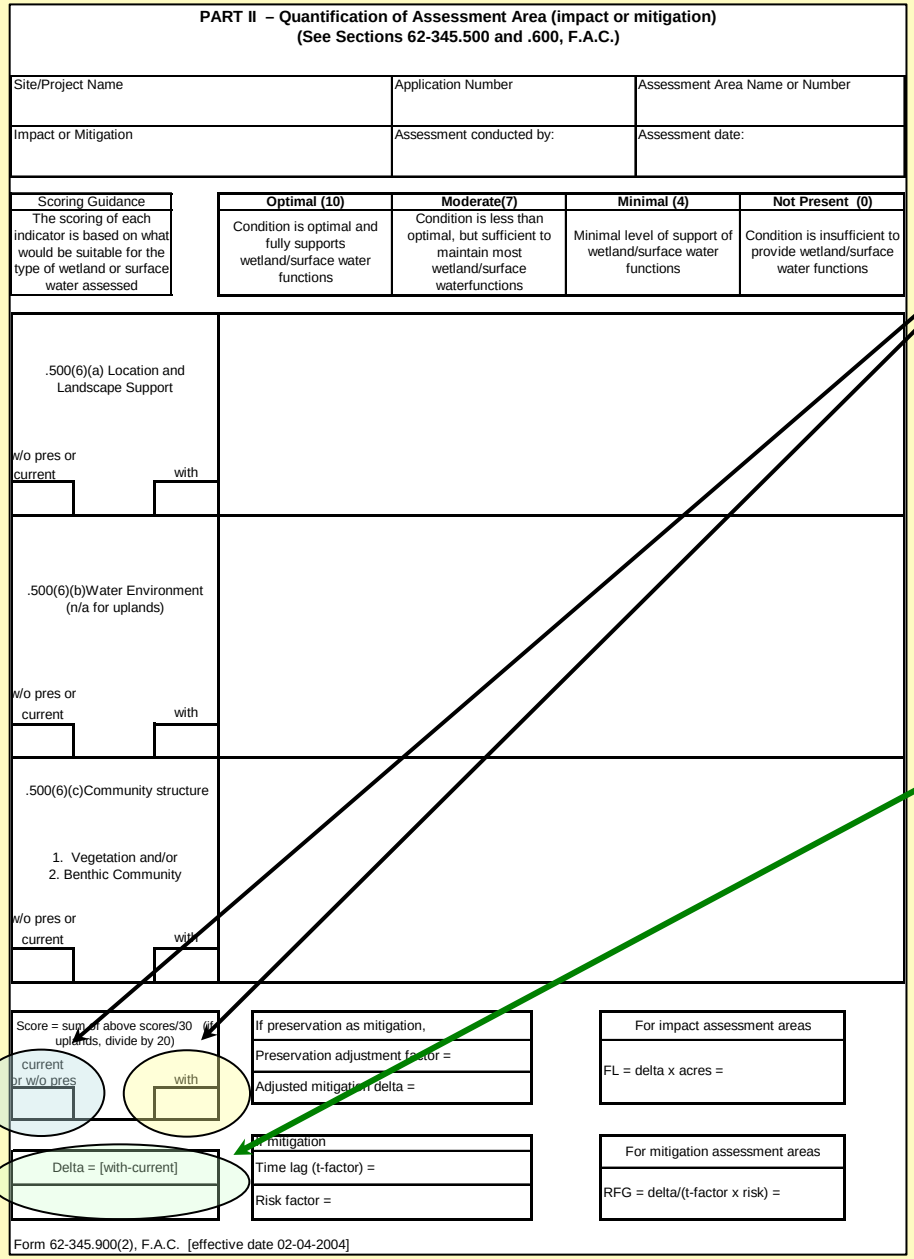
- A score of (10) means that the benthic communities are indicative of conditions that provide optimal support for all of the functions typical of the assessment area and provide optimal benefit to fish and wildlife.
- A score of (7) means that, relative to ideal habitat, the benthic communities of the assessment area provide functions at 70% of the optimal level.
- A score of (4) means that, relative to ideal habitat, the benthic communities of the assessment area provide functions to 40% of the optimal level.
- A score of (0) means that the benthic communities do not support the functions identified and do not provide benefits to fish and wildlife.

A Summary Worksheet for Benthic and Sessile Communities is included to help in the field assessment scoring.

Mitigation Determination

This section describes step by step procedures for incorporating the Preservation Adjustment Factor, Time Lag, and Risk to determine the amount of mitigation required

Part II Score - 62-345.500(7), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support

w/o pres or current | with

.500(6)(b)Water Environment (n/a for uplands)

w/o pres or current | with

.500(6)(c)Community structure

1. Vegetation and/or
2. Benthic Community

w/o pres or current | with

Score = sum of above scores/30 (if uplands, divide by 20)

current or w/o pres | with

Delta = [with-current]

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

If mitigation
Time lag (t-factor) =
Risk factor =

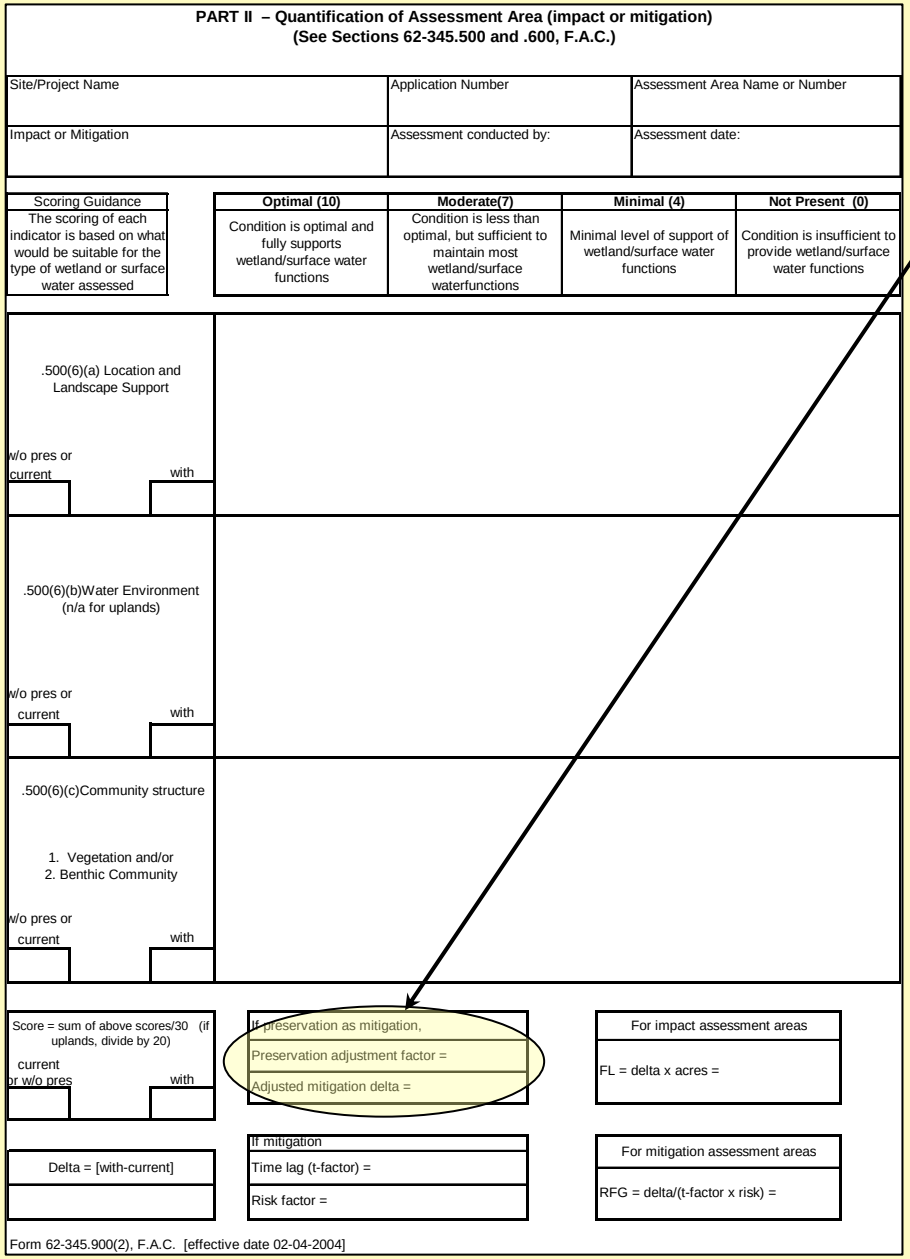
For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

The Part II score for an impact, wetland, or surface water mitigation assessment area is determined by summing the scores for each of the indicators and dividing that value by 30 to yield a number between 0 and 1. For upland mitigation assessment areas, the Part II score is determined by summing the scores for the location and community structure indicators and dividing that value by 20 to yield a number between 0 and 1.

The mathematical difference between the current condition and with-impact condition assessment, and between the current condition or without preservation and the with mitigation condition assessments is termed the "delta."

Preservation Adjustment Factor - 62-345.500 (3), FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		
Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

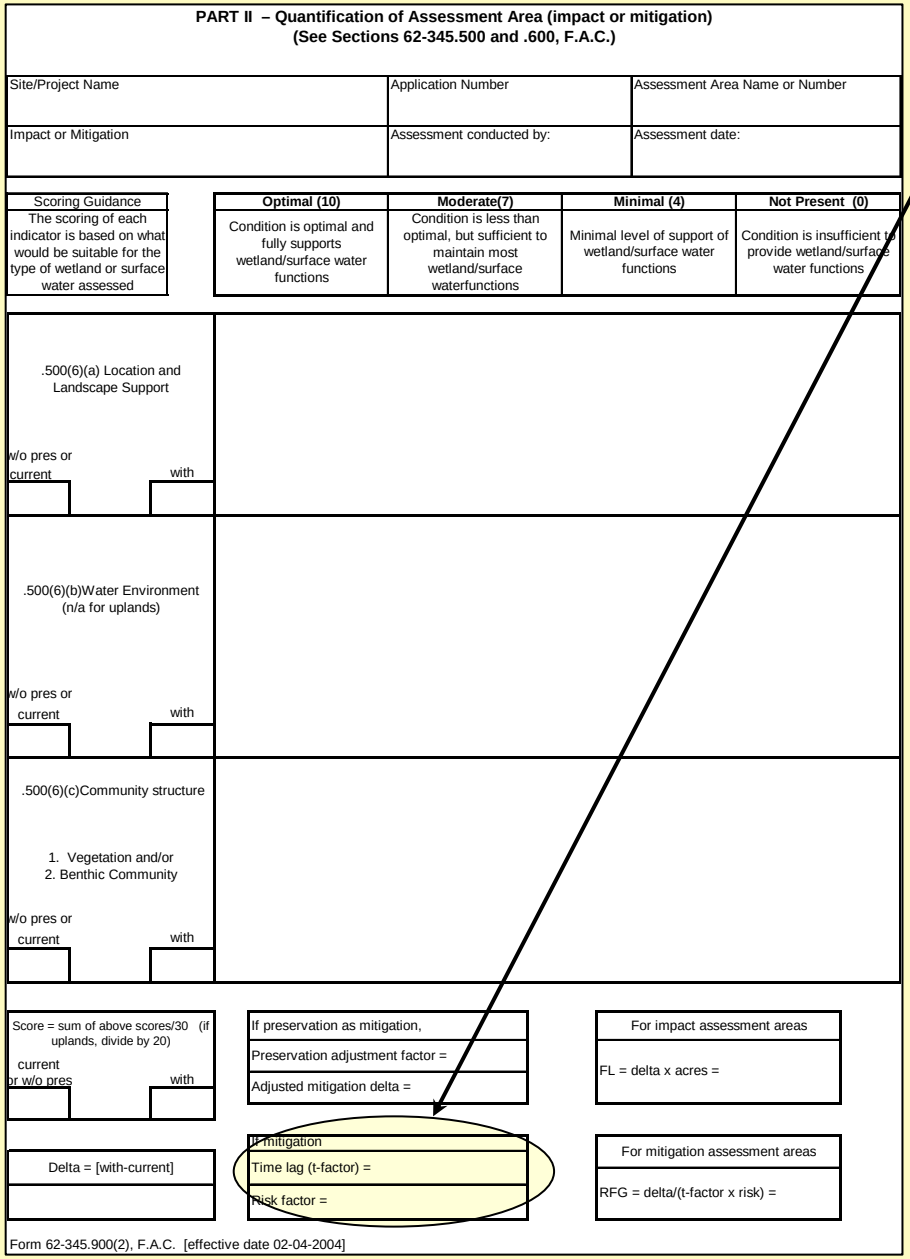
For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

When assessing preservation, the gain in ecological value is determined by multiplying the delta by a preservation adjustment factor. The preservation adjustment factor is scored on a scale from 0 (no preservation value) to 1 (optimal preservation value), on one-tenth increments. The score is based on:

1. The extent the preserved area will promote natural ecological conditions such as fire patterns or the exclusion of invasive exotic species.
2. The ecological and hydrological relationship between wetlands, other surface waters, and uplands to be preserved.
3. The scarcity of the habitat provided by the proposed preservation area and the level of use by listed species.
4. The proximity of the preserved area to areas of national, state, or regional ecological significance, and whether the areas to be preserved include corridors between these habitats.
5. The extent and likelihood of potential adverse impacts if the assessment area were not preserved.

Time Lag, Risk, and Mitigation Determination - 62-345.600, FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

Delta = [with-current]

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

If mitigation
Time lag (t-factor) =
Risk factor =

For impact assessment areas
FL = delta x acres =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

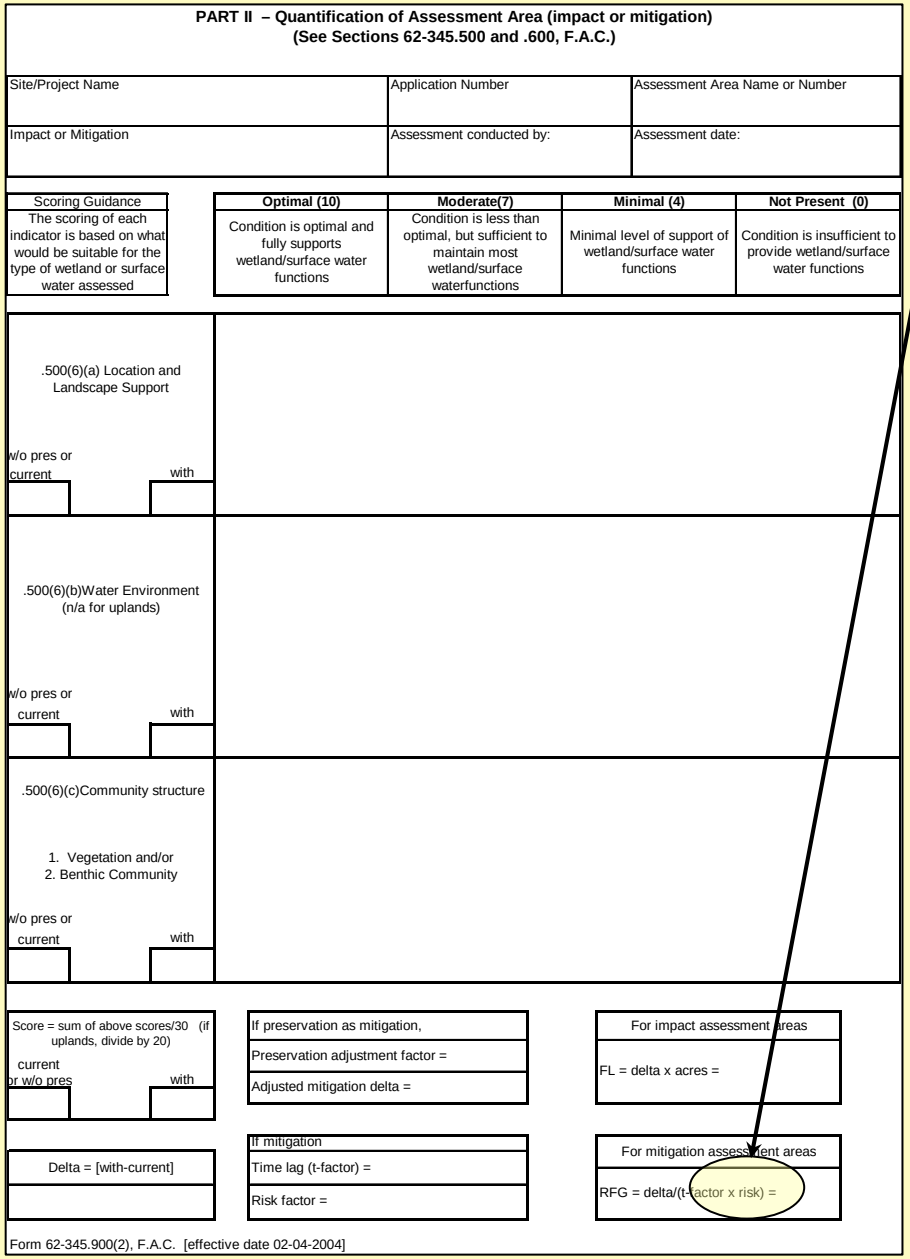
Time Lag

The time lag associated with mitigation means the period of time between when the functions are lost at an impact site and when those functions are replaced by the mitigation. The time lag, in years, is related to a factor (T-factor) as established in Table 1 below, to reflect the additional mitigation needed to account for the deferred replacement of wetland or surface water functions.

TABLE 1.

Year	T-factor
< or = 1	1
2	1.03
3	1.07
4	1.10
5	1.14
6 – 10	1.25
11 – 15	1.46
16 – 20	1.68
21 – 25	1.92
26 – 30	2.18
31 – 35	2.45
36 – 40	2.73
41 – 45	3.03
46 – 50	3.34
51 – 55	3.65
>55	3.91

Time Lag, Risk, and Mitigation Determination - 62-345.600, FAC



PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

Risk

For mitigation assessment areas, mitigation **risk** shall be evaluated to account for the degree of uncertainty that the proposed conditions will be achieved, resulting in a reduction in the ecological value of the mitigation assessment area. The assessment area shall be scored on a scale from 1 (for no or *de minimus* risk) to 3 (high risk), on quarter-point (0.25) increments. A score of one would most often be applied to mitigation conducted in an ecologically viable landscape and deemed successful or clearly trending towards success prior to impacts, whereas a score of three would indicate an extremely low likelihood of success based on a number of ecological factors.

Time Lag, Risk, and Mitigation Determination - 62-345.600, FAC

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Impact or Mitigation	Assessment conducted by:	Assessment date:

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
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	w/o pres or current	with
.500(6)(a) Location and Landscape Support		
.500(6)(b)Water Environment (n/a for uplands)		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community		

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres =

Delta = [with-current]

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

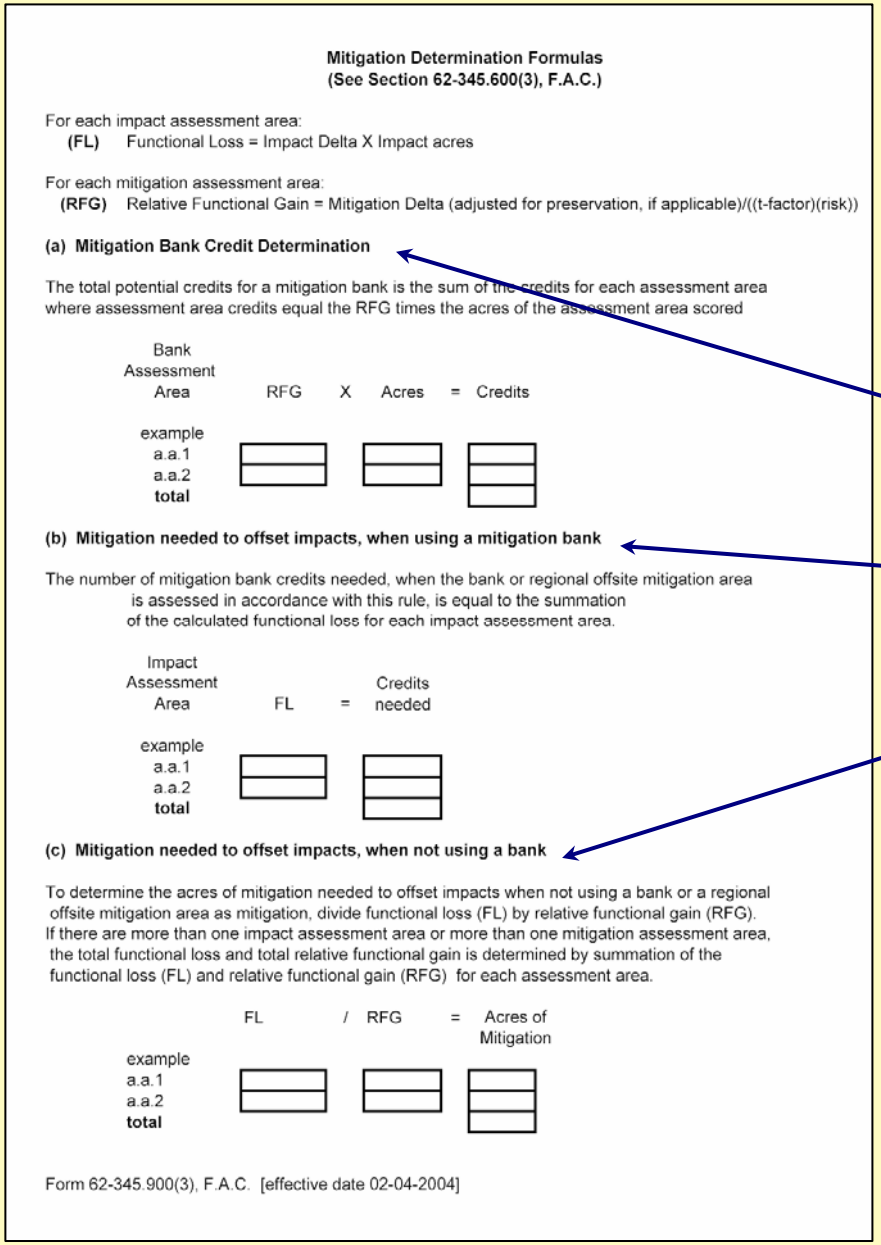
Functional Loss (FL)

The loss of functions provided by impact assessment areas is determined using the following formula: Functional loss (FL) = Impact Delta x Impact Acres.

Relative Functional Gain (RFG)

The relative gain of functions provided by a mitigation assessment area must be adjusted for time lag and risk using the following formula:
Relative functional gain (RFG) = Mitigation Delta (or adjusted mitigation delta for preservation)/(risk x t-factor).

Mitigation Determination Formulas - 62-345.600 (3), FAC



Mitigation Determination Formulas
(See Section 62-345.600(3), F.A.C.)

For each impact assessment area:
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:
(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable)/((t-factor)(risk))

(a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

Bank Assessment Area	RFG	X	Acres	=	Credits
example					
a.a.1					
a.a.2					
total					

(b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assessed in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

Impact Assessment Area	FL	=	Credits needed
example			
a.a.1			
a.a.2			
total			

(c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.

	FL	/	RFG	=	Acres of Mitigation
example					
a.a.1					
a.a.2					
total					

Form 62-345.900(3), F.A.C. [effective date 02-04-2004]

After calculating the FL and RFL, you can use the Mitigation Determination Formulas on the left to determine:

1. Total Potential credits for a mitigation bank
2. Mitigation needed to offset impacts when using a bank
3. Mitigation needed to offset impacts, when not using a bank

Section Divider

Tools

This section introduces a tool developed by the UF-CFW to help in the assessment of the Location and Landscape Support section of UMAM

Landscape Support Index (LSI)*

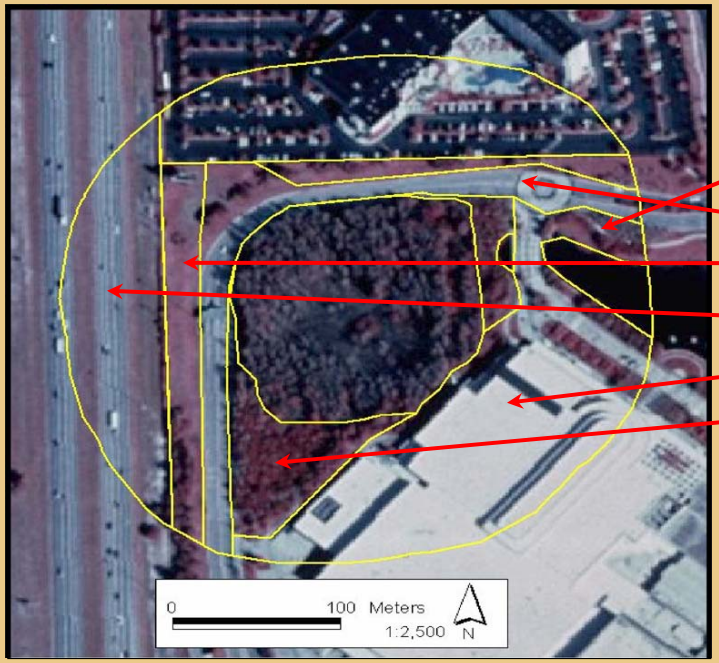
Location and Landscape Support – The value of functions provided by an assessment area to fish and wildlife are influenced by the landscape position of the assessment area, its relationship with surrounding areas, and the conditions in those surrounding areas.

Since many species that nest, feed or find cover in a specific habitat type are also dependent to varying degrees upon other habitats that are present in the surrounding landscape, the LSI provides a "numeric score" of landscape support which is based on the intensity of human use of the surrounding landscape. The ERAtools contains a calculator for calculating the LSI.

The LSI is based on detailed studies of wetlands throughout Florida that were conducted by the Center for Wetlands at the University of Florida. Scientific reports for these studies are available from the Center for Wetlands or Florida Department of Environmental Protection.

* The LSI is ***not*** part of Ch 62-345, but it is presented here as a tool that may be used to assist in both the qualitative characterization and subsequent quantitative assessment of the project area.

Landscape Support Index (LSI) (continued)



Land Use	Area (m2)	Area Contribution	LSI Coefficient	LSI Contribution
LI-Open Space	7893.2	09	9.05	0.85
LI-Transportation	10029.3	12	2.43	0.29
MI-Open Space	10725.3	13	6.57	0.84
HI-Transportation	12884.6	15	1.91	0.29
HI-Commercial	42042.5	50	0.91	0.46
Wetland	20332.1			
	=sum of area (m2)			= sum for LSI Value
	83574.9			2.74

The LSI is a number between 0 and 10, with the higher score signifying a high level of Location and Landscape Support. This number is based on a 100 meter (~300 feet) buffer around the entire wetland, and it takes into account the intensity of development and resulting practices in the surrounding land uses.

The ERAtools application will automatically calculate the LSI for any site included in the National Wetlands Inventory (NWI) coverage. If a site is not included in the NWI, the boundary of the site must be digitized before performing the operation.

Section Divider

Office Module ~ Part 1: Qualitative Characterization (continued)

- **FLUCCS code for ecological communities and land cover**

Guidance *- generally applicants will use the FLUCCS code for delineation of land cover and land uses in the assessment area. If they do not use the FLUCCS classification system it may be possible to use the FLUCCS classification cross-reference table to cross reference land cover classes. The FLUCCS classification system for certain wetlands and waters is given below.*

Florida Land Use Cover and Forms Classification System (FLUCCS, January 1999)

610 Wetland Hardwood Forests
- 611 Bay Swamps
- 612 Mangrove Swamps
- 613 Gum Swamps
- 614 Titi Swamps
- 615 Stream and Lake Swamps (Bottomland)
- 616 Inland Ponds and Sloughs
- 617 Mixed Wetland Hardwoods
- 618 Willow and Elderberry
- 619 Exotic Wetland Hardwoods

620 Wetland Coniferous Forests
- 621 Cypress Forests
- 622 Pond Pine
- 623 Atlantic White Cedar
- 624 Cypress-Pine-Cabbage Palm
- 625 Hydric Pine Flatwoods
- 626 Hydric Pine Savanna
- 627 Slash Pine Swamp Forest

630 Wetland Forested Mixed
- 631 Wetland Scrub

640 Vegetated Non-Forested Wetlands
- 641 Freshwater Marshes
- 642 Saltwater Marshes
- 643 Wet Prairies
- 644 Emergent Aquatic Vegetation
- 645 Submergent Aquatic Vegetation
- 646 Treeless Hydric Savanna

650 Non-Vegetated
- 651 Tidal Flats
- 652 Shorelines
- 653 Intermittent Ponds
- 654 Oyster Bars

Office Module ~ Part 1: Qualitative Characterization (continued)

- **Size of assessment area**

Guidance **-** *The assessment area should include all of the wetland or surface water impact site, or mitigation site. The assessment area may be divided into sub units that are sufficiently homogeneous in character, impact, or mitigation benefits to be assessed as single units. The area of each assessment area or sub area should be determined separately.*

The size of the assessment area can be found in the permit application (ie, wetland/surface water area proposed for impact or for mitigation). If you require further confirmation, you can:

- Consult the National Wetlands Inventory (NWI) GIS data layer. If the assessment area is an entire wetland that has been delineated in the NWI, the size of the wetland can be obtained with the information tool.

- Alternatively, the assessment area boundary may need to be digitized using the most recent aerial photography available (www.labins.org), and the area can then be derived from the on-screen delineation .

Office Module ~ Part 1: Qualitative Characterization (continued)

- **Water bodies and their classification**

Guidance *- Affected water bodies are surface water bodies that are within or immediately adjacent to the assessment area, or that will otherwise be affected by activities within the assessment area. Class means Water Quality Class, and can be obtained from ERAonline. Florida has 5 surface water quality classes as follows:*

Class I - Potable Water Supplies. Fourteen general areas throughout the state including: impoundments and associated tributaries, certain lakes, rivers, or portions of rivers, used as a drinking water supply.

Class II - Shellfish Propagation or Harvesting. Generally coastal waters where shellfish harvesting occurs.

Class III - Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife. The surface waters of the state are Class III unless described in rule 62-302.400 F.A.C.

Class IV - Agricultural Water Supplies. Generally located in agriculture areas around Lake Okeechobee.

Class V - Navigation, Utility and Industrial Use. Currently, there are not any designated Class V bodies of water.

Office Module ~ Part 1: Qualitative Characterization (continued)

- **Basin/watershed name/number**

Guidance **-** *This information should be included in the permit application. Each water management district (except NWFWMD) has adopted their own drainage basins for cumulative impact review and their own regional watersheds for mitigation bank regulatory purposes. Consult the following maps and links for additional information.*

Basin and Watershed data can be obtained from the following web locations:

http://www.dep.state.fl.us/legal/Rules/rulelistpro.htm#wmd
http://www.dep.state.fl.us/legal/Rules/rulelistpro.htm#saw

Additional slides present in Adobe pdf version are provided in Microsoft Word due to their format

Office Module ~ Part 1: Qualitative Characterization (continued)

- **Maps and aerial photos of the assessment area and surrounding area**

Guidance **-** *The ERAtools contains a wealth of information that can be accessed to develop responses to the questions pertaining to:*

Geographic relationship and hydrologic connections - are there significant geographic relationships to other ecological communities, sink holes, etc. that need to be noted, or hydrologic connections to uplands, wetlands or surface water bodies?

Description of the assessment area - briefly describe the landscape position and surrounding land uses and land cover.

Significant nearby features - Are there significant nearby features like wildlife nesting areas, known occurrences of endangered species, land uses that may enhance or degrade the assessment area?

Uniqueness - The relative rarity of the wetland or other surface water and floral and faunal components on the assessment area in relation to the surrounding regional landscape;

Use maps and aerial photos of the assessment area, the 100 meter buffer around the assessment area, and a 1 mile buffer around the assessment area. Note and document geographic relationships and hydrologic connections, significant nearby features, and the uniqueness of the ecological communities of the assessment areas. Develop a general description of the assessment area and its surrounding area.

*The Standard Resources at Risk (RAR) Report also provides information on a number of GIS data layers including Jurisdictional Boundaries, Landuse/Landcover, Cultural Resources and Historic & Geological Sites, Permitted Activities , Fish & Wildlife Resources, Water Resources, and Water Quality

Office Module ~ Part 1: Qualitative Characterization (continued)

- **Wetland field guides**

Guidance **-** *The Wetland Field Guides contain a wealth of information about wetland communities. Use the field guides to develop information to address the following:*

Functions performed by the assessment area - does the assessment area provide cover, substrate, and refuge for wildlife; is it a breeding, nesting, denning, or nursery area; does it function as a corridor for wildlife movement; does it provide food chain support? Further, does the assessment area provide natural water storage, natural flow attenuation, or water quality improvement, which would enhance fish, wildlife, and listed species utilization?

Anticipated wildlife utilization - What is the type of use (feeding, breeding, nesting, resting, or denning)? Does the assessment are provide these uses for listed species (threatened, endangered, or species of special concern as defined by Rules 68A-27.003, 68A-27.004, and 68A-27.005, F.A.C.)?

The field guides provide detailed information about structure and function of major wetland community types identified in level 3 FLUCCS codes. In addition, the ERAtools contains maps of listed and endangered species and the following information regarding Fish and Wildlife Resources :

- Florida Natural Areas Inventory (FNAI) Rare/Endangered Plants & Animals, Bird Rookeries, and Rare Habitats;
- Florida Marine Research Institute (FMRI) Mangrove, Saltmarsh, Seagrass, Seagrass Scarring, and Tidal Flats;
- Areas of Critical State Concern;
- Conservation and Recreation Lands (CARL) Projects;
- Conservation Lands
- Manatee Aggregation Areas and Protection Zones; and
- Sea Turtle Nesting Areas.

In addition to the Wetland Field Guides, general scientific literature may be helpful.

Office Module ~ Part 1: Qualitative Characterization (continued)

General Scientific Literature

Scientific literature that may be helpful in determining anticipated wildlife utilization and hydrologic functions of assessment areas

- Florida Fish and Wildlife Conservation Commission. 2004. Florida's Endangered Species, Threatened Species, And Species of Special Concern. Last accessed 7/10/04. Found at: http://wildflorida.org/imperiled/pdf/Endangered-Threatened-Special-Concern-2004.pdf
- Florida Natural Areas Inventory and Department of Natural Resources. 1990. Guide to Natural Communities of Florida. February http://www.fnai.org/PDF/Natural_Communities_Guide.pdf
- Myers, R.L and J.J. Ewel, eds. 1990. Ecosystems of Florida. University of Central Florida Press, Orlando, Florida, USA.
- Soil Conservation Service. 1984. 26 Ecological Communities of Florida.

Office Module ~ Part 1: Qualitative Characterization (continued)

Additional Literature

The following literature list includes reports and publications written by the UF-CFW:

- Brown, M.T. and M.B. Vivas. 2005. Landscape Development Intensity Index. Environmental Monitoring and Assessment 101: 289-309.
- Cohen, M.J., S.M. Carstenn, and C.R. Lane. 2004. Floristic quality indices for biotic assessment of depressional marsh condition in Florida. Ecological Applications 14(3): 784-794. 14(3): 784-794.
- Cohen, M.J., C.R. Lane, K.C. Reiss, J.A. Surdick, and E. Bardi. 2005. Vegetation based classification trees for rapid inference of isolated wetland condition. Ecological Indicators: 5 (2005) 189-206.
- Doherty, S.J., C.R. Lane, and M.T. Brown. 2000. Proposed classification for biological assessment of Florida inland freshwater Wetlands. Report to the U.S. Environmental Protection Agency. Center for Wetlands, University of Florida, Gainesville, Florida.
- Doherty, S., M. Cohen, C. Lane, L. Line, and J. Surdick. 2000. Biological criteria for inland freshwater wetlands in Florida: a review of technical & scientific literature (1990-1999). Report to the U.S. Environmental Protection Agency. Center for Wetlands, University of Florida, Gainesville, Florida.
- Lane, C.R. 2000. Proposed wetland regions for Florida freshwater wetlands. Report to the Florida Department of Environmental Protection. Howard T. Odum Center for Wetlands, University of Florida, Gainesville, Florida.
- Lane, C.R., M.T. Brown, M. Murray-Hudson, and M.B. Vivas. 2003. The Wetland Condition Index (WCI): biological indicators of wetland condition for isolated depressional herbaceous wetlands in Florida. Report to the Florida Department of Environmental Protection. Howard T. Odum Center for Wetlands, University of Florida, Gainesville, Florida.
- Reiss, K.C. and M.T. Brown. 2005, in review. An evaluation of Florida depressional wetlands: application of USEPA levels 1, 2, and 3 assessment methods. EcoHealth.
- Reiss, K.C. and M.T. Brown. 2005. The Florida Wetland Condition Index (FWCI): developing biological indicators for isolated depressional forested wetlands. Report to the Florida Department of Environmental Protection. Howard T. Odum Center for Wetlands, University of Florida, Gainesville, Florida.
- Reiss, K.C. and M.T. Brown. 2005. Pilot Study - The Florida Wetland Condition Index (FWCI): preliminary development of biological indicators for forested strand and floodplain wetlands. Report to the Florida Department of Environmental Protection. Howard T. Odum Center for Wetlands, University of Florida, Gainesville, Florida.
- Reiss, K.C. 2005, in press. Florida Wetland Condition Index for depressional forested wetlands. Ecological Indicators.
- Lane, C.R. 2005, in review. More bang for the buck: diatom assessment of wetland condition at genus, species, and subspecies taxonomic resolution. EcoHealth.

Office Module ~ Part 1: Qualitative Characterization (continued)

- **Regionalized weather data**

Guidance: *consult regional weather data to better understand seasonal rainfall patterns as background information to assess expected degree of flooding on the site. During dryer times of the year, one can expect lower water levels in wetlands and water bodies, while the converse is true during the wet season.*

The following websites provide regionalized historical weather data, including mean precipitation, by nearest city:

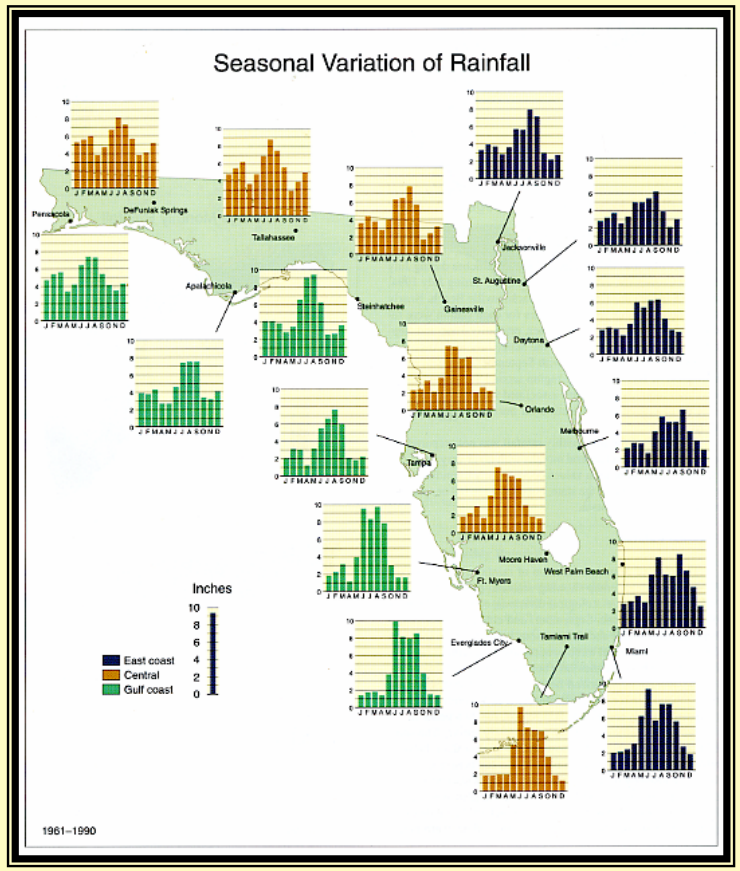
http://www.dnr.state.sc.us/climate/sercc/climateinfo/historical/historical_fl.html

http://weathercenter.com/almanacs/index.htm

For current data, visit:

http://www.weather.com

Enter your zipcode and click on "monthly" to see current monthly precipitation as well as the previous month compared to the historical averages



From: Fernald, E.A. and E.D. Purdum (eds). 1998. Water Resources Atlas of Florida.

Observed Evidence of Wildlife Utilization…

Guidance: *Become familiar with listed species* and their habitat requirements. Upon arriving at the site and during the site survey pay particular attention to signs of wildlife use. What animals did you flush? Are there signs of animal nesting, feeding or resting? Based on the expected wildlife species, do you encounter any listed species?*

After reviewing the Wetland Field Guides determine the likelihood that the site is used by listed species, consider site characteristics and the range and habitat needs of such species, and whether the proposed system will impact that use;

Look for:

- Flushed animals, animal nests, burrows, etc.
- Remains of animals that may have been preyed upon
- Feathers, tree rubbings, etc. that document animal use
- Scat (animal feces)

* defined by Rules 68A-27.003, 68A-27.004, and 68A-27.005, F.A.C.

Additional Relevant Factors…

Guidance: *After reviewing the application and all information regarding the site, determine if there are additional factors that may influence the assessment. For instance, are there local buffer requirements that should be taken into account? Is the site within the drainage basin of an OFW? Is the site adjacent to significant ecological or archeological resources? Are there plans for further development within the immediate area that might affect this site? Are there historical factors (site History) that may have an impact on the site today?*

Some review for relevant factors can be done in the office. In the field, pay particular attention to surrounding uses, and site conditions that were not evident from the office portion of the site analysis, such as changes in land use subsequent to the date of the latest aerial photography.

Section Divider

Standardized Field Protocol (SFP)*

Review of UMAM Part I - Qualitative Characterization….

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number	
FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Should be checked and updated as needed during the field survey…

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Functions	Mitigation for previous permit/other historic use
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Should be filled out in the field during the field survey…

Additional relevant factors:

Should be checked and updated in the field during the field survey…

Assessment conducted by:	Assessment date(s):

Form 62-345.900(1), F.A.C. [effective date 02-04-2004]

The Geographic Relationships/Hydrologic Connections, Description, and Significant Nearby Features of **Part I – Qualitative Characterization** should be evaluated in light of the information obtained during the field survey, and

During the field assessment, observations of wildlife use or signs of use as well as listed species should be documented in the section related to wildlife utilization in **Part I – Qualitative Characterization**

Finally, the last section of Part I should be updated based on observation of the assessment area and its immediately surrounding area.

* The SFP is ***not*** part of Ch 62-345, but it is presented here as a tool that may be used to assist in field assessments of the project area.

Standardized Field Protocol (SFP)* (continued)

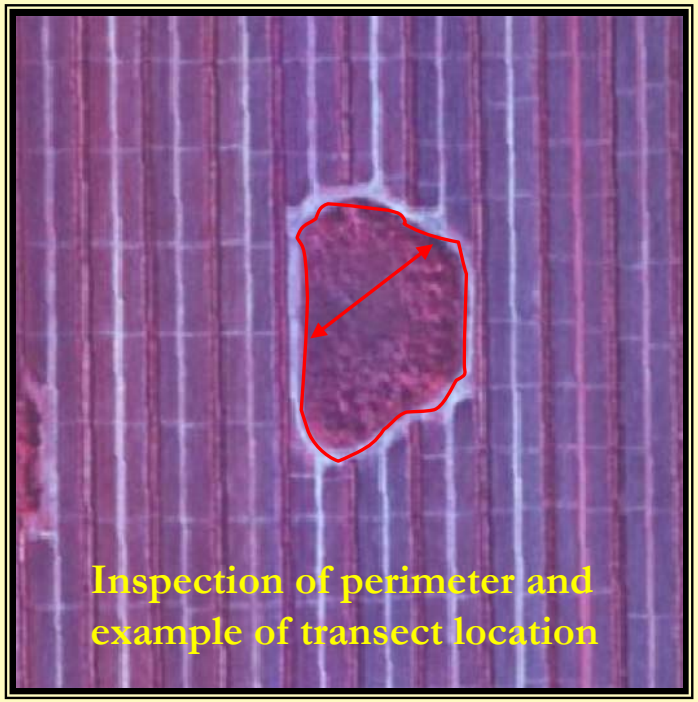
Guidance: *To fill out Part II, it is necessary to conduct a field survey of the assessment area and the areas immediately adjacent to the assessment area. A standardized protocol is necessary to insure reproducibility of results as well as defensibility should the assessment be challenged. The following SFP is the* ***minimum*** *necessary to adequately assess an area. If time allows, a more detailed field evaluation should be employed.*

A SFP is part of a Quality Assurance/Quality Control program which results in assessments that are conducted in such a way as to insure that they are comprehensive, repeatable, and defensible.

In addition to a SFP, training and standard scientific precautions are necessary to insure that staff are capable of producing unbiased sampling of the assessment area. The field methods should be calibrated on sites whose ecological functions are known, and duplications conducted where members of the field team assess the same areas and achieve the same results.

* The SFP is ***not*** part of Ch 62-345, but it is presented here as a tool that may be used to assist in field assessments of the project area.

Description of Standardized Field Protocol (SFP)* (continued)



Freshwater marsh surrounded by citrus groves in Martin County.

Field Surveys

Field surveys should include an inspection of the entire perimeter of the assessment area (i.e. the area that receives **direct impacts** from the proposed activity; the inspection can be done in conjunction with the examination of the wetland delineation line). In addition to the perimeter, an examination of the wetland interior to the fullest extent possible should be conducted, based on time availability and site requirements

These guidelines can be adjusted to account for site accessibility, (both physical and legal), and depending on the homogeneity and size of the site.

* The SFP is ***not*** part of Ch 62-345, but it is presented here as a tool that may be used to assist in field assessments of the project area.

Description of Standardized Field Protocol (SFP)* (continued)

Following are suggested ***minimum*** guidelines that can be used to standardize field surveys across all agencies involved in the review process, **if time constraints prohibit a thorough walk-over of the assessment area:**

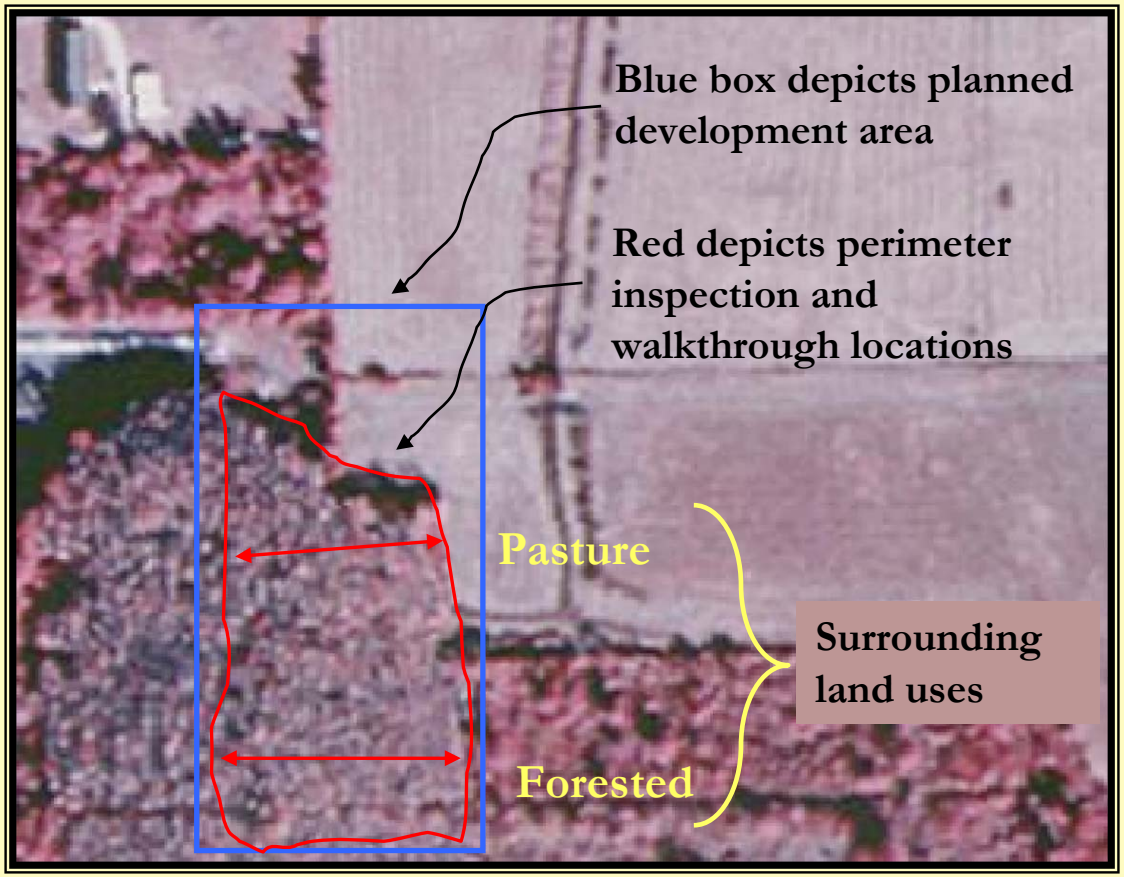
Area	Sampling Effort
1-2 acres	100% of perimeter and minimum of two 30 m transects, depending on homogeneity of site*
>2 to <5 acres	100% of perimeter and minimum of four 30 m transects, depending on homogeneity of site*
>5 to <20 acres	100% of perimeter and minimum of six 30 m transect, depending on homogeneity of site*
>20 acres	100% of perimeter and minimum of ten 30 m transects, depending on homogeneity of site*

* The transects are located from the wetland or water body edge towards the interior of the assessment area, perpendicular to the edge, for a distance of 30 meters or until the limit of the proposed activity, whichever is greater. Depending on the homogeneity of the site, these minimum requirements can be adjusted. For instance, when sampling a *Juncus* spp. marsh where there is ample visibility of the entire site, it may not be necessary to repeat the transects.

* The SFP is ***not*** part of Ch 62-345, but it is presented here as a tool that may be used to assist in field assessments of the project area.

Description of Standardized Field Protocol (SFP)* (continued)

When assessing an area that is surrounded by different land uses, make sure to divide your efforts equally among the portions of the assessment area that are surrounded by different land uses, so that they can be equally represented. For instance, in the image below, complete a walkthrough of each portion of the site, as depicted below.



Forested wetland in Orange County.

* The SFP is ***not*** part of Ch 62-345, but it is presented here as a tool that may be used to assist in field assessments of the project area.

Description of Standardized Field Protocol (SFP)* (continued)

Secondary Impacts

Regulatory agencies may have different buffer requirements for wetlands. For instance, the SJRWMD buffer requirement is 25 feet (~7.5 m), while Alachua county requires 35 feet (~11 m). When this requirement is met, the wetland is assumed to receive no secondary impacts. However, when an upland buffer requirement cannot be provided, as in the case of a road or a driveway that bisects a wetland, potential secondary impacts must be assessed. In this case, the area of anticipated secondary impacts needs to be defined, based on the proposed activity, before being scored as a separate assessment area.

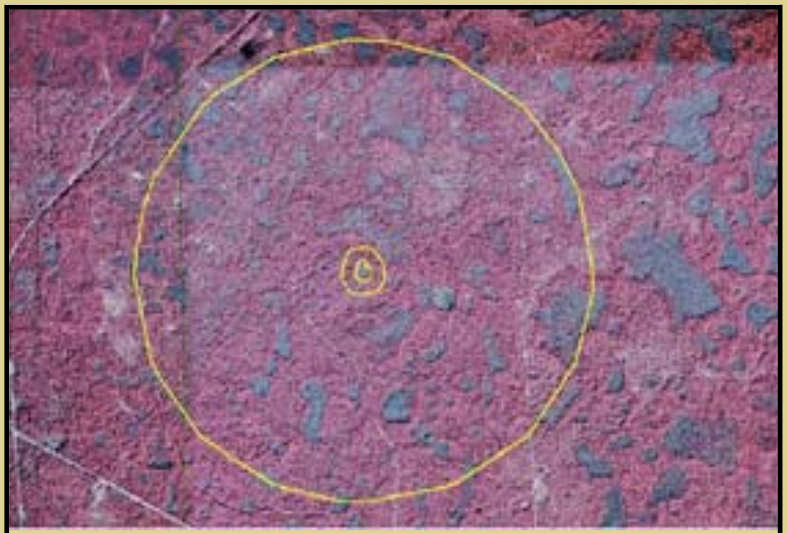
Section Divider

Location and Landscape Support - 62-345.500(6)(a), FAC

a. Support to wildlife by outside habitats

Guidance: *This attribute assesses the extent to which habitats outside the assessment area represent the full range of habitats needed to fulfill the life history requirements of all wildlife listed in Part I, and the extent to which these habitats are available in sufficient quantity to provide optimal support for wildlife. Evaluate an area surrounding the assessment area that is appropriate for the species listed in Part 1.*

Many species that nest, feed, or find cover in a specific habitat or habitat type are also dependent in varying degrees upon other habitats, including upland, wetland, and surface waters, that are present in the regional landscape. Depending on the wildlife species listed in Part I, an area of outside habitats up to 1 mile in radius may be appropriate. *Read more on support to wildlife by outside habitats*.

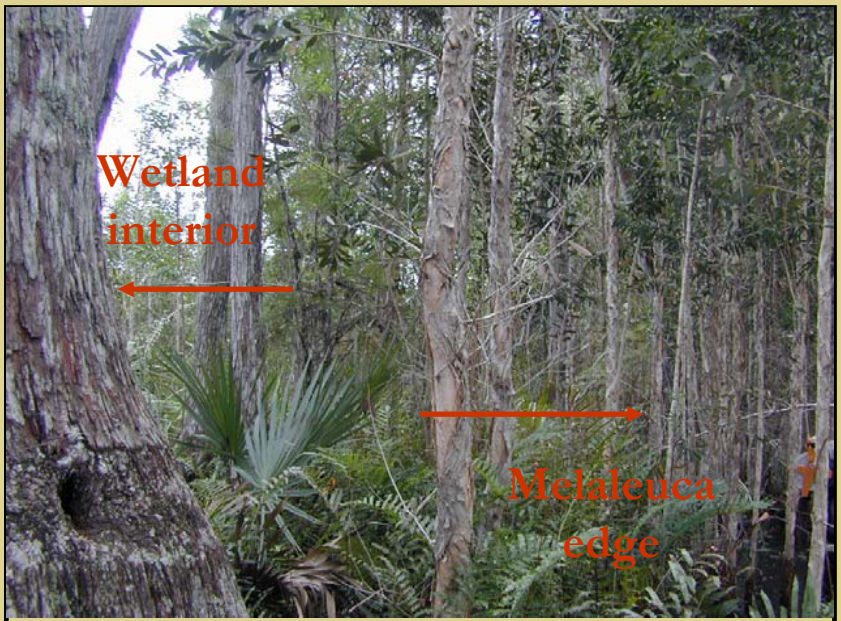


Outside habitat providing full range of habitats needed to support wildlife species of the assessment area (Goethe State Forest).

Outside habitat (fields of row crops) fails to provide support for some, or provides minimal support for many wildlife species (Collier County).

b. Invasive exotics or other invasive plant species in proximity to the assessment area

Guidance: *The value of functions provided by an assessment area to fish and wildlife are influenced by the condition of surrounding areas. If surrounding habitats are degraded due to the presence, and especially dominance, of invasive or exotic plant species, then the value of functions provided by the assessment area to the fish and wildlife identified in Part I is reduced.* *Read more on invasive exotics or invasive plant species.*



Wetland in Lee County with wall of melaleuca forming the outside perimeter. (SC)

Wetland in Walton County with no invasive exotics in proximity of the assessment area. (JS)

Location and Landscape Support - 62-345.500(6)(a), FAC

c. Wildlife access to and from outside – distance and barriers

Guidance: *The value of functions provided by an assessment area to fish and wildlife are influenced by wildlife access (both to and from outside areas). Access may be influenced by distance to other natural habitats, or by landscape barriers such as roads, walls, canals, and other man made structures. Avian fauna are probably least affected by distance and barriers. Mammals are more affected, but can obviously cover greater distances than can herpetofauna. The degree of influence is highly dependent on type and amount of cover in the intervening area and the types of barriers. Fauna traversing open fields are more susceptible to predators than if traveling through dense shrubs. Well traveled roads offer greater hazards to ground dwelling fauna than seldom traveled "two-track" dirt roads.*

Wetland in Osceola County where wildlife access is severely limited due to distance and barriers.

Wetland in Collier County within an agricultural landscape (plowed field, post harvest) that partially limits some wildlife access to and from outside, for example due to exposure to predators or heat. (CRL)

Location and Landscape Support - 62-345.500(6)(a), FAC

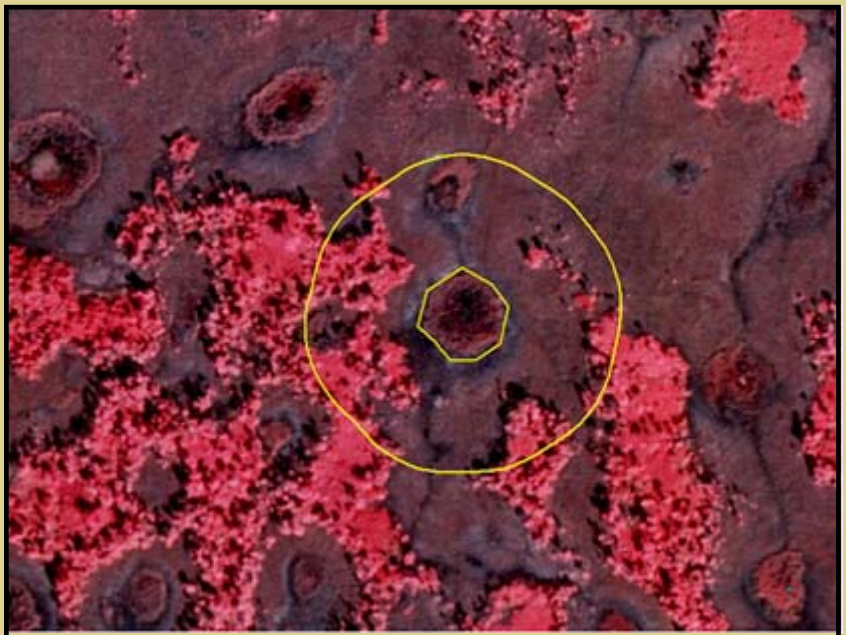
c. Wildlife access to and from outside – distance and barriers (continued)

Wetland in Hernando County with no landscape barriers such that wildlife access is not limited. (LS)

Wetland in Palm Beach County where wildlife access is severely limited due to distance and barriers including roads, a parking lot, and single family residential.. (KCR)

Location and Landscape Support - 62-345.500(6)(a), FAC

c. Wildlife access to and from outside – distance and barriers (continued)



Wetland with no landscape barriers such that wildlife access is not limited. (KCR)

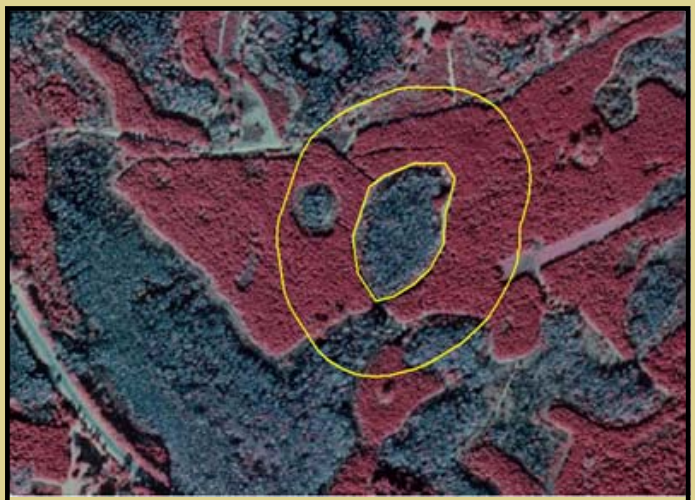
Wetland in Alachua County with landscape barriers (privacy fence) that substantially limits some wildlife access to and from outside. The fence delineates a high density residential area to the N and E of the wetland. (KCR)

Location and Landscape Support- 62-345.500(6)(a), FAC

d. Functions that benefit fish and wildlife downstream – distance or barriers

Guidance: *The functions provided by an assessment area to fish and wildlife in "downstream locations" are influenced by distance or barriers that reduce the opportunity for the assessment area to provide these benefits. Are there physical barriers to hydrologic connections? Is the distance so great that little influence to downstream fish and wildlife populations is possible? Are there intervening conditions that make a connection with downstream habitats unlikely (for instance waters with zero oxygen, or highly contaminated)? If the assessment area were to serve as a nursery or breeding area for a species, can the young disperse to downstream habitats?*

Scoring this attribute for isolated wetlands. It is recognized that isolated wetlands generally lack surface water connections to downstream waters *except in seasonally high waters*, and as a result, this attribute should be evaluated in light of potential connections rather than existing connections.



Wetlands partially limited by distance and barriers (pine plantation to W and inflow ditch to NW) to provide benefits to downstream habitats (100 m radius around the wetland).

Wetland in Osceola county with distance and barriers that substantially reduce opportunity to provide benefits to downstream habitats (1 mile radius around the wetland).

Location and Landscape Support - 62-345.500(6)(a), FAC

e. Impacts of land uses outside assessment area to fish and wildlife

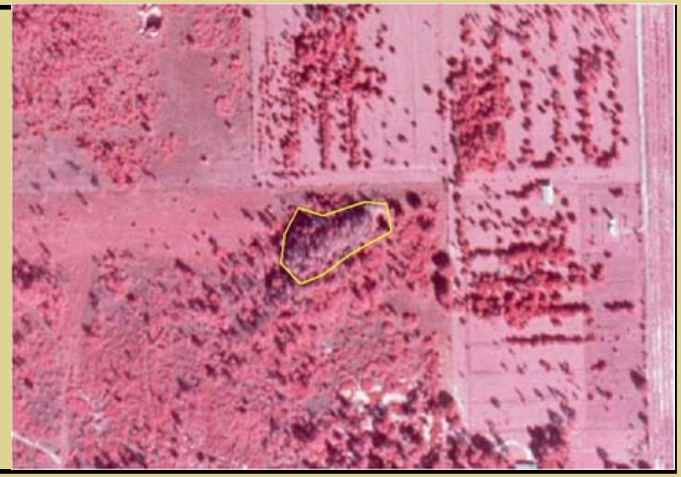
Guidance: *The functions provided by an assessment area to fish and wildlife are influenced by the intensity and types of land uses in the surrounding areas. Some land uses, by the presence of associated attributes like noise, people, domesticated animals, and runoff of pollutants, can have deleterious effects on habitat quality. Do surrounding land uses have noise levels that might reduce habitat quality? Are there other disturbances such as potential for humans or domesticated animals to affect habitat quality? Is the assessment area situated in such a way as to receive direct runoff from parking lots, roads, or buildings? Are there adjacent land uses that may adversely affect habitat quality because of night lighting, or activity?*

Reference wetland in Levy County, where land uses have no adverse impacts on wildlife (right), while the high density residential landscape in Flagler County (left) may have significant adverse impacts on wildlife.

Location and Landscape Support - 62-345.500(6)(a), FAC

e. Impacts of land uses outside assessment area to fish and wildlife (continued)

Low density residential in Collier County (left), and improved and unimproved pasture in Lee County (right), may both provide moderate adverse impacts to wildlife.



Wetland in Hardee county surrounded by mining operations that may have significant adverse impacts to wildlife.

f. Benefits to downstream or other hydrologically connected areas

Guidance: *The assessment area may provide water quantity and quality benefits to downstream habitats based on the degree of hydrologic connectivity, which in turn can be impaired by roads, ditches, channels, and other water barriers. Are there hydrologic impediments or flow restrictions that may limit the opportunity of the assessment area to provide benefits to downstream or other hydrologically connected areas?*

Scoring this attribute for isolated wetlands. It is recognized that isolated wetlands generally lack surface water connections to downstream waters *except in seasonally high waters*, and as a result, this attribute should be evaluated in light of potential connections during the wet season rather than existing connections.

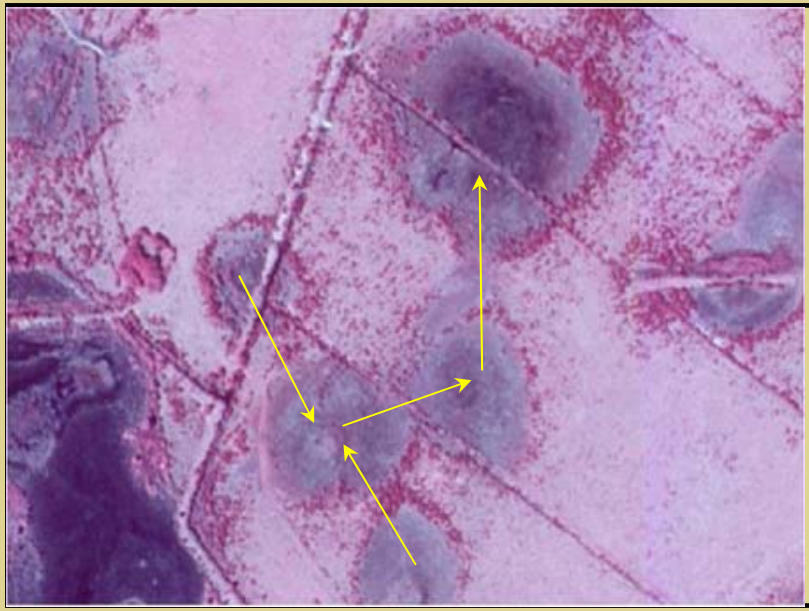
Wetland in Osceola County, looking downstream. This wetland has limited impediments to downstream connectivity due to ditching. (CV)

Wetland in Osceola County severely limited by hydrologic impediments such as the highway to the south.

g. Benefits to downstream habitats from discharges

Guidance: *This attribute evaluates the extent to which downstream habitats are affected by discharges from the assessment areas. If a downstream system is critically or solely dependent on discharges from the assessment area, then the benefits to downstream habitats would be very high.*

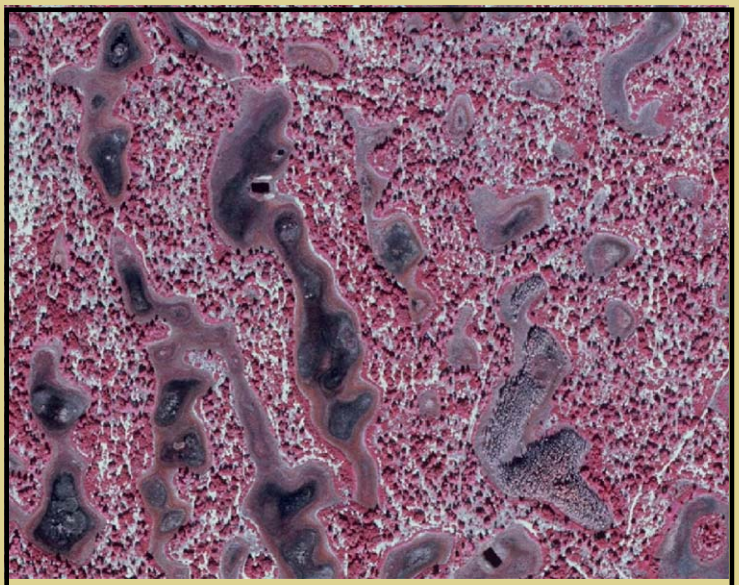
Scoring this attribute for isolated wetlands. It is recognized that isolated wetlands generally lack surface water connections to downstream waters *except in seasonally high waters*, and as a result, this attribute should be evaluated in light of potential connections during the wet season rather than existing connections.



False color image showing a series of herbaceous wetlands in Palm Beach County connected to each other, where each is progressively dependent on the upstream marshes for hydrologic discharges. Even though some channelization has occurred, the wetlands downstream continue to derive significant benefits from discharges from upstream.

h. Protection of wetland functions by upland mitigation assessment areas

Guidance: *This factor applies to upland mitigation areas only. It assesses the level of protection of wetland functions by the upland mitigation areas. Does the proposed upland mitigation area adequately protect wetland functions through adjacency? Is it connected? Does it provide some measure of water quality improvement or sediment control? Does it act as a buffer to surrounding land uses or other adverse activities? Does the upland mitigation area provide some measure of habitat enhancement through interconnection with wetland areas?*



Aerial false color image of upland buffer (sand hills in Polk County) that provides hydrologic and habitat support for adjacent wetlands.

Aerial false color image of upland pine community in Marion County with no direct connection to surface water and wetlands.

Section Divider

Support to wildlife by outside habitats

Relevant Literature for assessing the appropriate area for outside habitats

Environmental Law Institute. 2003. **Conservation Thresholds for Land Use Planners.** Environmental Law Institute, Washington D.C., 64 pp. www.elistore.org (Last accessed June 2005)

Conservation Thresholds for Land-Use Planners provides a review and synthesis of information from the most up-to-date scientific literature to provide basic thresholds to land use planners to rely upon when making decisions affecting biodiversity. With more than 1,400 papers and abstracts reviewed for the project and a total of 160 papers selected for inclusion in the review, the report covers conservation thresholds on habitat patch area, percent suitable habitat, edge effects, riparian buffers, and corridors. The report summarizes what is known within the scientific community about potential land use planning and design thresholds.

Semlitsch, R.D. And J. R. Bodie. 2003. **Biological Criteria for Buffer Zones Around Wetlands and Riparian Habitats for Amphibians and Reptiles.** Conservation Biology (17) 5: 1219–1228

The authors provide an estimate of the biologically relevant size of core habitats surrounding wetlands for amphibians and reptiles and summarize data from the literature on the use of terrestrial habitats by amphibians and reptiles associated with wetlands (19 frog and 13 salamander species representing 1363 individuals; 5 snake and 28 turtle species representing more than 2245 individuals). Core terrestrial habitat ranged from 159 to 290 m for amphibians and from 127 to 289 m for reptiles from the edge of the aquatic site.

JEA et al., 1999. **Calculating Buffer Zone Widths for Protection of Wetlands and Other Environmentally Sensitive Lands in St. Johns County** (JEA PROJECT NO.: 19270-485-01). JONES, EDMUNDS & ASSOCIATES, INC. 730 N.E. Waldo Road, Building A Gainesville, Florida 32641)

This report provides a basis for determining appropriate buffer width(s) that will protect environmentally sensitive lands in St. Johns County, Florida based on results published in the scientific literature. Methodologies based on scientific studies were assembled calculating appropriate buffer widths that will protect aquatic resources in environmentally sensitive lands. Much of the methodology was adopted from previous buffer zone studies conducted in Florida, (referenced throughout the text). Three goals were identified that were used to determine buffer sizes for wetland protection: protection of wildlife habitat; minimization of sediment transport into wetlands; and minimization of groundwater drawdown in wetlands. The report provides methodologies for calculating buffer sizes necessary to achieve these three goals. Volume 1 of the report summarizes information that was reviewed and assessed for developing buffer zone widths for the county, including identification and classification of ecological habitats in the county, review of other county ordinances, review of other wetland regulations, review of related reports and studies, and review of legal implications.

Support to wildlife by outside habitats

Partial List of Spatial Requirements of Wetland-Dependent Native Wildlife Species
(FROM: JEA et al. 1999)

Additional slides present in Adobe pdf version are provided in Microsoft Word due to their format

Invasive exotics or other invasive plant species

Additional slides present in Adobe pdf version are provided in Microsoft Word due to their format

Section Divider

Water Environment - 62-345.500(6)(b), FAC

a. Water levels and flows

Guidance: *Depending on season and wetland type, standing water may or may not be present in an assessment area. During the wet season (May-August), cypress swamps, floodplain forests, basin swamps, and freshwater marshes may all have standing water. However, in the dry (November-March) season, even the wettest sites may only exhibit saturated soils. While every year is different, most of the precipitation in Florida occurs between May and August, so expect to see standing water in a wetland beginning in late summer (June and July) extending into the early fall.*

Regional differences can affect the amounts of flowing or standing water as well. For instance, in north Florida during the winter months, reduced transpiration from deciduous species may result in higher water levels than otherwise expected.

Reduced transpiration in surrounding upland vegetation as a result of logging operations, for instance, can significantly increase water levels in wetlands and water bodies.

When scoring this indicator criterion, determine whether the water levels and flows are appropriate for the particular system you are evaluating, taking into consideration seasonal variation, antecedent weather, and other climatic effects.

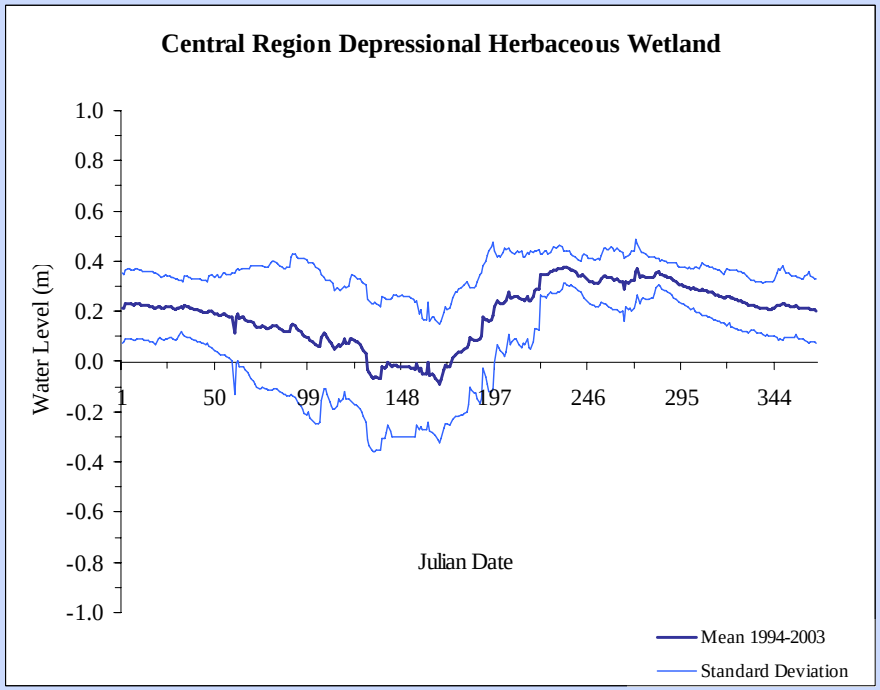
Below are typical hydroperiods of some common wetland communities (FNAI, 1990):

wet flatwoods	30-90 days/yr
wetland hardwood forests	60 days/yr
wet prairie	50-100 days/yr
basin marshes	200 days/yr
isolated cypress domes	200-300 days/yr
floodplain swamps	300 days/yr

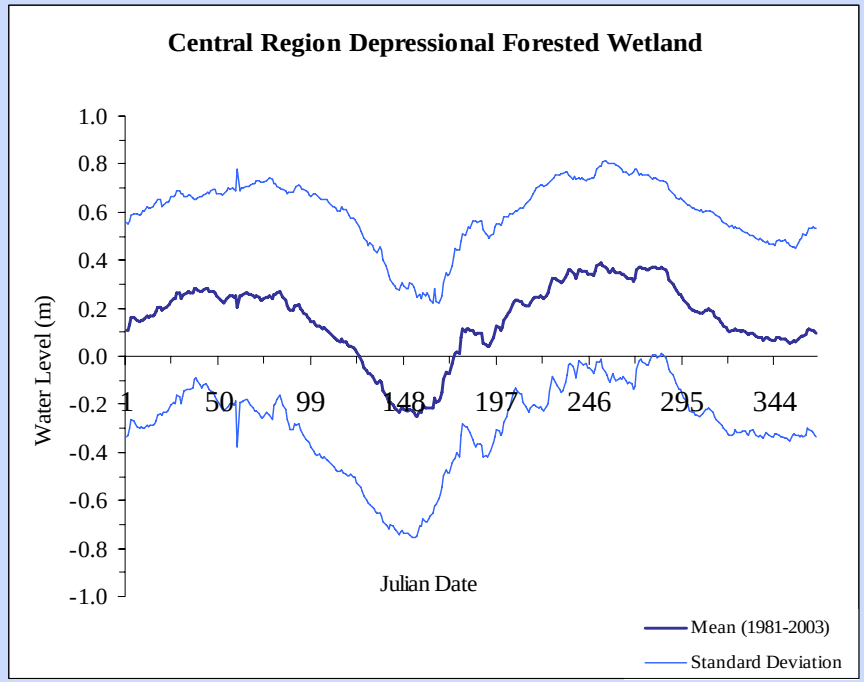
Water Environment - 62-345.500(6)(b), FAC

a. Water levels and flows (continued)

The graphs below provide examples of average "expected" levels for depressional herbaceous (left) and forested (right) wetlands in central Florida. Since water levels are extremely variable and dependent on many factors (precipitation, weather patterns, etc.), please take all other variables into account when scoring this indicator.



Data from SWFWMD 1994-2003.



Data from SWFWMD 1981-2003.

Water Environment - 62-345.500(6)(b), FAC

b. Water level indicators

Guidance: *Several hydrologic indicators exist that help assess water conditions at a site. This section focuses on those indicators that give insight into typical water levels experienced at a site. Can you see distinct water lines? Are they indicative of reasonable water levels for the community type you are assessing?*

Mosses or liverworts. These are in a group of plants called bryophytes, which lack true roots and leaves, and are found in moist environments. When water levels fall, they appear as a dark greenish-brown growth on the bark of trees or on hard substrates such as rocks.

Moss collars and lichen lines on a cypress trunk. (KCR)

Moss collars, lichen lines, and water marks on cypress trees during low water levels. (KCR)

Water Environment - 62-345.500(6)(b), FAC

b. Water level indicators (continued)

Aufwuchs. Aufwuchs are assemblages of sessile, attached or free-living, nonvascular plants and invertebrate animals that develop during periods of inundation. They can be present on branches, rocks or other objects that have been submerged, and when dry appear as a crusty growth, sometimes white.

Dried out aufwuchs in Meritt Island. (EH)

Water Environment - 62-345.500(6)(b), FAC

b. Water level indicators (continued)

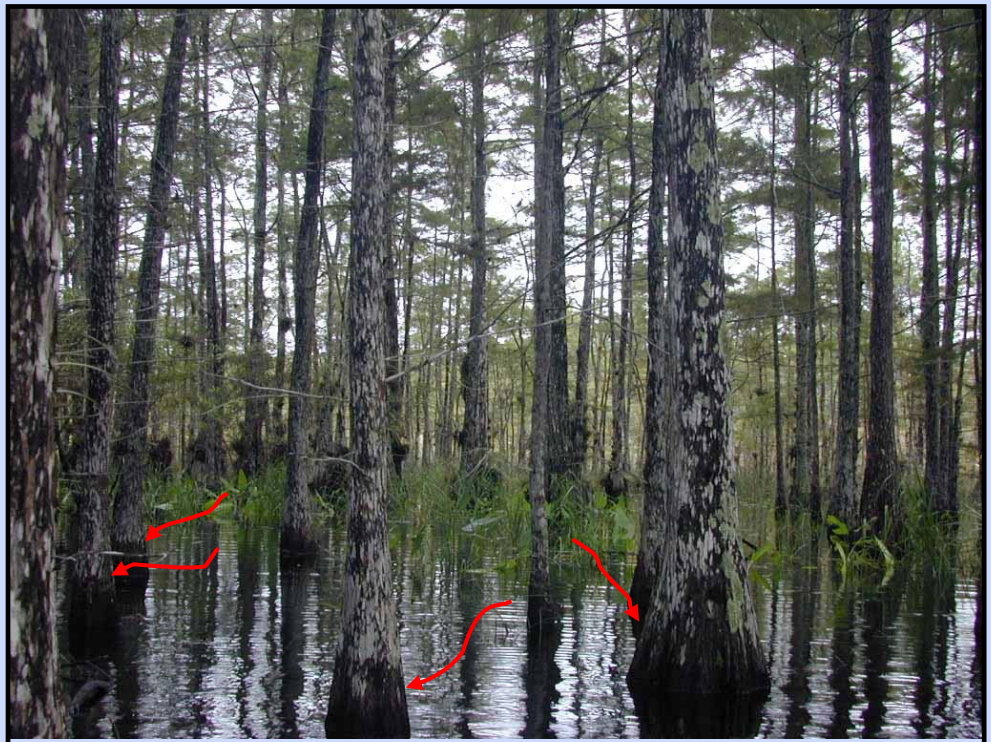
Drift lines and rafted debris. These are composed of vegetation, litter, and other materials that have been carried by water and have been deposited, usually in distinct lines or locations, directly on the ground or sometimes entangled within vegetation. They can be indicative of high water levels. This indicator will typically be found in coastal wetlands as well as floodplains or any wetland exhibiting high water levels fluctuations.

Drift lines and rafted debris in the St. Marks Wildlife Refuge showing high water mark. (EH)

Water Environment - 62-345.500(6)(b), FAC

b. Water level indicators (continued)

Elevated lichen lines. Lichens are an association of a fungus and an alga, and appear as flattened film on the bark of trees. They are not tolerant of inundation, therefore high standing water around the trunks of trees impedes their growth, thus producing a distinct line which is indicative of ordinary or seasonal high water levels. In wetlands that do not have prolonged inundation, lichens can grow on the trunks at ground level.



Lichen lines on tree trunks, stopping at the high water line. (KCR)

b. Water level indicators (continued)

Morphological Plant Adaptations. These refer to special structures or features developed by plants under water logged conditions, which are not normally present in dry conditions. They include adventitious roots and lenticels. The former are usually developed on the stem or trunk of certain plants, and they aid the plant's aerobic respiration during anoxic periods. When the inundation period ends, these roots stop developing. Lenticels are another mechanism for aerobic respiration, and they appear as blister-like breaks on the outer bark of stems and roots.

Many species of bottomland hardwood trees develop adventitious roots and lenticels, as well as shrub species such as wax myrtle (*Myrica cerifera*), water-primrose (*Ludwigia* spp.), and St. John's wort (*Hypericum* spp.).

Other examples of morphological plant adaptations to water logged conditions include the "knees" of cypress trees (*Taxodium* spp.), and the buttressed trunks of swamp tupelo (*Nyssa sylvatica* var. *biflora*), American elm (*Ulmus americana*), and swamp laurel oak (*Quercus laurifolia*).

Water Environment - 62-345.500(6)(b), FAC

b. Water level indicators (continued)

Lenticels on trunk of water tupelo. (EB)

Buttresses on cypress trees. (EB)

Water Environment - 62-345.500(6)(b), FAC

b. Water level indicators (continued)

Water Marks. Water marks are the result of sustained water levels and appear as distinct stain lines on fixed objects and vegetation. These are usually related to the elevated lichen lines, and can be used to evaluate ordinary or seasonal high water levels.

Distinct water stain lines, approximately 2 feet high, on trunks of bald cypress in the Lower Suwannee NWR floodplain ecosystem. Photo taken March 2004. (EB)

Water stain lines and lichen lines on trunks of bald cypress. (KS)

c. Soil moisture

Guidance: *Most wetlands exhibit moist or saturated soils throughout the year. In some cases, practices such as excessive well water pumping result in lowered groundwater tables and consequent drainage of wetlands. Dry soils oxidize rapidly and this can result in soil subsidence, which is defined as the lowering of the soil level caused by the shrinkage of organic layers due to desiccation, consolidation, and biological oxidation. When scoring this indicator criterion, you must determine whether the soil moisture is appropriate for the particular system you are evaluating, taking into consideration seasonal variation, antecedent weather, and other climatic effects.*

Soil subsidence that has resulted in root exposure (MS).

Soil subsidence exposing roots of cypress knees (EH).

Water Environment - 62-345.500(6)(b), FAC

c. Soil moisture (continued)

The following hydric soil indicators identify soils with a high water table capable of providing saturation to the soil surface for extended periods of time.

All Soils	Sandy Soils	Loamy and Clayey Soils
Stratified Layers	Sandy Redox	Depleted Matrix
Organic Bodies	Stripped Matrix	Marl
	Dark Surface	Umbric Surface
	Polyvalue Below Surface	Thick Dark Surface
	Thin Dark Surface	Fe/Mn Masses
		Depleted Dark Surface
		Redox Dark Surface

A fact sheet on hydric soil characteristics is available from FDEP at the following URL:

http://www.dep.state.fl.us/water/wetlands/delineation/fact.htm

Water Environment - 62-345.500(6)(b), FAC

c. Soil moisture (continued)

Generally, in sandy textured soils, if the soils are wetland/hydric soils, the hydric soil indicators should be prevalent within 6 inches of the soil surface.

In loamy and clayey textured soils, the hydric soil indicators should be prevalent within 12 inches of the soil surface.

Soil core from reference marsh in Apalachicola Nat. Forest, Leon County (RF).

Consolidation and oxidation in a cypress forest in Clay county. (JS)

Water Environment - 62-345.500(6)(b), FAC

d. Soil erosion or deposition

Guidance: *Evidence of soil erosion and deposition is usually found in flowing systems such as floodplain swamps. When the river or stream overflows its banks, it deposits its sediment load in the floodplain. Water flowing through the system can also carry away some of the topsoil, and this is more prominent when water levels and velocity are excessively high. It is important to make the distinction between natural erosion/deposition and one indicative of deviation from that normal state (ie, bends in a river versus a delta at the mouth of a canal).*

Creek in Leon County that is receiving run-off high in sediments and eroded soil from a nearby wetland. (EH)

Soil deposition in forested wetland (EH).

Water Environment - 62-345.500(6)(b), FAC

e. Evidence of fire history

Guidance: *This attribute assesses whether the evidence of fire history indicates increased fire frequency and intensity due to decreased water supply/hydroperiod, or, on the opposite side of the spectrum, fire suppression, perhaps caused by seasonally or permanently impounding too much water. Excessively dry wetlands burn more often, with greater intensity, and may lead to deep muck fires than the same type wetland with normal hydrology. On the opposite side of the spectrum, fires could be suppressed in those communities adapted to it by seasonally or permanently impounding too much water.*

Prescribed fire in pine flatwoods adjacent to a forested wetland in Leon County. (JS)

A thick layer of evergreen shrubs in the background of this urban forested wetland in Lee County has developed perhaps from water impoundment causing higher water depth and sustained periods of flooding, in turn decreasing the possibility of fire. (KCR)

Water Environment - 62-345.500(6)(b), FAC

e. Evidence of fire history (continued)

Comparison of a prescribed fire in Taulking State Forest pine flatwoods with adjacent unburned area (EH).

Extreme fire in pitcher plant bog in Escambia county (EH).

Water Environment - 62-345.500(6)(b), FAC

f. Vegetation – community zonation

Guidance: *This attribute assesses whether the community zonation is appropriate for the ecosystem type. Many wetland types exhibit distinct community zonation. For instance, isolated freshwater marshes may have distinct rings of vegetation from the edge towards the interior. Similarly, cypress domes may have an inner core dominated by pure cypress canopy and a shrub layer adapted to deep standing water, whereas the outer zone may include a variety of species.*

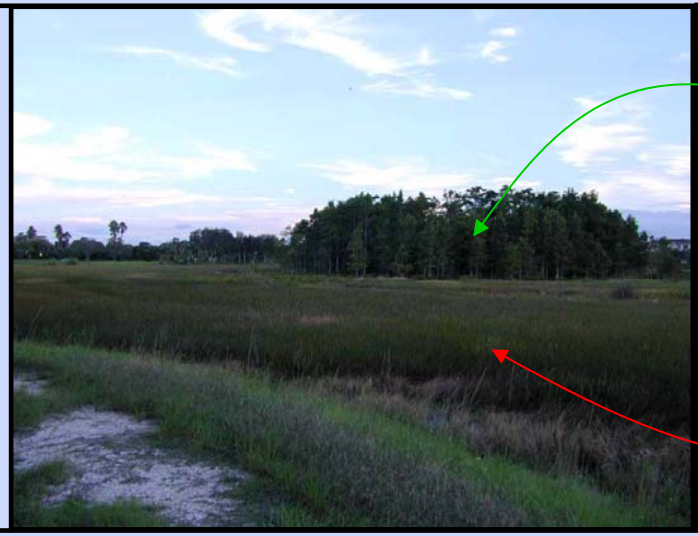
When a wetland becomes hydrologically impaired, this community zonation can be disrupted. For instance, the presence of young pines (slash and loblolly), indicating regeneration, in the center of a cypress dome can be indicative of water drawdown. Similarly, upland species encroachment into a wetland is also indicative of wetland drainage. On the other hand, community zonation can also be disrupted by water impoundment. For instance, cattails (Typha spp.) are adapted to high water levels in marshes, while in forested systems water impoundment results in the lack of a herbaceous layer.

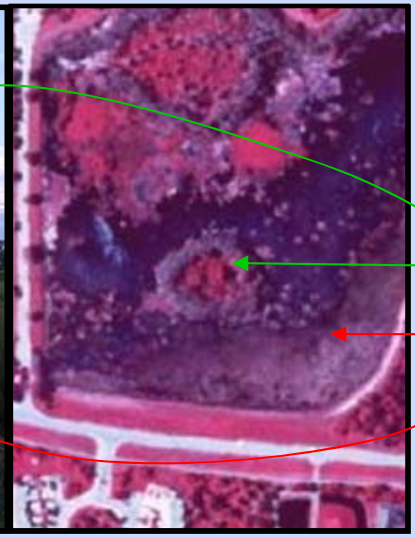
Urban wetland in Osceola County receiving excess water inputs from large roadways and commercial parcels, showing limited herbaceous layer and an abundance of red maple *(Acer rubrum)* seedlings. (KCR)

Water Environment - 62-345.500(6)(b), FAC

f. Vegetation – community zonation (continued)

Wetland complex in Palm Beach County with distinct community zonation, herbaceous vegetation in the foreground and forested areas in the distance. Photos show the landscape view (left) and the aerial view (right). (KCR)





Forested vegetation zone

Herbaceous vegetation zone

Zonation in reference wetland in Hale Scott showing species zonation starting with Rhexia, then hypericum, etc progressing to forested hammock with increasing water levels. (EH)

Water Environment - 62-345.500(6)(b), FAC

g. Vegetation – hydrologic stress

Guidance: *This attribute assesses the extent of hydrologic stress on vegetation. Hydrologic stress can manifest itself in many different ways, including increased mortality, leaning or fallen trees, thinning canopy, as well as susceptibility to insect damage or disease. Do you see a large number of leaning or fallen trees? Is there increased plant mortality at the site? Is there evidence of insect damage or disease?*

This image was taken in late May 2001. Notice how the cypress trees have not yet leafed out, most likely due to hydrologic stress. This is also indicated by the growth of pasture grass at the base of the cypress trees. (KCR)

Fallen and leaning trees in a hydrologically impacted forested wetland in Saint Lucie County. The wetland is surrounded by orange groves, and water is routinely drawn down or impounded according to the needs of the orange growers. (KCR)

Water Environment - 62-345.500(6)(b), FAC

h. Use by animal species with specific hydrological requirements

Guidance: *This attribute assesses the presence or evidence of use by certain animal species with specific hydrologic requirements. However, when scoring this factor keep in mind that many species will not be seen during a brief site investigation, so the mere absence of sightings should not be counted against the particular site.*

Many amphibians, such as pinewoods treefrog, barking treefrog, striped newt, and flatwoods salamander, can only survive and reproduce in ephemeral isolated wetlands that lack predatory fish. Apple snails, mostly found in freshwater marshes in south Florida (Everglades) and in spring runs, lay their eggs above the water line on vegetation, logs, boats, or other suitable structures. Therefore, water levels need to be consistent in order for apple snails' eggs to hatch successfully. Wood storks require decreasing water levels that concentrate food when nesting and feeding their young.

pinewoods treefrog

barking treefrog

crayfish chimneys

striped newt

flatwoods salamander

apple snail

Water Environment - 62-345.500(6)(b), FAC

i. Plant community composition – species tolerant of and associated with water quality degradation or alterations in water levels and flows

Guidance: *The presence of tolerant wetland plant species can be an indication of degraded water quality. For instance, cattails (Typha spp.), duckweeds (Lemna spp. and Spirodela spp.), water lettuce (Pistia stratioties) and water hyacinth (Eichornia crassipes) are usually associated with high levels of nutrients. Species typical of low nutrient conditions include bladderwort (Utricularia spp.), sawgrass (Cladium jamaicense), pitcher plants (Sarracenia spp.), and wire grass (Aristida beyrichiana).*

Forested wetland in Holmes County with a floating mat of duckweed, which is indicative of water quality degradation and excess nutrients (notice the cows in the background). (MMH)

Forested wetland in Lower Suwannee NWR with bladderwort in water column, which is indicative of oligotrophic conditions. (EB)

Water Environment - 62-345.500(6)(b), FAC

i. Plant community composition – species tolerant of and associated with water quality degradation or alterations in water levels and flows (continued)

Urban wetland in Citrus county receiving excess water inputs from golf courses and high density residential, showing limited herbaceous layer and no regeneration of tree species . (JS)

Water Environment - 62-345.500(6)(b), FAC

j. Direct observation of standing water

Guidance: *When standing water is present, observations of water discoloration, turbidity, and oil sheen can help assess the water quality conditions at a site. It is extremely important, however, not to confuse what is a normal discoloration and turbidity from an atypical situation. For instance, even natural ecosystems exhibit an oil sheen on the water surface, but its appearance is very different from anthropogenic sources of oil.*

Normal oil sheen (covered in pollen) in reference cypress dome within the Lower Suwannee National Wildlife Refuge. March 2004. (EB)

Rusty water color resulting from algal growth in impacted wetland in Collier county. (JK)

Water Environment - 62-345.500(6)(b), FAC

j. Direct observation of standing water (continued)

Water color in a pristine marsh (above, Goethe State Forest), and a pristine cypress forest (right, LSRNWR), March 2004. (EB)

k. Existing water quality data

Guidance: *When water quality data exist for a particular site, it is important to compare them with expected values for the same ecosystem type. Studies have been conducted over the years that show typical values for nutrients and oxygen levels in different types of wetlands. However, the natural variability can be high, so caution needs to be used when using water quality data, especially if the information was collected only once and does not represent long-term collection and analysis.*

Following are typical values expected in a variety of sites.

		DO mg O_2/L	T °C	Color PCU	pH	Turbidity NTU	Specific Conductance umhos/cm	Ammonia-N mg N/L	NO_2NO_3-N mg N/L	TKN mg N/L	TP mg P/L
Marsh Reference	Minimum	0.62	15.0	30	3.43	0.4	13	0.005	0.002	0.410	0.008
	Maximum	27.00	36.0	1200	7.72	10.0	410	2.600	0.091	6.000	0.120
	Mean	4.53	25.8	289	5.05	2.1	76	0.174	0.006	1.899	0.036
Marsh Agricultural	Minimum	0.02	16.0	100	4.10	0.4	18	0.010	0.002	0.730	0.008
	Maximum	11.80	37.5	8000	8.14	5600.0	1400	48.000	0.220	110.000	45.000
	Mean	4.08	26.9	598	6.26	163.7	247	1.378	0.009	5.365	1.747
Forested Reference	Minimum	1.08	18.7	30	3.76	0.2	24	0.002	0.002	0.002	0.020
	Maximum	8.10	32.6	1000	7.77	20.0	180	1.700	1.900	5.600	0.640
	Mean	2.93	26.2	285	5.21	3.8	81	0.152	0.088	1.930	0.079
Forested Agricultural	Minimum	0.72	21.5	80	4.58	0.7	28	0.022	0.002	1.000	0.019
	Maximum	4.05	31.0	750	7.54	180.0	410	2.200	0.021	8.500	5.000
	Mean	1.64	25.2	346	6.22	17.7	136	0.332	0.007	3.174	0.808
Forested Urban	Minimum	0.32	18.5	50	4.06	0.7	62	0.012	0.002	0.600	0.040
	Maximum	4.40	29.4	600	7.74	58.0	580	0.960	0.120	3.700	1.100
	Mean	1.91	24.9	198	6.36	9.5	231	0.188	0.019	1.838	0.235

Data from UF-CFW 1999-2002.

Water Environment - 62-345.500(6)(b), FAC

l. Water depth, wave energy, currents, and light penetration

Guidance: *This attribute assesses the appropriateness of water depth, wave energy, currents, and light penetration in the particular type of wetlands or surface waters. For instance, seagrasses or other submerged aquatic vegetation are more likely found in clear water versus turbid water, where instead the submerged vegetation is usually sparse. While wave energy and currents do not generally apply to isolated systems, they can be quite important to stream and lake swamps and coastal systems.*

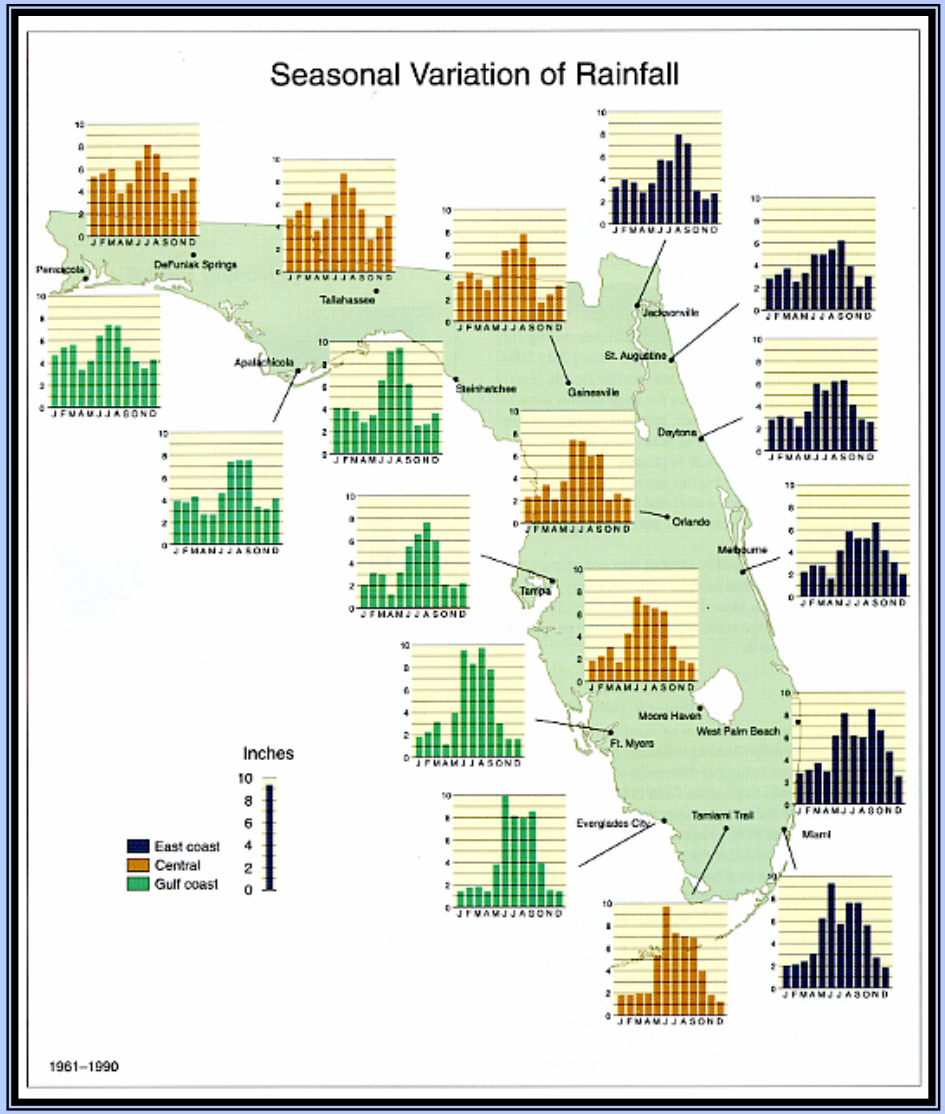
Light penetration in a reference cypress forest within the Lower Suwannee NWR. Notice bladderwort, indicative of oligotrophic systems, suspended in the water column. (EB)

Forested and herbaceous wetland in Wakulla county with extremely turbid waters that significantly limit light penetration. (JS)

Section Divider

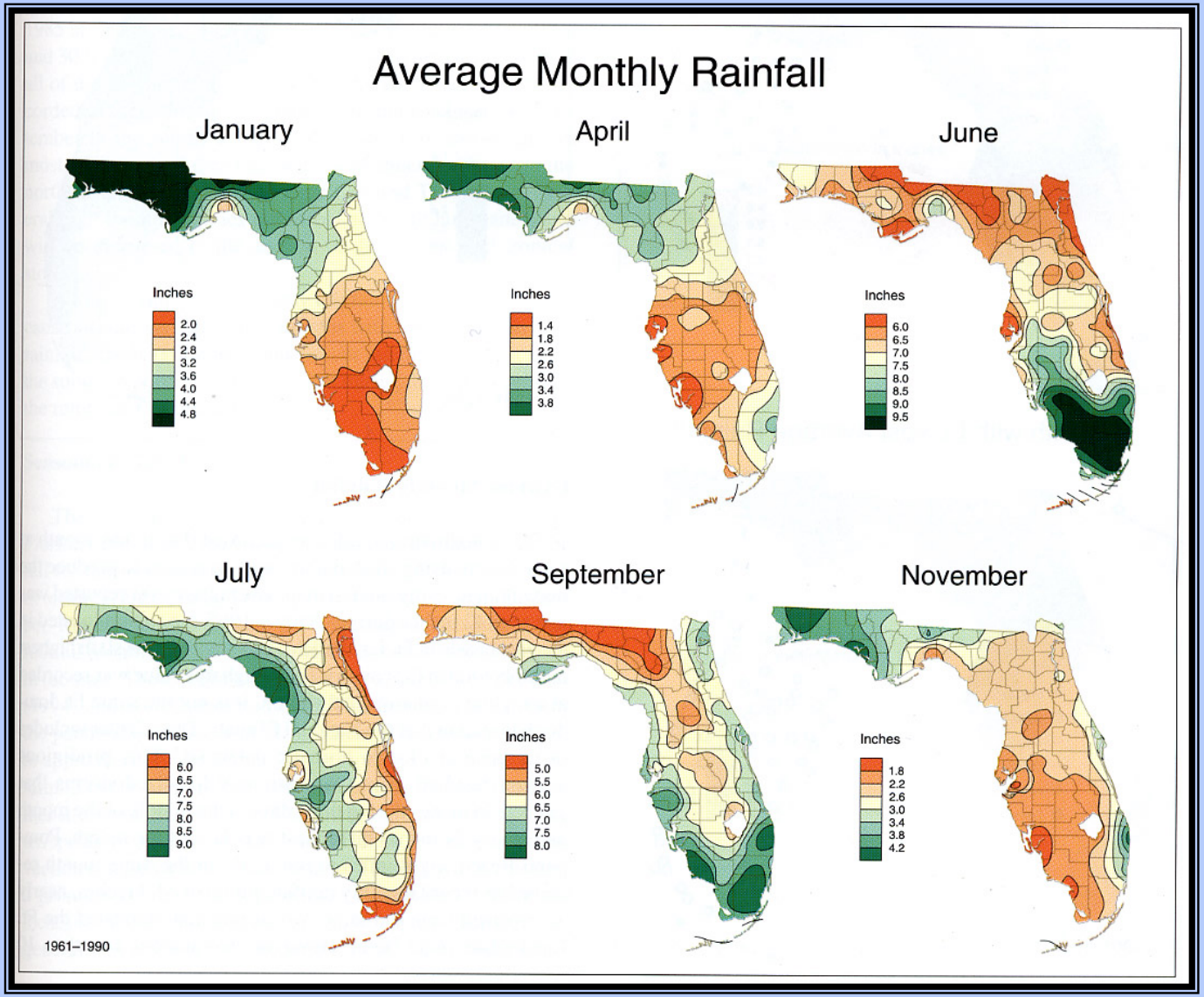
Florida Precipitation…

Precipitation varies from year to year. The graphs at right show average conditions for various locations in Florida. Generally, there is more rain fall in northern peninsular Florida and the panhandle in the winter months than is southern Florida. The dry season tends to be more pronounced in the south, while north Florida often has a relatively wet winter season.



From: Fernald, E.A. and E.D. Purdum (eds). 1998. Water Resources Atlas of Florida.

Florida Precipitation…



From: Fernald, E.A. and E.D. Purdum (eds). 1998. Water Resources Atlas of Florida.

Section Divider

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and Structural Habitat

I. Plant cover and species in the canopy, shrub, or ground stratum

Guidance: *This attribute evaluates the appropriateness of the plant composition in the canopy, shrub, and ground stratum of the wetland type being evaluated. Refer to the wetland field guides provided in this manual to identify appropriate and desirable species based on the wetland type. All three strata should be evaluated when present. In forested wetlands, often the herbaceous community (ground stratum) will exhibit changes in species composition resulting from degraded environment conditions long before the species composition of the shrub or canopy stratum.*

Cypress dome with typical species, including cypress and gum in the canopy layer, wax myrtle and sabal palmetto in the shrub layer, and chain fern and maidencane in the herbaceous layer. (KCR)

Floodplain swamp with typical species, including cypress, tupelo, sweet gum, red maple, and American elm in the canopy layer. (EB)

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and Structural Habitat

II. Invasive exotics or other invasive plant species

Guidance: *Identify any invasive exotic species within the assessment area, and estimate their cover with respect to desirable vegetation. Become familiar with the Florida Exotic Pest Plant Council's list of Invasive Species. You can also refer to the wetland field guides for identification of the most common exotic wetland hardwood species.*

Brazilian pepper

Chinese tallow

Melaleuca

Cypress wetland with majority of plant cover composed of invasive exotics such as Brazilian pepper and melaleuca (left). (KCR)

Floodplain swamp with typical species, and no invasive exotics or other invasive plant species (right). (EB)

II. Invasive exotics or other invasive plant species (continued)

Tuberous sword fern (*Nephrolepsis cordifolia*) an EPPC Category I invasive exotic found in an urban forested wetland in Palm Beach County. (KCR)

The EPPC Category II invasive exotic wedelia (*Wedelia trilobata*) and the exotic species wandering-jew (*Tradescantia zebrina*) in an urban forested wetland in Palm Beach County. (KCR)

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and Structural Habitat

III. Regeneration and recruitment

Guidance: *Regeneration and recruitment should be noted, since evidence of seed production can provide insight into the health of an ecosystem. Is there evidence of tree recruitment or seed production? Recruitment is not always evenly spaced throughout a wetland. For instance, a higher density of seedlings is typical in open canopy areas, where canopy cover is reduced either due to natural causes (tree fall or fire), or anthropogenic disturbance (harvest). In some ecosystems, such as cypress domes, regeneration and recruitment is often highest on the outskirts of the depression, where the high water levels deposit the seeds and hydroperiods and light levels are conducive to generation.*

Regeneration and recruitment along the edge of a cypress dome, where the high water levels deposit the seeds. (KCR)

The lack of regeneration and recruitment in a heavily grazed cypress dome in Alachua county is evidenced by the lack of small diameter trees and seedlings. (JS)

IV. Age and size distribution

Guidance: *Forested wetland ecosystems should exhibit a wide range of age and size distribution that includes several cohorts of mature trees, younger trees, and a variety of seedlings and saplings. This ensures that when the mature tree dies and/or falls, there will be quick recruitment by younger trees to fill the open space. Age and size distributions that lack young (small) trees may be indicative of environmental conditions that preclude germination.*

Age and size distribution in a logged cypress swamp, where only smaller trees have been left. (KCR)

Normal age and size distribution in a floodplain swamp, showing trees of different ages and sizes throughout. (EB)

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and Structural Habitat

V. Density and quality of coarse woody debris, snag, den and cavity

Guidance: *Woody debris, snags, dens and tree cavities provide cover habitat for wildlife, as well as offering a diversity of forage and nesting sites. Fallen tree logs also increase the microtopographic diversity within sites, thus allowing a diverse assemblage of plant species and providing microhabitats for various wildlife. Does the density and quality of coarse woody debris, snags, dens and cavities within the wetland appear to provide appropriate structural habitat for the type of system being evaluated?*

Fallen tree logs and woody debris in a reference cypress dome in Lower Suwannee NWR, showing overall optimal structural habitat. (EB)

Wildlife cavity at the base of a water tupelo. (EB)

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and Structural Habitat

V. Density and quality of coarse woody debris, snag, den and cavity (continued)

Forested wetland with excessive quantity of woody debris, because of increased levels of dying vegetation in a cow impacted wetland in Lee county (note "cow patties" in the foreground) . (KCR)

Normal woody debris in a forested wetland in Osceola County. (KCR)

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and Structural Habitat

VI. Plant condition

Guidance: *The overall condition of the plant community can be an indication of disturbance and can be evaluated by observing dead or dying vegetation, chlorotic (yellowing or bleaching) or spindly growth, and damage caused by insects. Often herbaceous vegetation and tree seedlings will exhibit chronic conditions before more mature vegetation.*

Careful attention should be given to seasonality effects on plant communities.

Dead cypress trees in a wetland in Polk County. Death probably due to water discharge from chicken farm. (KCR)

Impounded wetland near Bristol in Liberty County, used for storm water storage prior to discharge into Apalachicola River. (PJ)

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and Structural Habitat

VII. Land management practices

Guidance: *This attribute includes observations of land management practices in and around the wetland. Mowing, grazing, fire suppression and water control features (furrows or ditches), as well as logging operations can affect the condition of the plant community. Is there evidence of the management practices that will affect the plant community either in a positive (enhancing long term sustainability of the community) or negative manner?*

Wetland in Hendry county surrounded by high intensity pasture showing drainage ditch. (KCR)

Age and size distribution in a logged cypress swamp, where only smaller trees have been left. (KCR)

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and Structural Habitat

VIII. Topographic features such as refugia ponds, creek channels, flats or hummocks

Guidance: *Topographic diversity offers a variety of forage and cover sites for wildlife, as well as a diversity of microhabitat for the plant community. Forested wetlands generally have higher micro-topographic diversity, while herbaceous wetland tend to exhibit less. Deeper areas that do not dry out during the dry season offer wildlife refugia within a wetland.*

A refugia pond in the center of a forested wetland that holds water during drier periods . (KCR)

Secondary stream channel in a forested riparian wetland, Lower Suwannee River National Wildlife Refuge, June 2004 (EB).

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and Structural Habitat

VIII. Topographic features such as refugia ponds, creek channels, flats or hummocks (continued)

Recently constructed wetland, showing NO topographic relief (MTB).

Recently constructed wetland adjacent to forested riparian wetland, showing some topographic relief resulting from dozer tracks (MTB).

IX. Siltation or algal growth in submerged aquatic plant communities

Guidance: *Applicable only to submerged aquatic plant communities, this attribute evaluates the degree of siltation and algal growth, and the degree that it can impede normal aquatic plant growth. Waters dominated by algae or that have high silt impede photosynthesis of submerged vegetation. Secchi depth is a long-accepted methods for evaluating the transparency of water in lakes. However, care must be used in interpreting secchi data because of the potential influence of non-algal or silt particulate material, such as the tea color of some lakes that's due to dissolved organic matter and organic tannins.*

Blue-green algal growth, indicative of poor water quality, and would greatly impede normal aquatic plant growth. (RF)

Filamentous algae, the density of which is indicative of poor water quality and would impede normal aquatic plant growth. (MTB)

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and Structural Habitat

X. Upland mitigation area – the level of habitat and life history support provided by the uplands for the fish and wildlife in the associated wetlands and surface waters

Guidance: *Applicable to upland mitigation area only, this attribute assesses whether the plant community and physical structure of the upland provide an optimal level of habitat and life history support for fish and wildlife associated with the nearby wetlands and other surface waters.*

Upland providing optimal level of habitat and life history support for fish and wildlife in the associated wetlands in Alachua County. (CRL)

Upland providing little or no habitat and life history support for fish and wildlife in the associated wetland in Flagler County. (KCR)

Community Structure - 62-345.500(6)(c), FAC

2. Benthic Communities

I. Species number and diversity of benthic organisms

Guidance: *This attribute evaluates the appropriateness, number and diversity of benthic organisms.*

II. Non-native and inappropriate species

III. Regeneration, recruitment and age distribution

Guidance: *Natural regeneration and recruitment should be noted, as well as evidence of appropriate age distribution.*

IV. Condition of appropriate species

Guidance: *This attribute evaluates the health and biomass of appropriate species.*

V. Structural features

Guidance: *This attribute evaluates whether the structural features are appropriate for the system or whether there is evidence of physical damage.*

VI. Topographic features

Guidance: *This attribute evaluates the appropriateness and condition of topographic features such as relief, stability, and interstitial spaces for hardbottom and reef communities, or snags and coarse woody debris for riverine systems.*

VII. Spawning or nesting habitats

Guidance: *This attribute assesses the condition and number of spawning and nesting habitats such as rocky or sandy bottoms.*

Section Divider

Expected Variation

Natural wetland communities may exhibit seasonal and regional variability in vegetation community structure and hydrology. For example, many wetland communities will be inundated during the wet season but may have no standing water during the dry season.

Depressional marsh in Goethe State Forest surrounded by pine flatwoods. Photo taken in March 2004. Marsh dominated by maiden cane with a distinct ring of St. John's Wort (yellow line left and continuing around wetland). (EB)

The same wetland in June 2004. Note the ring of St. John's wort, remnant from the previous year's bloom, that has not yet leafed out. This is the typical field condition and should not be confused for abnormal, stressed, or diseased condition (EB).

Expected Variation (continued)

Deciduous wetland communities will appear green and lush in the summer months, while they will be bare of leaves in the winter. The lack of lush vegetation during the winter months should not be taken as a sign of diseased or stressed vegetation.

Isolated cypress dome in Lower Suwannee National Wildlife Refuge, March 2004. Depicted in photo are deciduous cypress trees, a red maple (far left), and the ecotone composed of evergreen shrubs and saw palmetto (EB).

The same isolated cypress dome in Lower Suwannee National Wildlife Refuge, June 2004. Notice the green cypress canopy after leaf-out, and the red colored maple leaves (EB).

Expected Variation (continued)

Forested wetland communities may completely lack an understory depending on time of year and water depths, while at other times they may be heavily vegetated.

Cypress wetland in north central Florida during the summer months. The understory vegetation is relatively dense (MTB).

The same cypress wetland in winter. The dense understory is absent (MTB).

Expected Variation (continued)

Tidally influenced wetlands may exhibit daily tidal fluctuations, while other wetlands like hydric hammocks exhibit little change seasonally.

Hydric Hammock along the west coast of Florida near Crystal River. Depths of inundation rarely change throughout the year. (MTB)

The Withlachoochee River, a tidally influenced riparian wetland affected by two tidal cycles each day. Water levels fluctuate nearly 1 meter between low and high tides. (MTB)

Expected Variation (continued)

Similar hydrologic conditions may result in very different vegetative communities and standing biomass.

From year to year a wetland may be dominated by different vegetation depending on depths of inundation, fire history, or time of year.

A lake fringe wetland dominated by *Nuphar luteum*. Water depths at this time are about average. (MTB).

The similar lake fringe wetland, with comparable water depths, dominated by *Orontium aquaticum*. (MTB).

Expected Variation (continued)

Nutrient availability has a significant effect on the vegetative community. Oligotrophic (low nutrient) environments result in relatively sparse vegetation, small in stature, and often very slow growing, while eutrophic (high nutrient) environments are often dominated by thick vegetation, robust in stature, and relatively fast growing.

"Hat-rack" cypress (Pond Cypress) in the Big Cypress area.of south Florida The low nutrient environment and frequent fires results in very slow growing, widely spaced cypress trees of small stature. (MTB).

Pond Cypress in the Big Cypress area of south Florida. These trees are growing in a wetland slough with higher nutrient availability. (MTB).

Section Divider

Wetland Field Guides

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Identification Key to Wetlands by FLUCCS Codes
FLUCCS Classification Cross-reference Table
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- **612 Mangrove Swamps**
- **613 Gum Swamps**
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- **615 Stream and Lake Swamps (Bottomland)**
- **616 Inland Ponds and Sloughs**
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- **646 Treeless Hydric Savanna**

Wetland field guides present in Adobe pdf version are provided in Microsoft Word due to their format

FLUCCS Codes for wetlands in Florida

Florida Land Use Cover and Forms Classification System (FLUCCS, January 1999)

610 Wetland Hardwood Forests
- 611 Bay Swamps
- 612 Mangrove Swamps
- 613 Gum Swamps
- 614 Titi Swamps
- 615 Stream and Lake Swamps (Bottomland)
- 616 Inland Ponds and Sloughs
- 617 Mixed Wetland Hardwoods
- 618 Willow and Elderberry
- 619 Exotic Wetland Hardwoods

620 Wetland Coniferous Forests
- 621 Cypress Forests
- 622 Pond Pine
- 623 Atlantic White Cedar
- 624 Cypress-Pine-Cabbage Palm
- 625 Hydric Pine Flatwoods
- 626 Hydric Pine Savanna
- 627 Slash Pine Swamp Forest

630 Wetland Forested Mixed
- 631 Wetland Scrub

640 Vegetated Non-Forested Wetlands
- 641 Freshwater Marshes
- 642 Saltwater Marshes
- 643 Wet Prairies
- 644 Emergent Aquatic Vegetation
- 645 Submergent Aquatic Vegetation
- 646 Treeless Hydric Savanna

Identification Key to Wetlands by FLUCCS Codes

1) Is the community forested (minimum 10 percent closure)?
    a. Yes, go to 2.
    b. No, go to 16.
2) Is the community dominated (66 percent or more) by hardwood species?
    a. Yes, go to 3.
    b. No, go to 9.
3) Is the community dominated by bay species (loblolly bay, sweetbay, swamp bay)?
    a. Yes – **611 Bay Swamp**
    b. No, go to 4.
4) Is the community dominated by mangrove species (black or red mangrove)?
    a. Yes – **612 Mangrove Swamp**
    b. No, go to 5.
5) Is the community dominated by swamp tupelo, water tupelo, or Ogeechee tupelo
    a. Yes – **613 Gum Swamp** (please continue below)
        i. Is the community associated with river, streams, and lakes floodplains and overflow areas?
            Yes - **615 Stream and Lake Swamp (Bottomland)**
            No, go to ii.
        ii. Is the community associated with depression and drainage areas that are not associated with rivers and streams?
            Yes - **616 Inland Ponds Slough**
            No – **613 Gum Swamp**
    b. No, go to 6.
6) Is the community dominated by titi?
    a. Yes – **614 Titi Swamp**
    b. No, go to 7.
7) Is the community dominated by willow (sometimes in association with elderberry)?
    a. Yes – **618 Willow and Elderberry**
    b. No, go to 8.
8) Is the community composed by a variety of hardwood species with an ill defined mixture of species?
    a. Yes – **617 Mixed Wetland Hardwoods** (please continue below)
        i. Is the community associated with river, streams, lakes floodplain and overflow areas?
            Yes - **615 Stream and Lake Swamp (Bottomland)**
            No, go to ii.
        ii. Is the community associated with depression and drainage areas that are not associated with rivers and streams?
            Yes - **616 Inland Ponds Slough**
            No – **617 Mixed Wetland Hardwood**
    b. No, go to 2.

Identification Key to Wetlands by FLUCCS Codes

9) Is the community dominated by coniferous tree species (cypress, pine, cedar)?
    a. Yes, go to 10.
    b. No, go to 15.

10) Is the community dominated by pond cypress or bald cypress
    a. Yes – **621 Cypress**
    b. No, go to 11.

11) Is the community dominated by Atlantic White Cedar?
    a. Yes – **623 Atlantic White Cedar**
    b. No, go to 12.

12) Is the community dominated by pond pine (*Pinus serotina*)?
    a. Yes – **622 Pond Pine**
    b. No, go to 13.

13) Is the community dominated by slash pine (*Pinus elliottii)*?
    a. Yes – **625 Hydric Pine Flatwoods** (also see FLUUCS codes **626 Hydric Pine Savanna** and **627 Slash Pine Swamp Forest**)
    b. No, go to 14.

14) Is the community composed of cypress, pine and cabbage palm, with no one species achieving dominance?
    a. Yes – **624 Cypress-Pine-Cabbage Palm**
    b. No, go to 2.

15) Is the community composed of hardwood and coniferous species, where neither achieves 66 percent dominance?
    a. Yes – **630 Wetland Forested Mixed** (also see FLUCCS code **631 Wetland Scrub**)
    b. No, go to 2.

16) Is the community dominated by floating vegetation or vegetation that is found either partially or completely above the surface of water (ex. water lettuce, spatterdock, water hyacinth, duckweed, water lily)?
    a. Yes – **645 Emergent Aquatic Vegetation**
    b. No, go to 17.

17) Is the community composed of aquatic species growing completely below the surface (ex. hydrilla)?
    a. Yes – **646 Submergent Aquatic Vegetation**
    b. No, go to 18.

18) Is the community dominated by wiregrass and cutthroat grass, and is it usually associated with wet pine flatwoods?
    a. Yes – **646 Treeless Hydric Savannah**
    b. No, go to 19.

19) Is the community dominated by salt-tolerant plants such as smooth cordgrass, blackneedle rush, or saltwart?
    a. Yes – **642 Salt Marsh**
    b. No, go to 20.

20) Is the community found on flat topography, and is it only seasonally inundated or saturated (50-100 days/year)?
    a. Yes – **643 Wet Prairie**
    b. No – **641 Freshwater Marsh**

FLUCCS Classification Cross-reference Table (adapted from Doherty et al. 2000)

FLUCCS	FNAI	SCS	FWC	NWI
610 - *Wetland Hardwood Forests*				
611 - Bay Swamps	Baygall	22-Shrub Bog/Bay Swamp	14-Bay Swamp	PFO3-Palustrine, Forested, Broad-Leaved Evergreen, PFO6Palustrine, Forested Deciduous (mixed)
613 - Gum Swamps	Basin Swamp, Dome Swamp, Floodplain Swamp, Freshwater Tidal Swamp, River Floodplain/Swamp	21-Swamp Hardwood, 12-Wetland Hardwood Hammock	13-Hardwood Swamp	PFO1-Palustrine Forested, Broad-LeavedDeciduous, PFO6-Palustrine, Florested, Deciduous (mixed)
614 - Titi Swamps	Seepage Slope, Bog, Baygall	22-Shrub Bog/Bay Swamp	15-Shrub Swamp	PFO1-Palustrine Forested, Broad-Leaved Deciduous, PFO6-Palustrine, Forested Deciduous (mixed) , PFO6 -Palustrine, Forested Deciduous (mixed)
615 - Stream and Lake Swamps (Bottomland)	Bottomland Forest, Floodplain Forest, Floodplain Swamp, Freshwater Tidal Swamp, River Floodplain Lake/Swamp Lake	20-Bottomland Hardwood	17-Bottomland Hardwood	PFO1-Palustrine Forested, Broad-Leaved Deciduous, PFO6-Palustrine, Forested Deciduous (mixed)
616 - Inland Ponds and Sloughs	Basin Swamp, Dome Swamp	26-Slough	13-Hardwood Swamp	PSS-Palustrine, Scrub Shrub, PFO1-Forested, Broad-Leaved Deciduous, PFO6-Palustrine, Forested, Deciduous (mixed)
617 - Mixed Wetland Hardwoods	Hydric Hammock, Bottomland Forest, Floodplain Forest, Basin Swamp	12-Wetland Hardwood Hammock	13-Hardwood Swamp	PFO1-Palustrine, Forested, Broad-Leaved Deciduous, PFO6- Palustrine, Forested, Deciduous (mixed)
618 - Willow and Elderberry	Bog, Slough, Floodplain Forest	22-Shrub Bog/Bay Swamp, 21-Swamp Hardwood	15-Shrub Swamp	PSS- Palustrine, Scrub Shrub, PFO1-Palustrine, Forested, Broad-Leaved Deciduous, PFO6-Palustrine, Forested, Deciduous (mixed)
619 - Exotic Wetland Hardwood	Bog, Slough, Floodplain Forest	22-Shrub Bog/Bay Swamp, 21-Swamp Hardwood	15-Shrub Swamp	PSS-Palustrine, Scrub Shrub, PFO6-Palustrine, Forested, Deciduous (mixed)
620 - *Wetland Coniferous Forests*				
621 - Cypress	Dome Swamp, Basin Swamp, Strand Swamp, Floodplain Swamp, Marl Prairie	16-Scrub Cypress, 17-Cypress Swamp	12-Cypress Swamp	PFO2-Palustrine, Forested, Needle-Leaved Deciduous, PFO6-Palustrine, Forested, Deciduous (mixed
622 - Pond Pine	Wet Flatwoods	6-7-N/S Florida Flatwoods, 20-Bottomland Hardwood	3-Pinelands	PFO4- Palustrine, Forested, Needle-Leaved Evergreen, PFO7-Palustrine, Forested, Evergreen (mixed)
623 - Atlantic White Cedar	Bottomland Forest, Freshwater Tidal Swamp	20-Bottomland Hardwood, 21-Swamp Hardwood	17-Bottomland Hardwood	PFO4-Palustrine, Forested, Needle-Leaved Evergreen, PFO7-Palustrine, Forested, Evergreen (mixed)
624 - Cypress - Pine-Cabbage Palm	Wet Flatwoods, Freshwater Tidal Swamp	8-Cabbage Palm Flatwoods, 21-Swamp Hardwood	17-Bottomland Hardwood	PFO6- Palustrein, Forested, Deciduous (mixed), PFO7-Palustrine, Forested, Evergreen (mixed)
625 - Hydric Pine Flatwoods	Wet Flatwoods	6-7-N/S Florida Flatwoods	3-Pinelands	PFO4-Palustrine, Forested, Needle-Leaved Evergreen
626 - Hydric Pine Savanna	Wet Flatwoods	7-S Florida Flatwoods	3-Pinelands	PFO4-Palustrine, Forested, Needle-Leaved Evergreen
627 - Slash Pine Swamp Forest	Wet Flatwoods	6-7-N/S Florida Flatwoods	3-Pinelands	PFO4-Palustrine, Forested, Needle-Leaved Evergreen

FLUCCS Classification Cross-reference Table

FLUCCS	FNAI	SCS	FWC	NWI
630 - *Wetland Forested Mixed*				
631 - Wetland Scrub	Bog, Wet Flatwoods, Bottomland Forest, Floodplain Forest, Flatwoods/Prairie/ Marsh Lake	22-Shrub Bog/Bay Swamp	15-Shrub Swamp	PSS-Palustrine, Scrub Shrub
640 - *Vegetated Non-Forested Wetlands*				
641 - Freshwater Marshes	Basin Marsh, Depression Marsh, Swale, Marl Prairie, Flatwoods/Prairie/Marsh Lake	25-Freshwater Marsh, 24-Sawgrass Marsh	11-Freshwater Marsh and wet Prairie	PEM- Palustrine, Emergent, R2EM-Riverine,Lower Perennial, Emergent, non-persistent, R4SB-Riverine, Intermittent, Streambed, L2EM-Lacustrine, Littoral, Emergent, Non-Persistent
643 - Wet Prairies	Wet Prairie, Marl Prairie, Seepage Slope, Swale, Basin Marsh, Flatwwoods/Prairie/Marsh Lake	23-Pitcher Plant Bog, 25-Freshwater Marsh	11-Freshwater Marsh and wet Prairie	PEM-Palustrine, Emergent, R2EM- Riverine, Lower Perennial,Emergent, non-persistant, R4SB-Riverine Intermittent, Streambed, L2EM-Lacustrine, Littral, Emergent, non-presistant
644 - Emergent Aquatic Vegetation	Basin Marsh, Depression Marsh, Floodplain Marsh, Flatwoods/Prairie/Marsh Lake	25-Freshwater Marsh, 24-Sawgrass Marsh	11-Freshwater Marsh and wet Prairie	R2AB-Riverine, Lower Perennial, Aquatic Bed, R3AB-Riverine, Upper Perennial, Aquatic Bed, L1AB-Lacustrine, Limnetic, Aquatic Bed, L2AB-Lacustrine, Littoral, Aquatic Bed, PAB3-Palustrine, Aquatic Bed, Rooted Vascular, PAB4-Palustrine, Aquatic Bed, Floating Vascular
645 - Submerged Aquatic Vegetation	River Floodplain Lake/Swamp Lake	25-Freshwater Marsh	11-Freshwater Marsh and wet Prairie	R2AB- Riverine, Lower Perennial, Aquatic Bed, R3AB- Riverine, Upper Perennial, Aquatic Bed, L1AB-Lacustrine, Limnetic, Aquatic Bed, L2AB-Lacustrine, Littoral, Aquatic Bed, PAB3-Palustrine, Aquatic Bed, Rooted Vascular
646 - Treeless Hydric Savanna	Wet Flatwoods	26-Slough	3-Pinelands, 11-Freshwater marsh and wet prarie	PFO4-Palustrine, Forested, Needle-Leaved Evergreen
653 - Intermittent Ponds	Depression Marsh	25-Freshwater Marsh, 26-Slough	11-Freshwater Marsh and wet Prairie	PEM1-Palustrine, Forested, Broad-Leaved Deciduous, PAB4- Palustrine, Aquatic Bed, Floating Vascular

FNAI. Florida Natural Areas Inventory. 1990. Guide to the natural communities of Florida. Prepared by FNAI and Florida Department of Natural Resources, Tallahassee FL. 111 pp.

SCS. Soil Conservation Service, U.S. Department of Agriculture. 1984. 26 Ecological Communities of Florida.

FWC. Florida Fish and Wildlife Conservation Service. Land Cover map.

NWI. National Wetlands Inventory. Cowardin, L.M., V. Carter, F.C. Golet and E.T. Laroe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. U.S. Fish and Wildlife Service / Department of the Interior, Washington, D.C. 103 pp.

Section Divider

UMAM Scoring Worksheet ~ Location and Landscape Support

Guidance:. *This worksheet is only a summary and is not intended to replace the rule. The rule should be used to resolve any question or dispute.*

	Optimal (10)	Moderate (7)	Minimal (4)	Not Present (0)
Location and Landscape Support	full opportunity to perform beneficial functions at optimal level	opportunity to perform beneficial functions is limited to 70% of optimal ecological value	opportunity to perform beneficial functions is limited to 40% of optimal ecological value	provides no habitat support or opportunity to provide benefits to fish and wildlife
a. Support to wildlife by outside habitats	full range of habitats needed to support all wildlife species	optimal support for most, but not all wildlife species	fail to provide support for some, or minimal support for many wildlife species	no habitat support for wildlife
b. Invasive exotics or other invasive plant species in proximity of the assessment area	not present	present but cover is minimal and has minimal adverse effects	majority of plant cover consists of invasive exotics that adversely affect functions	predominance of plant cover consists of invasive exotics so that little or no function is provided
c. Wildlife access to and from outside – distance and barriers	not limited by distance or barriers	partially limited by distance or barriers	substantially limited by distance or barriers	precluded by distance or barriers
d. Functions that benefit fish & wildlife downstream – distance or barriers	not limited by distance or barriers	somewhat limited by distance or barriers that reduce opportunity to provide benefits	limited by distance or barriers that substantially reduce opportunity to provide benefits	functions not present
e. Impacts of land uses outside assessment area to fish and wildlife	no adverse impacts on wildlife	minimal adverse impacts on wildlife	significant adverse impacts on wildlife	severe adverse impacts on wildlife
f. Benefits to downstream or other hydrologically connected areas	opportunity is not limited by hydrologic impediments or flow restrictions	limited by hydrologic impediments or flow restrictions so that benefits are provided with lesser freq. or magnitude	limited by hydrologic impediments so that benefits are rarely provided or are provided at greatly reduced levels	no opportunity to provide benefits due to hydrologic impediments or flow restrictions
g. Benefits to downstream habitats from discharges	downstream habitats are critically or solely dependent on discharges	downstream habitats derive significant benefits from discharges	downstream habitats derive minimal benefits from discharges	downstream habitats derive negligible or no benefits from discharges
h. Protection of wetland functions by upland mitigation assessment areas	optimal protection of wetland functions	significant, but suboptimal, protection of wetland functions	minimal protection to wetland functions	no protection of wetland function

UMAM Scoring Worksheet ~ Water Environment

	Optimal (10)	Moderate (7)	Minimal (4)	Not Present (0)
Water Environment	hydrology and water quality fully supports functions and provides benefits to fish and wildlife at optimal capacity	hydrology and water quality supports functions and provides benefits at 70% of optimal capacity	hydrology and water quality supports functions and provides benefits at 40% of optimal capacity	hydrology and water quality does not support functions and provides no benefits to fish and wildlife
a. Water levels and flows	appropriate	slightly higher or lower than appropriate	moderately higher or lower than appropriate	extreme degree of deviation
b. Water level indicators	distinct and consistent with expected	not as distinct or as consistent as expected	not distinct and not consistent with expected	not present or greatly inconsistent with expected hydrologic conditions
c. Soil moisture	appropriate with no evidence of soil desiccation, oxidation or subsidence	minimal soil oxidation or subsidence; soils are drier than expected	strong evidence of soil desiccation, oxidation or subsidence	strong evidence of substantial soil desiccation, oxidation or subsidence
d. Soil erosion or deposition	not atypical or indicative of altered flow rates	minor alteration in flow rates or points of discharge	atypical and indicative of alterations in flow rates or points of discharge	greatly atypical and indicative of greatly altered flow rates or points of discharge
e. Evidence of fire history	not atypical frequency or severity due to excessive dryness	fire frequency or severity may be more than expected	frequency or severity much more than expected, possibly due to dryness	great deviation from typical, due to extreme dryness
f. Vegetation - community zonation	appropriate in all strata	inappropriate in some strata	inappropriate in most strata	inappropriate in all strata
g. Vegetation – hydrologic stress	no signs of hydrologic stress such as excessive mortality, leaning or fallen tress, thinning canopy, insect damage or disease associated with hydrologic stress	slightly greater than normal mortality, leaning or fallen tress, thinning canopy, or signs of insect damage or disease associated with hydrologic stress	strong evidence of greater than normal mortality, leaning or fallen tress, thinning canopy, or signs of insect damage or disease associated with hydrologic stress	strong evidence of much greater than normal mortality, leaning or fallen tress, thinning of canopy, or signs of insect damage or disease associated with hydrologic stress
h. Use by animal species with specific hydrological requirements	consistent with expected hydrological conditions	less than expected	greatly reduced	lacking
i. Plant community composition – species tolerant of and associated with water quality degradation or flow alteration	Plant community composition is not characterized by species tolerant of and associated with water quality degradation or flow alteration	some species tolerant of and associated with water quality degradation or flow alteration	much of the community consists of species tolerant of and associated with water quality degradation or flow alteration	community consists predominantly of species tolerant of and associated with water quality degradation or flow alteration
j. Direct observation of standing water	no water quality degradation such as discoloration, turbidity, or oil sheen	slight water quality degradation such as discoloration, turbidity, or oil sheen	moderate water quality degradation such as discoloration, turbidity, or oil sheen	significant water quality degradation such as obvious discoloration, turbidity, or oil sheen
k. Existing water quality data	conditions are optimal for community type	slight deviation from normal, with minimal ecological effects	moderate deviation from normal, with expected ecological effects	large deviation from normal, with expected adverse ecological effects
l. Water depth, wave energy, currents and light penetration	optimal for community type	generally sufficient but expected to cause some changes in species, age classes and densities	not well suited for and expected to cause significant changes in species, age classes and densities	inappropriate for community type

UMAM Scoring Worksheet ~ Community Structure: *Terrestrial*

Community Structure	Optimal (10)	Moderate (7)	Minimal (4)	Not Present (0)
1. Vegetation and Structural Habitat	vegetation community and physical structure provide conditions which support an optimal level of function to benefit fish and wildlife	vegetation community and physical structure limited to 70% of optimal level of function to benefit fish and wildlife in Part I	vegetation community and physical structure limited to 40% of optimal level of function to benefit fish and wildlife in Part I	vegetation community and physical structure do not provide function to benefit fish and wildlife in Part I
I. Plant species in the canopy, shrub, or ground stratum	all or nearly all appropriate and desirable	majority appropriate and desirable	majority inappropriate or undesirable	no appropriate or desirable species
II. Invasive exotics or other invasive plant species	not present	present, but cover is minimal	majority of plant cover	high presence and cover
III. Regeneration & recruitment	normal and natural	near-normal	minimal evidence	no evidence
IV. Age & size distribution	typical of type of system with no deviation from normal patterns of succession or mortality	no indication of permanent deviation, but may have had temporary deviations or impacts to age and size distribution	atypical and indicative of permanent deviation from normal successional pattern, with greater than expected mortality	high percentage of dead and dying vegetation, with no typical age and size distribution
V. Density and quality of coarse woody debris, snag, den, and cavity	optimal structural habitat	slightly lower or slightly greater than normal quantity	not present or greater than normal because vegetation is dead or dying	not present or exist only because native vegetation is dead or dying
VI. Plant condition	good condition, with very little to no evidence of chlorotic or spindly growth or insect damage	generally good, with little evidence of chlorotic or spindly growth or insect damage	generally poor, with evidence of chlorotic or spindly growth or insect damage	overall very poor, with strong evidence of chlorotic or spindly growth or insect damage
VII. Land management practices	optimal for long term viability of plant community	generally appropriate some possible fire suppression or water control features that have caused a shift in plant community	partial removal or alteration of natural structure, or introduction or artificial features, such as furrow or ditches	removal or alteration of natural structure, or introduction or artificial features, such as furrow or ditches
VIII. Topographic features such as refugia ponds, creek channels, flats or hummocks	present and normal	slightly less than optimal	reduction in extent of topographic features from what is normal	lack of topographic features that are normal for the area being assessed
IX. Siltation or algal growth in submerged aquatic plant communities	no evidence	minor degree of siltation or algal growth	moderate degree of siltation or algal growth	high degree of siltation or algal growth
X. Upland mitigation area - level of habitat and support for fish and wildlife in the associated wetlands or surface waters	optimal level of habitat and life history support	high, but less than optimal level of habitat and life history support	moderate level of habitat and life history support	little or no habitat and life history support

UMAM Scoring Worksheet ~ Community Structure: *Benthic*

Community Structure	**Optimal (10)**	**Moderate (7)**	**Minimal (4)**	**Not Present (0)**
2. Benthic and Sessile Communities	benthic and sessile communities provide optimal support for all functions typical of the assessment area and provide optimal benefit to fish and wildlife	benthic and sessile communities provide functions at 70% of optimal level	benthic and sessile communities provide functions at 40% of optimal level	benthic and sessile communities do not support functions or provide benefits
I. Species number and diversity of benthic organisms	appropriate species number and diversity optimal for type of system	majority of species are appropriate with number and diversity slightly less than normal	appropriate species greatly decreased	lack of appropriate species, any appropriate species in poor condition
II. Non-native or inappropriate species	not present	represent a minority	majority	dominant
III. Regeneration, recruitment and age distribution	optimal	slightly less than expected	minimal	no indication
IV. Condition of appropriate species	good, with typical biomass	generally good	substantial number dying or in poor condition	not present
V. Structural features	typical with no evidence of past physical damage	typical, or with little evidence of past physical damage	atypical	structural integrity very low or non-existent, evidence or serious physical damage
VI. Topographic features such as relief, stability, and interstitial spaces (hardbottom and reef communities) or snags and coarse woody debris (riverine systems)	typical and optimal	slight deviation from expected	greatly reduced	lacking
VII. Spawning or nesting habitats	optimal	less than expected	few are available	none

Section Divider

62-345.500 Assessment and Scoring—Part II

(1) Utilizing the frame of reference established in Part I, the information obtained under this part (Part II) must be used to determine the degree to which the assessment area provides the functions identified in Part I and the amount of function lost or gained by the project. Each impact assessment area and each mitigation assessment area must be assessed under two conditions.

(a) Current condition or, in the case of preservation mitigation, without preservation--For assessment areas where previous impacts that affect the current condition are temporary in nature, consideration will be given to the inherent functions of these areas relative to seasonal hydrologic changes, and expected vegetation regeneration and projected habitat functions if the use of the area were to remain unchanged. When evaluating impacts to a previously permitted mitigation site that has not achieved its intended function, the reviewing agency shall consider the functions the mitigation site was intended to offset and any delay or reduction in offsetting those functions that may be caused by the project. Previous construction or alteration undertaken in violation of Part IV, Chapter 373, F.S., or Sections 403.91-.929, F.S. (1984 Supp.), as amended, or rule, order or permit adopted or issued thereunder, will not be considered as having diminished the condition and relative value of a wetland or surface water, when assigning a score under this part. When evaluating wetlands or other surface waters that are within an area that is subject to a recovery strategy pursuant to Rule 40D-80, F.A.C., impacts from water withdrawals will not be considered when assigning a score under this part.

(b) "With mitigation" or "with impact"--The "with mitigation" and "with impact" assessments are based on the reasonably expected outcome, which may represent an increase, decrease, or no change in value relative to current conditions. For the "with impact" and "with mitigation" assessments, the evaluator will assume that all other necessary regulatory authorizations required for the proposed project have been obtained and that construction will be consistent with such authorizations. The "with mitigation" assessment will be scored only when reasonable assurance has been provided that the proposed plan can be conducted.

62-345.500 Assessment and Scoring—Part II (continued)

(2) Upland mitigation assessment areas shall be scored using the location and community structure indicators listed in subsection 62-345.500(6), F.A.C. Scoring of these indicators for the upland assessment areas shall be based on benefits provided to the fish and wildlife of the associated wetlands or other surface waters, considering the current or anticipated ecological value of those wetlands and other surface waters.

(a) For upland preservation, the gain in ecological value is determined by the mathematical difference between the score of the upland assessment area with the proposed preservation measure and the upland assessment area without the proposed preservation measure. The resulting delta is then multiplied by the preservation adjustment factor contained in subsection 62-345.500(3), F.A.C.

(b) For upland enhancement or restoration, the value provided shall be determined by the mathematical difference between the score of the upland assessment area with the proposed restoration or enhancement measure and the current condition of the upland assessment area.

(c) For uplands proposed to be converted to wetlands or other surface waters through creation or restoration measures, the upland areas shall be scored as "zero" in their current condition. Only the "with mitigation" assessment shall be scored in accordance with the indicators listed in subsection 62-345.500(6), F.A.C.

62-345.500 Assessment and Scoring—Part II (continued)

(3)(a) When assessing preservation, the "with mitigation" assessment shall consider the potential of the assessment area to perform current functions in the long term, considering the protection mechanism proposed, and the "without preservation" assessment shall evaluate the assessment area's functions considering the extent and likelihood of what activities would occur if it were not preserved, the temporary or permanent effects of those activities, and the protection provided by existing easements, restrictive covenants, or state, federal, and local rules, ordinances and regulations. The gain in ecological value is determined by the mathematical difference between the Part II scores for the "with mitigation" and "without preservation" (the delta) multiplied by a preservation adjustment factor. The preservation adjustment factor shall be scored on a scale from 0 (no preservation value) to 1 (optimal preservation value), on one-tenth increments. The score shall be assigned based on the applicability and relative significance of the following considerations:

1. The extent to which proposed management activities within the preserve area promote natural ecological conditions such as fire patterns or the exclusion of invasive exotic species.
2. The ecological and hydrological relationship between wetlands, other surface waters, and uplands to be preserved.
3. The scarcity of the habitat provided by the proposed preservation area and the degree to which listed species use the area.
4. The proximity of the area to be preserved to areas of national, state, or regional ecological significance, such as national or state parks, Outstanding Florida Waters, and other regionally significant ecological resources or habitats, such as lands acquired or to be acquired through governmental or non-profit land acquisition programs for environmental conservation, and whether the areas to be preserved include corridors between these habitats.
5. The extent and likelihood of potential adverse impacts if the assessment area were not preserved.

(b) The preservation adjustment factor is multiplied by the mitigation delta assigned to the preservation proposal to yield an adjusted mitigation delta for preservation.

Location and Landscape Support - 62-345.500(6)(a), FAC

(a) Location and landscape support – The value of functions provided by an assessment area to fish and wildlife are influenced by the landscape position of the assessment area and its relationship with surrounding areas. While the geographic location of the assessment area does not change, the ecological relationship between the assessment area and surrounding landscape may vary from the current condition to the "with impact" and "with mitigation" conditions. Many species that nest, feed or find cover in a specific habitat or habitat type are also dependent in varying degrees upon other habitats, including upland, wetland and other surface waters, that are present in the regional landscape. For example, many amphibian species require small isolated wetlands for breeding pools and for juvenile life stages, but may spend the remainder of their adult lives in uplands or other wetland habitats. If these habitats are unavailable or poorly connected in the landscape or are degraded, then the value of functions provided by the assessment area to the fish and wildlife identified in Part I is reduced. The location of the assessment area shall be considered to the extent that fish and wildlife utilizing the area have the opportunity to access other habitats necessary to fulfill their life history requirements. The availability, connectivity, and quality of offsite habitats, and offsite land uses which might adversely impact fish and wildlife utilizing these habitats, are factors to be considered in assessing the location of the assessment area. The location of the assessment area shall be considered relative to offsite and upstream hydrologic contributing areas and to downstream and other connected waters to the extent that the diversity and abundance of fish and wildlife and their habitats is affected in these areas. The opportunity for the assessment area to provide off site water quantity and quality benefits to fish and wildlife and their habitats downstream and in connected waters is assessed based on the degree of hydrologic connectivity between these habitats and the extent to which offsite habitats are affected by discharges from the assessment area. It is recognized that isolated wetlands lack surface water connections to downstream waters and as a result, do not perform certain functions (e.g., detrital transport) to benefit downstream fish and wildlife; for such wetlands, this consideration does not apply.

Water Environment - 62-345.500(6)(b), FAC

(b) Water Environment – The quantity of water in an assessment area, including the timing, frequency, depth and duration of inundation or saturation, flow characteristics, and the quality of that water, may facilitate or preclude its ability to perform certain functions and may benefit or adversely impact its capacity to support certain wildlife. Hydrologic requirements and tolerance to hydrologic alterations and water quality variations vary by ecosystem type and the wildlife utilizing the ecosystem. Hydrologic conditions within an assessment area, including water quantity and quality, must be evaluated to determine the effect of these conditions on the functions performed by area and the extent to which these conditions benefit or adversely affect wildlife. Water quality within wetlands and other surface waters is affected by inputs from surrounding and upstream areas and the ability of the wetland or surface water system to assimilate those inputs. Water quality within the assessment area can be directly observed or can be inferred based on available water quality data, on-site indicators, adjacent land uses and estimated pollutant removal efficiencies of contributing surface water management systems. Hydrologic conditions in the assessment area are a result of external hydrologic inputs and the water storage and discharge characteristics of the assessment area. Landscape features outside the assessment area, such as impervious surfaces, borrow pits, levees, berms, swales, ditches, canals, culverts, or control structures, may affect hydrologic conditions in the assessment area. Surrounding land uses may also affect hydrologic conditions in the assessment area if these land uses increase discharges to the assessment area, such as agricultural discharges of irrigation water, or decrease discharges, such as wellfields or mined areas.

Community Structure - 62-345.500(6)(c), FAC

(c) Community Structure – Each impact and mitigation assessment area is evaluated with regard to its characteristic community structure. In general, a wetland or other surface water is characterized either by plant cover or by open water with a submerged benthic community. Wetlands and surface waters characterized by plant cover will be scored according to subparagraph 62-345.500(6)(c)1., F.A.C., while benthic communities will be assessed in accordance with subparagraph 62-345.500(6)(c)2., F.A.C. If the assessment area is a mosaic of relatively equal parts of submerged plant cover and a submerged benthic community, then both of these indicators will be scored and those scores averaged to obtain a single community structure score.

Community Structure - 62-345.500(6)(c), FAC

1. Vegetation and structural habitat – The presence, abundance, health, condition, appropriateness, and distribution of plant communities in surface waters, wetlands, and uplands can be used as indicators to determine the degree to which the functions of the community type identified are provided. Vegetation is the base of the food web in any community and provides many additional structural habitat benefits to fish and wildlife. In forested systems, for example, the vertical structure of trees, tree cavities, standing dead snag, and fallen logs provide forage, nesting, and cover habitat for wildlife. Topographic features, such as flats, deeper depressions, hummocks, or tidal creeks also provide important structure for fish and wildlife habitat. Overall condition of a plant community can often be evaluated by observing indicators such as dead or dying vegetation, regeneration and recruitment, size and age distribution of trees and shrubs, fruit production, chlorotic or spindly plant growth, structure of the vegetation strata, and the presence, coverage and distribution of inappropriate plant species. Human activities such as mowing, grazing, off-road vehicle activity, boat traffic, and fire suppression constitute more direct and easily observable impacts affecting the condition of plant communities. Although short-term environmental factors such as excessive rainfall, drought, and fire can have temporary impacts, human activities such as flooding, drainage via groundwater withdrawal and conveyance canals, or construction of permanent structures such as seawalls in an aquatic system can permanently damage these systems. The plant community should be evaluated to consider whether natural successional patterns for the community type are permanently altered. Inappropriate plants, including invasive exotic species, other invasive species, or other species atypical of the community type being evaluated, do not support the functions attributable to that community type and can out-compete and replace native species. Native upland and wetland vegetation, such as wax myrtle, pines and willow, which are not typically considered as invasive, can occur in numbers and coverage not appropriate for the community type and can serve as indicators of disturbance. The relative degree of coverage by inappropriate species, inappropriate vegetation strata, condition of vegetation, and both biotic and abiotic structure all provide an indication of the degree to which the functions anticipated for the community type identified are being provided.

Community Structure - 62-345.500(6)(c), FAC

2. Benthic Communities – This indicator is intended to be used in marine or freshwater aquatic systems that are not characterized by a plant community, and is not intended to be used in wetlands that are characterized by a plant community. The benthic communities within nearshore, inshore, marine and freshwater aquatic systems are analogous to the vascular plant communities of terrestrial wetland systems in that they provide food and habitat for other biotic components of the system and function in the maintenance of water quality. For example, oyster bars and beds in nearshore habitats and estuaries filter large amounts of particulate matter and provide food and habitat for a variety of species, such as boring sponges, mollusks, and polycheate worms. Live hardbottom community composition varies with water depths and substratum, but this community type contributes to the food web, as well as providing three-dimensional structure through the action of reef-building organisms and rock-boring organisms and water quality benefits from filter-feeding organisms. The distribution and quality of coral reefs reflect a balance of water temperature, salinity, nutrients, water quality, and presence of nearby productive mangrove and seagrass communities. Coral reefs contribute to primary productivity of the marine environment as well as creating structure and habitat for a large number of organisms. Even benthic infauna of soft-bottom systems stabilize the substrate, provide a food source, and serve as useful indicators of water quality. All of these communities are susceptible to human disturbance through direct physical damage, such as dredging, filling, or boating impacts, and indirect damage through changes in water quality, currents, and sedimentation.

62-345.500 - Assessment and Scoring - Part II

(7) The Part II score for an impact, wetland, or surface water mitigation assessment area shall be determined by summing the scores for each of the indicators and dividing that value by 30 to yield a number between 0 and 1. For upland mitigation assessment areas, the Part II score shall be determined by summing the scores for the location and community structure indicators and dividing that value by 20 to yield a number between 0 and 1.

62-345.300 - Assessment Method Overview and Guidance

(5) The degree of ecological change on a site must be determined for both the impact and mitigation assessment areas by the mathematical difference in the Part II scores established pursuant to section 62-345.500, FAC, between the current condition and with-impact condition assessment, and between the current condition or without preservation and the with mitigation condition assessments. This difference is termed the "delta." This formula must be applied to all assessment areas within both proposed impact sites and mitigation sites (including mitigation banks and regional offsite mitigation areas when applicable).

62-345.600 *Time Lag*, Risk, and Mitigation Determination.

(1) Time lag shall be incorporated into the gain in ecological value of the proposed mitigation as follows.

(a) The time lag associated with mitigation means the period of time between when the functions are lost at an impact site and when those functions are replaced by the mitigation. In general, the time lag varies by the type and timing of mitigation in relation to the impacts. Wetland creation generally has a greater time lag to establish certain wetland functions than most enhancement activities. Forested systems typically require more time to establish characteristic structure and function than most herbaceous systems. Factors to consider when assigning time lag include biological, physical, and chemical processes associated with nutrient cycling, hydric soil development, and community development and succession. There is no time lag if the mitigation fully offsets the anticipated impacts prior to or at the time of impact.

(b) The time lag factor under this section shall be scored as 1 when evaluating mitigation for proposed phosphate and heavy mineral mining activities in accordance with this rule to determine compliance with section 373.414(6)(b), F.S.

(c)For the purposes of this rule, the time lag, in years, is related to a factor (T-factor) as established in Table 1 below, to reflect the additional mitigation needed to account for the deferred replacement of wetland or surface water functions.

62-345.600 - *Time Lag*, Risk, and Mitigation Determination. (continued)

(d) The "Year" column in Table 1 represents the number of years between the time the wetland impacts are anticipated to occur and the time when the mitigation is anticipated to fully offset the impacts, based on reasonable scientific judgment of the proposed mitigation activities and the site specific conditions.

TABLE 1.

Year		T-factor
< or = 1		1
2		1.03
3		1.07
4		1.10
5		1.14
6 – 10		1.25
11 – 15		1.46
16 – 20		1.68
21 – 25		1.92
26 – 30		2.18
31 – 35		2.45
36 – 40		2.73
41 – 45		3.03
46 – 50		3.34
51 – 55		3.65
>55		3.91

62-345.600 - Time Lag, *Risk*, and Mitigation Determination.

(2) Mitigation **risk** shall be evaluated to account for the degree of uncertainty that the proposed conditions will be achieved, resulting in a reduction in the ecological value of the mitigation assessment area. In general, mitigation projects which require longer periods of time to replace lost functions or to recover from potential perturbations will be considered to have higher risk that those which require shorter periods of time. The assessment area shall be scored on a scale from 1 (for no or *de minimus* risk) to 3 (high risk), on quarter-point (0.25) increments. A score of one would most often be applied to mitigation conducted in an ecologically viable landscape and deemed successful or clearly trending towards success prior to impacts, whereas a score of three would indicate an extremely low likelihood of success based on the ecological factors below. A single risk score shall be assigned, considering the applicability and relative significance of the factors below, based upon consideration of the likelihood and the potential severity of reduction in ecological value due to these factors.

(a) The vulnerability of the mitigation to and the extent of the effect of different hydrologic conditions than those proposed, considering the degree of dependence on mechanical or artificial means to achieve proposed hydrologic conditions, such as pumps or adjustable weirs, effects of water withdrawals, diversion or drainage features, reliability of the hydrologic data, modeling, and design, unstable conditions due to waves, wind, or currents, and the hydrologic complexity of the proposed community. Systems with relatively simple and predictable hydrology, such as tidal wetlands, would entail less risk than complex hydrological systems such as seepage slopes or perched wetlands;

62-345.600 Time Lag, *Risk*, and Mitigation Determination.

(b) The vulnerability of the mitigation to the establishment and long-term viability of plant communities other than that proposed, and the potential reduction in ecological value which might result, considering the compatibility of the site soils and hydrologic conditions with the proposed plant community, planting plans, and track record for community or plant establishment method;

(c) The vulnerability of the mitigation to colonization by invasive exotic or other invasive species, considering the location of recruitment sources, the suitability of the site for establishment of these species, the degree to which the functions provided by plant community would be affected;

(d) The vulnerability of the mitigation to degraded water quality, considering factors such as current and future adjacent land use, and construction, operation, and maintenance of surface water treatment systems, to the extent that ecological value is affected by these changes;

(e) The vulnerability of the mitigation to secondary impacts due to its location, considering potential land use changes in surrounding area, existing protection provided to surrounding areas by easements, restrictive covenants, or federal, state, or local regulations, and the extent to which these factors influence the long term viability of functions provided by the mitigation site; and

(f) The vulnerability of the mitigation to direct impacts, considering its location and existing and proposed protection provided to the mitigation site by easements, restrictive covenants, or federal, state, or local regulations, and the extent to which these measures influence the long term viability of the mitigation site.

62-345.600 Time Lag, Risk, and *Mitigation Determination*.

(3) The relative gain of functions provided by a mitigation assessment area must be adjusted for time lag and risk using the following formula: Relative functional gain (RFG) = Mitigation Delta (or adjusted mitigation delta for preservation)/(risk x t-factor). The loss of functions provided by impact assessment areas is determined using the following formula: Functional loss (FL) = Impact Delta x Impact Acres.

(a) To determine the number of potential mitigation bank credits a bank or regional offsite mitigation area can provide, multiply the relative functional gain (RFG) times the acres of the mitigation bank or regional offsite mitigation assessment area scored. The total amount of credits is the summation of the potential RFG for each assessment area.

(b) To determine the number of mitigation bank credits or amount of regional offsite mitigation needed to offset impacts, when the bank or regional offsite mitigation area is assessed in accordance with this rule, calculate the functional loss (FL) of each impact assessment area. The total number of credits required is the summation of the calculated functional loss for each impact assessment area. Neither time lag nor risk is applied to determining the number of mitigation bank credits or amount of mitigation necessary to offset impacts when the bank or regional offsite mitigation area has been assessed under this rule.

(c) To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there is more than one impact assessment area or more than one mitigation assessment area, the total functional loss and total relative functional gain is determined by summation of the functional loss and relative functional gain for each assessment area.

Section Divider